6/9/2018

Chennai

From

The Course Coordinator

Certificate Program in Sanitary Inspector

Department of Surgery

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Program in Sanitary Inspector

Respected sir,

With reference to subject mentioned above, the Surgery proposes to conduct a value-added course titled: Certificate Program in Sanitary Inspector

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 6/12/2018

R. No 211/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Surgery

The Department of **Surgery** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Program in Sanitary Inspector from 7/9/2018 for a period of 3 weeks. Interested students can approach the Head of Surgery department and Course Coordinator, for registration and for further details on or before 7/12/2018.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE PROGRAM IN SANITARY INSPECTOR

Training Outcomes

This course trains students to manage health and sanitation aspects in a variety of organizations and sectors, thus enabling them to safeguard public health and the environment.

Learning Objectives

- Should have knowledge of food safety and the ability to apply it to establishments such as restaurants.
- Apply the principles of natural and mechanical ventilation, as needed.
- Should be able to dispose of waste (solid, liquid and sewage) appropriately with minimum harm to the environment.
- Applying the techniques of communicable diseases and their prevention
- Should be able to survey housing colonies to assess sanitary standards and prescribe corrective measures.
- Should assist in sanitation management at fairs and festivals.
- Should understand communicable diseases and their prevention.
- Should be able to assist in or independently conduct disinfection of areas in a hospital such as wards, operation theatres, labour rooms, etc.
- Conducting programmes on personal hygiene.
- Should be able to conduct visits to various establishments for assessment of cleanliness and hygienic practices and ensure the desirable standards are maintained.

COURSE COORDINATOR: ASSOCIATE PROFESSOR / ASSISTANT PROFESSOR OF COMMUNITY MEDICINE

SYLLABUS

Topic	Faculty	Hours allotted
INTRODUCTION	Assistant Professor of Community Medicine	2 hours
First Aid and Basic Medicine	Associate Professor of Community Medicine	2 hours
Public Healthcare and Primary Healthcare	Assistant Professor of Community Medicine	2 hours
Healthcare Statistics and Population Education	Associate Professor of Community Medicine	2 hours
Environmental Sanitation	Assistant Professor of Community Medicine	2 hours
Communication and Health Education	Associate Professor of Community Medicine	2 hours
Behavioral Science	Assistant Professor of Community Medicine	2 hours

Waste Management	Associate Professor of Community Medicine	2 hours
Nutrition, Hygiene, Basic Pharmacology, Basic Microbiolog	Assistant Professor of Community Medicine	2 hours
Disaster Management and Rehabilitation	Associate Professor of Community Medicine	2 hours
communicable diseases and their prevention	Assistant Professor of Community Medicine	2 hours
communicable diseases and their prevention	Associate Professor of Community Medicine	2 hours
Viva voce	Assistant Professor of Community Medicine	2 hours
Written test	Associate Professor of Community Medicine	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. DIVYA C REDDY V has completed the value added course on Certificate Program in Sanitary Inspector conducted by Surgery at Sree Balaji Medical College & Hospital, Chennai held during 7/9/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH



Certificate Program in Sanitary Inspector

S. No	Regn. No.	Name
1	U18MB001	AARON RAJ K
2	U18MB002	ABHISHEK ARORA
3	U18MB003	ABHISHEK BHADANA
4	U18MB004	ABHISHEK RAMACHANDRAN V
5	U18MB005	ABINAYA M (05.10.2000)
6	U18MB006	ABINAYA M (12.11.2000)
7	U18MB007	ABINAYA S
8	U18MB008	ABINI M
9	U18MB009	ABIRAMI R
10	U18MB010	AFIALI H G
11	U18MB011	AFRID AHAMED
12	U18MB012	AGNES CELSHEYA A
13	U18MB013	AISHVARYAA T V
14	U18MB014	AISHWARYA M
15	U18MB015	AISWARYAA B
16	U18MB016	AJEETH KUMAR N
17	U18MB017	AKANKSHA SINGH
18	U18MB018	AKASH RAJ J
19	U18MB019	AKSHARA C
20	U18MB020	AKSHARA R K
21	U18MB021	AKSHAYA M
22	U18MB022	ALLA REETHU CHOWDARY
23	U18MB023	AMALA SHYBI
24	U18MB024	AMRISH B
25	U18MB025	AMRITHA S
26	U18MB026	ANDREW GEORGE DCOUTO
27	U18MB027	ANKURITA BHAUMIK
28	U18MB028	ANOUSHYA S
29	U18MB029	ANUGRAH K
30	U18MB030	APARNA R
31	U18MB031	ARAVINDHAN D
32	U18MB032	ARKAJAA K
33	U18MB033	ARPITA CHOUDHURY
34	U18MB034	ARUN SANTHAN M
35	U18MB035	ARUNNIDHI R
36	U18MB036	ARYA R
37	U18MB037	ASHLIN SHARAN R
38	U18MB038	ASHMITHAA R
39	U18MB039	ASWATHI SUDHEER
40	U18MB040	ATUL K SHANKAR
41	U18MB041	AVINASH K
42	U18MB042	AVINASH KUMAR PATHAK
43	U18MB043	AYSHWARIYA M
44	U18MB044	BACHU SRAVYA SAI
45	U18MB045	BAKSHI ANUSHKA

CORSE FEEDBACK FORM

Course Title: Certificate Program in Sanitary Inspector **Date:** 7/12/2018

Name: Abinaya. M

RegNo:

Department: Community medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations					✓
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

NIL

Weakness of the course:

Strength of the course:

Abinaya. M

Signature

Thank you

CORSE FEEDBACK FORM

Date:

Course Title: Certificate Program in Sanitary Inspector

Name: Aishwarya.

RegNo:

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations					✓
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	✓ 5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Aishwarya.

Signature

Thank you

6/9/2018

Chennai

From

The Course Coordinator

Advanced training in Hearing Language and Speech

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Advanced training in Hearing Language and Speech

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Advanced training in Hearing Language and Speech

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 6/12/2018

R. No 222/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Advanced training in Hearing Language and Speech from 7/9/2018 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 7/2/2018.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

ADVANCED TRAINING IN HEARING LANGUAGE AND SPEECH

Course outcome

The programme is designed to generate manpower that will cater to the needs of individuals with communication disorders at the grass-root level. In this programme the students are trained to identify individuals with communication disorders and make appropriate referrals for further diagnosis. The students are also trained to supervise the caregivers in following the guidelines given by professionals for rehabilitation. Extensive practical training is given to supplement the theoretical knowledge that is imparted.

Course objectives

This course is aimed at training lower level functionaries in the area of hearing, language and speech. The course is designed as a comprehensive and practical oriented programme. The main objective of the course is to generate Speech and Hearing Technicians to take up routine clinical work of assessment and therapeutic management for various speech, language and hearing disorders at village, block/taluka and town levels. Wherever possible they will work under the guidance of a fully trained graduate or a postgraduate Speech & Hearing clinician. However, in the absence of such trained personnel they will be able to execute the routine clinical services. They will be ideally suited to work at district level and below levels, rural health centres, special schools for spastics, schools for the mentally retarded and school for the deaf. They can be included as trained Rehabilitation personnel under State/Central health care and/or rehabilitation systems. They shall be designated as "Speech and Hearing Technicians". They may also find openings in hearing aid and other instrument manufacturing/dispensing centres. The course

enables the candidates after completion of the course to be self employed. The course provides base for gaining lateral entry into the BASLP equivalent program.

Course coordinator – Assistant Professor and Associate Professor of Otolaryngology

Duration – 30 hours

Syllabus:

Topic	Faculty	Hours allotted
Introduction to course	Assistant Professor of ENT	2 hours
Introduction to Audiology	Associate Professor of ENT	2 hours
Introduction to Speech & Language Pathology	Assistant Professor of ENT	2 hours
Psychology	Associate Professor of ENT	2 hours
Community Based Rehabilitation	Assistant Professor of ENT	2 hours
Education for Children with Special Needs	Associate Professor of ENT	2 hours
Evaluation of hearing	Assistant Professor of ENT	2 hours
Hearing aids & earmolds	Associate Professor of ENT	2 hours
Counseling on use, trouble shooting and rehabilitation	Assistant Professor of ENT	2 hours
Hearing loss and effects	Associate Professor of ENT	2 hours
Audimetery	Assistant Professor of ENT	2 hours
Practical session on audimetery	Associate Professor of ENT	2 hours
Viva voce	Assistant Professor of ENT	2 hours
Written test	Associate Professor of ENT	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. ISHWARYA V has completed the value added course on Advanced training in Hearing Language and Speech conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 7/9/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

Advanced training in Hearing Language and Speech

S. No	Regn. No.	Name
1	U18MB046	BALAJI S
2	U18MB047	BANA SUPRIYA
3	U18MB048	BEMILTON MACUS A
4	U18MB049	BINISHA I
5	U18MB050	BISWAJEET SAHU
6	U18MB051	BLESSY RACHEL R
7	U18MB052	BRAMATHESHWAR S
8	U18MB053	CATHRINE S
9	U18MB054	DEEPANKAR SHAN S
10	U18MB055	DENSINGH A
11	U18MB056	DHAMEEM HUSSAIN M
12	U18MB057	DIVYA SREE R
13	U18MB058	DONY JAMES L
14	U18MB059	EBENESAR T D
15	U18MB060	ELAMATHI M
16	U18MB061	ELAVENIL SARAVANAN
17	U18MB062	EMIDEIRIPHYLLA SUTING
18	U18MB063	ESHA ELANGO
19	U18MB064	FARZAN SADDIQ
20	U18MB065	FAZEELA FATHIMA TAJDEEN
21	U18MB066	FYAZ SHAFIUL MUHAIMIN S
22	U18MB067	GAJAPRIYA S
23	U18MB068	GANGALAKURTHI LOKESH
24	U18MB069	GEO JOSEPH
25	U18MB070	GOMATHI SELVI K
26	U18MB071	GUHAPPRIYA R
27	U18MB072	GURDASRH KAUR
28	U18MB073	GURU PRASAD T
29	U18MB074	HABEEB NATHIRA
30	U18MB075	HAMSINI SUDHAKAR
31	U18MB076	HARIHARAN P A
32	U18MB077	HARIMADHAV H
33	U18MB078	HARIPRASATH B
34	U18MB079	HARISH KUMAR M S
35	U18MB080	HARSHITA MADHUSUDHAN
36	U18MB081	HEMALAKSHMI R
37	U18MB082	HERSON F
38	U18MB083	HIRA A NATARAJAN
39	U18MB084	HONEY B
40	U18MB085	HRITINA M
41	U18MB086	JANANI G C
42	U18MB087	JASWANTH ASIRVATHAM J
43	U18MB088	JASWIN S
44	U18MB089	JAYAKRISHNA R
45	U18MB090	JAYESH N
46	U18MB091	JEBASTIN JAYAPRAKASH J
47	U18MB092	JEMI HAMIDA B
48	U18MB093	JOSILY VARUGHESE
49	U18MB094	KAAVIYASHREE M
50	U18MB095	KAMALESHWAR K J



CORSE FEEDBACK FORM

Date: 05/09/2018

Course Title: Advanced Training in Hearing Lawguage and Speech.

Name: Hari Madhav.H.

RegNo: U18MB077

Department: ENT

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Harimadhav.H.
Signature

Thank you

CORSE FEEDBACK FORM

Date: 05/09/2018

Course Title: Advanced Training in Hearing Language and Speech

Name: Balaji.S

RegNo: U18MB046

Department: ENT

S.NO	Particulars	1	2	3	4	5
(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)						
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course					
(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)						
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Balaji.S
Signature

Thank you

6/8/2018

Chennai

From

The Course Coordinator

Certificate Program in CT Scan Technician

Department of Anatomy

Sree Balaji Medical College

Bharath Institute of Higher Education and Research.

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research.

Chennai

Sub: -Permission to conduct value- added course: Certificate Program in CT Scan Technician

Respected sir,

With reference to subject mentioned above, the Anatomy proposes to conduct a value-added course titled: Certificate Program in CT Scan Technician

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE AND HOSPITAL

VALUE ADDED COURSE ON CERTIFICATE PROGRAMME IN CT SCAN TECHNICIAN

40 HOURS –

UNIT –I – SLICE ANATOMY, NORMAL AND PHYSIOLOGY

NORMAL AND PHYSIOLOGY

MODULE	TOPIC	HOURS	TEACHING METHODOLOGY	FACULTY
1.	INTRODUCTION OF ANATOMY & PHYSIOLOGY SKELETAL SYSTEM • CLASSIFICATION OF BONES • BONES OF THE SKULL • BONES UPPER & LOWER LIMB	2	LECTURE	Anatomy tutor
2.	CIRCULATORY SYSTEM • PARTS OF CIRCULATORY SYSTEM • ANATOMY OF HEART	2	LECTURE	
3.	NERVOUS SYSTEM • CSF • CENTRAL NERVOUS SYSTEM	1	LECTURE	Anatomy tutor
4.	URINARY SYSTEM • STRUCTURE OF NEPHRONS • PHYSIOLOGY OF URINE FORMATION	1	LECTURE	
5.	ASSIGNMENT	1	MCQs	Anatomy tutor

UNIT-II APPLICATION OF CT SCAN IN HUMAN DISEASE COMMON DISEASE, ITS CLINICAL PRESENTATION & CT APPEARANCE

NORMAL ANATOMY & PHYSIOLOGY

MODULE	TOPIC	HOURS	TEACHING METHODOLOGY	FACULTY
1.	CRANIO CEREBRAL TRAUMATIC LESSONS	1	LECTURE	Anatomy tutor
2.	CSF RHINNORRHOEA	1	LECTURE	
3.	HYDROCHEPHALUS	1	LECTURE	Anatomy tutor
4.	CEREBRAL ATRPHY	1	LECTURE	
5.	MENINGITIS	1	LECTURE	
6.	BRAIN ABSES	1	LECTURE	Anatomy tutor
7.	PNEUMONIA	1	LECTURE	
8.	BRONCHGENIC EFFUSION	1	LECTURE	Anatomy tutor
9.	HYDRO THORAX	1	LECTURE	
10.	POLYSCYSTIC DISEASE	1	LECTURE	Anatomy tutor
11.	HYDRONEPHROSIS	1	LECTURE	
12.	OSTEO MALACIA & OSTEO MYOCELITIS	1	LECTURE	Anatomy tutor
13.	ASSIGNMENT	1	MCQs	
UNIT –III – BASIC PHYSICS AND CT TECHNIQUES				
MODULE	**TOPIC**	**HOURS**	**TEACHING METHODOLOGY**	**FACULTY**
1.	INTRODUCTION and BASIC PHYSICS	1	LECTURE	Radiology tutor
2.	COMPUTER TOMOGRAPHY-DEFINITION & PRINCIPLE	2	LECTURE	
3.				

	GENERATION OF CT & SPIRAL CT	2	LECTURE	Radiology tutor
4.	SLIP-RING TECHNOLOGY	2	LECTURE	Radiology tutor
5.	DETECTORS	1	LECTURE	
6.	WORKING OF CT	2	LECTURE	Radiology tutor
7.	PIXEL, VOXEL AND MATRIX	1	LECTURE	
8.	PHYSICAL COMPONENTS OF CT IMAGING SYSTEM	2	LECTURE	Radiology tutor
9.	ARTIFACTS	1	LECTURE	Radiology tutor
10.	IMAGE RECONSTRUCTION	1	LECTURE	
11.	CONTRAST MEDIA AND DIFFERENT TYPES	2	LECTURE	Radiology tutor
12.	PROCEDURES IN CT • CT BRAIN • CT THROAX • CT ABDOMEN • CT ORBIT • CT SPINE	2	LECTURE	Radiology tutor
13.	3-D IMAGING	1	LECTURE	
14.	ASSIGNMENT	1	MCQs	Radiology tutor

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

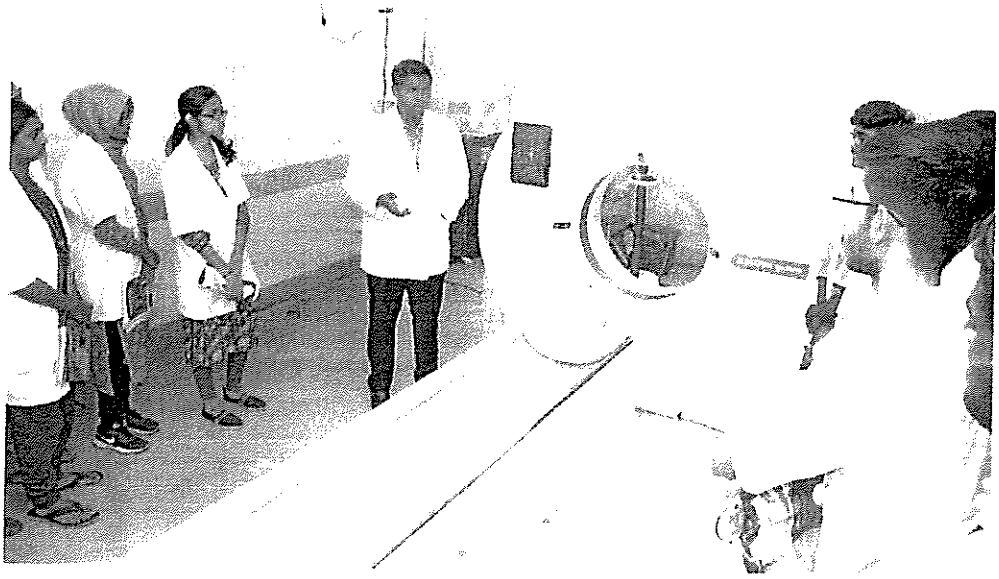
This is to certify that Mr./Ms. JADAV AKSHAY RAMESHBHAI has completed the value added course on Certificate Program in CT Scan Technician conducted by Anatomy at Sree Balaji Medical College & Hospital, Chennai held during 7/9/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH



Certificate Program in CT Scan Technician

S. No	Regn. No.	Name
1	U18MB096	KANISSHKA M
2	U18MB097	KARAN PATEL
3	U18MB098	KARANKUMAR J
4	U18MB099	KARTHIKEYAN A
5	U18MB100	KARUNASHANKAR K S
6	U18MB101	KAYALVIZHI M
7	U18MB102	KEERTHI SREE K R
8	U18MB103	KIRUTHIKA B
9	U18MB104	KRIPA KAVYAVARTHINI P K
10	U18MB105	KUSHMITHAA HARISHENAN C
11	U18MB106	KUSUM SONI J
12	U18MB107	LAKSHMI HARI PRIYA T
13	U18MB108	LAKSHMI NARAYANAN R
14	U18MB109	LAKSHMIPRIYA L
15	U18MB110	LAVANYA G
16	U18MB111	LINGESHWARAN S
17	U18MB112	LITHESH RAJ S
18	U18MB113	MADHANAGOPAL A
19	U18MB114	MADHAVAN K
20	U18MB115	MADHUMITHA K
21	U18MB116	MAHALAKSHMI S
22	U18MB117	MAHESH CHANDANI
23	U18MB118	MALAVIKA M
24	U18MB119	MANASWINI G
25	U18MB120	MANIRAAM M
26	U18MB121	MANISHA B
27	U18MB122	MANO SATHISH K
28	U18MB123	MANOJ KUMAR D
29	U18MB124	MANTHRA B
30	U18MB125	MARIAM S
31	U18MB126	MAYUKHI SEN
32	U18MB127	MEENAKSHI VARMA N K
33	U18MB128	MITHRASHREE M
34	U18MB129	MITIKSHA R
35	U18MB130	MOHAMED NASRUL ARIFFIN I
36	U18MB131	MOHAMMED AKHIL B
37	U18MB132	MOHANA SHANKARI S
38	U18MB133	MONA J
39	U18MB134	MONICA NANCY F
40	U18MB135	MONIKA V
41	U18MB136	MONISHA P
42	U18MB137	MOUSHMI A
43	U18MB138	MRIDUL
44	U18MB139	MRIDULA B
45	U18MB140	MRITUNJAY PRATAP SINGH

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 6/11/2018

R. No 225/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Anatomy

The Department of **Anatomy** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Program in CT Scan Technician from 7/9/2018 for a period of 3 weeks. Interested students can approach the Head of Anatomy department and Course Coordinator, for registration and for further details on or before 7/2/2018.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

COURSE FEEDBACK FORM

Date: 9/07/2018

Course Title: Certificate Program in Dialysis Technician

Name: Lakshmi Narayanan. R

RegNo: U18MB108

Department: Anatomy

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations					✓
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5 ✓

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Lakshmi Narayanan

Signature

Thank you

COURSE FEEDBACK FORM

Date: 09/07/2018

Course Title: Certificate Program in [illegible]

Name: Lingeshwaran S

RegNo: U18MB111

Department: Anatomy

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations					✓
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Lingeshwaran

Signature

Thank you

7/11/2018

Chennai

From

The Course Coordinator

Short term course on Audiology

Department of Psychiatry

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Short term course on Audiology

Respected sir,

With reference to subject mentioned above, the Psychiatry proposes to conduct a value-added course titled: Short term course on Audiology

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 7/14/2018

R. No 201/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Psychiatry

The Department of **Psychiatry** of Sree Balaji Medical College is scheduled to offer a Value added Course on Short term course on Audiology from 8/10/2018 for a period of 3 weeks. Interested students can approach the Head of Psychiatry department and Course Coordinator, for registration and for further details on or before 8/3/2018.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

SHORT TERM COURSE ON AUDIOLOGY

COURSE OUTLINE:

It reviews latest concepts in signal processing, programming skills, evoked potentials, SSD, electro-acoustic programming, and management of those with challenging etiologies and special needs.

This Course includes hands on Advanced Programming Practicum. Each week participants watch (anytime) a pre-recorded lecture, access a monitored discussion board and complete a short assessment before the interactive online web class. The hands-on practicum highlights case studies and practical applications led by distinguished researchers and clinicians in the field. Previous experience programming cochlear implants will maximize gain from this course. A certificate is awarded to those who successfully complete the training program.

COURSE OUTCOME:

- This course in Audiology is very beneficial as it opens many jobs in different areas.
- The students will gain a high level of clinical skill in all areas of hearing and balance diagnosis and excellent decision making skills.
- Students will be able to motivate patients to follow rehabilitation programs and the ability to analyze and deal with complex situations.

COURSE OBJECTIVES:

- The course aims to produce skilled and efficient manpower to work effectively With the persons having communication disorders.
- Offer you a broad and thorough education in the identification, assessment, rehabilitation and management of adults and children with audiological and vestibular dysfunction, with a critical and evaluative understanding of the underlying scientific, medical, public health and disability knowledge base;
- Develop your practical knowledge and skills related to core clinical procedures;
- Develop your research and critical skills by undertaking a piece of original research and presenting your findings via a research dissertation.

Syllabus:

Topic	Faculty	Hours allotted
Audiometers/Audiogram	Assistant Professor of ENT	2 hours
Audiological tests	Associate Professor of ENT	2 hours
Basic Anatomy and Physiology of the Auditory system	Assistant Professor of ENT	2 hours
Immittance Evaluation	Associate Professor of ENT	2 hours
Evoked Repose Audiometry	Assistant Professor of ENT	2 hours
Insertion gain measurement	Associate Professor of ENT	2 hours
Auditory Training/Learning	Assistant Professor of ENT	2 hours
Speech Reading/Communication	Associate Professor of ENT	2 hours

training		
Hearing Aids	Assistant Professor of ENT	2 hours
Causes of hearing loss	Associate Professor of ENT	2 hours
Mainstreaming the hearing impaired	Assistant Professor of ENT	2 hours
Earmold and its modifications	Associate Professor of ENT	2 hours
Electrophysiological measures of the ear	Assistant Professor of ENT	2 hours
Audiovisual course in noise measurement and hearing conservation	Associate Professor of ENT	2 hours

Short term course on Audiology

S. No	Regn. No.	Name
1	U18MB141	MUKHTHA RENESWARI K
2	U18MB142	NACHIAPPAN M
3	U18MB143	NAMEERA N A
4	U18MB144	NARMADA DEVI C M
5	U18MB145	NEHA ARUL MALAR R
6	U18MB146	NEHAL LODHA R
7	U18MB147	NIHARIKA M S
8	U18MB148	NILOFER GNANA SELVAN A
9	U18MB149	NIRMAL ARUL MATHEW J
10	U18MB150	NISHA T
11	U18MB151	NISHOK T G R
12	U18MB152	NITHIN B
13	U18MB153	NIVAEDHAA T
14	U18MB154	NIVEDITHA B
15	U18MB155	NIVETHAA M
16	U18MB156	NIVETHINI S
17	U18MB157	NOWMIYA M
18	U18MB158	PAVENDAN A V
19	U18MB159	PAVITHRAA K R
20	U18MB160	PERAVALI VIHARIKA
21	U18MB161	PONRAJ B
22	U18MB162	POOJA B
23	U18MB163	POOJA G B
24	U18MB164	POOMAALAI S B
25	U18MB165	PRATIK DAS (04.02.1999)
26	U18MB166	PRATIK DAS (12.11.1999)
27	U18MB167	PRAVEEN K
28	U18MB168	PRAVEENA KUMARI J
29	U18MB169	PREETHI DEVI S
30	U18MB170	PRITHI K

CORSE FEEDBACK FORM

Date: 6/10/18

Course Title: Short Term Course on audiology

Name: Pooja.G.B

RegNo: U18MB163

Department: ENT

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Pooja.GB
Signature

Thank you

CORSE FEEDBACK FORM

Date: 7/10/18

Course Title: Short Term Course on Audiology.

Name: Prithi. K

RegNo: U18MB170

Department: ENT

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	✓
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4 ✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Prithi. K.
Signature

Thank you



Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. KISHOR B has completed the value added course on Short term course on Audiology conducted by Psychiatry at Sree Balaji Medical College & Hospital, Chennai held during 8/10/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

12:00:00 AM

Chennai

From

The Course Coordinator

Short term course on Advanced Cardiac Life Support (ALS)

Department of Psychiatry

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Short term course on Advanced Cardiac Life Support (ALS)

Respected sir,

With reference to subject mentioned above, the Psychiatry proposes to conduct a value-added course titled: Short term course on Advanced Cardiac Life Support (ALS)

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 12:00:00 AM

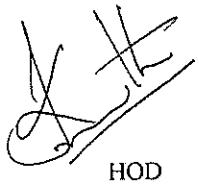
R. No 291/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Psychiatry

The Department of **Psychiatry** of Sree Balaji Medical College is scheduled to offer a Value added Course on Short term course on Advanced Cardiac Life Support (ALS) from 12:00:00 AM for a period of 3 weeks. Interested students can approach the Head of Psychiatry department and Course Coordinator, for registration and for further details on or before 12:00:00 AM.

Eligibility-MBBS STUDENTS



Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

Short term course on Advanced Cardiac Life Support (ALS)

Course outline: The ALS course builds on the foundation of lifesaving BLS skills, emphasizing the importance of preventing cardiac arrest, early and continuous high-quality CPR, and high-performing teams. For healthcare professionals who either direct or participate in the management of cardiopulmonary arrest or other cardiovascular emergencies and for personnel in emergency response

Course Objectives:

- Define systems of care
- Apply the BLS, Primary, and Secondary Assessments sequence for a systematic evaluation of adult patients
- Discuss how the use of a rapid response team (RRT) or medical emergency team (MET) may improve patient outcomes
- Discuss early recognition and management of Acute Coronary Syndrome (ACS), including appropriate disposition
- Discuss early recognition and management of stroke, including appropriate disposition
- Recognize bradycardias and tachycardias that may result in cardiac arrest or complicate resuscitation outcome
- Recognize respiratory arrest
- Perform early management of respiratory arrest
- Recognize cardiac arrest
- Perform prompt, high-quality BLS including prioritizing early chest compressions and integrating early automated external defibrillator (AED) use
- Perform early management of cardiac arrest until termination of resuscitation or transfer of care, including immediate post–cardiac arrest care
- Evaluate resuscitative efforts during a cardiac arrest through continuous assessment of CPR quality, monitoring the patient's physiologic response, and delivering real-time feedback to the team

Course Duration: 30 hours

Course Coordinator: Assistant Professor / Associate Professor of Emergency Medicine

Modules

ALS Introduction

- Introduction To ALS

The Initial Assessment

- The Initial Assessment

ALS Basic Life Support

- ALS BLS for Adults
- Initiating the Chain of Survival
- 2020 BLS Guideline Changes
- One Rescuer Adult BLS CPR
- Two Rescuer Adult BLS CPR
- Adult Mouth-to-Mask and Bag-Mask Ventilation
- Adult Basic Life Support (BLS) Algorithm
- BLS for Children/Infants
- One-Rescuer BLS/CPR for Infant (newborn to age 12 months)
- CPR Steps for Children
- CPR Steps for Infants
- Child/Infant Mouth-to-Mouth Ventilation

Advance Life Support

- Normal Heart Anatomy and Physiology
- The ACLS Survey (A-B-C-D)
- Airway Management

- Basic Airway Adjuncts
- Basic Airway Technique
- Advanced Airway Adjuncts
- Routes Of Access
- Pharmacological Tools

Principles of Early Defibrillation

- Principles Of Early Defibrillation
- Key To Using An Automated External Defibrillator (AED)

Systems of Care

- Systems Of Care
- Cardiopulmonary Resuscitation
- Post-Cardiac Arrest Care
- Acute Coronary Syndrome
- Acute Stroke
- The Resuscitation Team
- Education, Implementation, Teams

ALS Skills Training

- Airway Management
- ACLS Skills Videos
- ACLS Skills Training Test

Syllabus

Topic	Faculty	Hours allotted
INTRODUCTION	Assistant Professor of Medicine	2 hours
BASIC ANATOMY & PHYSIOLOGY OF AIRWAY	Associate Professor of Medicine	2 hours
SYSTEMS OF CARE	Assistant Professor of Medicine	2 hours
BASIC AIRWAY ADJUNCTS	Associate Professor of Medicine	2 hours
CPR	Assistant Professor of Medicine	2 hours
CARDIAC & RESPIRATORY ARREST	Associate Professor of Medicine	2 hours
AIRWAY MANAGEMENT	Assistant Professor of Medicine	2 hours
HANDS ON TRAINING	Associate Professor of Medicine	2 hours
HANDS ON TRAINING	Assistant Professor of Medicine	2 hours
ADULT BASIC LIFE SUPPORT (BLS) ALGORITHM	Associate Professor of Medicine	2 hours
CPR STEPS FOR CHILDREN AND INFANTS	Assistant Professor of Medicine	2 hours
HANDS ON TRAINING	Associate Professor of Medicine	2 hours
HANDS ON TRAINING	Assistant Professor of Medicine	2 hours
ASSESSMENT	Associate Professor of Medicine	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. NEHA M has completed the value added course on Short term course on Advanced Cardiac Life Support (ALS) conducted by Psychiatry at Sree Balaji Medical College & Hospital, Chennai held during 9/13/2018.

Dr.P.Sai Kumar MD

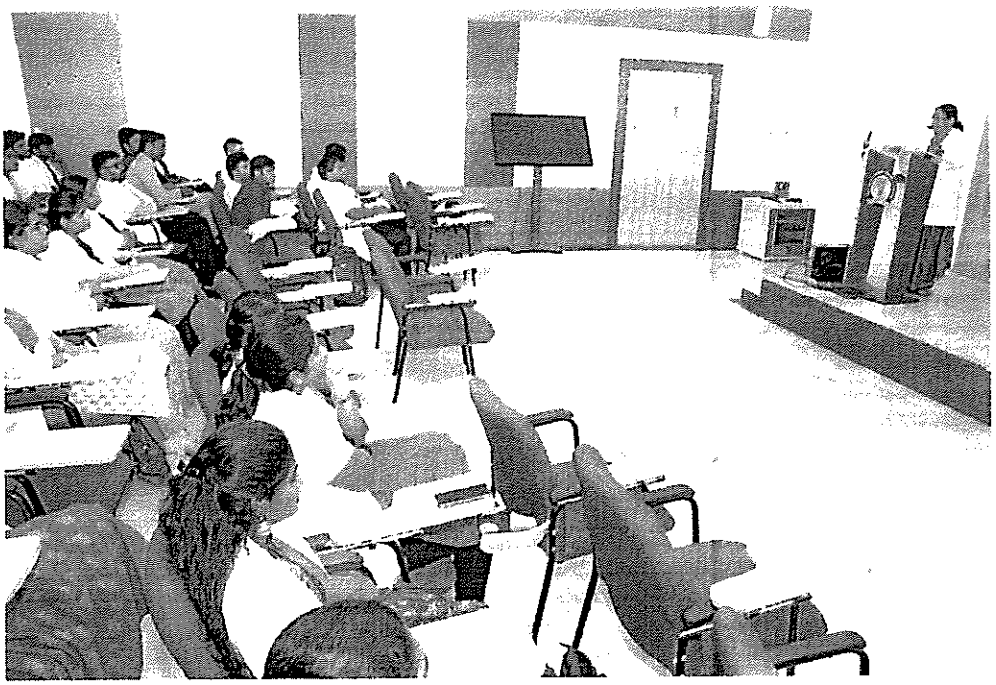
Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

Short term course on Advanced Cardiac Life Support (ALS)

S. No	Regn. No.	Name
1	U18MB171	PRITHVI BHAUMIK
2	U18MB172	PRIYADHARSAN L
3	U18MB173	PRIYADHARSHAN C
4	U18MB174	PRIYADHARSHINI T
5	U18MB175	RACHAGULLA VENKATA SIVA NAGA BRAHMACHARI
6	U18MB176	RAJESH J
7	U18MB177	RAMYA MALAISAMY
8	U18MB178	RAMYAJAYAN
9	U18MB179	RAMYASRI S
10	U18MB180	RANJAN V
11	U18MB181	REENA E
12	U18MB182	RESHMA A
13	U18MB183	RISHI ELANGO
14	U18MB184	RISHI KUMAR S
15	U18MB185	RITHIK DANIEL RAJ G
16	U18MB186	ROHITH G
17	U18MB187	SABIN JOSEPH
18	U18MB188	SAIGAYATRI K
19	U18MB189	SAILESH V
20	U18MB190	SAKSHI SINGH
21	U18MB191	SAKTHI SRINI K L
22	U18MB192	SAKTHI SUNDARAM S
23	U18MB193	SAMBAVIGA M
24	U18MB194	SAMYUKTHA R G K
25	U18MB195	SAMYUKTHA THADDERINA A
26	U18MB196	SANCHAL S S
27	U18MB197	SANTOSH RAJ K
28	U18MB198	SARANMANI JYOTSNA KUMARAN
29	U18MB199	SARIGA T
30	U18MB200	SENAPATHI S
31	U18MB201	SHAALINI J
32	U18MB202	SHAILA U
33	U18MB203	SHAINA MISHRA
34	U18MB204	SHAKSHITHA SHREE A
35	U18MB205	SHAKTHI PRIYANGHA S
36	U18MB206	SHAKTHIMALARKODI T A
37	U18MB207	SHAMMA GRACY CATHERINE S
38	U18MB208	SHANMUGA PRIYAA D
39	U18MB209	SHARABESH S G
40	U18MB210	SHEREEN FATHIMA M S
41	U18MB211	SHIJIN CHRISTY S
42	U18MB212	SHREYABRATA CHANDRA
43	U18MB213	SHREYANSHI SAH
44	U18MB214	SIIRIIN S
45	U18MB215	SMITA SINGH
46	U18MB216	SNEHA BABU V
47	U18MB217	SNEHA D
48	U18MB218	SNEHA V RAJ
49	U18MB219	SNEHITH REDDY ARDHA
50	U18MB220	SOHAIL HUSSAIN
51	U18MB221	SOPHIA PANDA
52	U18MB222	SOURADIPTA DEB
53	U18MB223	SRINIVAS P K
54	U18MB224	SRIRAM RAVISANKAR
55	U18MB225	SUBITHA S
56	U18MB226	SUDHAKAR A
57	U18MB227	SUDHIR S
58	U18MB228	SUJA J
59	U18MB229	SUMITHAA S



CORSE FEEDBACK FORM

Date: 11/09/2018

Course Title: Short term course on advanced cardiac life support

Name: Sirin.S

RegNo: U18MB214

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Sirin.S
Signature

Thank you

CORSE FEEDBACK FORM

Date: 12/09/18

Course Title: Short term course on advanced cardiac life support

Name: Subistha.S

RegNo: U18MB225

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Subistha.S
Signature

Thank you

8/14/2018

Chennai

From

The Course Coordinator

Certificate Program in Basic Cardiac Life support (BLS)

Department of Psychiatry

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Program in Basic Cardiac Life support (BLS)

Respected sir,

With reference to subject mentioned above, the Psychiatry proposes to conduct a value-added course titled: Certificate Program in Basic Cardiac Life support (BLS)

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 8/17/2018

R. No 241/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Psychiatry

The Department of **Psychiatry** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Program in Basic Cardiac Life support (BLS) from 9/13/2018 for a period of 3 weeks. Interested students can approach the Head of Psychiatry department and Course Coordinator, for registration and for further details on or before 9/6/2018.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE PROGRAM IN BASIC CARDIAC LIFE SUPPORT (BLS)

COURSE OUTLINE: This course will help the participant acquire the knowledge and skill needed for fundamental patient evaluation and stabilization in the event of emergencies. They will be able to recognize life-threatening emergencies, provide Cardio Pulmonary Resuscitation (CPR), and relieve choking in a safe, timely and effective manner. They will be able to understand the value of standard guidelines for resuscitation.

COURSE OBJECTIVE:

1. Define systems of care
2. Apply the BLS, Primary, and Secondary Assessments sequence for a systematic evaluation of adult patients
3. Recognize respiratory arrest
4. Perform early management of respiratory arrest
5. Recognize cardiac arrest
6. Perform prompt, high-quality BLS including prioritizing early chest compressions and integrating early automated external defibrillator (AED) use
7. Perform early management of cardiac arrest until termination of resuscitation or transfer of care, including immediate post–cardiac arrest care
8. Evaluate resuscitative efforts during a cardiac arrest through continuous assessment of CPR quality, monitoring the patient's physiologic response, and delivering real-time feedback to the team

COURSE COORDINATOR : ASSOCIATE PROFESSOR /ASSISTAMT PROFESSOR OF MEDICINE

COURSE DURATION: 30 HOURS

Syllabus

Topic	Faculty	Hours allotted
INTRODUCTION	Assistant Professor of Medicine	2 hours
BASIC ANATOMY & PHYSIOLOGY OF AIRWAY	Associate Professor of Medicine	2 hours
SYSTEMS OF CARE	Assistant Professor of Medicine	2 hours
BASIC AIRWAY ADJUNCTS	Associate Professor of Medicine	2 hours
CPR	Assistant Professor of Medicine	2 hours
CARDIAC & RESPIRATORY ARREST	Associate Professor of Medicine	2 hours
AIRWAY MANAGEMENT	Assistant Professor of Medicine	2 hours
HANDS ON TRAINING	Associate Professor of Medicine	2 hours
HANDS ON TRAINING	Assistant Professor of Medicine	2 hours
ADULT BASIC LIFE SUPPORT (BLS) ALGORITHM	Associate Professor of Medicine	2 hours
CPR STEPS FOR CHILDREN AND INFANTS	Assistant Professor of Medicine	2 hours
HANDS ON TRAINING	Associate Professor of Medicine	2 hours
HANDS ON TRAINING	Assistant Professor of Medicine	2 hours
ASSESSMENT	Associate Professor of Medicine	2 hours

IMPACT OF MEDICINAL PLANTS ON SOCIETY

COURSE OUTLINE: Medicinal plants have been used in healthcare since time immemorial. Studies have been carried out globally to verify their efficacy and some of the findings have led to the production of plant-based medicines. The global market value of medicinal plant products exceeds $100 billion per annum. This paper discusses the role, contributions and usefulness of medicinal plants in tackling the diseases of public health importance, with particular emphasis on the current strategic approaches to disease prevention. The course focuses on the uses and application of medicinal plants in society

COURSE OBJECTIVE:

- Distinguish between medicinal herbs in cultivation
- Discuss the history of medicinal herb usage.
- Compare the chemical components of different medicinal herbs in terms of their general affect on the human body.
- Prepare simple and safe herbal remedies in a domestic situation.
- Explain the potential dangers involved in dealing with plants.
- Prepare a schedule of cultural practices for a medicinal herb crop.
- Develop a production plan for a medicinal herb crop.

Lesson Structure

1. Introduction to Medicinal Herbs
    - Scope and Nature of Herbal Medicine
    - Being Cautious
    - Growing and Knowing Medicinal Herbs
    - Accurate Plant Naming
    - Pronouncing Plant Names
    - Finding Reliable Resources
2. Culture of Medicinal Herbs
    - What is a Herb
    - Soils and Nutrition
    - Cultivation
    - Fertilizing Herbs

- Compost, Mulch, Watering
- Propagation
- Pest and Disease

3. History
   - Introduction
   - Hippocrates
   - Chinese Herbalists
   - Egyptian Influence
   - Greek Influences
   - The Dark Ages
   - German and English Herbals
   - Other Influences
4. Main Medicinal Herbs
   - Introduction and Varieties to Grow
   - Production Plan
   - Improving Soil Fertility
   - Cover Crops and Legumes
   - Cultivation, Growing Methods, Compost
   - Growing and using Ginger
   - Garlic Culture
   - Echinacea Culture
5. Herbal Remedies
   - Alternatives
   - Anthelmintics
   - Astringents
   - Bitter Tonics
   - Calmatives
   - Carminatives and Aromatics
   - Cathartics
   - Diaphoretics
   - Dietetics
   - Demulcents
   - Emollients
   - Expectorants
   - Nervines
   - Relaxants
   - Vulnerary Herbs
   - Common Herbs with Medicinal Properties
   - Nervines as Healing Agents
   - Natural Chemicals in Plants and their Affect on Health; saponins, phenolglycosides, anthraglycosides, flavonoids, mustard oils, polysaccharides, prussic acid, glycosides, coumarin, tannins, bitters, essential oils, alkaloids, purines, essential minerals
   - Chemistry of Herbs
   - Herbal Sources for Human Nutrients
6. Preparing Herbal Remedies

- Infusion
- Decoction
- Poulice
- Medical Preparations
- Problem of Accurately Formulating Herbal Medicines
- How herbalists used to work
- The Difference Today
- Harvesting Material for Herbal Preparations
- Post Harvest Handling of Herbs
- Post Harvest Preservation; Fresh, Modified Atmospere Packaging
- Herbal Preparations for Teas, Rinses and Baths
- Producing Essential Oils; Water distilation, Steam distilation
- Uses for Eucalyptus Oil

7. Poisonous Plants
   - Introduction
   - Review of Plant Poisons
   - Hazardous Herbs
   - Carcinogens, Potosensitizers, Allergens, Hormone Like Affects, Teratogens, Respiratory Inhibitors, etc
   - Toxic Plant Constituents
8. Developing a Production Plan
   - Managing a Market Garden
   - Deciding What to Grow
   - Production Planning
   - Types of Problems
   - Standards
   - Crop Schedules
   - Farming Medicinal Herbs
   - Production Requirements for Different Herbs

COURSE DURATION: 30 HOURS

COURSE COORDINATOR: ASSOCIATE PROFESSOR / ASSISTANT PROFESSOR OF PHARAMACOLOGY

SYLLABUS

Topic	**Faculty**	**Hours allotted**
Introduction to Medicinal Herbs	Assistant Professor of pharmacology	2 hours

Culture of Medicinal Herbs History	Associate Professor of pharamacology	2 hours
Main Medicinal Herbs	Assistant Professor of pharmacology	2 hours
Herbal Remedies	Associate Professor of pharamacology	2 hours
Preparing Herbal Remedies	Assistant Professor of pharmacology	2 hours
Poisonous Plants	Associate Professor of pharamacology	2 hours
Health care benefits of medicinal plants	Assistant Professor of pharmacology	2 hours
Global use and current affairs	Associate Professor of pharamacology	2 hours
Developing a Production Pla	Assistant Professor of pharmacology	2 hours
Practicals	Associate Professor of pharamacology	2 hours
Natural Chemicals in Plants and their Affect on Health	Assistant Professor of pharmacology	2 hours
Common Herbs with Medicinal Properties	Associate Professor of	2 hours

	pharamacology	
Vice voce	Assistant Professor of pharmacology	2 hours
Assessmentg	Associate Professor of pharamacology	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. NISHANTH NARAYAN V has completed the value added course on Certificate Program in Basic Cardiac Life support (BLS) conducted by Psychiatry at Sree Balaji Medical College & Hospital, Chennai held during 9/13/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

Certificate Program in Basic Cardiac Life support (BLS)

S. No	Regn. No.	Name
1	U18MB038	ASHMITHAA R
2	U18MB039	ASWATHI SUDHEER
3	U18MB040	ATUL K SHANKAR
4	U18MB041	AVINASH K
5	U18MB042	AVINASH KUMAR PATHAK
6	U18MB043	AYSHWARIYA M
7	U18MB044	BACHU SRAVYA SAI
8	U18MB045	BAKSHI ANUSHKA
9	U18MB046	BALAJI S
10	U18MB047	BANA SUPRIYA
11	U18MB048	BEMILTON MACUS A
12	U18MB049	BINISHA I
13	U18MB050	BISWAJEET SAHU
14	U18MB051	BLESSY RACHEL R
15	U18MB052	BRAMATHESHWAR S
16	U18MB053	CATHRINE S
17	U18MB054	DEEPANKAR SHAN S
18	U18MB055	DENSINGH A
19	U18MB056	DHAMEEM HUSSAIN M
20	U18MB057	DIVYA SREE R
21	U18MB058	DONY JAMES L
22	U18MB059	EBENESAR T D
23	U18MB060	ELAMATHI M
24	U18MB061	ELAVENIL SARAVANAN
25	U18MB062	EMIDEIRIPHYLLA SUTING
26	U18MB063	ESHA ELANGO
27	U18MB064	FARZAN SADDIQ
28	U18MB065	FAZEELA FATHIMA TAJDEEN
29	U18MB066	FYAZ SHAFIUL MUHAIMIN S
30	U18MB067	GAJAPRIYA S
31	U18MB068	GANGALAKURTHI LOKESH
32	U18MB069	GEO JOSEPH
33	U18MB070	GOMATHI SELVI K
34	U18MB071	GUHAPPRIYA R
35	U18MB072	GURDASRH KAUR



CORSE FEEDBACK FORM

Date: 12/09/18

Course Title: Certificate program in Basic cardiac life support

Name: Brnesha . I

RegNo: U18MB049

Department: Pharmacology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Bnesha . I
Signature

Thank you

CORSE FEEDBACK FORM

Date: 13/09/18

Course Title: Certificate Program in Basic Cardiac life Support

Name: Divya Sree.R

RegNo: U18MB057

Department: Pharmacology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Divyasree.R
Signature

Thank you

9/10/2018

Chennai

From

The Course Coordinator

Impact of Medicinal Plants on Society

Department of Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Impact of Medicinal Plants on Society

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Impact of Medicinal Plants on Society

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 9/14/2018

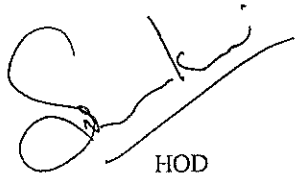
R. No 321/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Medicine

The Department of **Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Impact of Medicinal Plants on Society from 10/10/2018 for a period of 3 weeks. Interested students can approach the Head of Medicine department and Course Coordinator, for registration and for further details on or before 10/3/2018.

Eligibility-MBBS STUDENTS



Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

IMPACT OF MEDICINAL PLANTS ON SOCIETY

COURSE OUTLINE: Medicinal plants have been used in healthcare since time immemorial. Studies have been carried out globally to verify their efficacy and some of the findings have led to the production of plant-based medicines. The global market value of medicinal plant products exceeds $100 billion per annum. This paper discusses the role, contributions and usefulness of medicinal plants in tackling the diseases of public health importance, with particular emphasis on the current strategic approaches to disease prevention. The course focuses on the uses and application of medicinal plants in society

COURSE OBJECTIVE:

- Distinguish between medicinal herbs in cultivation
- Discuss the history of medicinal herb usage.
- Compare the chemical components of different medicinal herbs in terms of their general affect on the human body.
- Prepare simple and safe herbal remedies in a domestic situation.
- Explain the potential dangers involved in dealing with plants.
- Prepare a schedule of cultural practices for a medicinal herb crop.
- Develop a production plan for a medicinal herb crop.

Lesson Structure

1. Introduction to Medicinal Herbs
    - Scope and Nature of Herbal Medicine
    - Being Cautious
    - Growing and Knowing Medicinal Herbs
    - Accurate Plant Naming
    - Pronouncing Plant Names
    - Finding Reliable Resources
2. Culture of Medicinal Herbs
    - What is a Herb
    - Soils and Nutrition
    - Cultivation
    - Fertilizing Herbs

- Compost, Mulch, Watering
- Propagation
- Pest and Disease

3. History
   - Introduction
   - Hippocrates
   - Chinese Herbalists
   - Egyptian Influence
   - Greek Influences
   - The Dark Ages
   - German and English Herbals
   - Other Influences
4. Main Medicinal Herbs
   - Introduction and Varieties to Grow
   - Production Plan
   - Improving Soil Fertility
   - Cover Crops and Legumes
   - Cultivation, Growing Methods, Compost
   - Growing and using Ginger
   - Garlic Culture
   - Echinacea Culture
5. Herbal Remedies
   - Alternatives
   - Anthelmintics
   - Astringents
   - Bitter Tonics
   - Calmatives
   - Carminatives and Aromatics
   - Cathartics
   - Diaphoretics
   - Dietetics
   - Demulcents
   - Emollients
   - Expectorants
   - Nervines
   - Relaxants
   - Vulnerary Herbs
   - Common Herbs with Medicinal Properties
   - Nervines as Healing Agents
   - Natural Chemicals in Plants and their Affect on Health; saponins, phenolglycosides, anthraglycosides, flavonoids, mustard oils, polysaccharides, prussic acid, glycosides, coumarin, tannins, bitters, essential oils, alkaloids, purines, essential minerals
   - Chemistry of Herbs
   - Herbal Sources for Human Nutrients
6. Preparing Herbal Remedies

- Infusion
- Decoction
- Poulice
- Medical Preparations
- Problem of Accurately Formulating Herbal Medicines
- How herbalists used to work
- The Difference Today
- Harvesting Material for Herbal Preparations
- Post Harvest Handling of Herbs
- Post Harvest Preservation; Fresh, Modified Atmospere Packaging
- Herbal Preparations for Teas, Rinses and Baths
- Producing Essential Oils; Water distilation, Steam distilation
- Uses for Eucalyptus Oil

7. Poisonous Plants
   - Introduction
   - Review of Plant Poisons
   - Hazardous Herbs
   - Carcinogens, Potosensitizers, Allergens, Hormone Like Affects, Teratogens, Respiratory Inhibitors, etc
   - Toxic Plant Constituents
8. Developing a Production Plan
   - Managing a Market Garden
   - Deciding What to Grow
   - Production Planning
   - Types of Problems
   - Standards
   - Crop Schedules
   - Farming Medicinal Herbs
   - Production Requirements for Different Herbs

COURSE DURATION: 30 HOURS

COURSE COORDINATOR: ASSOCIATE PROFESSOR / ASSISTANT PROFESSOR OF PHARAMACOLOGY

SYLLABUS

Topic	**Faculty**	**Hours allotted**
Introduction to Medicinal Herbs	Assistant Professor of pharmacology	2 hours

Culture of Medicinal Herbs History	Associate Professor of pharamacology	2 hours
Main Medicinal Herbs	Assistant Professor of pharmacology	2 hours
Herbal Remedies	Associate Professor of pharamacology	2 hours
Preparing Herbal Remedies	Assistant Professor of pharmacology	2 hours
Poisonous Plants	Associate Professor of pharamacology	2 hours
Health care benefits of medicinal plants	Assistant Professor of pharmacology	2 hours
Global use and current affairs	Associate Professor of pharamacology	2 hours
Developing a Production Pla	Assistant Professor of pharmacology	2 hours
Practicals	Associate Professor of pharamacology	2 hours
Natural Chemicals in Plants and their Affect on Health	Assistant Professor of pharmacology	2 hours
Common Herbs with Medicinal Properties	Associate Professor of	2 hours

	pharamacology	
Vice voce	Assistant Professor of pharmacology	2 hours
Assessmentg	Associate Professor of pharamacology	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

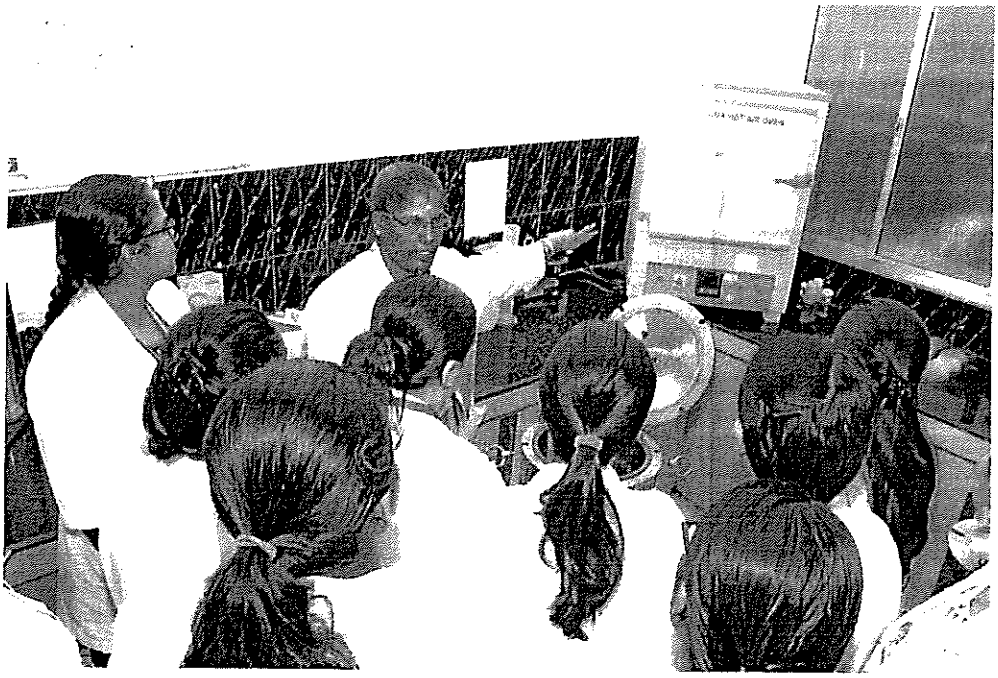
This is to certify that Mr./Ms, PRAVEEN S has completed the value added course on Impact of Medicinal Plants on Society conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 10/10/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH



CORSE FEEDBACK FORM

Date: 9/10/2018

Course Title: Impact of Medicinal Plants on Society

Name: Swetha. R

RegNo: U18MB237

Department: Pharmacology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Swetha.S
Signature

Thank you

CORSE FEEDBACK FORM

Date: 10/10/2018

Course Title: Impact of medicinal plants on Society

Name: Vishnu.P

RegNo: U18MB348

Department: Pharmacology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations					
3.	The lecture sequence was well planned					
4.	The lecturers were clear and easy to understand					
5.	The teaching aids were effective					
6.	The instructors encourage interaction and were helpful					
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Vishnu.P.
Signature

Thank you

Impact of Medicinal Plants on Society

S. No	Regn. No.	Name
1	U18MB221	SOPHIA PANDA
2	U18MB222	SOURADIPTA DEB
3	U18MB223	SRINIVAS P K
4	U18MB224	SRIRAM RAVISANKAR
5	U18MB225	SUBITHA S
6	U18MB226	SUDHAKAR A
7	U18MB227	SUDHIR S
8	U18MB228	SUJA J
9	U18MB229	SUMITHAA S
10	U18MB230	SUNIL THURAI I
11	U18MB231	SUNIT STEVE JAMES
12	U18MB232	SURESH KUMAR SHARANYA
13	U18MB233	SURESH V N
14	U18MB234	SURYA TEJA M Y B
15	U18MB235	SUSHMA LEISHANGTHEM
16	U18MB236	SWATHI K
17	U18MB237	SWETHA R
18	U18MB238	SWETHA S
19	U18MB239	TADIMETI AISHWARYA RAMARAO
20	U18MB240	THARUN J
21	U18MB241	UPPARA MADHUMITHA
22	U18MB242	VANI SRI M P
23	U18MB243	VARSHA K
24	U18MB244	VARSHA R
25	U18MB245	VENKATASAI RACHANA RANDHI
26	U18MB246	VIDYADHARAN H V
27	U18MB247	VIGNESHWARAN S
28	U18MB248	VISHNU P
29	U18MB249	VISHNU RAM H
30	U18MB250	YASHOTHARA M G

9/10/2018

Chennai

From

The Course Coordinator

Introduction to Inter Cultural Communication

Department of Surgery

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Introduction to Inter Cultural Communication

Respected sir,

With reference to subject mentioned above, the Surgery proposes to conduct a value-added course titled: Introduction to Inter Cultural Communication

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 9/13/2018

R. No 326/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Surgery

The Department of **Surgery** of Sree Balaji Medical College is scheduled to offer a Value added Course on Introduction to Inter Cultural Communication from 10/10/2018 for a period of 3 weeks. Interested students can approach the Head of Surgery department and Course Coordinator, for registration and for further details on or before 10/3/2018.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

INTRODUCTION TO INTER CULTURAL COMMUNICATION

Course outline: Intercultural Communication and Conflict Resolution is a growing area of importance considering the pace and volume of global transactions. The ease of global communication using technology, the abundance of cheaper transportation costs, and the frequency of businesses using cross-border talent is fostering millions of interactions a day between people of different cultures. Examine how the process of communication can be further complicated during interactions between people of different cultures. The topics of stereotypes, generalizations, communication styles, communication strategies, and communication orientations will be explored.

Intercultural Communication focuses on the importance of culture in our everyday lives, and the ways in which culture interrelates with and effects communication processes. We live in an era of rapid globalization in which being able to communicate across cultures is imperative to our ability to function in a diverse workplace, city, and world. This course will take us on a journey. Using our stories and our online discussions, this course is designed to increase our sensitivity to other cultures. Just as importantly, this journey increases our awareness of our own cultural backgrounds, and the contexts (social, cultural and historical) in which we live and communicate.

Course objective:

1. to explore cultural self-awareness, other culture awareness, and the dynamics that arise in interactions between the two.
2. To understand how communication processes differ among cultures.
3. To identify challenges that arise from these differences in intercultural interactions and learn ways to creatively address them.
4. To discover the importance of the roles of context and power in studying intercultural communication.
5. To acquire knowledge, skills and attitudes that increase intercultural competence

Course duration: 30 hours

Course coordinator: Associate Professor / Assistant Professor of Psychiatry

Syllabus

Topic	**Faculty**	**Hours allotted**
Introduction to course	Assistant Professor of Psychiatry	2 hours
Self awareness	Associate Professor of Psychiatry	2 hours
Culture awareness	Assistant Professor of Psychiatry	2 hours
Challenges in society and cultural diversities	Associate Professor of Psychiatry	2 hours
Good communication skills	Assistant Professor of Psychiatry	2 hours
Body language	Associate Professor of Psychiatry	2 hours
Importance of the roles of context and power in studying intercultural communication	Assistant Professor of Psychiatry	2 hours

Dynamics of cultural diversities	Associate Professor of Psychiatry	2 hours
Society views and current trends	Assistant Professor of Psychiatry	2 hours
Communication Process	Associate Professor of Psychiatry	2 hours
knowledge, skills and attitudes that increase intercultural competence	Assistant Professor of Psychiatry	2 hours
Group Discussion	Associate Professor of Psychiatry	2 hours
Viva voce	Assistant Professor of Psychiatry	2 hours
Written test	Associate Professor of Psychiatry	2 hours

Introduction to Inter Cultural Communication

S. No	Regn. No.	Name
1	U17MB001	AADITHYA JAGAN N R
2	U17MB002	AAKASH KUMAR R S
3	U17MB003	AARATHI R A
4	U17MB004	AARTHI SHREE S
5	U17MB005	AARTHI SINDHU V
6	U17MB006	AARTI D R
7	U17MB007	ABDUL KABEER A
8	U17MB008	ABHINAV MALVIYA
9	U17MB009	ABHINAYA R
10	U17MB010	ABHINAYA S
11	U17MB011	ABINISHA K V
12	U17MB012	ABISHEIKKANNA K
13	U17MB013	AFTAB KAMRAN RAYANI
14	U17MB014	AKANSHA MISHRA
15	U17MB015	AKASH S
16	U17MB016	AKSHAYA N
17	U17MB017	ALAMELU ARASI N (Name changed as Aarthikka N)
18	U17MB018	ALICE AGNES JENIFER A
19	U17MB019	ALMAS RIFANA M
20	U17MB020	AMARJITH A
21	U17MB021	ANAGHA K
22	U17MB022	ANITHA M
23	U17MB023	ANKITA PADHY
24	U17MB024	ARADHANA KUMARI
25	U17MB025	ARAVIND KRISHNA H
26	U17MB026	ARAVINDHA NARAYANAN V
27	U17MB027	ARCHANA M L
28	U17MB028	ARCHANA P
29	U17MB029	ARPIT
30	U17MB030	ARULSREE S S
31	U17MB031	ARUN R
32	U17MB032	ASHWATHAMINI B
33	U17MB033	ASHWIN SUNDAR V
34	U17MB034	ASHWIN V
35	U17MB035	ASIF MOHAMED P
36	U17MB036	AVDESH SINGH
37	U17MB037	AYANKISA PANDA
38	U17MB038	AYUSHI MANYA JAIN
39	U17MB039	AYUSHI KUMARI
40	U17MB040	BALAJI R
41	U17MB041	BALAVINOD S
42	U17MB042	BHARATH RAM R
43	U17MB043	BHUVANASRI L Y
44	U17MB044	BINDU PRIYA K
45	U17MB045	CHANDRAPRAKASH V

CORSE FEEDBACK FORM

Date: 9/10/18

Course Title: Introduction to Inter Cultural Communication

Name: Archana · M · L

RegNo: U18MB027

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Archana · M · L
Signature

Thank you

CORSE FEEDBACK FORM

Date: 9/10/18

Course Title: Introduction to Inter cultural communication

Name: Bindu Priya.K

RegNo: U17MB044

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations					✓
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	✓
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Bindu Priya.K
Signature

Thank you



Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. AFTAB KAMRAN RAYANI has completed the value added course on Introduction to Inter Cultural Communication conducted by Surgery at Sree Balaji Medical College & Hospital, Chennai held during 10/10/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

9/10/2018

Chennai

From

The Course Coordinator

Certificate Program in First Aid and Emergency Care

Department of Paediatrics

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Program in First Aid and Emergency Care

Respected sir,

With reference to subject mentioned above, the Paediatrics proposes to conduct a value-added course titled: Certificate Program in First Aid and Emergency Care

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 9/13/2018

R. No 263/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Paediatrics

The Department of Paediatrics of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Program in First Aid and Emergency Care from 10/10/2018 for a period of 3 weeks. Interested students can approach the Head of Paediatrics department and Course Coordinator, for registration and for further details on or before 10/3/2018.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE PROGRAM IN FIRST AID AND EMERGENCY CARE

Course Outline: first aid & emergency care prepares the contender to become specialists in mishap and crisis care innovation. Toward the finish of this course, the competitors will have the information and abilities to give far-reaching and constant consideration to patients of all age bunches in crisis circumstances. They will have the option to guarantee sheltered and powerful administration choices for patients, and will be acquainted with the gear and medications utilized in crises. They will be effective mishap and crisis care, professionals

Course Objectives:

Course Duration: 30 hours

Course Coordinator: Associate Professor / Assistant Professor of Medicine.

Syllabus

Topic	Faculty	Hours allotted
Introduction to course	Assistant Professor of Medicine	2 hours
Introduction to first Aid	Associate Professor of Medicine	2 hours
Body systems	Assistant Professor of Medicine	2 hours
Victim Assessment	Associate Professor of Medicine	2 hours
Respiratory Emergencies	Assistant Professor of Medicine	2 hours
Cardiac Emergencies and Unconscious choking	Associate Professor of Medicine	2 hours
Bleeding and Shock	Assistant Professor of Medicine	2 hours

First aid for open wounds	Associate Professor of Medicine	2 hours
First aid for open wounds	Assistant Professor of Medicine	2 hours
Infection, Bites, Closed wounds, Injuries	Associate Professor of Medicine	2 hours
Poisoning	Assistant Professor of Medicine	2 hours
CPR	Associate Professor of Medicine	2 hours
Viva voce	Assistant Professor of Medicine	2 hours
Written test	Associate Professor of Medicine	2 hours

Certificate Program in First Aid and Emergency Care

S. No	Regn. No.	Name
1	U17MB046	CHARULATHA G
2	U17MB047	CHINMAYEE PANIGRAHI
3	U17MB048	CLIVE ROYSON M J
4	U17MB049	DAYALA GANESH T
5	U17MB050	DEBASHREE SAHOO
6	U17MB051	DHANUSIYA U
7	U17MB052	DHARINI M (Name changed as HAASINI M)
8	U17MB053	DHEVHA HARINI SA
9	U17MB054	DHILIP V
10	U17MB055	DINESH C K M
11	U17MB056	DINESH KUMAR M
12	U17MB057	DURGA ARUN PATWARDHAN
13	U17MB058	FAZAL RIAZ
14	U17MB059	FRANCIS N S
15	U17MB060	GAGANCHAND C
16	U17MB061	GAMANI V I
17	U17MB062	GOKULA VARDHAN R
18	U17MB063	GOPIKA A
19	U17MB064	GOWTHAM GANESH D
20	U17MB065	GOWTHAM S
21	U17MB066	GUNASUNDARI V
22	U17MB067	HAASHIKA M
23	U17MB068	HAMRUTHA V
24	U17MB069	HAMSANANDHINI S
25	U17MB070	HARIHARAN B
26	U17MB071	HARIHARAN S
27	U17MB072	HARIKRISHNA SURESH
28	U17MB073	HARIPRASATH M
29	U17MB074	HARIRAM M R
30	U17MB075	HARISH N
31	U17MB076	HARISH SACHIN M
32	U17MB077	HARITHA S
33	U17MB078	HAROONKHAN M K J
34	U17MB079	HARSHAN SABAPATHY V
35	U17MB080	HARSHAVARDHINI A
36	U17MB081	HEERA P
37	U17MB082	HELEN ANGELLA B
38	U17MB083	HEMA D
39	U17MB084	HMANGAIHSANGZUALI
40	U17MB085	JAI SANTHOSH T

CORSE FEEDBACK FORM

Date: 9/10/18

Course Title: Certificate Program in first aid and emergency care

Name: Gopika.A

RegNo: U17MB063

Department: Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Gopika.A
Signature

Thank you

CORSE FEEDBACK FORM

Date: 10/10/18

Course Title: Certificate Program in first aid and Emergency care

Name: Hari Prasath.T.M

RegNo: U17MB073

Department: Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Hari Prasath.T.M
Signature

Thank you



Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. AKANSHA MISHRA has completed the value added course on Certificate Program in First Aid and Emergency Care conducted by Paediatrics at Sree Balaji Medical College & Hospital, Chennai held during 10/10/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

9/9/2018

Chennai

From

The Course Coordinator

Introduction to Health and Fitness

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Introduction to Health and Fitness

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Introduction to Health and Fitness

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

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SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

R. No 147/ SBMCH/2018

Date: 9/12/2018

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Introduction to Health and Fitness from 10/10/2018 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 10/3/2018.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

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Introduction to Health and Fitness

Course Outline:

Health and Fitness are simply some of many the different words used to describe people being in good condition. There are many different services and products on offer which promise to improve or maintain a state of wellbeing, and any (or all) of these goods and services might be considered to be part of the health and fitness industry. These can include things as variable as medical services through to sport, recreation, food and natural therapies. The Health and Fitness industry is not a clearly defined industry. It does have many aspects to it, and it does overlap into many different fields. Your perception of the scope of this field may be limited as you commence this course; but on completing the course it should have broadened considerably; and in doing so your prospects for employment should have also broadened.

Course Duration: 30 Hours

Course Coordinator: Associate Professor / Assistant Professor of Community Medicine

Week 1: Concept of Fitness and Wellness and their significance in Modern times, Scope of Fitness TrainerAnd Health and Fitness Component, Health Screening- Health Conditions that affect Physical Activity and Medication

Week 2: Client Preferences, Expectations and Life Style information, Physical Screening and General Principles of Training, Training consideration while selecting nature of exercise and Understanding suitability and forms of exercise for fitness 1 question

Week 3: Types of exercise: Calisthenics, Aerobics and Dance, Weight Training, Yoga and Other forms of Exercise, Designing fitness program for-Sedentary and active population for Different Age groups and Different fitness levels

Week 4: Designing Weight Reduction training, Fitness and Rehabilitation Training Consideration for-Obese age adult and Diabetic Subjects, Nutrition-Caloric Consumption, Weight variation due to dietary habit, Physiological and

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Metabolic changes during exercise

Week 5: The energy support in aerobic and anaerobic activity, Relationship of Exercise with heart rate, equation for calculating heart rate zones for various exercises intensities, Recommended nutritional intakes, Dietary guidelines and Nutrient needs for people with different life style and Sport

Week 6: Selection of training organization of trainer and Layout of Health Clubs and fitness centre, Procurement of Equipments and their maintenance in Personal Management and Legal Responsibilities, Facilities, Equipments, Supervision, Instruction and Safety Guidelines

Week 7: Exercise recommendation and testing, Indemnity Bond, Legal formalities prior to conducting fitness programme for various categories of client, Code of Ethics, Professional Responsibilities of a fitness trainer towards clients

Week 8: An employee of fitness centre as contractual Personal Trainer, Business Structure, Sole Proprietorship, Partnership- General Partnership, Limited Partnership and Corporations, Marketing and Promoting Business, Advantages and Disadvantages, Blood borne Pathogens and Wrist Management

BOOKS AND REFERENCES

Armbruster, B. and Gladwin, L. A.2001: "More than Fitness for Older Adults."

A Whole-istic Approach to Wellness. ACSM's Health and Fitness Journal,Springer Publishing Company, New York.

Centers for Disease Control and Prevention. "Ten Great Public Health Accomplishments-United States 1900-1999." Morbidity and Mortality WeeklyReports.

Corbin, Charkes. Gregory Welk, William Corbin; Concepts of Fitness andWellness: A Comprehensive Lifestyle Approach; 9th Edition, McGraw-HillHigher Education Pubication, USA.

Corbin, Charkes. Gregory Welk. William Corbin, Karen Welk; Concepts ofFitness and Wellness: A Comprehensive Lifestyle Approach, Loose Leaf Edition 11th Edition, McGraw-Hill Higher Education Pubication, USA.

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Syllabus

Topic	**Faculty**	**Hours allotted**
Introduction to Course	Assistant Professor of Community Medicine	2 hours
Physical and Mental Health	Associate Professor of Community Medicine	2 hours
Yoga	Assistant Professor of Community Medicine	2 hours
Global Health	Associate Professor of Community Medicine	2 hours
Importance of General health	Assistant Professor of Community Medicine	2 hours
Types of Exercises	Associate Professor of Community Medicine	2 hours
Designing Weight Reduction training, Fitness and Rehabilitation	Assistant Professor of Community Medicine	2 hours
Fitness and training	Associate Professor of	2 hours

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	Community Medicine	
Exercise recommendation and testing, Indemnity Bond, Legal formalities	Assistant Professor of Community Medicine	2 hours
Expectations and Life Style information, Physical Screening and General Principles of Training,	Associate Professor of Community Medicine	2 hours
aerobic and anaerobic activity,	Assistant Professor of Community Medicine	2 hours
Exercise, Designing fitness program for- Sedentary and active population for Different Age groups	Associate Professor of Community Medicine	2 hours
Viva Voce	Assistant Professor of Community Medicine	2 hours
Assessment	Associate Professor of Community Medicine	2 hours

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Introduction to Health and Fitness

S. No	Regn. No.	Name
1	U17MB086	JAISHREE M
2	U17MB087	JANANI S
3	U17MB088	JAYALAKSHMI G
4	U17MB089	JAYASURYA M
5	U17MB090	JEEVARATHINAM SANCHEZ D
6	U17MB091	JEMI DAFFODIL S
7	U17MB092	JESON DAGAM
8	U17MB093	JIDAN CHRISTINA TOPNO
9	U17MB094	JIGNESH L
10	U17MB095	JOSIKA M N
11	U17MB096	KALAIVANI U
12	U17MB097	KAMAL HARAVEL G K
13	U17MB098	KAMALESH U
14	U17MB099	KANISHKHA K M S
15	U17MB100	KARTHIK BALAJI N
16	U17MB101	KARTHIK S S
17	U17MB102	KARTHIKEYAN S
18	U17MB103	KAVYA S DHESH
19	U17MB104	KAYALVIZHII S
20	U17MB105	KIRAN RAJ R B
21	U17MB106	KISHOREKUMAR S
22	U17MB107	KUMARESH S
23	U17MB108	LAKSHMIPRIYA S
24	U17MB109	MACHLIN S
25	U17MB110	MADHU SWETHA P
26	U17MB111	MADHUMITHA M
27	U17MB112	MADHUMITHA N
28	U17MB113	MADHUMITHAA M
29	U17MB114	MAGESH DEV S
30	U17MB115	MAHARABAM RONALDO

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Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. ARUN R has completed the value added course on Introduction to Health and Fitness conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 10/10/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

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CORSE FEEDBACK FORM

Date: 09/10/18

Course Title: Introduction to Health and fitness

Name: Jai Shree.M

RegNo: U17MB086

Department: Community Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Jai Shree.M
Signature

Thank you

Scanned by TapScanner

CORSE FEEDBACK FORM

Date: 9/10/18

Course Title: Introduction to Health and fitness

Name: Karthick. S.S

RegNo: U17MB101

Department: Community Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Karthick. S.S
Signature

Thank you

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10/8/2018

Chennai

From

The Course Coordinator

Introduction to Clinical Research

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Introduction to Clinical Research

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Introduction to Clinical Research

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 10/11/2018

R. No 276/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Introduction to Clinical Research from 11/7/2018 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 10/31/2018.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

INTRODUCTION TO CLINICAL RESEARCH

Course Outline: The drug and medical device development industry is experiencing a tremendous change globally. This change has geared momentum towards development of unique, newer and safer therapies and towards personalized medicinal drugs. The business models are advancing to the higher levels of niche busters and towards a coexistence of newer and blockbuster therapies used in the past. Due to the strengthening of economies in the BRIC countries i.e. Brazil, Russia, India & China, drug and device companies are focusing their research and development efforts in these regions particularly the research for clinical development of products i.e. Phase I to Phase IV clinical trials. Further, local pharmaceutical and biotech companies in these regions are also rapidly stepping up their work in Research and Development for developing promising new molecules as well as generics.
With the growth of the industry a number of clinical trial management organizations and business models have come into existence which include full-service Contract Research Organizations (CROs), early phase CROs, Site Management Organizations (SMOs), companies offering fewer but specialized services such as Clinical Data Management, Business Consulting, Knowledge Process Outsourcing (KPOs) etc. This growth has eventually amplified the demand for trained staff in the clinical research industry.

Clinical Research Course equips you with the knowledge and skills required for making a successful career in drug development and clinical trials. The program has been designed in a way so as to compliment your basic education and to provide you a platform to enter the pharmaceutical and biotech industry as a clinical research professional.

Course Duration: 30 hours

Course Coordinator: Associate Professor /Assistant professor of Medicine

Syllabus

Topic	**Faculty**	**Hours allotted**
GENERAL INTRODUCTION	Assistant Professor of Medicine	2 hours
EPIDEMIOLOGY & EVIDENCE BASED MEDICINE	Associate Professor of Medicine	2 hours
PHARMACEUTICAL MEDICINE	Assistant Professor of Medicine	2 hours
THERAPEUTIC AREAS	Associate Professor of Medicine	2 hours
ETHICS IN CLINICAL RESEARCH	Assistant Professor of Medicine	2 hours

ROLES AND RESPONSIBILITIES	Associate Professor of Medicine	2 hours
CLINICAL TRIAL PREPARATION	Assistant Professor of Medicine	2 hours
ESSENTIAL DOCUMENTS AND REGULATORY SUBMISSION	Associate Professor of Medicine	2 hours
STUDY START-UP, CLINICAL TRIALS MONITORING	Assistant Professor of Medicine	2 hours
COMPLIANCE AND AUDITS	Associate Professor of Medicine	2 hours
DATA MANAGEMENT AND BIOSTATISTICS	Assistant Professor of Medicine	2 hours
REGULATORY AFFAIRS IN CLINICAL RESEARCH	Associate Professor of Medicine	2 hours
FINANCIAL MANAGEMENT OF CLINICAL TRIALS	Assistant Professor of Medicine	2 hours
Written test	Associate Professor of Medicine	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. CHINMAYEE PANIGRAHI has completed the value added course on Introduction to Clinical Research conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 11/7/2018.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

Introduction to Clinical Research

S. No	Regn. No.	Name
1	U17MB116	MALAVIKA G
2	U17MB117	MANOJ PRABHU V S
3	U17MB118	MANOJKUMAR J
4	U17MB119	MEENAKSHI B
5	U17MB120	MINIE HULDAH R
6	U17MB121	MOHAMED ARIF M
7	U17MB122	MOHAMEDROHETH R
8	U17MB123	MOHAMMAD TALHA SHADAN
9	U17MB124	MOHAMMED ABUBACKER SIDDIQUE
10	U17MB125	MOHAMMED FAISAL U
11	U17MB126	MOHITH M P
12	U17MB127	MUDRAGADA PRANEETH
13	U17MB128	MUSKAN BANSAL
14	U17MB129	NANDHITHA NAIDU V
15	U17MB130	NATTISHA JENIFER B
16	U17MB131	NAVEENBALAJI G V
17	U17MB132	NAVIN A
18	U17MB133	NEELESH V
19	U17MB134	JUWAIN SHEHZAD NEHIL
20	U17MB135	NIGHIL AADHITHYA M
21	U17MB136	NISHANTH S R
22	U17MB137	NITHISH S
23	U17MB138	NIVEDHA V
24	U17MB139	NIVETHITHA N
25	U17MB140	PADMANABAN P
26	U17MB141	PAMURU YASHWITHA
27	U17MB142	PARKAVI G
28	U17MB143	PAUL REMIUS A
29	U17MB144	PAVITHRA P
30	U17MB145	PAVITHRA RESHMA S
31	U17MB146	PAVITHRA S
32	U17MB147	PEER MOHAMMED K
33	U17MB148	PONBARATHY V M
34	U17MB149	POOJA P
35	U17MB150	PRADAKSHINE S
36	U17MB151	PRADEEP G
37	U17MB152	PRADEEP M
38	U17MB153	PRADEEP KUMAR S
39	U17MB154	PRADHA RANJAN
40	U17MB155	PRAJIT N
41	U17MB156	PRANAV R P
42	U17MB157	PRAVEEN S
43	U17MB158	PRAVEENKUMAR S
44	U17MB159	PREETHI N
45	U17MB160	PREMALATHA R
46	U17MB161	PRITHA R J
47	U17MB162	PRIYADHARSHINI S
48	U17MB163	PRIYANKA KUMARI B
49	U17MB164	PRIYANKA T
50	U17MB165	PRIYANKHA R
51	U17MB166	PUSHPA PREETHI A
52	U17MB167	RAGHUL PRASATH R
53	U17MB168	RAHUL P NAIR
54	U17MB169	RAIHANA
55	U17MB170	RAKSAI VARTH S
56	U17MB171	RAMALINGAM MADHUMITHA



CORSE FEEDBACK FORM

Date: 9/7/18

Course Title: Introduction to clinical Reserch

Name: Pavithra.S

RegNo: U17MB146

Department: Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Pavithra.S
Signature

Thank you

CORSE FEEDBACK FORM

Date: 10/7/18

Course Title: Introduction to clinical Research

Name: Malavika .G

RegNo: U17MB116

Department: Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand				✓	✓
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Malavika G
Signature

Thank you

12/11/2018

Chennai

From

The Course Coordinator

Impact on Hospital Information System

Department of Physiology

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Impact on Hospital Information System

Respected sir,

With reference to subject mentioned above, the Physiology proposes to conduct a value-added course titled: Impact on Hospital Information System

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 12/14/2018

R. No 233/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Physiology

The Department of **Physiology** of Sree Balaji Medical College is scheduled to offer a Value added Course on Impact on Hospital Information System from 1/10/2019 for a period of 3 weeks. Interested students can approach the Head of Physiology department and Course Coordinator, for registration and for further details on or before 1/3/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

IMPACT ON HOSPITAL INFORMATION SYSTEM

Course Outline: A number of Hospital Information Systems (HISs) fail, because users are inadequately trained. The HIS led to many changes. Training is necessary for providers and staff to adequately learn how to use the new system and adapt them these changes. Unfortunately, often with inadequate training, the system usually does operate, but does not fulfill the original expectations. The 'Organizing for Excellence' program aims at providing insights into the multiple pathways that stakeholders can utilize to achieve competitive advantage. Specifically, this program showcases tools, techniques, and strategies to increase creative ability of individuals as well as institutionalize innovation. Particular to the healthcare context, the program will cover how organizations can be structured, how performance management and broader human resource management systems can be designed, how change can be managed (including the managing of resistance from medical professionals), how crisis management skills can be honed, and how healthcare settings can be managed through inclusion and human rights and ethics perspectives.

Course Duration: 30 hours

Course Coordinator: Associate Professor / Assistant Professor of Community Medicine

Syllabus

Topic	**Faculty**	**Hours allotted**
Introduction to course	Assistant Professor of Community Medicine	2 hours
Why health information systems? 1 Definitions 2 What is wrong with current health information systems?	Associate Professor of Community Medicine	2 hours
A framework for designing health information systems	Assistant Professor of Community Medicine	2 hours
The relationship between the	Associate Professor of	2 hours

health information system and the health system at large 17 Matching the health information system restructuring process with the health services system	Community Medicine	
Identifying information needs and indicators	Assistant Professor of Community Medicine	2 hours
Assessing health information systems	Associate Professor of Community Medicine	2 hours
Population-based community health information systems	Assistant Professor of Community Medicine	2 hours
Management of health information systems	Associate Professor of Community Medicine	2 hours
Using computers in health information systems	Assistant Professor of Community Medicine	2 hours
The context of health information system reform	Associate Professor of Community Medicine	2 hours
Data transmission, data processing, and data quality	Assistant Professor of Community Medicine	2 hours
A framework for assessing the health information system Reasons for health information	Associate Professor of Community Medicine	2 hours

system assessment ,Basic steps of health information system assessmen		
Viva voce	Assistant Professor of Community Medicine	2 hours
Written test	Associate Professor of Community Medicine	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. HAASHIKA M has completed the value added course on Impact on Hospital Information System conducted by Physiology at Sree Balaji Medical College & Hospital, Chennai held during 1/10/2019.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

Impact on Hospital Information System

S. No	Regn. No.	Name
1	U17MB174	RITAMBHARA JOSHI
2	U17MB175	RIYA KANT
3	U17MB176	RIZWAN FIZAL R
4	U17MB177	ROHINI R
5	U17MB178	ROHITH V
6	U17MB179	ROSHAN PAUL S
7	U17MB180	ROSHINI S
8	U17MB181	RUDRA D R
9	U17MB182	RUHANI SULTANA SHAIK A
10	U17MB183	SAHINI SNEHA
11	U17MB184	SAI SIDDARTH M
12	U17MB185	SAKSHI RANA
13	U17MB186	SALONI KUMARI
14	U17MB187	SANTHOSH KUMAR V M
15	U17MB188	SARAVANA PRIYAN T
16	U17MB189	SARAVANAPANDIYAN B
17	U17MB190	SELVABHARATHI M
18	U17MB191	SENTHIL KUMARAN S
19	U17MB192	SHAKTHI PARAMESH T
20	U17MB193	SHALINI K
21	U17MB194	SHANA PRASTHARAN S
22	U17MB195	SHANE HANS
23	U17MB196	SHANMUGA PRASAD C
24	U17MB197	SHEMA S N
25	U17MB198	SHOBITHRA K
26	U17MB199	SHRIRAM A P
27	U17MB200	SHRUTHI SRINIVASAN
28	U17MB201	SHYAM GANESH K
29	U17MB202	SHYAM KARTHICK C
30	U17MB203	SIVA SHANKARI P
31	U17MB204	SMITHA SURESH BABU M S
32	U17MB205	SNEHA ANAND
33	U17MB206	SNEHA JENIFER D
34	U17MB207	SNEHA SURESH
35	U17MB208	SNEHAA S



CORSE FEEDBACK FORM

Date: 30/09/18

Course Title: Impact on Hospital Information System

Name: Rohini. R

RegNo: 017MB177

Department: Community Medicine

S.NO	Particulars	1	2	3	4	5
(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)						
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)						
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Rohini.S
Signature

Thank you

CORSE FEEDBACK FORM

Date: 29/09/18

Course Title: Impact on Hospital Information System

Name: Shyam Ganesh .K

RegNo: U17MB201

Department: Community Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations					
3.	The lecture sequence was well planned					
4.	The lecturers were clear and easy to understand					
5.	The teaching aids were effective					
6.	The instructors encourage interaction and were helpful					
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Shyam Ganesh. K.
Signature

Thank you

12/11/2018

Chennai

From

The Course Coordinator

NABH for Hospitals

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: NABH for Hospitals

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: NABH for Hospitals

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 12/14/2018

R. No 221/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on NABH for Hospitals from 1/10/2019 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 1/3/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

NABH for Hospitals

Course Outline: The National Accreditation Board for Hospitals and Healthcare Providers (NABH) standards help in building a quality culture at all levels and across all the functions of a healthcare facility.

NABH offers an accreditation program for Indian hospitals and healthcare providers. NABH is a constituent board of Quality Council of India (QCI) and a member of the International Society for Quality in Healthcare (ISQua) Accreditation Council. The NABH standards offer a rigorous framework for patient care and quality improvement in the hospitals to achieve accreditation. This course provides an insight into the framework.

The **NABH** Course is designed to provide you the knowledge and insights that can prove critical in achieving NABH accreditation for your healthcare organization. The course offers practical guidelines and tips to overcome accreditation challenges that hospitals and other healthcare facilities encounter while getting them accredited.\

Course outcome:

this course you will learn:

- Overview of NABH accreditation
- NABH accreditation process
- NABH standards
- NABH documentation requirements

The students who successfully complete this course can look forward to finding job opportunities in quality departments of leading hospitals and other healthcare organizations.

Course Syllabus

Topic	**Faculty**	**Hours allotted**
Introduction To NABH	Assistant Professor of Pathology	2 hours
Access, Assessment & Continuity of Care	Associate Professor of Pathology	2 hours
Care of Patients	Assistant Professor of Pathology	2 hours
Management of Medication	Associate Professor of Pathology	2 hours

Patient Rights & Education	Assistant Professor of Pathology	2 hours
Hospital Infection Control	Associate Professor of Pathology	2 hours
Continual Quality Improvement	Assistant Professor of Pathology	2 hours
Responsibilities Of Management	Associate Professor of Pathology	2 hours
Facility management & Safety	Assistant Professor of Pathology	2 hours
.Human Resource Management	Associate Professor of Pathology	2 hours
Information Management System	Assistant Professor of Pathology	2 hours
Documentation Requirements & Implementation Guidelines	Associate Professor of Pathology	2 hours
Accreditation Process	Assistant Professor of Pathology	2 hours
Final Assessment	Associate Professor of Pathology	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, HEERA P has completed the value added course on NABH for Hospitals conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 1/10/2019.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

NABH for Hospitals

S. No	Regn. No.	Name
1	U17MB209	SNOWIN SERENA A
2	U17MB210	SOUMYADWEEP MUDULI
3	U17MB211	SOWMYA S S
4	U17MB212	SRI NANTHINI P
5	U17MB213	SRINIDHI N
6	U17MB214	SRINITHIN B S
7	U17MB215	SRIRAM S
8	U17MB216	SRIVAISHALI T
9	U17MB217	SRUTHI B
10	U17MB218	SUBHADRA PRADHAN S
11	U17MB219	SUBHAJIT NAYAK
12	U17MB220	SUBHASHREE KARISHMA CHOUDHURY
13	U17MB221	SUBIKSHA A K
14	U17MB222	SUDHA RANI J
15	U17MB223	SUHAS P KAUSHIK
16	U17MB224	SURANJAN EMMANUEL SAMUEL
17	U17MB225	SUREKHA S
18	U17MB226	SURESH BALAJI T
19	U17MB227	SURYA MATHIPRAKASAM KANNAN
20	U17MB228	SUSHMA P
21	U17MB229	SWATHI LAKSHMI V
22	U17MB230	SWETHA K
23	U17MB231	TEJAS G
24	U17MB232	THARANIMA A
25	U17MB233	THIRUMENI A
26	U17MB234	THOSIT KRISHNAA A A
27	U17MB235	VERTIKA
28	U17MB236	VIGNESH C S
29	U17MB237	VIJAYAPRIYA P
30	U17MB238	VIMAL KUMAR M



CORSE FEEDBACK FORM

Date: 1/10/19

Course Title: NABH for Hospitals

Name: Sowmya.S.S

RegNo: 917MB211

Department: Pathology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Sowmya.S.S.
Signature

Thank you

CORSE FEEDBACK FORM

Date: 1/10/19

Course Title: NABH for Hospitals

Name: Vedika

RegNo: U17MB235

Department: Pathology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Vedika...
Signature

Thank you

12/11/2018

Chennai

From

The Course Coordinator

Certificate Course in Hospital Infection Control (CHIC)

Department of Anatomy

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Course in Hospital Infection Control (CHIC)

Respected sir,

With reference to subject mentioned above, the Anatomy proposes to conduct a value-added course titled: Certificate Course in Hospital Infection Control (CHIC)

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 12/15/2018

R. No 254/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Anatomy

The Department of **Anatomy** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Course in Hospital Infection Control (CHIC) from 1/10/2019 for a period of 3 weeks. Interested students can approach the Head of Anatomy department and Course Coordinator, for registration and for further details on or before 1/3/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE COURSE IN HOSPITAL INFECTION CONTROL (CHIC)

Course Outline: Patients receiving health and social care are at risk of developing infection as a result of their compromised state of health, underlying medical conditions or as a result of contact with health care interventions such as surgery, diagnostic testing or invasive devices. People who receive and provide care can transmit organisms between them and health care setting provides conducive conditions for micro organisms to grow.

Health care workers have a professional and ethical responsibility to ensure our knowledge and skills are upto date and we practice safely and competently at all times. Thus, this program is designed to provide a comprehensive training for health care workers which will enhance them to provide and take responsibility over hospital infection control services.

Course Objectives:

To provide systematic training to the health care workers in sciences relevant to infection control
- To enable the health care workers to be aware of the standard practices of infection control and thereby support the employing organization to meet and improve the expected standards
- To facilitate key health care workers to take lead in the employed organization to formulate systematic hospital infection control program

Course Duration: 30 hours

Course Coordinator: Associate Professor /Assistant Professor of Microbiology

Syllabus

Topic	**Faculty**	**Hours allotted**
Introduction course	Assistant Professor of Microbiology	2 hours
Routes of transmission and their prevention	Associate Professor of Microbiology	2 hours
Infection control program organization	Assistant Professor of Microbiology	2 hours

Needle stick injury and post exposure prophylaxis	Associate Professor of Microbiology	2 hours
Sterilization and disinfection	Assistant Professor of Microbiology	2 hours
Personal protective equipment and standard precautions	Associate Professor of Microbiology	2 hours
Biomedical Medical Waste Management	Assistant Professor of Microbiology	2 hours
Isolation protocols	Associate Professor of Microbiology	2 hours
Device associated infections and Antimicrobial resistance (AMR)	Assistant Professor of Microbiology	2 hours
Vaccination, Blood spill and Hand hygiene	Associate Professor of Microbiology	2 hours
Observation of Biomedical Waste Management (Visit to ward, OPD , lab)	Assistant Professor of Microbiology	2 hours
Central Sterile Services Department (CSSD)	Associate Professor of Microbiology	2 hours
Viva voce	Assistant Professor of Microbiology	2 hours
Written test	Associate Professor of	2 hours

	Microbiology	

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, JIDAN CHRISTINA TOPNO has completed the value added course on Certificate Course in Hospital Infection Control (CHIC) conducted by Anatomy at Sree Balaji Medical College & Hospital, Chennai held during 1/10/2019.

Dr.P.Sai Kumar MD

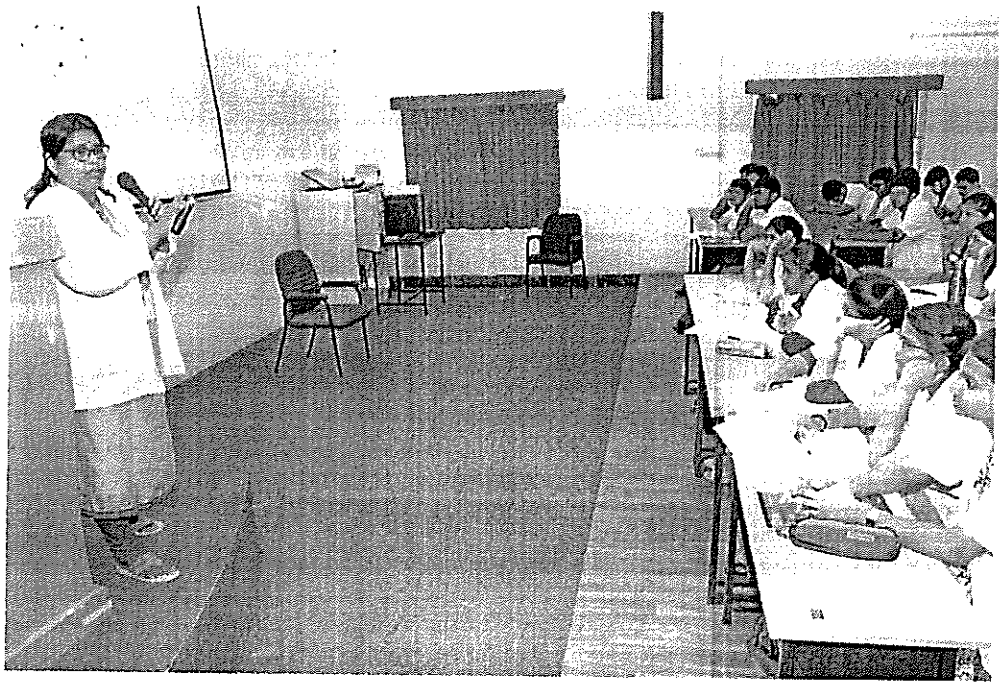
Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

Certificate Course in Hospital Infection Control (CHIC)

S. No	Regn. No.	Name
1	U17MB078	HAROONKHAN M K J
2	U17MB079	HARSHAN SABAPATHY V
3	U17MB080	HARSHAVARDHINI A
4	U17MB081	HEERA P
5	U17MB082	HELEN ANGELLA B
6	U17MB083	HEMA D
7	U17MB084	HMANGAIHSANGZUALI
8	U17MB085	JAI SANTHOSH T
9	U17MB086	JAISHREE M
10	U17MB087	JANANI S
11	U17MB088	JAYALAKSHMI G
12	U17MB089	JAYASURYA M
13	U17MB090	JEEVARATHINAM SANCHEZ D
14	U17MB091	JEMI DAFFODIL S
15	U17MB092	JESON DAGAM
16	U17MB093	JIDAN CHRISTINA TOPNO
17	U17MB094	JIGNESH L
18	U17MB095	JOSIKA M N
19	U17MB096	KALAIVANI U
20	U17MB097	KAMAL HARAVEL G K
21	U17MB098	KAMALESH U
22	U17MB099	KANISHKHA K M S
23	U17MB100	KARTHIK BALAJI N
24	U17MB101	KARTHIK S S
25	U17MB102	KARTHIKEYAN S
26	U17MB103	KAVYA S DHESH
27	U17MB104	KAYALVIZHII S
28	U17MB105	KIRAN RAJ R B
29	U17MB106	KISHOREKUMAR S
30	U17MB107	KUMARESH S



COURSE FEEDBACK FORM

Date: 08/01/19

Course Title: Certificate Course in Hospital Infection Control

Name: Kumaresh, S

RegNo: U17MB107

Department: Micro Biology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Kumaresh S
Signature

Thank you

COURSE FEEDBACK FORM

Date: 12/01/19

Course Title: Certificate Course in Hospital Infection Control.

Name: Heera.P

RegNo: U17MB081

Department: Micro Biology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations			✓		
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Heera.S
Signature

Thank you

12/11/2018

Chennai

From

The Course Coordinator

Training on Environmental health and hygiene

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Training on Environmental health and hygiene

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Training on Environmental health and hygiene

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 12/14/2018

R. No 254/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Training on Environmental health and hygiene from 1/10/2019 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 1/3/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

TRAINING ON ENVIRONMENTAL HEALTH AND HYGIENE

Course Outline: The curriculum of the course is interdisciplinary in nature and intended to serve as an introduction to the major issues of environmental health science with a focus on India, although global health issues are considered as well. The course will examine what those environmental health issues are, what determines them, and how they can be altered/resolved. As an introductory course it covers many facets of environmental health exposing the students with a broad overview of hygiene, sanitation and waste management for bringing an awareness about its importance in healthy life. The course will provide good grounding for students, especially those who wish to pursue a major coursework in environmental health.

Course Duration – 30 hours

Course Coordinator: Associate Professor /Assistant professor of Community Medicine

Course Syllabus

Topic	**Faculty**	**Hours allotted**
Introduction to Course	Assistant Professor of Community Medicine	2 hours
Perspectives: Environmental Health - Hygiene (EH), Sanitation and Waste Management. Introduction to the course	Associate Professor of Community Medicine	2 hours
Introduction to cleanliness; Sociology of Environmental Hygiene and Sanitation	Assistant Professor of Community Medicine	2 hours
Sanitation: Infrastructure and Maintenance	Associate Professor of Community Medicine	2 hours

Waste water, treatment and use	Assistant Professor of Community Medicine	2 hours
Technology for Recovery of Resources and Treatment	Associate Professor of Community Medicine	2 hours
Solid Waste Management	Assistant Professor of Community Medicine	2 hours
Air hygiene	Associate Professor of Community Medicine	2 hours
Management of Collectives	Assistant Professor of Community Medicine	2 hours
Global Health	Associate Professor of Community Medicine	2 hours
Environmental aspects in health	Assistant Professor of Community Medicine	2 hours
Recent Updates	Associate Professor of Community Medicine	2 hours
Viva Voce	Assistant Professor of Community Medicine	2 hours
Assessment	Associate Professor of Community Medicine	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. KAMAL HARAVEL G K has completed the value added course on Training on Environmental health and hygiene conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 1/10/2019.

Dr.P.Sai Kumar MD

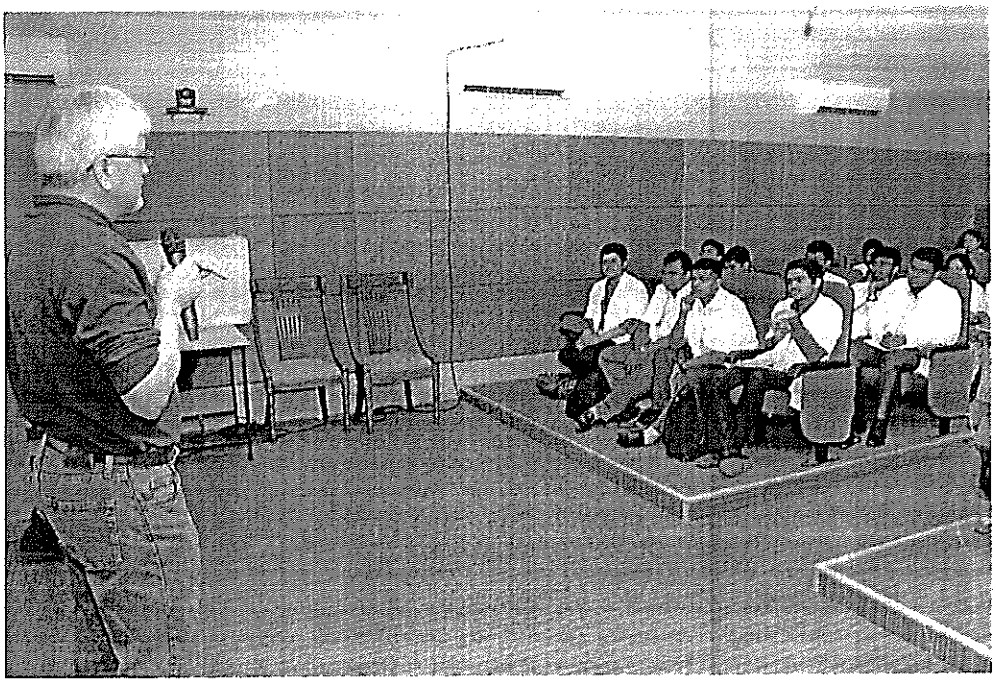
Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

Training on Environmental health and hygiene

S. No	Regn. No.	Name
1	U15MB001	AARTHI P
2	U15MB002	ABDUL RAHUMAN J
3	U15MB003	ABHIJIT SATISH RAO
4	U15MB004	ABHILASH V
5	U15MB005	ADIN DAVID
6	U15MB006	AISHWARYA RAMESH
7	U15MB007	AISHWARYA S
8	U15MB008	AJAEY S
9	U15MB009	AJAY ANNAMALAI M
10	U15MB010	AJEY PRASANTH P
11	U15MB011	AKSHARA P ROY
12	U15MB012	ALICIA CATHERINE A
13	U15MB013	ANAND R
14	U15MB014	ANAND S A
15	U15MB015	ANNA SHAJU AYNIKKAL
16	U15MB016	ANU ANANYA A
17	U15MB017	ANUJA P
18	U15MB018	ANUSHA A G
19	U15MB019	ARCHANA S
20	U15MB020	ARTHI SHREE V
21	U15MB021	ARUN KUMAR G
22	U15MB022	ASHRAF MOHAMED M
23	U15MB023	ASHWIN GOPAL B
24	U15MB024	ASHWIN KUMAR R P
25	U15MB025	AYEESHA SHOWKKATH S
26	U15MB026	BALAJI AJAYKRISHNA V
27	U15MB027	BALAKRISHNAN N
28	U15MB028	BALAMURUGAN C
29	U15MB029	BAVATHARINI S A
30	U15MB030	BENISHA DEFI S I
31	U15MB031	BERNATSHA R
32	U15MB032	BEWIN PIUS A
33	U15MB033	BHARANI DHARAN V
34	U15MB034	BHUVANESWARI K U
35	U15MB035	BOOPESH K
36	U15MB036	BRINDHA M
37	U15MB037	DAKINI PALA
38	U15MB038	DEBBIE AISHWARYA SATHYA
39	U15MB039	DEEPAK GAUTAM G
40	U15MB040	DEEPAKCHANDAR N



CORSE FEEDBACK FORM

Date: 01/10/19

Course Title: Training on Environmental Health and Hygiene

Name: Anand. R

RegNo: U15MB013

Department: Community medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations			✓		
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Anand.R
Signature

Thank you

CORSE FEEDBACK FORM

Date: 01/10/19

Course Title: Training on Environmental Health and Hygiene

Name: Brindha. M

RegNo: 015MB036

Department: Community Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Brindha. M.
Signature

Thank you

12/11/2018

Chennai

From

The Course Coordinator

Certificate Course in Pediatric Palliative Care

Department of Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Course in Pediatric Palliative Care

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Certificate Course in Pediatric Palliative Care

We kindly solicit your kind permission to commence the program.

Warm Regards,

Nandhini. S

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 12/14/2018

R. No 245/ SBMCH/2018

CIRCULAR

Notification for Value added courses offered by the Department of Medicine

The Department of **Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Course in Pediatric Palliative Care from 1/10/2019 for a period of 3 weeks. Interested students can approach the Head of Medicine department and Course Coordinator, for registration and for further details on or before 1/3/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

Learning Objectives:

At the end of this course, the learner will be able to:

1. Discover individual perspectives about end of life issues.

2. Identify the care at the actual time of death to ensure best practices.

3. Discuss the basic principles of palliative care within nursing practice.

4. Discuss the basic principles of pain assessment and management at the end of life.

5. Identify cultural differences in end of life issues to adequately communicate and provide culturally competent care.

6. Discuss key ethical and legal concerns in end of life and palliative care.

7. Emphasize the importance of therapeutic communication at the end of life.

8. Discover the challenging aspects of grief, loss, and bereavement of patients and families, as well as the loss experience of the health care professional.

MODULE –I

Individual perspective:

1. Assessment of attitudes regarding time of death is helpful to strengthen professional effectiveness.

2. Define personal death awareness and cumulative loss associated with caregiving.

MODULE – II

Preparation for and Care at the time of death:

1. Assess dying patients and list five physical signs and symptoms of the dying process and three signs of death.

2. Assess physical, psychological, social, and spiritual needs and interventions for a dying patient and their family.

MODULE –III

Palliative care:

1. Describe the role of the nurse and other members of the health care team, including the role of nursing assistants, in providing quality palliative care.

2. Identify the need for collaboration with team members when implementing palliative care

COURSE DURATION: 30 HOURS

COURSE COORDINATOR: Professor /Associate professor of Pediatrics

LESSON PLAN

S.NO	TOPIC	DURATION	FACULTY
1.	Introduction to course and terminologies	2 hours	Asst Prof : Dept of Pediatrics
2.	Assessment of attitudes regarding time of death is helpful to strengthen professional effectiveness.	2 hours	Assoc Prof : : Dept of Pediatrics
3.	Define personal death awareness and cumulative loss associated with caregiving	2 hours	Asst Prof : Dept of Pediatrics
4.	Assess dying patients and list five physical signs and symptoms of the dying process and three signs of death.	2 hours	Assoc Prof : : Dept of Pediatrics
5	Assess physical, psychological, social, and spiritual needs and interventions for a dying patient and their family	2 hours	Asst Prof : Dept of Pediatrics
6.	Describe the role of the nurse and other members of the health care team, including the role of nursing assistants, in providing quality palliative care	2 hours	Assoc Prof : : Dept of Pediatrics
7.	Identify the need for collaboration with team members when implementing palliative care.	2 hours	Asst Prof : Dept of Pediatrics
8.	Describe the philosophy and principles of hospice and palliative care that can be integrated across healthcare settings to affect quality care at the end of life.	2 hours	Assoc Prof : : Dept of Pediatrics
9.	Discuss aspects of suffering for patients and families facing a life-threatening illness or event.	2 hours	Asst Prof : Dept of Pediatrics
10.	Pain assessment and management:	2 hours	Assoc Prof : : Dept of Pediatrics

11.	Cultural indications at the end of lif	2 hours	Asst Prof : Dept of Pediatrics
12.	Ethical and legal issues at the end of life:	2 hours	Asst Prof : Dept of Pediatrics
13.	Therapeutic communication:	2 hours	Assoc Prof : : Dept of Pediatrics
14.	Loss, grief, and bereavement:	2 hours	Asst Prof : Dept of Pediatrics
15.	Assessment	2 hours	Assoc Prof : : Dept of Pediatrics

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. MEENAKSHI B has completed the value added course on Certificate Course in Pediatric Palliative Care conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 1/10/2019.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. AARON RAJ K has completed the value added course on Training on Epidemiology: The Basic Science of Public Health conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 2/14/2019.

Dr.W M S Johnson

Dean, SBMCH

Certificate Course In Pediatric Palliative Care

S. No	Regn. No.	Name
1	U15MB041	DESHNA V
2	U15MB042	DEVI C
3	U15MB043	DHARANPATHY D
4	U15MB044	DINEASH V R
5	U15MB045	DIVYA KURUP P S
6	U15MB046	DOMINIC BABU
7	U15MB047	ELANGOVAN I
8	U15MB048	ELBICH SONISA L
9	U15MB049	ELIZA NONGMAITHEM
10	U15MB050	FASALURAHMAN K M
11	U15MB051	GADILI LAVANYA
12	U15MB052	GANAPATHY S
13	U15MB053	GANESH K
14	U15MB054	GANUGAPANTA PREM SAI REDDY
15	U15MB055	GAUTAM B
16	U15MB056	GAUTHAM M
17	U15MB057	GAUTHAM N
18	U15MB058	GAYATHRI K
19	U15MB059	GOKUL G
20	U15MB060	GOKUL S
21	U15MB061	GOPIKA GIRI
22	U15MB062	GOPINATH S
23	U15MB063	GOTTAM BHARGAVA SAI SRINIVAS
24	U15MB064	GOWSHIK RAJA K S
25	U15MB065	GOWTHAMAN K
26	U15MB066	GRACELYN SHARON P
27	U15MB067	GREESHMI C
28	U15MB068	HARIHARAN M
29	U15MB069	HARINI G
30	U15MB070	HARRIBALAJI M
31	U15MB071	HARSHATH KUMAR K N
32	U15MB072	HARSHITHA REDDY D
33	U15MB073	HOMA SAMANVITHA S
34	U15MB074	IMMANUEL ABRAHAM S
35	U15MB075	JANANI S
36	U15MB076	JASMINE NISHA N
37	U15MB077	JAYA KALYANI P S
38	U15MB078	JAYAPREETHI S
39	U15MB079	JEEVITHA P
40	U15MB080	JENISHA THERESA LALICHAN
41	U15MB081	JESVANTHAN E
42	U15MB082	JEYA PRADHA C
43	U15MB083	JINU SHIRLEY T
44	U15MB084	JOSEPH MARTIN J
45	U15MB085	JOTHIRLATHA Y J



CORSE FEEDBACK FORM

Date: 30/09/2019

Course Title: Certificate Course in Pediatric Palliative care

Name: Gokul.G

RegNo: U15MB059

Department: pediatric

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations			✓		
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Gokul.G
Signature

Thank you

CORSE FEEDBACK FORM

Date: 30/09/19.

Course Title: Certificate Course in Pediatric Palliative care

Name: Janani.S

RegNo: U15MB075

Department: Pediatric

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Janani.S
Signature

Thank you

1/16/2019

Chennai

From

The Course Coordinator

Certificate Course in Basic medical and surgical skill

Department of Forensic Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Course in Basic medical and surgical skill

Respected sir,

With reference to subject mentioned above, the Forensic Medicine proposes to conduct a value- added course titled: Certificate Course in Basic medical and surgical skill

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 1/19/2019

R. No 237/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Forensic Medicine

The Department of **Forensic Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Course in Basic medical and surgical skill from 2/14/2019 for a period of 3 weeks. Interested students can approach the Head of Forensic Medicine department and Course Coordinator, for registration and for further details on or before 2/7/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE COURSE IN BASIC MEDICAL AND SURGICAL SKILL

Course Outline :
This course / workshop is designed for undergraduates.The course intends to give comprehensive knowledge on surgical etiquettes and basic skills required to carry out surgical procedures in their own practise or when need arises.
The content of the course will throw light on operating room environment; sterilisation and asepsis with hands on experience of scrubbing methods and Draping and Gloving processes. Display of various instruments for touch and feel to familiarise the participants with their method of use. Participants will also be able to practise incisions; flap reflection and suturing techniques on artificial skin models under guidance from mentors.
Hands on for some of the latest techniques in surgery.

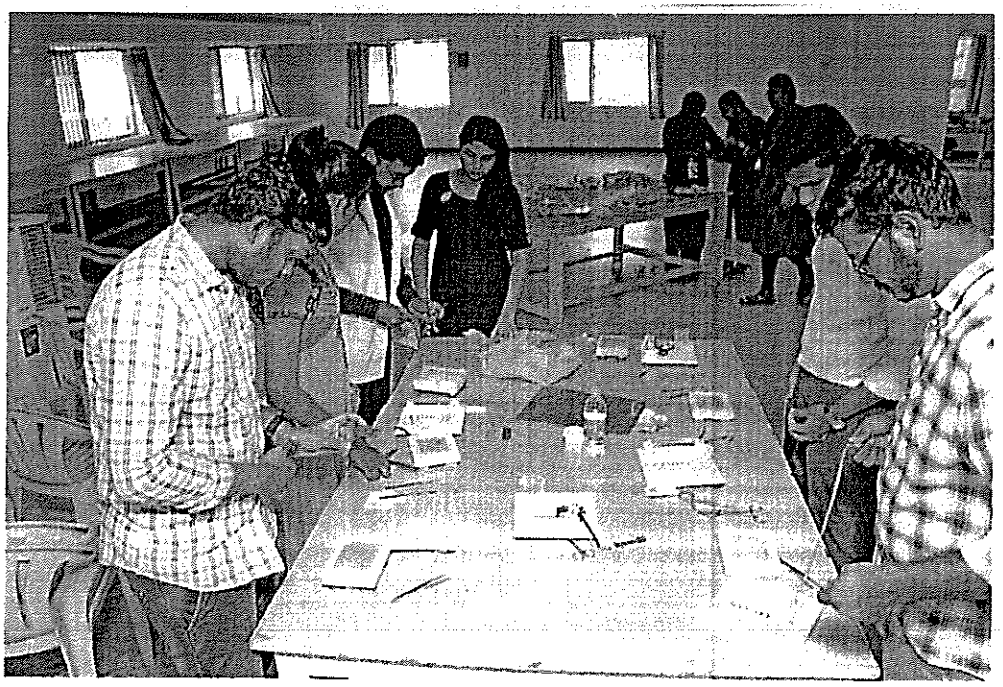
Course coordinator: Associate Professor & Assistant Professor of General surgery

Course Duration: 30 hours
Course Syllabus

Topic	Faculty	Hours allotted
Introduction to Surgery as a speciality	Assistant Professor of Surgery	2 hours
Sterilisation; Disinfection; asepsis and antisepsis	Assistant Professor of Surgery	2 hours
Basic surgical instruments.	Associate Professor of Surgery	2 hours
Incisions1. Design of Incisions 2. Types of Incisions 3. Flap reflection 4. Retraction of Flaps 5. Latest Trends	Assistant Professor of Surgery	2 hours
Suturing1. Suture materials 2. Types of Suturing 3. Surgical Knots 4. Latest Trends	Assistant Professor of Surgery	2 hours
Wound care management; Postoperative care	Associate Professor of Surgery	2 hours

Simple and complicated Exodontia Procedures; Transalveolar extraction concepts, tips and tricks	Assistant Professor of Surgery	2 hours
Complications in surgical procedures; Common errors to avoid.	Assistant Professor of Surgery	2 hours
Complications in surgical procedures; Common errors to avoid.	Associate Professor of Surgery	2 hours
Hands on experience1. How to Scrub and prepare for Surgery; Correct Draping and Gloving process – Demonstration and Practice **2. Display of various Surgical instruments; discussions on their use** **3. Incision and suturing techniques; practice on artificial skin models.** **4. Hands on LASER and R.F use on real tissues.** **5. Tissue Glue demonstration.**	Assistant Professor of Surgery	2 hours
Group Discussion	Assistant Professor of Surgery	2 hours
Assignment	Assistant Professor of Surgery	2 hours
Viva voce	Associate Professor of Surgery	2 hours
Written test	Assistant Professor of Surgery	2 hours

Certificate Course in Basic medical and surgical skill		
S. No	Regn. No.	Name
1	U15MB088	KARTHICK M
2	U15MB089	KARTHIKA RAJESWARI R
3	U15MB090	KAVIN S
4	U15MB091	KAVINKUMAR V
5	U15MB092	KAVYA G
6	U15MB093	KEERTHANA K
7	U15MB094	KEERTHANA SURESH
8	U15MB095	KEERTHI RAJ G
9	U15MB096	KHAAVYA B
10	U15MB097	KISHORE G
11	U15MB098	KODURU NAVEEN KUMAR
12	U15MB099	KRISHNA PRABA S
13	U15MB100	KRISHNAKKUMAR N R
14	U15MB101	LAKSHANA D
15	U15MB102	LAKSHMI PRASHANTH N
16	U15MB103	LOGESHRAJA V M
17	U15MB104	MADAN KUMAR S
18	U15MB105	MADHANKUMAR M
19	U15MB106	MAHALAKSHMI B
20	U15MB107	MAHALAKSHMI M
21	U15MB108	MALACK MAHMOOD USAMA
22	U15MB109	MANEESH P
23	U15MB110	MANGAIYARKARASI A
24	U15MB111	MANIKANDAN J K
25	U15MB112	MANISHA V
26	U15MB113	MANJUPAARGAVI R
27	U15MB114	MARTINA LINDSAY PAUL A
28	U15MB115	MATCHA REDDYSRI
29	U15MB116	MICHAEL SWETHA J
30	U15MB117	MITHUN J
31	U15MB118	MOHAMMED AZHERUDDIN M K J
32	U15MB119	MOHAMMED JUNAIDH KHAN B
33	U15MB120	MONICA SATHYANARAYANAN
34	U15MB121	MONIHA R
35	U15MB122	MONISHA P
36	U15MB123	MUNDLURI SAI KRISHNA
37	U15MB124	MURALI N
38	U15MB125	MURUGAN NANDHINI
39	U15MB126	MURUGESAN M
40	U15MB127	ANEES FATHIMA M



CORSE FEEDBACK FORM

Date: 18/02/19

Course Title: Certificate Course in Basic medical and Surgical Skill

Name: mahalakshmi B

RegNo: U15MB106

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations					✓
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Signature

Thank you

CORSE FEEDBACK FORM

Date: 15/02/2019

Course Title: Certificate Course in Basic medical and Surgical Skill

Name: Kavin. S

RegNo: U15MB090

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations					✓
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Signature

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, KARTHICK M has completed the value added course on Certificate Course on Basic Medical and Surgical Skill conducted by at Sree Balaji Medical College & Hospital, Chennai held during 2 /14 /2019.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

1/15/2019

Chennai

From

The Course Coordinator

Training on Epidemiology: The Basic Science of Public Health

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Training on Epidemiology: The Basic Science of Public Health

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Training on Epidemiology: The Basic Science of Public Health

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 1/18/2019

R. No 221/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Training on Epidemiology: The Basic Science of Public Health from 2/14/2019 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 2/7/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

Training on Epidemiology: The basic Science in public health

Course Outline :

Public health, epidemiology is the study of the distribution and determinants of diseases, health conditions, or events among populations and the application of that study to control health problems. By applying the concepts learned in this course to current public health problems and issues, students will understand the practice of epidemiology as it relates to real life and makes for a better appreciation of public health programs and policies

Objectives of the course

The program aims to provide students basic skills and expertise to understand health disparities, health inequalities at local, national and global level, impart knowledge to improve health outcomes through the effective planning, implementation and assessment of health interventions to change positive health behaviour. The learning outcomes are:

- Basic understanding of local, national and global health problems and issues
- Comprehensive knowledge on health care system, functions and policies
- Insight into design, implement and assess appropriate interventions to reduce health inequalities

COURSE COORDINATOR: Associate professor / Assistant professor of community medicine

SYLLABUS

Topic	Faculty	Hours allotted
INTRODUCTION	Assistant Professor of Community Medicine	2 hours
Course Introduction, History of Epidemiology and Epidemiology Research	Associate Professor of Community Medicine	2 hours
Understanding Measures of Disease Frequency	Assistant Professor of Community Medicine	2 hours
Study Designs	Associate Professor of Community Medicine	2 hours
Measures of Association	Assistant Professor of Community Medicine	2 hours
Group discussion	Associate Professor of Community Medicine	2 hours

Measures of association and confidence intervals.	Assistant Professor of Community Medicine	2 hours
public health issues like cardiovascular and infectious diseases	Associate Professor of Community Medicine	2 hours
current public health problems and issues	Assistant Professor of Community Medicine	2 hours
Assignment	Associate Professor of Community Medicine	2 hours
Distribution and determinants of health-related states or events in specified populations	Assistant Professor of Community Medicine	2 hours
patterns and determinants of health and disease conditions	Associate Professor of Community Medicine	2 hours
Viva voce	Assistant Professor of Community Medicine	2 hours
Written test	Associate Professor of Community Medicine	2 hours

Training on Epidemiology: The Basic Science of Public Health

S. No	Regn. No.	Name
1	U17MB001	AADITHYA JAGAN N R
2	U17MB002	AAKASH KUMAR R S
3	U17MB003	AARATHI R A
4	U17MB004	AARTHI SHREE S
5	U17MB005	AARTHI SINDHU V
6	U17MB006	AARTI D R
7	U17MB007	ABDUL KABEER A
8	U17MB008	ABHINAV MALVIYA
9	U17MB009	ABHINAYA R
10	U17MB010	ABHINAYA S
11	U17MB011	ABINISHA K V
12	U17MB012	ABISHEIKKANNA K
13	U17MB013	AFTAB KAMRAN RAYANI
14	U17MB014	AKANSHA MISHRA
15	U17MB015	AKASH S
16	U17MB016	AKSHAYA N
17	U17MB017	ALAMELU ARASI N (Name changed as Aarthikka N)
18	U17MB018	ALICE AGNES JENIFER A
19	U17MB019	ALMAS RIFANA M
20	U17MB020	AMARJITH A
21	U17MB021	ANAGHA K
22	U17MB022	ANITHA M
23	U17MB023	ANKITA PADHY
24	U17MB024	ARADHANA KUMARI
25	U17MB025	ARAVIND KRISHNA H
26	U17MB026	ARAVINDHA NARAYANAN V
27	U17MB027	ARCHANA M L
28	U17MB028	ARCHANA P
29	U17MB029	ARPIT
30	U17MB030	ARULSREE S S
31	U17MB031	ARUN R
32	U17MB032	ASHWATHAMINI B
33	U17MB033	ASHWIN SUNDAR V
34	U17MB034	ASHWIN V
35	U17MB035	ASIF MOHAMED P
36	U17MB036	AVDESH SINGH
37	U17MB037	AYANKISA PANDA
38	U17MB038	AYUSHI MANYA JAIN
39	U17MB039	AYUSHI KUMARI
40	U17MB040	BALAJI R
41	U17MB041	BALAVINOD S
42	U17MB042	BHARATH RAM R
43	U17MB043	BHUVANASRI L Y



COURSE FEEDBACK FORM

Date:

Course Title:

Name:

RegNo:

Department:

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations					
3.	The lecture sequence was well planned					
4.	The lecturers were clear and easy to understand					
5.	The teaching aids were effective					
6.	The instructors encourage interaction and were helpful					
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Signature

Thank you

COURSE FEEDBACK FORM

Date:

Course Title:

Name:

RegNo:

Department:

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations					
3.	The lecture sequence was well planned					
4.	The lecturers were clear and easy to understand					
5.	The teaching aids were effective					
6.	The instructors encourage interaction and were helpful					
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

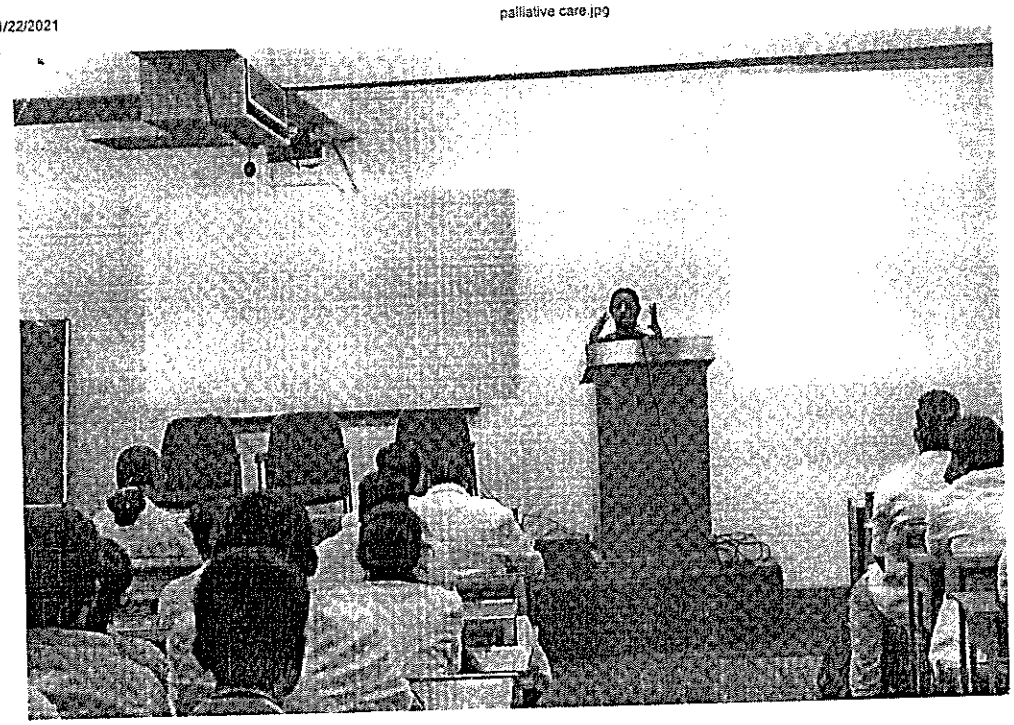
Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Signature

Thank you



Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, ANITHA M has completed the value added course on Training on Epidemiology: The Basic Science of Public Health conducted by at Sree Balaji Medical College & Hospital, Chennai held during 2/7/2019.

Dr.P.Sai Kumar MD

Vice Principal, SBMCH

Dr.Gunasekeran MS

Dean, SBMCH

1/15/2019

Chennai

From

The Course Coordinator

Training program on Respect for Life

Department of Forensic Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Training program on Respect for Life

Respected sir,

With reference to subject mentioned above, the Forensic Medicine proposes to conduct a value- added course titled: Training program on Respect for Life

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 1/18/2019

R. No 218/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Forensic Medicine

The Department of **Forensic Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Training program on Respect for Life from 2/14/2019 for a period of 3 weeks. Interested students can approach the Head of Forensic Medicine department and Course Coordinator, for registration and for further details on or before 2/7/2019.

Eligibility-MBBS STUDENTS

HOD

Course Coordinator

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

Name of the Course: COURSE ON RESPECT OF LIFE

Hours: 30 hrs

Course Coordinator : Associate Professor / Assistant Professor of Psychiatry

Syllabus

SL NO	Topic	Faculty	Hours allotted
1	Introduction of the course	Assistant Professor of Psychiatry	2
2	The modern scientific conclusion about when human life begins	Associate Professor of Psychiatry	1
3	Role of government in protection of human life	Assistant Professor of Psychiatry	
4	International pro-life principles	Associate Professor of Psychiatry	1
5	Laws pertaining to human rights.	Assistant Professor of Psychiatry	2
6	Assessment	Associate Professor of Psychiatry	2
7	Role of a physician in imparting knowledge of respect for fellow beings and patients	Assistant Professor of Psychiatry	2
8	Confidentiality in medicine	Associate Professor of Psychiatry	2
9	Consumer protection act and medical negligence	Assistant Professor of Psychiatry	2
10	Ethics of respect of life	Associate Professor of Psychiatry	2
11	Dimensions of physician patient relations	Assistant Professor of Psychiatry	2
12	Assessment	Associate Professor of Psychiatry	2
13	Moral basis of medical ethics	Assistant Professor of Psychiatry	2
14	Regulation consumption and consumer protection in clinical medicine and public health	Associate Professor of Psychiatry	2
15	Truth-telling in physician patient relationship	Assistant Professor of Psychiatry	1
16	Medical experimentation on human subjects	Associate Professor of Psychiatry	2
17	Assessment	Assistant Professor of Psychiatry	1
18	Assignment	Associate Professor of Psychiatry	1



CORSE FEEDBACK FORM

Date: 13/02/19

Course Title: Course on Respect of life

Name: Haritha .S

RegNo: U17MB072

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Haritha.S
Signature

Thank you

CORSE FEEDBACK FORM

Date: 13/02/19

Course Title: Course of Respect of life

Name: Hema.D

RegNo: U17MB083

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Hema.S
Signature

Thank you

Training program on Respect for Life

S. No	Regn. No.	Name
1	U17MB046	CHARULATHA G
2	U17MB047	CHINMAYEE PANIGRAHI
3	U17MB048	CLIVE ROYSON M J
4	U17MB049	DAYALA GANESH T
5	U17MB050	DEBASHREE SAHOO
6	U17MB051	DHANUSIYA U
7	U17MB052	DHARINI M (Name changed as HAASINI M)
8	U17MB053	DHEVHA HARINI SA
9	U17MB054	DHILIP V
10	U17MB055	DINESH C K M
11	U17MB056	DINESH KUMAR M
12	U17MB057	DURGA ARUN PATWARDHAN
13	U17MB058	FAZAL RIAZ
14	U17MB059	FRANCIS N S
15	U17MB060	GAGANCHAND C
16	U17MB061	GAMANI V I
17	U17MB062	GOKULA VARDHAN R
18	U17MB063	GOPIKA A
19	U17MB064	GOWTHAM GANESH D
20	U17MB065	GOWTHAM S
21	U17MB066	GUNASUNDARI V
22	U17MB067	HAASHIKA M
23	U17MB068	HAMRUTHA V
24	U17MB069	HAMSANANDHINI S
25	U17MB070	HARIHARAN B
26	U17MB071	HARIHARAN S
27	U17MB072	HARIKRISHNA SURESH
28	U17MB073	HARIPRASATH M
29	U17MB074	HARIRAM M R
30	U17MB075	HARISH N
31	U17MB076	HARISH SACHIN M
32	U17MB077	HARITHA S
33	U17MB078	HAROONKHAN M K J
34	U17MB079	HARSHAN SABAPATHY V
35	U17MB080	HARSHAVARDHINI A
36	U17MB081	HEERA P
37	U17MB082	HELEN ANGELLA B
38	U17MB083	HEMA D
39	U17MB084	HMANGAIHSANGZUALI
40	U17MB085	JAI SANTHOSH T
41	U17MB086	JAISHREE M
42	U17MB087	JANANI S
43	U17MB088	JAYALAKSHMI G
44	U17MB089	JAYASURYA M
45	U17MB090	JEEVARATHINAM SANCHEZ D
46	U17MB091	JEMI DAFFODIL S
47	U17MB092	JESON DAGAM
48	U17MB093	JIDAN CHRISTINA TOPNO
49	U17MB094	JIGNESH L
50	U17MB095	JOSIKA M N

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. ABHISHEK ARORA has completed the value added course on Training program on Respect for Life conducted by Forensic Medicine at Sree Balaji Medical College & Hospital, Chennai held during 2/14/2019.

Dr.W M S Johnson

Dean, SBMCH

1/15/2019

Chennai

From

The Course Coordinator

Training on Positive Mental Attitude

Department of Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Training on Positive Mental Attitude

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Training on Positive Mental Attitude

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 1/18/2019

R. No 199/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Medicine

The Department of **Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Training on Positive Mental Attitude from 2/14/2019 for a period of 3 weeks. Interested students can approach the Head of Medicine department and Course Coordinator, for registration and for further details on or before 2/7/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

TRAINING ON POSITIVE MENTAL ATTITUDE

COURSE OBJECTIVES

By the end of the Positive Thinking and Mindset Training Course, the participants of this syllabus will be able to:

- Explain the positive psychology
- Understand brain hemispheres and how the mind works
- Learn human behaviours and different types of thinking
- Create a roadmap for success with a result-oriented action plan
- Detect negative thinkings and the common negative thought patterns
- Understand the internal and external causes of negative thinking
- Manage the thoughts of your mind and your conversation
- Understand the impact of negative thinking over business performance
- Learn methods and techniques of switching from negative to positive mindsets
- Learn visualization techniques to transform personal thoughts and beliefs
- Utilize innovative and creative thinking to convert challenges into opportunities
- Learn effective tools and techniques for changing attitudes and behaviours
- Handle workplace negativity and negative people
- Learn Problem Solving techniques with creative thinking
- Learn the Tip and Techniques for Personal Development and overall health

Course Coordinator: Associate Professor / Assistant professor of Psychiatry

Course duration: 30 Hours

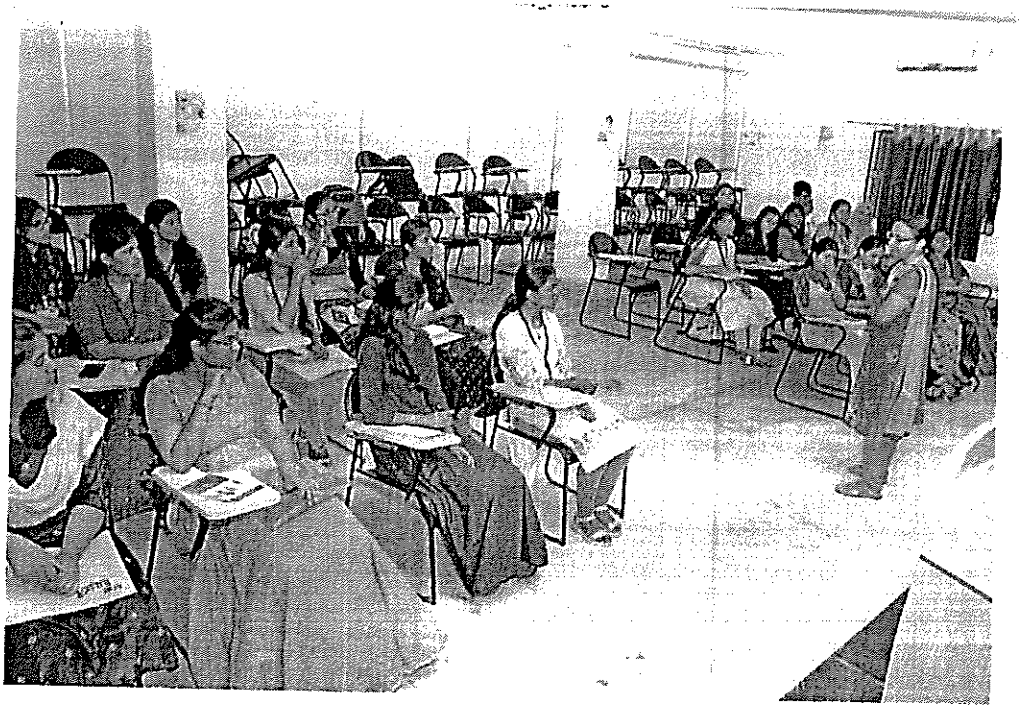
Course Syllabus

Topic	Faculty	Hours allotted
Psychology of Positivity: Introduction	Assistant Professor of Psychiatry	2 hours
Optimism versus Pessimism	Assistant Professor of Psychiatry	2 hours
Science and Power of the Human Brain	Associate Professor of Psychiatry	2 hours
Develop Positive Communication: Art of Positive Speaking	Associate Professor of Psychiatry	2 hours

Thinking in different Approaches and Backgrounds	Associate Professor of Psychiatry	2 hours
Understanding People and Negative behaviour	Assistant Professor of Psychiatry	2 hours
Workplace negativity: How to end	Associate Professor of Psychiatry	2 hours
Train your Mind to Train your Body	Associate Professor of Psychiatry	2 hours
Practical positive thinking tools and methods	Assistant Professor of Psychiatry	2 hours
Change Management: From negative to positive	Associate Professor of Psychiatry	2 hours
Deleting the history of old negative beliefs and foundations	Assistant Professor of Psychiatry	2 hours
Excellent Tips for positive thinking	Associate Professor of Psychiatry	2 hours
Viva voce	Assistant Professor of Psychiatry	2 hours
Written test		2 hours

Training on Positive Mental Attitude

S. No	Regn. No.	Name
1	U17MB106	KISHOREKUMAR S
2	U17MB107	KUMARESH S
3	U17MB108	LAKSHMIPRIYA S
4	U17MB109	MACHLIN S
5	U17MB110	MADHU SWETHA P
6	U17MB111	MADHUMITHA M
7	U17MB112	MADHUMITHA N
8	U17MB113	MADHUMITHAA M
9	U17MB114	MAGESH DEV S
10	U17MB115	MAHARABAM RONALDO
11	U17MB116	MALAVIKA G
12	U17MB117	MANOJ PRABHU V S
13	U17MB118	MANOJKUMAR J
14	U17MB119	MEENAKSHI B
15	U17MB120	MINIE HULDAH R
16	U17MB121	MOHAMED ARIF M
17	U17MB122	MOHAMEDROHETH R
18	U17MB123	MOHAMMAD TALHA SHADAN
19	U17MB124	MOHAMMED ABUBACKER SIDDIQUE
20	U17MB125	MOHAMMED FAISAL U
21	U17MB126	MOHITH M P
22	U17MB127	MUDRAGADA PRANEETH
23	U17MB128	MUSKAN BANSAL
24	U17MB129	NANDHITHA NAIDU V
25	U17MB130	NATTISHA JENIFER B
26	U17MB131	NAVEENBALAJI G V
27	U17MB132	NAVIN A
28	U17MB133	NEELESH V
29	U17MB134	JUWAIN SHEHZAD NEHIL
30	U17MB135	NIGHIL AADHITHYA M
31	U17MB136	NISHANTH S R
32	U17MB137	NITHISH S
33	U17MB138	NIVEDHA V
34	U17MB139	NIVETHITHA N
35	U17MB140	PADMANABAN P
36	U17MB141	PAMURU YASHWITHA
37	U17MB142	PARKAVI G
38	U17MB143	PAUL REMIUS A
39	U17MB144	PAVITHRA P
40	U17MB145	PAVITHRA RESHMA S
41	U17MB146	PAVITHRA S
42	U17MB147	PEER MOHAMMED K
43	U17MB148	PONBARATHY V M
44	U17MB149	POOJA P
45	U17MB150	PRADAKSHINE S
46	U17MB151	PRADEEP G
47	U17MB152	PRADEEP M
48	U17MB153	PRADEEP KUMAR S
49	U17MB154	PRADHA RANJAN
50	U17MB155	PRAJIT N
51	U17MB156	PRANAV R P
52	U17MB157	PRAVEEN S
53	U17MB158	PRAVEENKUMAR S
54	U17MB159	PREETHI N
55	U17MB160	PREMALATHA R
56	U17MB161	PRITHA R J
57	U17MB162	PRIYADHARSHINI S
58	U17MB163	PRIYANKA KUMARI B
59	U17MB164	PRIYANKA T
60	U17MB165	PRIYANKHA R
61	U17MB166	PUSHPA PREETHI A



CORSE FEEDBACK FORM

Date: 13/02/19

Course Title: Training on Positive mental Attitude

Name: Nithish.S

RegNo: U17MB137

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Nithish.S
Signature

Thank you

CORSE FEEDBACK FORM

Date: 14/02/19

Course Title: Training on Positive mental Attitude

Name: Malavika.G

RegNo: U17MB116

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations					
3.	The lecture sequence was well planned					
4.	The lecturers were clear and easy to understand					
5.	The teaching aids were effective					
6.	The instructors encourage interaction and were helpful					
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Malavika.G
Signature

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. APARNA R has completed the value added course on Training on Positive Mental Attitude conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 2/14/2019.

Dr.W M S Johnson

Dean, SBMCH

2/17/2019

Chennai

From

The Course Coordinator

Introduction to Honesty and Integrity of the Person

Department of Physiology

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Introduction to Honesty and Integrity of the Person

Respected sir,

With reference to subject mentioned above, the Physiology proposes to conduct a value-added course titled: Introduction to Honesty and Integrity of the Person

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 2/21/2019

R. No 189/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Physiology

The Department of Physiology of Sree Balaji Medical College is scheduled to offer a Value added Course on Introduction to Honesty and Integrity of the Person from 3/19/2019 for a period of 3 weeks. Interested students can approach the Head of Physiology department and Course Coordinator, for registration and for further details on or before 3/12/2019.

Eligibility-MBBS STUDENTS

HOD

Course Coordinator

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

INTRODUCTION TO HONESTY AND INTEGRITY OF THE PERSON

Course overview

Covers the importance of understanding and complying with the organization's Code, policies and the law, being honest and forthright, consequences of not being truthful during an investigation, the critical role of internal resources in helping resolve challenges and conflicts, and the importance of asking questions, and reporting concerns and potential violations internally.

What causes people to withdraw from participation in life? A carefree child grows reserved and wary as a teenager. A successful career woman who leaves one personal relationship after the other suffers from lack of self-esteem. A retired man looks back at his life with regret over the choices he made.

And he developed a precise way for you to help individuals regain their feelings of honesty and self-worth. Broken dreams and regret about the past do not have to continue to pull people away from involvement in the present.

There is an actual mechanism which makes people withdraw from relationships, from families, groups and, indeed, their dreams. And such situations can be remedied. In this course, you will discover how you can help others regain their integrity—and their zest for life. It is a new view of an old problem, and what it means is that you no longer need to sit on the sidelines and helplessly observe the anguish of others. Instead, you will have in your hands tools which thoroughly resolve such misery.

Course Duration: 30 hours

Course Coordinator: Associate Professor / Assistant Professor of Psychiatry

Syllabus

Topic	Faculty	Hours allotted
	Assistant Professor of Psychiatry	2 hours
Anti-Money Laundering	Assistant Professor of Psychiatry	2 hours
Competition Law	Associate Professor of Psychiatry	2 hours
Confidential Information	Associate Professor of Psychiatry	2 hours
Conflicts of Interest	Associate Professor of Psychiatry	2 hours
Data Privacy	Assistant Professor of Psychiatry	2 hours

Discrimination	Associate Professor of Psychiatry	2 hours
Financial Integrity	Associate Professor of Psychiatry	2 hours
Political Activities	Assistant Professor of Psychiatry	2 hours
Protecting Our Organization's Assets	Associate Professor of Psychiatry	2 hours
	Assistant Professor of Psychiatry	2 hours
Assignment	Associate Professor of Psychiatry	2 hours
Viva voce	Assistant Professor of Psychiatry	2 hours
Written test		2 hours

Introduction to Honesty and Integrity of the Person		
S. No	Regn. No.	Name
1	U17MB168	RAHUL P NAIR
2	U17MB169	RAIHANA
3	U17MB170	RAKSAI VARTH S
4	U17MB171	RAMALINGAM MADHUMITHA
5	U17MB172	RESHMA S
6	U17MB173	RESHMI E
7	U17MB174	RITAMBHARA JOSHI
8	U17MB175	RIYA KANT
9	U17MB176	RIZWAN FIZAL R
10	U17MB177	ROHINI R
11	U17MB178	ROHITH V
12	U17MB179	ROSHAN PAUL S
13	U17MB180	ROSHINI S
14	U17MB181	RUDRA D R
15	U17MB182	RUHANI SULTANA SHAIK A
16	U17MB183	SAHINI SNEHA
17	U17MB184	SAI SIDDARTH M
18	U17MB185	SAKSHI RANA
19	U17MB186	SALONI KUMARI
20	U17MB187	SANTHOSH KUMAR V M
21	U17MB188	SARAVANA PRIYAN T
22	U17MB189	SARAVANAPANDIYAN B
23	U17MB190	SELVABHARATHI M
24	U17MB191	SENTHIL KUMARAN S
25	U17MB192	SHAKTHI PARAMESH T
26	U17MB193	SHALINI K
27	U17MB194	SHANA PRASTHARAN S
28	U17MB195	SHANE HANS
29	U17MB196	SHANMUGA PRASAD C
30	U17MB197	SHEMA S N
31	U17MB198	SHOBITHRA K
32	U17MB199	SHRIRAM A P
33	U17MB200	SHRUTHI SRINIVASAN
34	U17MB201	SHYAM GANESH K
35	U17MB202	SHYAM KARTHICK C
36	U17MB203	SIVA SHANKARI P
37	U17MB204	SMITHA SURESH BABU M S
38	U17MB205	SNEHA ANAND
39	U17MB206	SNEHA JENIFER D
40	U17MB207	SNEHA SURESH
41	U17MB208	SNEHAA S
42	U17MB209	SNOWIN SERENA A
43	U17MB210	SOUMYADWEEP MUDULI
44	U17MB211	SOWMYA S S
45	U17MB212	SRI NANTHINI P

CORSE FEEDBACK FORM

Date: 18/3/19

Course Title: Introduction to Honesty and Integrity of the Person

Name: Rohith.V

RegNo: U17MB178

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations			✓		
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Rohith.V
Signature

Thank you

CORSE FEEDBACK FORM

Date: 19/3/19

Course Title: Introduction to Honesty and Integrity of the Person

Name: Sri Nandhini. P

RegNo: U17MB212

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓	✓	
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	☑	5

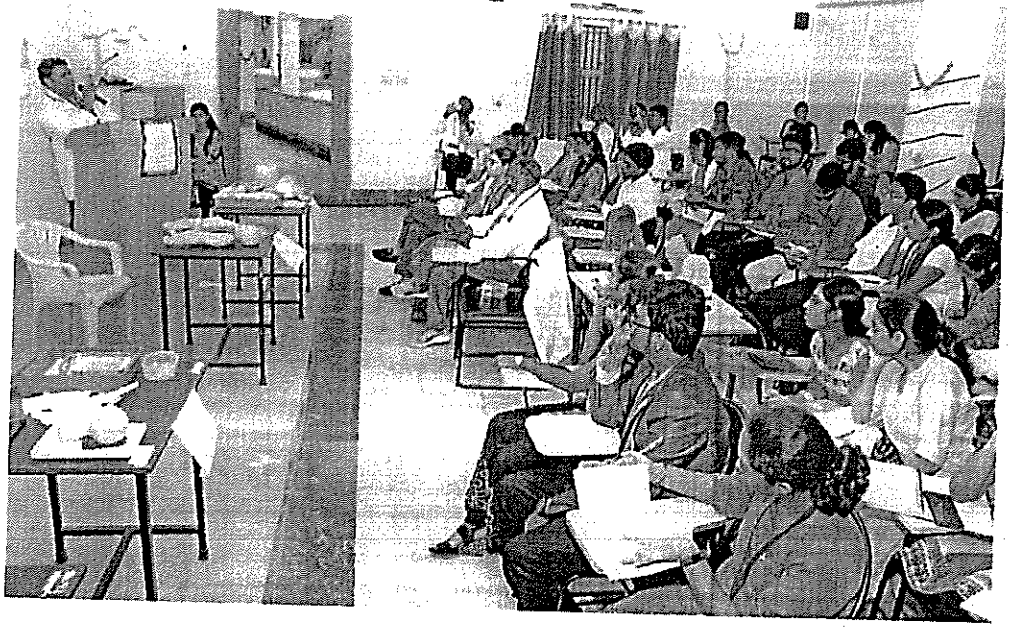
Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Sri nandhini. P
Signature

Thank you



Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. BLESSY RACHEL R has completed the value added course on Introduction to Honesty and Integrity of the Person conducted by Physiology at Sree Balaji Medical College & Hospital, Chennai held during 3/19/2019.

Dr.W M S Johnson

Dean, SBMCH

2/16/2019

Chennai

From

The Course Coordinator

Impact of Drug Abuse and Alcoholism

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Impact of Drug Abuse and Alcoholism

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Impact of Drug Abuse and Alcoholism

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 2/19/2019

R. No 198/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Impact of Drug Abuse and Alcoholism from 3/18/2019 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 3/11/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

IMPACT OF DRUG ABUSE AND ALCOHOLISM

Course overview

Drug and Alcohol Abuse: Awareness, Counseling and Prevention is a comprehensive course that addresses the problems of drug abuse across the spectrum, including the latest thinking about prevention and awareness. This course provides an understanding of the origins and current status of drug use, and includes special notations addressed to a person who may be experiencing problems with substance abuse. This curriculum is a valuable tool for teachers, parents, students and workers, as well as someone seeking help for him or herself. The course also covers assessment, intervention, rehabilitation and recovery, and includes a list of helpful resources.

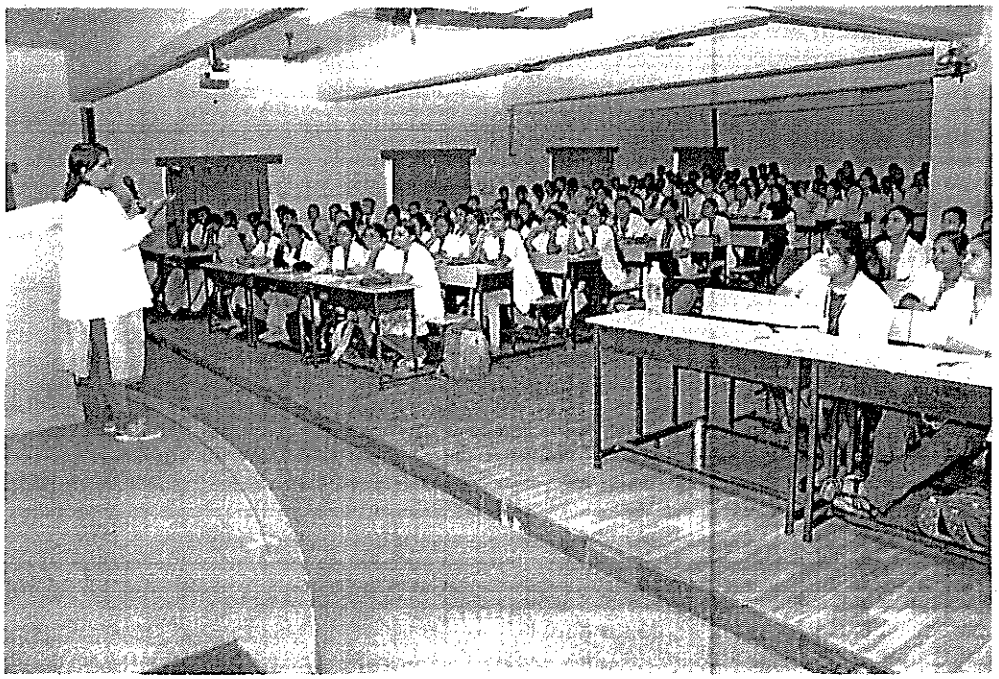
Course Duration: 30 hours

Course Coordinator: Associate Professor / Assistant Professor of Psychiatry

Syllabus

Topic	Faculty	Hours allotted
Introduction to Drug and Alcohol Abuse -- Awareness, Counseling, and Prevention	Assistant Professor of Psychiatry	2 hours
Availability of Drugs	Assistant Professor of Psychiatry	2 hours
Why Do Humans Abuse Substances?	Associate Professor of Psychiatry	2 hours
Dependence and Addiction	Associate Professor of Psychiatry	2 hours
Effects of Use and Dependency -- Potential Social Consequences of Substance Abuse	Associate Professor of Psychiatry	2 hours
	Assistant Professor of Psychiatry	2 hours
Prevention in the Home	Associate Professor of Psychiatry	2 hours
Workplace Prevention	Associate Professor of Psychiatry	2 hours
Assessment and Intervention	Assistant Professor of Psychiatry	2 hours
Treatment	Associate Professor of Psychiatry	2 hours
Following Up	Assistant Professor of Psychiatry	2 hours
Assignment	Associate Professor of	2 hours

	Psychiatry	
Viva voce	Assistant Professor of Psychiatry	2 hours
Written test		2 hours



CORSE FEEDBACK FORM

Date: 17/03/19

Course Title: Impact of Drug Abuse and Alcoholism

Name: Sri Ram.S

RegNo: U17MB215

Department: Community medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Sriram S
Signature

Thank you

CORSE FEEDBACK FORM

Date: 17/03/19

Course Title: Impact of Drug Abuse and Alcoholism

Name: Sudha Rani. J

RegNo: U 17MB222

Department: Community medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Sudharani S
Signature

Thank you

Impact of Drug Abuse and Alcoholism

S. No	Regn. No.	Name
1	U17MB194	SHANA PRASTHARAN S
2	U17MB195	SHANE HANS
3	U17MB196	SHANMUGA PRASAD C
4	U17MB197	SHEMA S N
5	U17MB198	SHOBITHRA K
6	U17MB199	SHRIRAM A P
7	U17MB200	SHRUTHI SRINIVASAN
8	U17MB201	SHYAM GANESH K
9	U17MB202	SHYAM KARTHICK C
10	U17MB203	SIVA SHANKARI P
11	U17MB204	SMITHA SURESH BABU M S
12	U17MB205	SNEHA ANAND
13	U17MB206	SNEHA JENIFER D
14	U17MB207	SNEHA SURESH
15	U17MB208	SNEHAA S
16	U17MB209	SNOWIN SERENA A
17	U17MB210	SOUMYADWEEP MUDULI
18	U17MB211	SOWMYA S S
19	U17MB212	SRI NANTHINI P
20	U17MB213	SRINIDHI N
21	U17MB214	SRINITHIN B S
22	U17MB215	SRIRAM S
23	U17MB216	SRIVAISHALI T
24	U17MB217	SRUTHI B
25	U17MB218	SUBHADRA PRADHAN S
26	U17MB219	SUBHAJIT NAYAK
27	U17MB220	SUBHASHREE KARISHMA CHOUDHURY
28	U17MB221	SUBIKSHA A K
29	U17MB222	SUDHA RANI J
30	U17MB223	SUHAS P KAUSHIK
31	U17MB224	SURANJAN EMMANUEL SAMUEL
32	U17MB225	SUREKHA S
33	U17MB226	SURESH BALAJI T
34	U17MB227	SURYA MATHIPRAKASAM KANNAN
35	U17MB228	SUSHMA P
36	U17MB229	SWATHI LAKSHMI V
37	U17MB230	SWETHA K
38	U17MB231	TEJAS G
39	U17MB232	THARANIMA A
40	U17MB233	THIRUMENI A
41	U17MB234	THOSIT KRISHNAA A A
42	U17MB235	VERTIKA
43	U17MB236	VIGNESH C S
44	U17MB237	VIJAYAPRIYA P
45	U17MB238	VIMAL KUMAR M
46	U17MB239	VINAYCHOWDARY V
47	U17MB240	VINEETH V
48	U17MB241	VINODHINI S S
49	U17MB242	VIPIN S
50	U17MB243	VISHNUVARADAN R
51	U17MB244	VYSHNAVI B S
52	U17MB245	YASHIKA P
53	U17MB246	YATISH T

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, GAJAPRIYA S has completed the value added course on Impact of Drug Abuse and Alcoholism conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 3/18/2019.

Dr.W M S Johnson

Dean, SBMCH

2/17/2019

Chennai

From

The Course Coordinator

Short term course on HIV/AIDS prevention

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Short term course on HIV/AIDS prevention

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Short term course on HIV/AIDS prevention

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 2/20/2019

R. No 237/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Short term course on HIV/AIDS prevention from 3/19/2019 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 3/12/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

Short term course on HIV/AIDS prevention

Background

HIV/AIDS poses a huge challenge to the developmental gains achieved in the past few decades. Sexually Transmissible Infections (STIs) and HIV are closely interlinked and therefore, there is a need to develop comprehensive response that deals with all the aspects of STIs and HIV. This calls for the need of skilled human resources working to prevent, control and treat STIs and HIV. The number of skilled professionals needed are large while matching training programs to strengthen the skills are adhoc or inadequate. The course in STI & HIV/AIDS intends to fill up the existing gap by building capacity of variety of professionals ranging from medical doctors, nurses, counsellors, health educators, trainers, consultants, social workers, program managers, faculty of health-related ins tuition, researchers to policy makers, by providing necessary training to acquire knowledge, skills and attitude for the prevention and control of STI and HIV/AIDS.

Aims & Objectives

The course aims to equip the professionals working in or intending to work with STI and HIV/ AIDS prevention, control and/ or treatment programs with enhanced knowledge, necessary skills and attitude to provide services, implement programs and conduct training & research in STI and HIV/ AIDS.

Course Content

This course will provide inter-professional, multidisciplinary, program management-led certificate that meets the needs of students working in a range of disciplines related to sexual health and STIs / HIV, including public health professionals, medical doctors, nurses,

counsellors, educators and program managers. This course will explore the social, public health and medical aspects of HIV and common sexually transmissible infections. Emphasis will be placed on the way in which they impact on society, present to clinical services, and can be prevented and effectively managed. Students will develop an awareness of all aspects of sexual health, including the importance of multidisciplinary approaches and the sexual rights of all individuals. The potential geographic, societal, cultural and political challenges faced in the delivery of effective health care for sexual health, STIs and HIV will be discussed. The program will be strongly research-led and provide the student with an understanding of the importance of evidenced-based practice. Broadly, the course will cover introduction to Sexual health, Epidemiology of STIs and HIV, essential biological and clinical aspects of STIs and HIV, Public Health aspects of STIs and HIV, and Health Promotion, Legal, Policy and Advocacy strategies, Program Management and Monitoring and Evaluation. These will be discussed with a focus on STIs and HIV epidemic in India and will cover the national response to STIs and HIV.

Course Duration: 30 Hours

Course Coordinator: Assistant Professor / Associate professor of Medicine & Community Medicine

Syllabus:

S.No	TOPIC	DURATION	FACULTY
1	Introduction to course	2 hours	
2.	Pathophysiology of HIV and common sexually transmissible infections	2 hours	
3	Potential geographic, societal,	2 hours	

	cultural and political challenges faced in the delivery of effective health care for sexual health		
4	Introduction to Sexual health, Epidemiology of STIs and HIV	2 hours	
5	Public Health aspects of STIs and HIV	2 hours	
6	Epidemiology of STIs and HIV, essential biological and clinical aspects of STIs and HIV,	2 hours	
7	AIDS prevention, control and/ or treatment programs	2 hours	
8	Assigtnment	2 hours	
9	Group discussion	2 hours	
10	Importance of multidisciplinary approaches and the sexual rights of all individuals.	2 hours	
11	Research in STI and HIV/ AIDS.	2 hours	
12	Health Promotion, Legal, Policy and Advocacy strategies	2 hours	
13	STIs and HIV epidemic in India and will cover the national response to STIs and HIV.	2 hours	
14	VIVA VOCE	2 hours	
15	Assessment	2 hours	

Short term course on HIV/AIDS prevention

S. No	Regn. No.	Name
1	U16MB142	NIVEDITHA S
2	U16MB143	OGIRALA PRATHYUSHA
3	U16MB144	OVIYAL T M
4	U16MB145	PARVATHY K
5	U16MB146	PAVITHRA T
6	U16MB147	PERUMALLA NAGA LAKSHMI NAVEENA
7	U16MB148	PINAKI NAYAK
8	U16MB149	POLUPONGU MAHESH
9	U16MB150	PONKAUSHIKAN M
10	U16MB151	POOJA
11	U16MB152	POOJA MOHAN
12	U16MB153	POOJA S
13	U16MB154	PRABANCHAN L G
14	U16MB155	PRABHA M
15	U16MB156	PRATHUSHA P M
16	U16MB157	PRAVEEN KUMAR V
17	U16MB158	PRAVEEN S
18	U16MB159	PREETHI A
19	U16MB160	PREETHI G
20	U16MB161	PREETI SHARMA
21	U16MB162	PRIYA RESHMA T
22	U16MB163	PRIYANKA R
23	U16MB164	PRUDHVI BALAJI S
24	U16MB165	PUTLURU PRUDHVINATH REDDY
25	U16MB166	RACHARLA ARAVIND
26	U16MB167	RAGAVI E
27	U16MB168	RAGHAV PRASHAR
28	U16MB169	RAHUL AGARWAL
29	U16MB170	RAHUL BAROD
30	U16MB171	RAHUL YADAV
31	U16MB172	RAMYA R
32	U16MB173	RANI ELIZUBAH JOSEPH
33	U16MB174	RASHIQA G
34	U16MB175	RAVI JHA
35	U16MB176	RAVIVARMA M
36	U16MB177	ROJA R
37	U16MB178	RUBANESH M
38	U16MB179	SABARIVENKAT R
39	U16MB180	SAI BHUVAN J
40	U16MB181	SAMEERUDDIN S
41	U16MB182	SANA SHAJI
42	U16MB183	SANDHYA M
43	U16MB184	SANGAMITHRA C
44	U16MB185	SANGEETHA SREE G
45	U16MB186	SANTHOSSINI S
46	U16MB187	SARANYA S
47	U16MB188	SARANYA SURESH BABU



CORSE FEEDBACK FORM

Date: 18/03/19

Course Title: Short Term Course on HIV/AIDS Prevention

Name: Ramya.R

RegNo: U16MB172

Department: Community Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4 ✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Ramya.R
Signature

Thank you

CORSE FEEDBACK FORM

Date: 17/03/19.

Course Title: Short Term Course on HIV/AIDS Prevention

Name: Sandhiya. M.

RegNo: U16MB183

Department: Community medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				—	
2.	The course contents met with your expectations				—	
3.	The lecture sequence was well planned			—		
4.	The lecturers were clear and easy to understand			—		
5.	The teaching aids were effective				—	
6.	The instructors encourage interaction and were helpful				—	
7.	The level of the course			—		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Sandhiya. M.
Signature

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. HAMSINI SUDHAKAR has completed the value added course on Short term course on HIV/AIDS prevention conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 3/19/2019.

Dr.W M S Johnson

Dean, SBMCH

2/18/2019

Chennai

From

The Course Coordinator

Short term course on Life Skills

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Short term course on Life Skills

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Short term course on Life Skills

We kindly solicit your kind permission to commence the program.

Warm Regards,



Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 2/21/2019

R. No 245/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Short term course on Life Skills from 3/19/2019 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 3/12/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

SHORT TERM COURSE ON LIFE SKILLS

COURSE OVERVIEW

The objective of this course is to familiarize students with basic aspects of life skills and its conceptual treatment, theoretical perspectives and practical strategies of life skills education. This course aims to provide systematic understanding of the theoretical basis of life skill education, application of life skill to the present day complicated contemporary living system and Professionalization of life skill education. The course can be well utilized for all prospective teachers as an inevitable course at any level. The structural frame work of the course will benefit to other fields. After completing the course, the learner is expected to master in developing life skills and applying it in various spheres of life.

COURSE COORDINATOR: ASSOCIATE PROFESSOR / ASSISTANT PROFESSOR ANAESTHESIOLOGY

COURSE DURATION: 30 HOURS

COURSE SYLLABUS :

Topic	Faculty	Hours allotted
Introduction to Life Skills and life Skills Education	Assistant Professor of Anaesthesiology	2 hours
Conceptual Basis of Life Skills: Definition, Need and significance.	Assistant Professor of Anaesthesiology	2 hours
Evolution and Development of the Concept of Life Skill Education	Associate Professor of Anaesthesiology	2 hours
Important Reports and Declarations related to Life Skill Education	Assistant Professor of Anaesthesiology	2 hours
Contributions of Various International organizations to life skill education	Assistant Professor of Anaesthesiology	2 hours
Classification of Life Skills - Generic, Problem Specific and Area Specific Skills	Associate Professor of Anaesthesiology	2 hours
Life Skills Approach in Education and Training	Assistant Professor of Anaesthesiology	2 hours
Theoretical Foundations of Life Skills : Social Learning Theory: Albert Bandura	Assistant Professor of Anaesthesiology	2 hours

Self-Awareness - Definition, Importance, Dimensions, Components	Associate Professor of Anaesthesiology	2 hours
Methods and Strategies for nurturing Self-Awareness	Assistant Professor of Anaesthesiology	2 hours
Group Discussion	Assistant Professor of Anaesthesiology	2 hours
Assignment	Associate Professor of Anaesthesiology	2 hours
Viva voce	Assistant Professor of Anaesthesiology	2 hours
Written test	Associate Professor of Anaesthesiology	2 hours

Short term course on Life Skills

S. No	Regn. No.	Name
1	U17MB001	AADITHYA JAGAN N R
2	U17MB002	AAKASH KUMAR R S
3	U17MB003	AARATHI R A
4	U17MB004	AARTHI SHREE S
5	U17MB005	AARTHI SINDHU V
6	U17MB006	AARTI D R
7	U17MB007	ABDUL KABEER A
8	U17MB008	ABHINAV MALVIYA
9	U17MB009	ABHINAYA R
10	U17MB010	ABHINAYA S
11	U17MB011	ABINISHA K V
12	U17MB012	ABISHEIKKANNA K
13	U17MB013	AFTAB KAMRAN RAYANI
14	U17MB014	AKANSHA MISHRA
15	U17MB015	AKASH S
16	U17MB016	AKSHAYA N
17	U17MB017	ALAMELU ARASI N (Name changed as Aarthikka N)
18	U17MB018	ALICE AGNES JENIFER A
19	U17MB019	ALMAS RIFANA M
20	U17MB020	AMARJITH A
21	U17MB021	ANAGHA K
22	U17MB022	ANITHA M
23	U17MB023	ANKITA PADHY
24	U17MB024	ARADHANA KUMARI
25	U17MB025	ARAVIND KRISHNA H
26	U17MB026	ARAVINDHA NARAYANAN V
27	U17MB027	ARCHANA M L
28	U17MB028	ARCHANA P
29	U17MB029	ARPIT
30	U17MB030	ARULSREE S S
31	U17MB031	ARUN R
32	U17MB032	ASHWATHAMINI B
33	U17MB033	ASHWIN SUNDAR V
34	U17MB034	ASHWIN V
35	U17MB035	ASIF MOHAMED P



COURSE FEEDBACK FORM

Date: 17/03/19

Course Title: Short Term Course on life Skills

Name: Akash.S

RegNo: U17MB015

Department: Anaesthesiology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Akash.S
Signature

Thank you

COURSE FEEDBACK FORM

Date: 17/03/19.

Course Title: Short term Course on lifeSkills

Name: Anitha.M

RegNo: U17MB022

Department: Anaesthesiology

S.NO	Particulars	1	2	3	4	5
(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)						
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations					
3.	The lecture sequence was well planned					
4.	The lecturers were clear and easy to understand					
5.	The teaching aids were effective					
6.	The instructors encourage interaction and were helpful					
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Anitha.M.
Signature

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. HARIHARAN P A has completed the value added course on Short term course on Life Skills conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 3/19/2019.

Dr.W M S Johnson

Dean, SBMCH

3/13/2019

Chennai

From

The Course Coordinator

Principles of Plastic Surgery and Burn Care Burns & Plastic Surgery

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Principles of Plastic Surgery and Burn Care Burns & Plastic Surgery

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Principles of Plastic Surgery and Burn Care Burns & Plastic Surgery

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 3/16/2019

R. No 256/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Principles of Plastic Surgery and Burn Care Burns & Plastic Surgery from 4/12/2019 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 4/5/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

PRINCIPLES OF PLASTIC SURGERY AND BURN CARE BURNS & PLASTIC SURGERY

COURSE OUTLINE:

This course / workshop is designed for undergraduates.The course intends to give comprehensive knowledge on surgical etiquettes and basic skills required to carry out surgical procedures in their own practise or when need arises.

The content of the course will throw light on operating room environment; sterilisation and asepsis with hands on experience of scrubbing methods and Draping and Gloving processes. Display of various instruments for touch and feel to familiarise the participants with their method of use. Participants will also be able to practise incisions; flap reflection and suturing techniques on artificial skin models under guidance from mentors.

Hands on for some of the latest techniques in surgery.

Course coordinator: Associate Professor & Assistant Professor of General surgery

Course Duration: 30 hours

Course Syllabus

Topic	Faculty	Hours allotted
Introduction to Surgery as a speciality	Assistant Professor of Surgery	2 hours
Sterilisation; Disinfection; asepsis and antisepsis	Assistant Professor of Surgery	2 hours
Basic surgical instruments.	Associate Professor of Surgery	2 hours
Incisions1. Design of Incisions 2. Types of Incisions 3. Flap reflection 4. Retraction of Flaps 5. Latest Trends	Assistant Professor of Surgery	2 hours
Suturing1. Suture materials 2. Types of Suturing 3. Surgical Knots 4. Latest Trends	Assistant Professor of Surgery	2 hours
Wound care management; Postoperative care	Associate Professor of Surgery	2 hours
Simple and complicated Exodontia Procedures;	Assistant Professor of Surgery	2 hours

Transalveolar extraction concepts, tips and tricks		
Complications in surgical procedures; Common errors to avoid.	Assistant Professor of Surgery	2 hours
Complications in surgical procedures; Common errors to avoid.	Associate Professor of Surgery	2 hours
Hands on experience1. How to Scrub and prepare for Surgery; Correct Draping and Gloving process – Demonstration and Practice **2. Display of various Surgical instruments; discussions on their use** **3. Incision and suturing techniques; practice on artificial skin models.** **4. Hands on LASER and R.F use on real tissues.** **5. Tissue Glue demonstration.**	Assistant Professor of Surgery	2 hours
Burns	Assistant Professor of Surgery	2 hours
Assignment	Assistant Professor of Surgery	2 hours
Viva voce	Associate Professor of Surgery	2 hours
Written test	Assistant Professor of Surgery	2 hours

Principles of Plastic Surgery and Burn Care Burns & Plastic Surgery

S. No	Regn. No.	Name
1	U17MB036	AVDESH SINGH
2	U17MB037	AYANKISA PANDA
3	U17MB038	AYUSHI MANYA JAIN
4	U17MB039	AYUSHI KUMARI
5	U17MB040	BALAJI R
6	U17MB041	BALAVINOD S
7	U17MB042	BHARATH RAM R
8	U17MB043	BHUVANASRI L Y
9	U17MB044	BINDU PRIYA K
10	U17MB045	CHANDRAPRAKASH V
11	U17MB046	CHARULATHA G
12	U17MB047	CHINMAYEE PANIGRAHI
13	U17MB048	CLIVE ROYSON M J
14	U17MB049	DAYALA GANESH T
15	U17MB050	DEBASHREE SAHOO
16	U17MB051	DHANUSIYA U
17	U17MB052	DHARINI M (Name changed as HAASINI M)
18	U17MB053	DHEVHA HARINI SA
19	U17MB054	DHILIP V
20	U17MB055	DINESH C K M
21	U17MB056	DINESH KUMAR M
22	U17MB057	DURGA ARUN PATWARDHAN
23	U17MB058	FAZAL RIAZ
24	U17MB059	FRANCIS N S
25	U17MB060	GAGANCHAND C
26	U17MB061	GAMANI V I
27	U17MB062	GOKULA VARDHAN R
28	U17MB063	GOPIKA A
29	U17MB064	GOWTHAM GANESH D
30	U17MB065	GOWTHAM S
31	U17MB066	GUNASUNDARI V
32	U17MB067	HAASHIKA M
33	U17MB068	HAMRUTHA V
34	U17MB069	HAMSANANDHINI S
35	U17MB070	HARIHARAN B
36	U17MB071	HARIHARAN S
37	U17MB072	HARIKRISHNA SURESH
38	U17MB073	HARIPRASATH M
39	U17MB074	HARIRAM M R
40	U17MB075	HARISH N



COURSE FEEDBACK FORM

Date: 02/04/19

Course Title: Principles of Plastic Surgery and Burn care Burns Plastic Surgery

Name: Dinesh. C.K.M

RegNo: U17MB055

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations			✓		
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective			✓	✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Dinesh.C
Signature

Thank you

COURSE FEEDBACK FORM

Date: 11/04/19

Course Title: Principles of Plastic Surgery and Burn care Burns Plastic Surgery

Name: Balaji.R

RegNo: U17MB040

Department: Surgery

S.NO	Particulars	1	2	3	4	5
(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)						
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)						
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Balaji.R
Signature

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, KEERTHI SREE K R has completed the value added course on Principles of Plastic Surgery and Burn Care Burns & Plastic Surgery conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 4/12/2019.

Dr.W M S Johnson

Dean, SBMCH

3/13/2019

Chennai

From

The Course Coordinator

Practical skill sessions on Hand Surgery

Department of Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Practical skill sessions on Hand Surgery

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Practical skill sessions on Hand Surgery

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 3/16/2019

R. No 259/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Medicine

The Department of **Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Practical skill sessions on Hand Surgery from 4/12/2019 for a period of 3 weeks. Interested students can approach the Head of Medicine department and Course Coordinator, for registration and for further details on or before 4/5/2019.

Eligibility-MBBS STUDENTS

HOD

Course Coordinator

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

PRACTICAL SKILL SESSIONS ON HAND SURGERY

Course overview:

The surgical-skill training program is named Surgical Skill and it includes hands-on training sessions for surgical-suturing techniques and advanced surgical procedures (i.e. laparoscopic and robot-assisted surgery), hybrid simulation sessions, and an operating-room session where aforementioned sessions are all put together. By the end of the program, students' improvements in surgical-suturing skills were assessed by experts in a form of checklist, and changes in the interest in a surgical career, if there were any, were answered by the students who participated in the program.

Course Coordinator: Associate Professor / Assistant Professor of Surgery

Course Duration: 30 hours

Course syllabus

Topic	Faculty	Hours allotted
Introduction to Surgery as a speciality	Assistant Professor of Surgery	2 hours
Basic surgical skills	Assistant Professor of Surgery	2 hours
Surturing techniques	Associate Professor of Surgery	2 hours
Wound closure	Assistant Professor of Surgery	2 hours
Post operative care	Assistant Professor of Surgery	2 hours
Bed side procedural skills	Associate Professor of Surgery	2 hours
Group discussion	Assistant Professor of Surgery	2 hours
Practicals : hands on training	Assistant Professor of Surgery	2 hours
Practicals : hands on Training	Associate Professor of Surgery	2 hours
Laproscopic workshop skills	Assistant Professor of Surgery	2 hours
Hysteroscopic skills	Assistant Professor of Surgery	2 hours
Assignments	Assistant Professor of Surgery	2 hours
Viva voce	Associate Professor of Surgery	2 hours
Written test	Assistant Professor of Surgery	2 hours



COURSE FEEDBACK FORM

Date: 10/04/19

Course Title: Practical Skill Sessions on Hand Surgery

Name: Gamini. V. I

RegNo: U17MB061

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Gamini. V
Signature

Thank you

COURSE FEEDBACK FORM

Date: 11/04/19

Course Title: ~~Philip.V~~ Practical Skill sessions on Hand Surgery

Name: Philip.V

RegNo: U17MB054

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned			✓		
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	~~4~~	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Philip.V
Signature

Thank you

Practical skill sessions on Hand Surgery

S. No	Regn. No.	Name
1	U17MB036	AVDESH SINGH
2	U17MB037	AYANKISA PANDA
3	U17MB038	AYUSHI MANYA JAIN
4	U17MB039	AYUSHI KUMARI
5	U17MB040	BALAJI R
6	U17MB041	BALAVINOD S
7	U17MB042	BHARATH RAM R
8	U17MB043	BHUVANASRI L Y
9	U17MB044	BINDU PRIYA K
10	U17MB045	CHANDRAPRAKASH V
11	U17MB046	CHARULATHA G
12	U17MB047	CHINMAYEE PANIGRAHI
13	U17MB048	CLIVE ROYSON M J
14	U17MB049	DAYALA GANESH T
15	U17MB050	DEBASHREE SAHOO
16	U17MB051	DHANUSIYA U
17	U17MB052	DHARINI M (Name changed as HAASINI M)
18	U17MB053	DHEVHA HARINI SA
19	U17MB054	DHILIP V
20	U17MB055	DINESH C K M
21	U17MB056	DINESH KUMAR M
22	U17MB057	DURGA ARUN PATWARDHAN
23	U17MB058	FAZAL RIAZ
24	U17MB059	FRANCIS N S
25	U17MB060	GAGANCHAND C
26	U17MB061	GAMANI V I
27	U17MB062	GOKULA VARDHAN R
28	U17MB063	GOPIKA A
29	U17MB064	GOWTHAM GANESH D
30	U17MB065	GOWTHAM S
31	U17MB066	GUNASUNDARI V
32	U17MB067	HAASHIKA M
33	U17MB068	HAMRUTHA V
34	U17MB069	HAMSANANDHINI S
35	U17MB070	HARIHARAN B
36	U17MB071	HARIHARAN S
37	U17MB072	HARIKRISHNA SURESH
38	U17MB073	HARIPRASATH M
39	U17MB074	HARIRAM M R
40	U17MB075	HARISH N
41	U17MB076	HARISH SACHIN M
42	U17MB077	HARITHA S
43	U17MB078	HAROONKHAN M K J
44	U17MB079	HARSHAN SABAPATHY V
45	U17MB080	HARSHAVARDHINI A

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, LINGESHWARAN S has completed the value added course on Practical skill sessions on Hand Surgery conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 4/12/2019.

Dr.W M S Johnson

Dean, SBMCH

3/13/2019

Chennai

From

The Course Coordinator

Intensive training in Hand & Micro Surgery

Department of Surgery

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Intensive training in Hand & Micro Surgery

Respected sir,

With reference to subject mentioned above, the Surgery proposes to conduct a value-added course titled: Intensive training in Hand & Micro Surgery

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 3/16/2019

R. No 263/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Surgery

The Department of **Surgery** of Sree Balaji Medical College is scheduled to offer a Value added Course on Intensive training in Hand & Micro Surgery from 4/12/2019 for a period of 3 weeks. Interested students can approach the Head of Surgery department and Course Coordinator, for registration and for further details on or before 4/5/2019.

Eligibility-MBBS STUDENTS

HOD

Course Coordinator

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

Intensive training in Hand & Micro Surgery

Course overview:

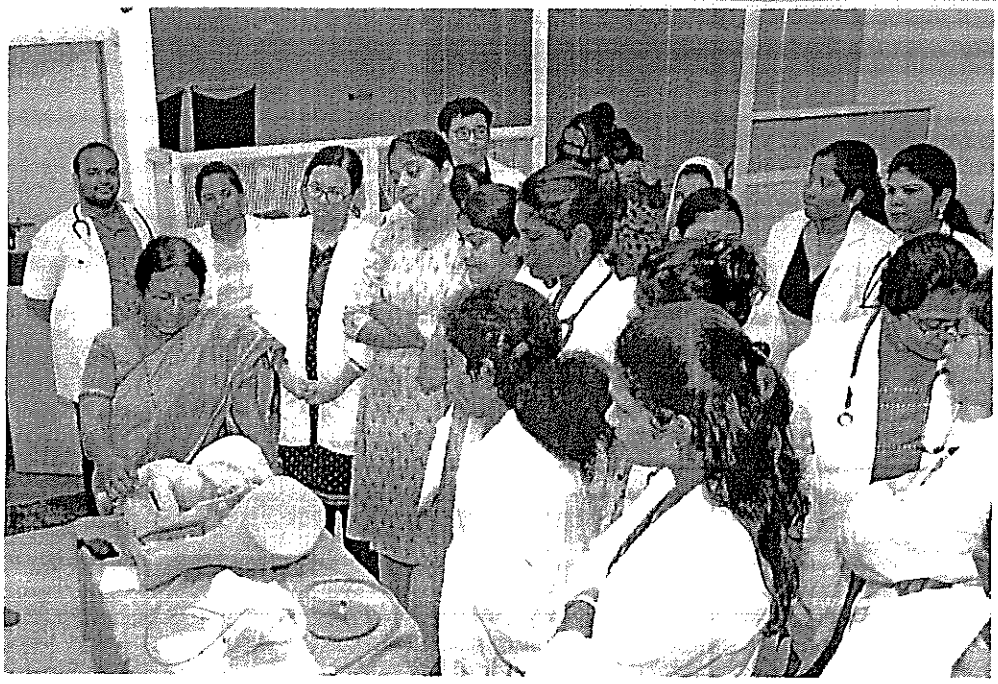
The surgical-skill training program is named Surgical Skill and it includes hands-on training sessions for surgical-suturing techniques and advanced surgical procedures (i.e. laparoscopic and robot-assisted surgery), hybrid simulation sessions, and an operating-room session where aforementioned sessions are all put together. By the end of the program, students' improvements in surgical-suturing skills were assessed by experts in a form of checklist, and changes in the interest in a surgical career, if there were any, were answered by the students who participated in the program.

Course Coordinator: Associate Professor / Assistant Professor of Surgery

Course Duration: 30 hours

Course syllabus

Topic	Faculty	Hours allotted
Introduction to Surgery as a speciality	Assistant Professor of Surgery	2 hours
Basic surgical skills	Assistant Professor of Surgery	2 hours
Surturing techniques	Associate Professor of Surgery	2 hours
Wound closure	Assistant Professor of Surgery	2 hours
Post operative care	Assistant Professor of Surgery	2 hours
Bed side procedural skills	Associate Professor of Surgery	2 hours
Group discussion	Assistant Professor of Surgery	2 hours
Practicals : hands on training	Assistant Professor of Surgery	2 hours
Practicals : hands on Training	Associate Professor of Surgery	2 hours
Laproscopic workshop skills	Assistant Professor of Surgery	2 hours
Hysteroscopic skills	Assistant Professor of Surgery	2 hours
Assignments	Assistant Professor of Surgery	2 hours
Viva voce	Associate Professor of Surgery	2 hours
Written test	Assistant Professor of Surgery	2 hours



COURSE FEEDBACK FORM

Date: 10/04/19

Course Title: Intensive Training in Hand & micro Surgery

Name: Jayalakshmi.G

RegNo: U17MB088

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations		✓	✓		
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Jayalakshmi G
Signature

Thank you

COURSE FEEDBACK FORM

Date: 13/04/2019

Course Title: Intensive training in Hand & micro Surgery

Name: Navin . A

RegNo: U17MB132

Department: Surgery

S.NO	Particulars	1	2	3	4	5
(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)						
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)						
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Navin.A
Signature

Thank you

Intensive training in Hand & Micro Surgery

S. No	Regn. No.	Name
1	U17MB081	HEERA P
2	U17MB082	HELEN ANGELLA B
3	U17MB083	HEMA D
4	U17MB084	HMANGAIHSANGZUALI
5	U17MB085	JAI SANTHOSH T
6	U17MB086	JAISHREE M
7	U17MB087	JANANI S
8	U17MB088	JAYALAKSHMI G
9	U17MB089	JAYASURYA M
10	U17MB090	JEEVARATHINAM SANCHEZ D
11	U17MB091	JEMI DAFFODIL S
12	U17MB092	JESON DAGAM
13	U17MB093	JIDAN CHRISTINA TOPNO
14	U17MB094	JIGNESH L
15	U17MB095	JOSIKA M N
16	U17MB096	KALAIVANI U
17	U17MB097	KAMAL HARAVEL G K
18	U17MB098	KAMALESH U
19	U17MB099	KANISHKHA K M S
20	U17MB100	KARTHIK BALAJI N
21	U17MB101	KARTHIK S S
22	U17MB102	KARTHIKEYAN S
23	U17MB103	KAVYA S DHESH
24	U17MB104	KAYALVIZHII S
25	U17MB105	KIRAN RAJ R B
26	U17MB106	KISHOREKUMAR S
27	U17MB107	KUMARESH S
28	U17MB108	LAKSHMIPRIYA S
29	U17MB109	MACHLIN S
30	U17MB110	MADHU SWETHA P
31	U17MB111	MADHUMITHA M
32	U17MB112	MADHUMITHA N
33	U17MB113	MADHUMITHAA M
34	U17MB114	MAGESH DEV S
35	U17MB115	MAHARABAM RONALDO
36	U17MB116	MALAVIKA G
37	U17MB117	MANOJ PRABHU V S
38	U17MB118	MANOJKUMAR J
39	U17MB119	MEENAKSHI B
40	U17MB120	MINIE HULDAH R
41	U17MB121	MOHAMED ARIF M
42	U17MB122	MOHAMEDROHETH R
43	U17MB123	MOHAMMAD TALHA SHADAN
44	U17MB124	MOHAMMED ABUBACKER SIDDIQUE
45	U17MB125	MOHAMMED FAISAL U
46	U17MB126	MOHITH M P
47	U17MB127	MUDRAGADA PRANEETH
48	U17MB128	MUSKAN BANSAL
49	U17MB129	NANDHITHA NAIDU V
50	U17MB130	NATTISHA JENIFER B
51	U17MB131	NAVEENBALAJI G V
52	U17MB132	NAVIN A
53	U17MB133	NEELESH V
54	U17MB134	JUWAIN SHEHZAD NEHIL
55	U17MB135	NIGHIL AADHITHYA M
56	U17MB136	NISHANTH S R
57	U17MB137	NITHISH S
58	U17MB138	NIVEDHA V
59	U17MB139	NIVETHITHA N
60	U17MB140	PADMANABAN P

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. MAHESH CHANDANI has completed the value added course on Intensive training in Hand & Micro Surgery conducted by Surgery at Sree Balaji Medical College & Hospital, Chennai held during 4/12/2019.

Dr.W M S Johnson

Dean, SBMCH

3/13/2019

Chennai

From

The Course Coordinator

Introduction to Genito-Urinary Surgery

Department of Paediatrics

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Introduction to Genito-Urinary Surgery

Respected sir,

With reference to subject mentioned above, the Paediatrics proposes to conduct a value-added course titled: Introduction to Genito-Urinary Surgery

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 3/17/2019

R. No 274/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Paediatrics

The Department of Paediatrics of Sree Balaji Medical College is scheduled to offer a Value added Course on Introduction to Genito-Urinary Surgery from 4/12/2019 for a period of 3 weeks. Interested students can approach the Head of Paediatrics department and Course Coordinator, for registration and for further details on or before 4/5/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

INTRODUCTION TO GENITO URINARY SURGERY

Course Objectives :

- Recognize the key importance of medical problems in the context of the health priority of the country; Practice the specialty of Urology in keeping with the principles of professional ethics;
- Identify social, economic, environmental, biological and emotional determinants
- of adult Urology and know the therapeutic, rehabilitative, preventive and promotion measures to provide holistic care to all patients; Take detailed history, perform full physical examination and make a clinical
- diagnosis Perform and interpret relevant investigations (Imaging and Laboratory).
- Perform and interpret important diagnostic procedures;
- Plan and deliver comprehensive treatment for illness in adults & children using principles of rational drug therapy.
- Plan and advise measures for the prevention of Urological diseases

Course Coordinator: Associate Professor / Assistant Professor of Obstetrics & Gynaecology

Course Duration: 30 hours

Course syllabus

Topic	Faculty	Hours allotted
Introduction to Course	Assistant Professor of OBG	2 hours
Importance of medical problems in the context of the health priority of the country	Assistant Professor of OBG	2 hours
Anatomy : Surgical Anatomy of the Retroperitoneum, Kidneys and Ureters	Associate Professor of OBG	2 hours
Infections and Inflammation 1. Infections of the Urinary Tract. 2. Schaeffer Inflammatory Conditions of the Male Genitourinary Tract	Assistant Professor of OBG	2 hours
Perioperative care, management of urological complications and care of the critically ill patients.	Assistant Professor of OBG	2 hours

Urolithiasis-Medical, Biochemical & Surgical aspects	Associate Professor of OBG	2 hours
Anomalies of the Kidney Renal Dysplasia and Cystic Disease of Kidney	Assistant Professor of OBG	2 hours
Anomalies and Surgery of the Ureteropelvic Junction	Assistant Professor of OBG	2 hours
Hypospadias Abnormalities of External Genitalia in Boys Abnormalities of Testis and Scrotum : Surgical Management Sexual Differentiation : Normal and Abnormal Surgical Management of Intersex	Associate Professor of OBG	2 hours
Complex Surgical Technique for One-Stage Exstrophy	Assistant Professor of OBG	2 hours
Voiding Dysfunction in Children : Neurogenic and Non-neurogenic Urinary Tract Reconstruction	Assistant Professor of OBG	2 hours
Assignments	Associate Professor of OBG	2 hours
Viva voce	Assistant Professor of OBG	2 hours
Written test	Assistant Professor of OBG	2 hours



COURSE FEEDBACK FORM

Date: 13/04/19

Course Title: Introduction to Genito Urinary Surgery

Name: Raihana

RegNo: U17MB169

Department: OBG

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Raihana
Signature

Thank you

COURSE FEEDBACK FORM

Date: 14/04/19

Course Title: Introduction to Genito-Urinary Surgery

Name: Saravana Pandiyan. B

RegNo: U17MB189

Department: OBG

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you			✓		
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Saravana
Signature

Thank you

Introduction to Genito-Urinary Surgery

S. No	Regn. No.	Name
1	U17MB141	PAMURU YASHWITHA
2	U17MB142	PARKAVI G
3	U17MB143	PAUL REMIUS A
4	U17MB144	PAVITHRA P
5	U17MB145	PAVITHRA RESHMA S
6	U17MB146	PAVITHRA S
7	U17MB147	PEER MOHAMMED K
8	U17MB148	PONBARATHY V M
9	U17MB149	POOJA P
10	U17MB150	PRADAKSHINE S
11	U17MB151	PRADEEP G
12	U17MB152	PRADEEP M
13	U17MB153	PRADEEP KUMAR S
14	U17MB154	PRADHA RANJAN
15	U17MB155	PRAJIT N
16	U17MB156	PRANAV R P
17	U17MB157	PRAVEEN S
18	U17MB158	PRAVEENKUMAR S
19	U17MB159	PREETHI N
20	U17MB160	PREMALATHA R
21	U17MB161	PRITHA R J
22	U17MB162	PRIYADHARSHINI S
23	U17MB163	PRIYANKA KUMARI B
24	U17MB164	PRIYANKA T
25	U17MB165	PRIYANKHA R
26	U17MB166	PUSHPA PREETHI A
27	U17MB167	RAGHUL PRASATH R
28	U17MB168	RAHUL P NAIR
29	U17MB169	RAIHANA
30	U17MB170	RAKSAI VARTH S
31	U17MB171	RAMALINGAM MADHUMITHA
32	U17MB172	RESHMA S
33	U17MB173	RESHMI E
34	U17MB174	RITAMBHARA JOSHI
35	U17MB175	RIYA KANT
36	U17MB176	RIZWAN FIZAL R
37	U17MB177	ROHINI R
38	U17MB178	ROHITH V
39	U17MB179	ROSHAN PAUL S
40	U17MB180	ROSHINI S
41	U17MB181	RUDRA D R
42	U17MB182	RUHANI SULTANA SHAIK A
43	U17MB183	SAHINI SNEHA
44	U17MB184	SAI SIDDARTH M
45	U17MB185	SAKSHI RANA
46	U17MB186	SALONI KUMARI
47	U17MB187	SANTHOSH KUMAR V M
48	U17MB188	SARAVANA PRIYAN T
49	U17MB189	SARAVANAPANDIYAN B
50	U17MB190	SELVABHARATHI M

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. ABIRAMI B has completed the value added course on Introduction to Genito-Urinary Surgery conducted by Paediatrics at Sree Balaji Medical College & Hospital, Chennai held during 4/12/2019.

Dr.W M S Johnson

Dean, SBMCH

3/14/2019

Chennai

From

The Course Coordinator

New Technologies in Plastic & Reconstructive Surgery

Department of Surgery

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: New Technologies in Plastic & Reconstructive Surgery

Respected sir,

With reference to subject mentioned above, the Surgery proposes to conduct a value-added course titled: New Technologies in Plastic & Reconstructive Surgery

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 3/17/2019

R. No 284/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Surgery

The Department of Surgery of Sree Balaji Medical College is scheduled to offer a Value added Course on New Technologies in Plastic & Reconstructive Surgery from 4/12/2019 for a period of 3 weeks. Interested students can approach the Head of Surgery department and Course Coordinator, for registration and for further details on or before 4/5/2019.

Eligibility-MBBS STUDENTS

HOD

Course Coordinator

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

NEW TECHNOLOGIES IN PLASTIC & RECONSTRUCTIVE SURGERY

Course overview:

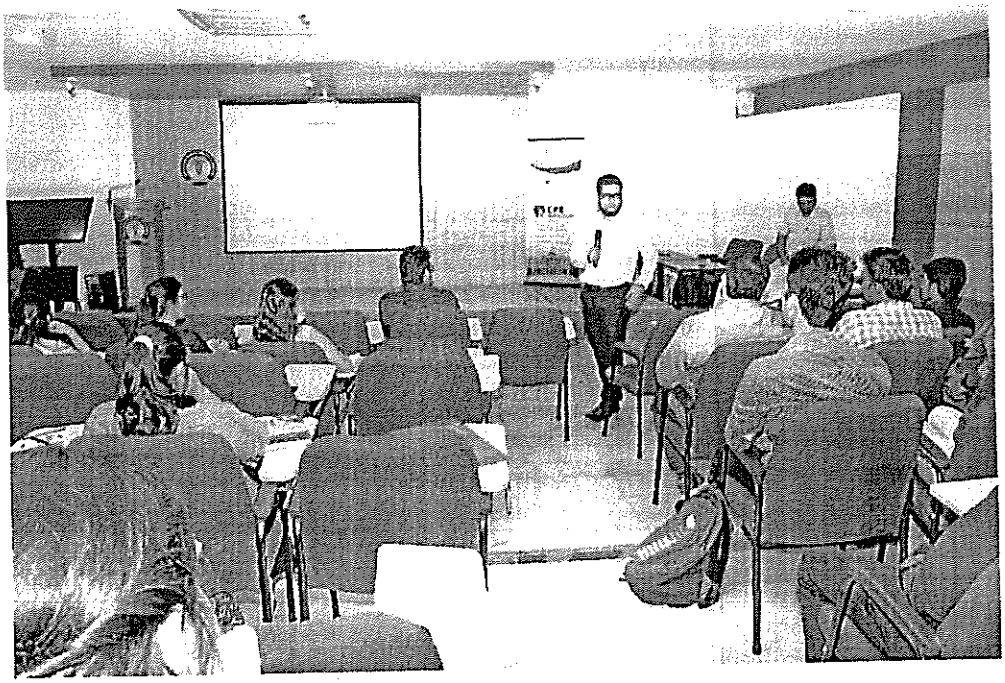
The surgical-skill training program is named Surgical Skill and it includes hands-on training sessions for surgical-suturing techniques and advanced surgical procedures (i.e. laparoscopic and robot-assisted surgery), hybrid simulation sessions, and an operating-room session where aforementioned sessions are all put together. By the end of the program, students' improvements in surgical-suturing skills were assessed by experts in a form of checklist, and changes in the interest in a surgical career, if there were any, were answered by the students who participated in the program.

Course Coordinator: Associate Professor / Assistant Professor of Surgery

Course Duration: 30 hours

Course syllabus

Topic	Faculty	Hours allotted
Introduction to Surgery as a speciality	Assistant Professor of Surgery	2 hours
Basic surgical skills	Assistant Professor of Surgery	2 hours
Surturing techniques	Associate Professor of Surgery	2 hours
Wound closure	Assistant Professor of Surgery	2 hours
Post operative care	Assistant Professor of Surgery	2 hours
Bed side procedural skills	Associate Professor of Surgery	2 hours
Group discussion	Assistant Professor of Surgery	2 hours
Practicals : hands on training	Assistant Professor of Surgery	2 hours
Practicals : hands on Training	Associate Professor of Surgery	2 hours
Laproscopic workshop skills	Assistant Professor of Surgery	2 hours
Hysteroscopic skills	Assistant Professor of Surgery	2 hours
Assignments	Assistant Professor of Surgery	2 hours
Viva voce	Associate Professor of Surgery	2 hours
Written test	Assistant Professor of Surgery	2 hours



COURSE FEEDBACK FORM

Date: 11/04/19

Course Title: New Technologies in Plastic & Reconstructive Surgery

Name: Snehaa.S

RegNo: U17MB2018

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations					
3.	The lecture sequence was well planned					
4.	The lecturers were clear and easy to understand					
5.	The teaching aids were effective					
6.	The instructors encourage interaction and were helpful					
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Snehaa.S
Signature

Thank you

COURSE FEEDBACK FORM

Date: 14/04/2019

Course Title: New Technologies in Plastic & Reconstructive Surgery

Name: Senthil Kumaran.S

RegNo: U17MB191

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective			✓		
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Senthil Kumaran
Signature

Thank you

New Technologies in Plastic & Reconstructive Surgery

S. No	Regn. No.	Name
1	U17MB191	SENTHIL KUMARAN S
2	U17MB192	SHAKTHI PARAMESH T
3	U17MB193	SHALINI K
4	U17MB194	SHANA PRASTHARAN S
5	U17MB195	SHANE HANS
6	U17MB196	SHANMUGA PRASAD C
7	U17MB197	SHEMA S N
8	U17MB198	SHOBITHRA K
9	U17MB199	SHRIRAM A P
10	U17MB200	SHRUTHI SRINIVASAN
11	U17MB201	SHYAM GANESH K
12	U17MB202	SHYAM KARTHICK C
13	U17MB203	SIVA SHANKARI P
14	U17MB204	SMITHA SURESH BABU M S
15	U17MB205	SNEHA ANAND
16	U17MB206	SNEHA JENIFER D
17	U17MB207	SNEHA SURESH
18	U17MB208	SNEHAA S
19	U17MB209	SNOWIN SERENA A
20	U17MB210	SOUMYADWEEP MUDULI
21	U17MB211	SOWMYA S S
22	U17MB212	SRI NANTHINI P
23	U17MB213	SRINIDHI N
24	U17MB214	SRINITHIN B S
25	U17MB215	SRIRAM S
26	U17MB216	SRIVAISHALI T
27	U17MB217	SRUTHI B
28	U17MB218	SUBHADRA PRADHAN S
29	U17MB219	SUBHAJIT NAYAK
30	U17MB220	SUBHASHREE KARISHMA CHOUDHURY
31	U17MB221	SUBIKSHA A K
32	U17MB222	SUDHA RANI J
33	U17MB223	SUHAS P KAUSHIK
34	U17MB224	SURANJAN EMMANUEL SAMUEL
35	U17MB225	SUREKHA S
36	U17MB226	SURESH BALAJI T
37	U17MB227	SURYA MATHIPRAKASAM KANNAN
38	U17MB228	SUSHMA P
39	U17MB229	SWATHI LAKSHMI V
40	U17MB230	SWETHA K

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. ARTHI T has completed the value added course on New Technologies in Plastic & Reconstructive Surgery conducted by Surgery at Sree Balaji Medical College & Hospital, Chennai held during 4/12/2019.

Dr.W M S Johnson

Dean, SBMCH

4/10/2019

Chennai

From

The Course Coordinator

Certificate course in Hepato Pancreato Biliary Surgery

Department of Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate course in Hepato Pancreato Biliary Surgery

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Certificate course in Hepato Pancreato Biliary Surgery

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 4/13/2019

R. No 311/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Medicine

The Department of Medicine of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate course in Hepato Pancreato Biliary Surgery from 5/10/2019 for a period of 3 weeks. Interested students can approach the Head of Medicine department and Course Coordinator, for registration and for further details on or before 5/3/2019.

Eligibility-MBBS STUDENTS

HOD

Course Coordinator

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE COURSE IN HEPATO PANCREATO BILIARY SURGERY

COURSE OVERVIEW:

COURSE COORDINATOR: ASSOCIATE PROFESSOR OF SURGERY / ASSISTANT PROFESSOR OF SURGERY

COURSE DURATION: 30 HOURS

COURSE SYLLABUS

Topic	Faculty	Hours allotted
Introduction to Surgery as a speciality	Assistant Professor of Surgery	2 hours
Sterilisation; Disinfection; asepsis and antisepsis	Assistant Professor of Surgery	2 hours
Basic surgical instruments.	Associate Professor of Surgery	2 hours
Incisions1. Design of Incisions 2. Types of Incisions 3. Flap reflection 4. Retraction of Flaps 5. Latest Trends	Assistant Professor of Surgery	2 hours
Suturing1. Suture materials 2. Types of Suturing 3. Surgical Knots 4. Latest Trends	Assistant Professor of Surgery	2 hours
Wound care management; Postoperative care	Associate Professor of Surgery	2 hours
Anatomy of hepatobiliary system	Assistant Professor of Surgery	2 hours
Complications in surgical procedures; Common errors to avoid.	Assistant Professor of Surgery	2 hours

Complications in surgical procedures; Common errors to avoid.	Associate Professor of Surgery	2 hours
Hands on experience1. How to Scrub and prepare for Surgery; Correct Draping and Gloving process – Demonstration and Practice **2. Display of various Surgical instruments; discussions on their use** **3. Incision and suturing techniques; practice on artificial skin models.** **4. Hands on LASER and R.F use on real tissues.** **5. Tissue Glue demonstration.**	Assistant Professor of Surgery	2 hours
Laparoscopic – hepatobiliary system	Assistant Professor of Surgery	2 hours
Assignment	Assistant Professor of Surgery	2 hours
Viva voce	Associate Professor of Surgery	2 hours
Written test	Assistant Professor of Surgery	2 hours



COURSE FEEDBACK FORM

Date: 9/05/19

Course Title: Certificate Course in Hepato Pan Creato Biliary Surgery

Name: Aparna. R

RegNo: U18MB030

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Aparna.S
Signature

Thank you

COURSE FEEDBACK FORM

Date: 11/05/2019.

Course Title: Certificate Course on Hepato Pancreato Biliary Surgery

Name: Abirami .R

RegNo: U 18MB009

Department: Surgery

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Abirami
Signature

Thank you

Certificate course in Hepato Pancreato Biliary Surgery

S. No	Regn. No.	Name
1	U18MB001	AARON RAJ K
2	U18MB002	ABHISHEK ARORA
3	U18MB003	ABHISHEK BHADANA
4	U18MB004	ABHISHEK RAMACHANDRAN V
5	U18MB005	ABINAYA M (05.10.2000)
6	U18MB006	ABINAYA M (12.11.2000)
7	U18MB007	ABINAYA S
8	U18MB008	ABINI M
9	U18MB009	ABIRAMI R
10	U18MB010	AFIALI H G
11	U18MB011	AFRID AHAMED
12	U18MB012	AGNES CELSHEYA A
13	U18MB013	AISHVARYAA T V
14	U18MB014	AISHWARYA M
15	U18MB015	AISWARYAA B
16	U18MB016	AJEETH KUMAR N
17	U18MB017	AKANKSHA SINGH
18	U18MB018	AKASH RAJ J
19	U18MB019	AKSHARA C
20	U18MB020	AKSHARA R K
21	U18MB021	AKSHAYA M
22	U18MB022	ALLA REETHU CHOWDARY
23	U18MB023	AMALA SHYBI
24	U18MB024	AMRISH B
25	U18MB025	AMRITHA S
26	U18MB026	ANDREW GEORGE DCOUTO
27	U18MB027	ANKURITA BHAUMIK
28	U18MB028	ANOUSHYA S
29	U18MB029	ANUGRAH K
30	U18MB030	APARNA R

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. ARUN STALIN G has completed the value added course on Certificate course in Hepato Pancreato Biliary Surgery conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 5/10/2019.

Dr.W M S Johnson

Dean, SBMCH

4/9/2019

Chennai

From

The Course Coordinator

Introduction to Virology

Department of Pharmacology

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Introduction to Virology

Respected sir,

With reference to subject mentioned above, the Pharmacology proposes to conduct a value- added course titled: Introduction to Virology

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 4/12/2019

R. No 312/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Pharmacology

The Department of **Pharmacology** of Sree Balaji Medical College is scheduled to offer a Value added Course on Introduction to Virology from 5/10/2019 for a period of 3 weeks. Interested students can approach the Head of Pharmacology department and Course Coordinator, for registration and for further details on or before 5/3/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

INTRODUCTION TO VIROLOGY

COURSE OVERVIEW:

The existence of viruses was first suspected in the nineteenth century when it was shown that filtered extract of infective material passed through filters small enough to stop all known bacteria could still be infectious, and hence the 'virus' (Latin for poisonous liquid) concept was first introduced. However, viral diseases such as smallpox and poliomyelitis had been known to affect mankind since many centuries before this.

Subsequent to the discovery of viruses, the next major step in elucidating their role in human disease was the invention of the electron microscope, followed by cell culture and now molecular diagnostic techniques to detect the presence of viruses in infected material. Many new viruses have been discovered in the past two to three decades, but it was the discovery of human immunodeficiency virus (HIV) (the virus responsible for acquired immunodeficiency syndrome (AIDS)) in 1983 and the explosion of the AIDS epidemic that brought clinical virology to the forefront as a significant specialty. Millions of dollars have been spent by pharmaceutical companies in discovering drugs to treat AIDS; a by-product has been that our understanding of virus replication and pathogenesis has improved substantially and this has resulted in new antiviral drugs becoming available to treat other viral infections.

Course duration: 30 hours

Course Coordinator: Associate Professor / Assistant Professor of Microbiology

Course Syllabus

Topic	Faculty	Hours allotted
Discovery, nature, origin and evolutionary importance of viruses	Assistant Professor of Microbiology	2 hours
Structure of Viruses	Assistant Professor of Microbiology	2 hours
Isolation, purification and cultivation of viruses	Associate Professor of Microbiology	2 hours
Viral taxonomy: Classification and nomenclature of different groups of viruses	Assistant Professor of Microbiology	2 hours
Diversity, classification and one step multiplication curve	Assistant Professor of Microbiology	2 hours
Lytic and lysogenic phages	Assistant Professor of Microbiology	2 hours
Regulation of transcription in lambda phage	Associate Professor of Microbiology	2 hours
Intracellular trafficking, assembly, maturation and release	Assistant Professor of Microbiology	2 hours

Physical and biological methods of detection of viruses	Assistant Professor of Microbiology	2 hours
Characterization of viral product expressed in the infected cells	Assistant Professor of Microbiology	2 hours
Viruses as biopesticides	Associate Professor of Microbiology	2 hours
Assignments	Assistant Professor of Microbiology	2 hours
Viva voce	Associate Professor of Microbiology	2 hours
Written test	Assistant Professor of Microbiology	2 hours

COURSE FEEDBACK FORM

Date: 08/05/2019

Course Title: Introduction to virology

Name: Arya.R

RegNo: U18MB036

Department: Micro-Biology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	✓
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Arya.R
Signature

Thank you

COURSE FEEDBACK FORM

Date: 09/05/19.

Course Title: Introduction to virology

Name: Binisha . I

RegNo: U18MB049

Department: Micro-biology

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Binisha I
Signature

Thank you



Introduction to Virology

S. No	Regn. No.	Name
1	U18MB031	ARAVINDHAN D
2	U18MB032	ARKAJAA K
3	U18MB033	ARPITA CHOUDHURY
4	U18MB034	ARUN SANTHAN M
5	U18MB035	ARUNNIDHI R
6	U18MB036	ARYA R
7	U18MB037	ASHLIN SHARAN R
8	U18MB038	ASHMITHAA R
9	U18MB039	ASWATHI SUDHEER
10	U18MB040	ATUL K SHANKAR
11	U18MB041	AVINASH K
12	U18MB042	AVINASH KUMAR PATHAK
13	U18MB043	AYSHWARIYA M
14	U18MB044	BACHU SRAVYA SAI
15	U18MB045	BAKSHI ANUSHKA
16	U18MB046	BALAJI S
17	U18MB047	BANA SUPRIYA
18	U18MB048	BEMILTON MACUS A
19	U18MB049	BINISHA I
20	U18MB050	BISWAJEET SAHU
21	U18MB051	BLESSY RACHEL R
22	U18MB052	BRAMATHESHWAR S
23	U18MB053	CATHRINE S
24	U18MB054	DEEPANKAR SHAN S
25	U18MB055	DENSINGH A
26	U18MB056	DHAMEEM HUSSAIN M
27	U18MB057	DIVYA SREE R
28	U18MB058	DONY JAMES L
29	U18MB059	EBENESAR T D
30	U18MB060	ELAMATHI M
31	U18MB061	ELAVENIL SARAVANAN
32	U18MB062	EMIDEIRIPHYLLA SUTING
33	U18MB063	ESHA ELANGO
34	U18MB064	FARZAN SADDIQ
35	U18MB065	FAZEELA FATHIMA TAJDEEN

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. DHIVYA S has completed the value added course on Introduction to Virology conducted by Pharmacology at Sree Balaji Medical College & Hospital, Chennai held during 5/10/2019.

Dr.W M S Johnson

Dean, SBMCH

4/10/2019

Chennai

From

The Course Coordinator

Certificate Course on Neonatology

Department of Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Course on Neonatology

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Certificate Course on Neonatology

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 4/13/2019

R. No 301/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Medicine

The Department of **Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Course on Neonatology from 5/10/2019 for a period of 3 weeks. Interested students can approach the Head of Medicine department and Course Coordinator, for registration and for further details on or before 5/3/2019.

Eligibility-MBBS STUDENTS

HOD

Course Coordinator

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE COURSE IN NEONATOLOGY

COURSE OVERVIEW:

This course is aimed at medical graduates who are already working or planning to work in pediatric units in the hospitals and intending to improve their knowledge and skills in managing child patients. Any MBBS graduate registered with a State Medical Council or the Medical Council of India (MCI) is eligible to take this course. Recognize the clinical characteristics and evolution of common and uncommon pediatric diseases.
This course also helps in understanding evidence-based diagnostic and treatment plans for children by formulating appropriate testing and treatment strategies for children. It also includes determining appropriate laboratory testing and interpret findings pertinent to children while planning the evaluation and treatment of diseases in immune compromised children.

COURSE COORDINATOR: ASSOCIATE PROFESSOR / ASSISTANT PROFESSOR OF PAEDIATRICS

COURSE DURATION: 30 HOURS

COURSE SYLLABUS:

Topic	Faculty	Hours allotted
Introduction to Course	Assistant Professor of Paediatrics	2 hours
Basic paediatrics	Assistant Professor of Paediatrics	2 hours
Care of new born Neonatology	Associate Professor of Paediatrics	2 hours
Paediatric infections	Assistant Professor of Paediatrics	2 hours
Paediatric Specialities	Assistant Professor of Paediatrics	2 hours
Assignment	Associate Professor of Paediatrics	2 hours
Paediatric resuscitation	Assistant Professor of Paediatrics	2 hours
Paediatric resuscitation practicals	Assistant Professor of Paediatrics	2 hours
critical role in caring for infants w	Associate Professor of Paediatrics	2 hours
Group discussion	Assistant Professor of Paediatrics	2 hours
cardiac malformations	Assistant Professor of Paediatrics	2 hours

Assignments	Associate Professor of Paediatrics	2 hours
Viva voce	Assistant Professor of Paediatrics	2 hours
Written test	Assistant Professor of Paediatrics	2 hours

Certificate Course on Neonatology

S. No	Regn. No.	Name
1	U18MB066	FYAZ SHAFIUL MUHAIMIN S
2	U18MB067	GAJAPRIYA S
3	U18MB068	GANGALAKURTHI LOKESH
4	U18MB069	GEO JOSEPH
5	U18MB070	GOMATHI SELVI K
6	U18MB071	GUHAPPRIYA R
7	U18MB072	GURDASRH KAUR
8	U18MB073	GURU PRASAD T
9	U18MB074	HABEEB NATHIRA
10	U18MB075	HAMSINI SUDHAKAR
11	U18MB076	HARIHARAN P A
12	U18MB077	HARIMADHAV H
13	U18MB078	HARIPRASATH B
14	U18MB079	HARISH KUMAR M S
15	U18MB080	HARSHITA MADHUSUDHAN
16	U18MB081	HEMALAKSHMI R
17	U18MB082	HERSON F
18	U18MB083	HIRA A NATARAJAN
19	U18MB084	HONEY B
20	U18MB085	HRITINA M
21	U18MB086	JANANI G C
22	U18MB087	JASWANTH ASIRVATHAM J
23	U18MB088	JASWIN S
24	U18MB089	JAYAKRISHNA R
25	U18MB090	JAYESH N
26	U18MB091	JEBASTIN JAYAPRAKASH J
27	U18MB092	JEMI HAMIDA B
28	U18MB093	JOSILY VARUGHESE
29	U18MB094	KAAVIYASHREE M
30	U18MB095	KAMALESHWAR K J
31	U18MB096	KANISSHKA M
32	U18MB097	KARAN PATEL
33	U18MB098	KARANKUMAR J
34	U18MB099	KARTHIKEYAN A
35	U18MB100	KARUNASHANKAR K S
36	U18MB101	KAYALVIZHI M
37	U18MB102	KEERTHI SREE K R
38	U18MB103	KIRUTHIKA B
39	U18MB104	KRIPA KAVYAVARTHINI P K
40	U18MB105	KUSHMITHAA HARISHENAN C
41	U18MB106	KUSUM SONI J
42	U18MB107	LAKSHMI HARI PRIYA T
43	U18MB108	LAKSHMI NARAYANAN R
44	U18MB109	LAKSHMIPRIYA L
45	U18MB110	LAVANYA G
46	U18MB111	LINGESHWARAN S
47	U18MB112	LITHESH RAJ S
48	U18MB113	MADHANAGOPAL A
49	U18MB114	MADHAVAN K
50	U18MB115	MADHUMITHA K
51	U18MB116	MAHALAKSHMI S
52	U18MB117	MAHESH CHANDANI
53	U18MB118	MALAVIKA M
54	U18MB119	MANASWINI G
55	U18MB120	MANIRAAM M
56	U18MB121	MANISHA B
57	U18MB122	MANO SATHISH K
58	U18MB123	MANOJ KUMAR D
59	U18MB124	MANTHRA B
60	U18MB125	MARIAM S

COURSE FEEDBACK FORM

Date: 09/05/2019

Course Title: Certificate course in Neonatology

Name: Gaja Priya.S

RegNo: U18MB067

Department: Paediatrics

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Gaja Priya.S
Signature

Thank you

COURSE FEEDBACK FORM

Date: 12/05/19

Course Title: Certificate Course in Neonatology

Name: Lavanya.G

RegNo: 0187MB110

Department: Paediatrics

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	✓5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Lavanya.G
Signature

Thank you



Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. GAJA AISHWARYA G P has completed the value added course on Certificate Course on Neonatology conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 5/10/2019.

Dr.W M S Johnson

Dean, SBMCH

4/10/2019

Chennai

From

The Course Coordinator

Introduction to Geriatric Mental Health

Department of Physiology

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Introduction to Geriatric Mental Health

Respected sir,

With reference to subject mentioned above, the Physiology proposes to conduct a value-added course titled: Introduction to Geriatric Mental Health

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 4/13/2019

R. No 301/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Physiology

The Department of **Physiology** of Sree Balaji Medical College is scheduled to offer a Value added Course on Introduction to Geriatric Mental Health from 5/10/2019 for a period of 3 weeks. Interested students can approach the Head of Physiology department and Course Coordinator, for registration and for further details on or before 5/3/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

INTRODUCTION TO GERIATRIC MENTAL HEALTH

Course overview:

In this course, we will learn how it is never too late to modify our lifestyle and engage in healthy behaviours, and we will address health promotion strategies for older adults. This is important to keep in mind, especially when caring for older adults who may need support in their everyday lives to reduce their risk for chronic and debilitating diseases, such as dementias, cardiovascular diseases and musculoskeletal conditions, and improve the quality of life.
One does not need to be a carer for an older person to benefit from this course; the principles of healthy ageing can be applied to you, your family members, your friends, or any person who wants to commit to an active lifestyle.

Course duration: 30 hours

Course syllabus:

Topic	Faculty	Hours allotted
Introduction to Course	Assistant Professor of psychiatry	2 hours
Introduction course	Assistant Professor of Psychiatry	2 hours
Health care	Associate Professor of Psychiatry	2 hours
Common geriatric diseases	Assistant Professor of psychiatry	2 hours
Management of geriatric diseases	Assistant Professor of Psychiatry	2 hours
Palliative care	Associate Professor of Psychiatry	2 hours
Importance of Nursing in bedridden patients	Assistant Professor of psychiatry	2 hours
lifestyle-related factors: cognitive and socioemotional aspects	Assistant Professor of Psychiatry	2 hours

Long-term perspectives in healthy ageing	Associate Professor of Psychiatry	2 hours
WHO's Global Strategy and Action Plan on Ageing and Health	Assistant Professor of psychiatry	2 hours
Environments that are age-friendly as well as improving measurement, monitoring and research on healthy ageing	Assistant Professor of Psychiatry	2 hours
Global course for Healthy Ageing	Associate Professor of Psychiatry	2 hours
Group discussion	Assistant Professor of psychiatry	2 hours
Viva voce	Assistant Professor of Psychiatry	2 hours
Written test	Assistant Professor of Psychiatry	2 hours



COURSE FEEDBACK FORM

Date: 11/05/2019

Course Title: Introduction to Geriatric mental Health.

Name: Nowmiya. M

RegNo: U18MB157

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Nowmiya M
Signature

Thank you

COURSE FEEDBACK FORM

Date: 08/05/2019

Course Title: Introduction to Geriatric mental Health.

Name: Monika.V

RegNo: U18MB135

Department: Psychiatry

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Monika.S
Signature

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms. GAYATRI R has completed the value added course on Introduction to Geriatric Mental Health conducted by Physiology at Sree Balaji Medical College & Hospital, Chennai held during 5/10/2019.

Dr.W M S Johnson

Dean, SBMCH

Introduction to Geriatric Mental Health

S. No	Regn. No.	Name
1	U18MB126	MAYUKHI SEN
2	U18MB127	MEENAKSHI VARMA N K
3	U18MB128	MITHRASHREE M
4	U18MB129	MITIKSHA R
5	U18MB130	MOHAMED NASRUL ARIFFIN I
6	U18MB131	MOHAMMED AKHIL B
7	U18MB132	MOHANA SHANKARI S
8	U18MB133	MONA J
9	U18MB134	MONICA NANCY F
10	U18MB135	MONIKA V
11	U18MB136	MONISHA P
12	U18MB137	MOUSHMI A
13	U18MB138	MRIDUL
14	U18MB139	MRIDULA B
15	U18MB140	MRITUNJAY PRATAP SINGH
16	U18MB141	MUKHTHA RENESWARI K
17	U18MB142	NACHIAPPAN M
18	U18MB143	NAMEERA N A
19	U18MB144	NARMADA DEVI C M
20	U18MB145	NEHA ARUL MALAR R
21	U18MB146	NEHAL LODHA R
22	U18MB147	NIHARIKA M S
23	U18MB148	NILOFER GNANA SELVAN A
24	U18MB149	NIRMAL ARUL MATHEW J
25	U18MB150	NISHA T
26	U18MB151	NISHOK T G R
27	U18MB152	NITHIN B
28	U18MB153	NIVAEDHAA T
29	U18MB154	NIVEDITHA B
30	U18MB155	NIVETHAA M
31	U18MB156	NIVETHINI S
32	U18MB157	NOWMIYA M
33	U18MB158	PAVENDAN A V
34	U18MB159	PAVITHRAA K R
35	U18MB160	PERAVALI VIHARIKA

4/10/2019

Chennai

From

The Course Coordinator

Short term course on Reproductive Medicine and Surgery

Department of Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Short term course on Reproductive Medicine and Surgery

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Short term course on Reproductive Medicine and Surgery

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 4/13/2019

R. No 312/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Medicine

The Department of **Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Short term course on Reproductive Medicine and Surgery from 5/10/2019 for a period of 3 weeks. Interested students can approach the Head of Medicine department and Course Coordinator, for registration and for further details on or before 5/3/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

SHORT TERM COURSE ON REPRODUCTIVE MEDICINE AND SURGERY

Course Overview:

Reproductive Medicine is designed as a course aimed at trainin It also includes training in the allied surgical subspecialties of Urology, Radiology, Perinatology , Endocrinology, and Clinical psychology The program is designed to provide the candidate with every opportunity to gain proficiency in the principles, of diagnosis and evidence based management. The program also stresses the importance of clinical and basic research relevant to the Subspecialty. A candidate who successfully completes the course will be expected to have gained

Course Duration: 30 hours

Course Coordinator: Associate Professor /Assistant Professor of Obstetrics & Gynaecology

Course Syllabus

Topic	Faculty	Hours allotted
Introduction to Course	Assistant Professor of OBG	2 hours
Embryology	Assistant Professor of OBG	2 hours
Urology	Associate Professor of OBG	2 hours
Andrology	Assistant Professor of OBG	2 hours
Reproductive Endocrinology	Assistant Professor of OBG	2 hours
Radiology and Foetal Medicine	Associate Professor of OBG	2 hours
Clinical Psychology	Assistant Professor of OBG	2 hours
IVFCentre	Assistant Professor of OBG	2 hours
Professional skills and Attitude	Associate Professor of OBG	2 hours
General operative gynaecology	Assistant Professor of OBG	2 hours
Reproductive Endocrinology including laboratory techniques	Assistant Professor of OBG	2 hours
Assignments	Associate Professor of OBG	2 hours
Viva voce	Assistant Professor of OBG	2 hours
Written test	Assistant Professor of OBG	2 hours

Short term course on Reproductive Medicine and Surgery

S. No	Regn. No.	Name
1	U18MB161	PONRAJ B
2	U18MB162	POOJA B
3	U18MB163	POOJA G B
4	U18MB164	POOMAALAI S B
5	U18MB165	PRATIK DAS (04.02.1999)
6	U18MB166	PRATIK DAS (12.11.1999)
7	U18MB167	PRAVEEN K
8	U18MB168	PRAVEENA KUMARI J
9	U18MB169	PREETHI DEVI S
10	U18MB170	PRITHI K
11	U18MB171	PRITHVI BHAUMIK
12	U18MB172	PRIYADHARSAN L
13	U18MB173	PRIYADHARSHAN C
14	U18MB174	PRIYADHARSHINI T
15	U18MB175	RACHAGULLA VENKATA SIVA NAGA BRAHMACHARI
16	U18MB176	RAJESH J
17	U18MB177	RAMYA MALAISAMY
18	U18MB178	RAMYAJAYAN
19	U18MB179	RAMYASRI S
20	U18MB180	RANJAN V
21	U18MB181	REENA E
22	U18MB182	RESHMA A
23	U18MB183	RISHI ELANGO
24	U18MB184	RISHI KUMAR S
25	U18MB185	RITHIK DANIEL RAJ G
26	U18MB186	ROHITH G
27	U18MB187	SABIN JOSEPH
28	U18MB188	SAIGAYATRI K
29	U18MB189	SAILESH V
30	U18MB190	SAKSHI SINGH
31	U18MB191	SAKTHI SRINI K L
32	U18MB192	SAKTHI SUNDARAM S
33	U18MB193	SAMBAVIGA M
34	U18MB194	SAMYUKTHA R G K
35	U18MB195	SAMYUKTHA THADDERINA A
36	U18MB196	SANCHAL S S
37	U18MB197	SANTOSH RAJ K



COURSE FEEDBACK FORM

Date: 09/05/19

Course Title: Short Term Course on Reproductive medicine & Surgery

Name: Priyadharsan. C

RegNo: U18MB173

Department: OBG

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations			✓		
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand			✓		
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	✓	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Priyadharsan. C
Signature

Thank you

COURSE FEEDBACK FORM

Date: 13/05/19.

Course Title: Short term course on Reproductive medicine & Surgery

Name: Ranjan .V

RegNo: U18MB180

Department: OBG

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	✓
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Signature Ranjan.V

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, HASWAATHAM K has completed the value added course on Short term course on Reproductive Medicine and Surgery conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 5/10/2019.

Dr.W M S Johnson

Dean, SBMCH

5/12/2019

Chennai

From

The Course Coordinator

Certificate Course in Emergency Care Technician

Department of Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Course in Emergency Care Technician

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Certificate Course in Emergency Care Technician

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 5/15/2019

R. No 328/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Medicine

The Department of Medicine of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Course in Emergency Care Technician from 6/11/2019 for a period of 3 weeks. Interested students can approach the Head of Medicine department and Course Coordinator, for registration and for further details on or before 6/4/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

Name of the Course: Certificate course in Emergency care technician

Hours: 30 hrs

Learning objective:

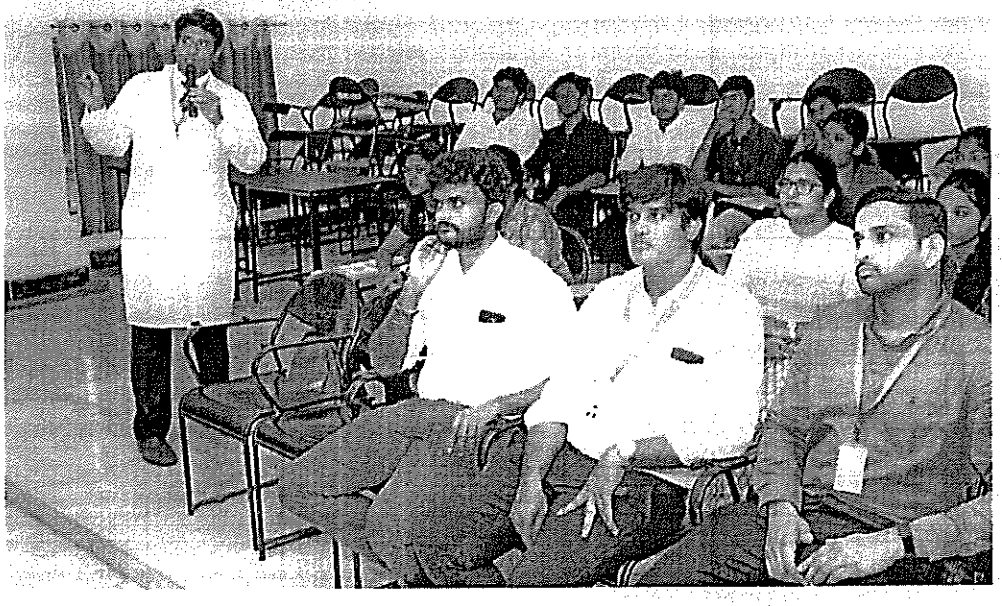
1. Demonstrate understanding of emergency care

2. Understand the use of emergency medicine

3. Demonstrate the basic principles of first aid

Syllabus

Topic	Faculty	Hours allotted
Identification of the nature of emergency	Assistant professor of Emergency medicine	2 hours
Assessment of patient onsite and Triage	Assistant Professor Anaesthesia	2 hours
Emergency medicines	Assistant Professor Pharmacology	2 hours
Managing Trauma	Assistant Professor Anaesthesia	2 hours
Basic life support	Associate professor Anaesthesia	2 hours
Basic life support – practice on mannequin	Assistant Professor Anaesthesia	2 hours
Managing Infants, Neonates And Children	Assistant professor of Emergency medicine	3 hours
Communication during an emergency	Assistant Professor Anaesthesia	1 hour
Managing Mass Casualty Incidents (MCI)	Associate professor Anaesthesia	3 hours
Assignment	Assistant Professor Anaesthesia	1 hour
Managing Patient Transfers	Assistant Professor emergency medicine	2 hours
Ambulance set up	Associate professor Anaesthesia	2 hours
Follow Evidence-Based Protocol while managing patients	Assistant Professor emergency medicine	3 hours
Follow Biomedical Waste Disposal Protocol	Associate professor emergency medicine	2 hours
Assesment	Associate professor emergency medicine	1 hour



COURSE FEEDBACK FORM

Date: 13/06/19

Course Title: Certificate Course in Emergency Care Technician

Name: Boopesh .K

RegNo: U15MB035

Department: Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Boopesh .K
Signature

Thank you

COURSE FEEDBACK FORM

Date: 10/06/2019

Course Title: Certificate Course in Emergency Care Technician

Name: Anuja P

RegNo: U15MB017

Department: Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓	✓	
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Signature Anuja P

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, KEERTHANA S (02.07.1999) has completed the value added course on Certificate Course in Emergency Care Technician conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 6/11/2019.

Dr.W M S Johnson

Dean, SBMCH

Certificate Course in Emergency Care Technician

S. No	Regn. No.	Name
1	U15MB001	AARTHI P
2	U15MB002	ABDUL RAHUMAN J
3	U15MB003	ABHIJIT SATISH RAO
4	U15MB004	ABIILASH V
5	U15MB005	ADIN DAVID
6	U15MB006	AISHWARYA RAMESH
7	U15MB007	AISHWARYA S
8	U15MB008	AJAEY S
9	U15MB009	AJAY ANNAMALAI M
10	U15MB010	AJEY PRASANTH P
11	U15MB011	AKSHARA P ROY
12	U15MB012	ALICIA CATHERINE A
13	U15MB013	ANAND R
14	U15MB014	ANAND S A
15	U15MB015	ANNA SHAJU AYNIKKAL
16	U15MB016	ANU ANANYA A
17	U15MB017	ANUJA P
18	U15MB018	ANUSHA A G
19	U15MB019	ARCHANA S
20	U15MB020	ARTHI SHREE V
21	U15MB021	ARUN KUMAR G
22	U15MB022	ASHRAF MOHAMED M
23	U15MB023	ASHWIN GOPAL B
24	U15MB024	ASHWIN KUMAR R P
25	U15MB025	AYEESHA SHOWKKATH S
26	U15MB026	BALAJI AJAYKRISHNA V
27	U15MB027	BALAKRISHNAN N
28	U15MB028	BALAMURUGAN C
29	U15MB029	BAVATHARINI S A
30	U15MB030	BENISHA DEFI S I
31	U15MB031	BERNATSHA R
32	U15MB032	BEWIN PIUS A
33	U15MB033	BHARANI DHARAN V
34	U15MB034	BHUVANESWARI K U
35	U15MB035	BOOPESH K

5/12/2019

Chennai

From

The Course Coordinator

Certificate Course in E.E.G./E.M.G. Course Technician

Department of Paediatrics

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Course in E.E.G./E.M.G. Course Technician

Respected sir,

With reference to subject mentioned above, the Paediatrics proposes to conduct a value-added course titled: Certificate Course in E.E.G./E.M.G. Course Technician

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 5/15/2019

R. No 326/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Paediatrics

The Department of **Paediatrics** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Course in E.E.G./E.M.G. Course Technician from 6/11/2019 for a period of 3 weeks. Interested students can approach the Head of Paediatrics department and Course Coordinator, for registration and for further details on or before 6/4/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE COURSE IN E.E.G/E.M.G COURSE TECHNICIAN

COURSE OVERVIEW:

n electroencephalograph (EEG) is a recording of the electrical activity of the brain and nervous system. An EEG technician is an individual with knowledge of the equipment that is used to measure and record that activity. The title of EEG technician has largely been replaced today by the title electroneurodiagnostic (END) technologist. Those interested in this field often pursue a certificate, diploma, or associate's degree.

END technologists typically hold an associate's degree in the field of electroneurodiagnostic technology. Program applicants need only a high school diploma or GED, CPR certification, and good written and oral communication skills in order to enroll. In these training programs, students complete one year of study that leads to either a diploma or Certificate of Completion. These programs combine classroom courses in topics such as anatomy, human disease, and neuroscience with hands-on clinical experience.

COURSE DURATION: 30 HOURS

COURSE COORDINATOR: Associate Professor /Assistant professor of Medicine

COURSE SYLLABUS:

Topic	Faculty	Hours allotted
GENERAL INTRODUCTION	Assistant Professor of Medicine	2 hours
Basic anatomy & physiology of heart	Associate Professor of anatomy / physiology	2 hours
Evoked Potential	Assistant Professor of Medicine	2 hours
Electrophysiology	Associate Professor of Medicine	2 hours
Practicals	Assistant Professor of Medicine	2 hours
Basic instrument methodology	Associate Professor of Medicine	2 hours
Background on EEG Analysis · Basics of spectral analysis – artifacting, background vs.	Assistant Professor of Medicine	2 hours

transients, resolution · Compressed Spectral Array, sum and difference displays using two EEG channels · Topographic Mapping – amplitude, variability, difference maps · Coherence and phase · Bispectral analysis		
Examples of EEG Patterns and Abnormalities	Associate Professor of Medicine	2 hours
Medication Effects	Assistant Professor of Medicine	2 hours
Event Related Potentials	Associate Professor of Medicine	2 hours
Examples of qEEG Patterns and Abnormalities	Assistant Professor of Medicine	2 hours
Practicals	Associate Professor of Medicine	2 hours
Viva	Assistant Professor of Medicine	2 hours
Written test	Associate Professor of Medicine	2 hours

CERTIFICATE COURSE IN E.E.G/E.M.G COURSE TECHNICIAN

COURSE OVERVIEW:

n electroencephalograph (EEG) is a recording of the electrical activity of the brain and nervous system. An EEG technician is an individual with knowledge of the equipment that is used to measure and record that activity. The title of EEG technician has largely been replaced today by the title electroneurodiagnostic (END) technologist. Those interested in this field often pursue a certificate, diploma, or associate's degree.

END technologists typically hold an associate's degree in the field of electroneurodiagnostic technology. Program applicants need only a high school diploma or GED, CPR certification, and good written and oral communication skills in order to enroll. In these training programs, students complete one year of study that leads to either a diploma or Certificate of Completion. These programs combine classroom courses in topics such as anatomy, human disease, and neuroscience with hands-on clinical experience.

COURSE DURATION: 30 HOURS

COURSE COORDINATOR: Associate Professor /Assistant professor of Medicine

COURSE SYLLABUS:

Topic	Faculty	Hours allotted
GENERAL INTRODUCTION	Assistant Professor of Medicine	2 hours
Basic anatomy & physiology of heart	Associate Professor of anatomy / physiology	2 hours
Evoked Potential	Assistant Professor of Medicine	2 hours
Electrophysiology	Associate Professor of Medicine	2 hours
Practicals	Assistant Professor of Medicine	2 hours
Basic instrument methodology	Associate Professor of Medicine	2 hours
Background on EEG Analysis · Basics of spectral analysis – artifacting, background vs.	Assistant Professor of Medicine	2 hours

transients, resolution · Compressed Spectral Array, sum and difference displays using two EEG channels · Topographic Mapping – amplitude, variability, difference maps · Coherence and phase · Bispectral analysis		
Examples of EEG Patterns and Abnormalities	Associate Professor of Medicine	2 hours
Medication Effects	Assistant Professor of Medicine	2 hours
Event Related Potentials	Associate Professor of Medicine	2 hours
Examples of qEEG Patterns and Abnormalities	Assistant Professor of Medicine	2 hours
Practicals	Associate Professor of Medicine	2 hours
Viva	Assistant Professor of Medicine	2 hours
Written test	Associate Professor of Medicine	2 hours

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, MAHALAKSHMI R has completed the value added course on Certificate Course in E.E.G./E.M.G. Course Technician conducted by Paediatrics at Sree Balaji Medical College & Hospital, Chennai held during 6/11/2019.

Dr.W M S Johnson

Dean, SBMCH

COURSE FEEDBACK FORM

Date: 10/06/19

Course Title: Certificate Course in E.E.G/E.M.G Course Technician

Name: Devi.c

RegNo: U1SMB042

Department: Medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful			✓		
7.	The level of the course			✓		
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Devi.c
Signature

Thank you

COURSE FEEDBACK FORM

Date: 12/06/19

Course Title: Certificate Course in EEG/EMG Course Technicias

Name: Harini.G

RegNo: U1SMB069

Department: medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course					✓
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

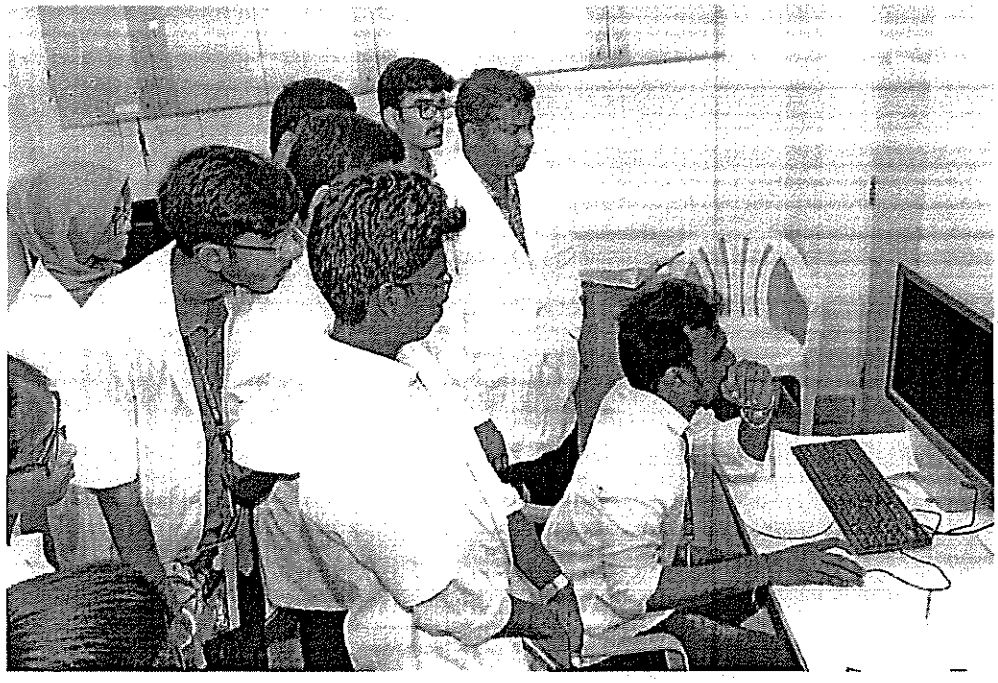
Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Harini
Signature

Thank you



Certificate Course in E.E.G./E.M.G. Course Technician

S: No	Regn. No.	Name
1	U15MB036	BRINDHA M
2	U15MB037	DAKINI PALA
3	U15MB038	DEBBIE AISHWARYA SATHYA
4	U15MB039	DEEPAK GAUTAM G
5	U15MB040	DEEPAKCHANDAR N
6	U15MB041	DESHNA V
7	U15MB042	DEVI C
8	U15MB043	DHARANPATHY D
9	U15MB044	DINEASH V R
10	U15MB045	DIVYA KURUP P S
11	U15MB046	DOMINIC BABU
12	U15MB047	ELANGOVAN I
13	U15MB048	ELBICH SONISA L
14	U15MB049	ELIZA NONGMAITHEM
15	U15MB050	FASALURAHMAN K M
16	U15MB051	GADILI LAVANYA
17	U15MB052	GANAPATHY S
18	U15MB053	GANESH K
19	U15MB054	GANUGAPANTA PREM SAI REDDY
20	U15MB055	GAUTAM B
21	U15MB056	GAUTHAM M
22	U15MB057	GAUTHAM N
23	U15MB058	GAYATHRI K
24	U15MB059	GOKUL G
25	U15MB060	GOKUL S
26	U15MB061	GOPIKA GIRI
27	U15MB062	GOPINATH S
28	U15MB063	GOTTAM BHARGAVA SAI SRINIVAS
29	U15MB064	GOWSHIK RAJA K S
30	U15MB065	GOWTHAMAN K
31	U15MB066	GRACELYN SHARON P
32	U15MB067	GREESHMI C
33	U15MB068	HARIHARAN M
34	U15MB069	HARINI G
35	U15MB070	HARRIBALAJI M
36	U15MB071	HARSHATH KUMAR K N
37	U15MB072	HARSHITHA REDDY D
38	U15MB073	HOMA SAMANVITHA S
39	U15MB074	IMMANUEL ABRAHAM S
40	U15MB075	JANANI S
41	U15MB076	JASMINE NISHA N
42	U15MB077	JAYA KALYANI P S
43	U15MB078	JAYAPREETHI S

5/14/2019

Chennai

From

The Course Coordinator

Certificate Course in Anaesthesia Technician

Department of Anaesthesia

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Course in Anaesthesia Technician

Respected sir,

With reference to subject mentioned above, the Anaesthesia proposes to conduct a value-added course titled: Certificate Course in Anaesthesia Technician

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 5/17/2019

R. No 333/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Anaesthesia

The Department of **Anaesthesia** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Course in Anaesthesia Technician from 6/11/2019 for a period of 3 weeks. Interested students can approach the Head of Anaesthesia department and Course Coordinator, for registration and for further details on or before 6/4/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE COURSE IN ANAESTHESIA TECHNICIAN

COURSE OVERVIEW :

Anaesthesia Technology course is opted by students who wish to learn about anaesthesia equipment, anaesthesia agents, techniques as well as dosage in order to ensure a better monitoring of the patient.

COURSE COORDINATOR: ASSOCIATE PROFESSOR / ASSISTANT PROFESSOR OF ANAESTHESIOLOGY

COURSE DURATION: 30 HOURS

Learning objective:

1. Demonstrate understanding of Anaesthesia care and procedure

2. Understand the machines used in Operation theatre and ICU

3. Know the basic principles of neonatal resuscitation

Syllabus

Topic	Faculty	Hours allotted
Applied Anatomy and physiology relevant to anaesthesia	Assistant professor of anatomy	3 hours
History of Anaesthesia	Assistant Professor Anaesthesia	1
Pharmacology of Anaesthesia	Assistant Professor Pharmacology	3
Anaesthetic postures	Assistant Professor Anaesthesia	2
Metabolic response to trauma and stress	Associate professor Anaesthesia	2
Neonatal resuscitation	Assistant Professor Anaesthesia	2
Post Anaesthesia care rooms	Assistant Professor Anaesthesia	2
Local Anaesthetics - use	Assistant Professor Anaesthesia	2
Anaesthesia machine	Associate professor Anaesthesia	3
Assignment	Assistant Professor Anaesthesia	1
Airway and Laryngoscope	Assistant Professor Anaesthesia	2
Monitering in OT	Associate professor Anaesthesia	3
Preanaesthetic Investigations and instructions	Associate professor Anaesthesia	3
Assesment		1

Certificate Course in Anaesthesia Technician

S. No	Regn. No.	Name
1	U15MB079	JEEVITHA P
2	U15MB080	JENISHA THERESA LALICHAN
3	U15MB081	JESVANTHAN E
4	U15MB082	JEYA PRADHA C
5	U15MB083	JINU SHIRLEY T
6	U15MB084	JOSEPH MARTIN J
7	U15MB085	JOTHIRLATHA Y J
8	U15MB086	KALAIVANI G
9	U15MB087	KAMLESH KANNA A S
10	U15MB088	KARTHICK M
11	U15MB089	KARTHIKA RAJESWARI R
12	U15MB090	KAVIN S
13	U15MB091	KAVINKUMAR V
14	U15MB092	KAVYA G
15	U15MB093	KEERTHANA K
16	U15MB094	KEERTHANA SURESH
17	U15MB095	KEERTHI RAJ G
18	U15MB096	KHAAVYA B
19	U15MB097	KISHORE G
20	U15MB098	KODURU NAVEEN KUMAR
21	U15MB099	KRISHNA PRABA S
22	U15MB100	KRISHNAKKUMAR N R
23	U15MB101	LAKSHANA D
24	U15MB102	LAKSHMI PRASHANTH N
25	U15MB103	LOGESHRAJA V M
26	U15MB104	MADAN KUMAR S
27	U15MB105	MADHANKUMAR M
28	U15MB106	MAHALAKSHMI B
29	U15MB107	MAHALAKSHMI M
30	U15MB108	MALACK MAHMOOD USAMA
31	U15MB109	MANEESH P
32	U15MB110	MANGAIYARKARASI A
33	U15MB111	MANIKANDAN J K
34	U15MB112	MANISHA V
35	U15MB113	MANJUPAARGAVI R
36	U15MB114	MARTINA LINDSAY PAUL A
37	U15MB115	MATCHA REDDYSRI
38	U15MB116	MICHAEL SWETHA J
39	U15MB117	MITHUN J
40	U15MB118	MOHAMMED AZHERUDDIN M K J
41	U15MB119	MOHAMMED JUNAIDH KHAN B
42	U15MB120	MONICA SATHYANARAYANAN
43	U15MB121	MONIHA R
44	U15MB122	MONISHA P
45	U15MB123	MUNDLURI SAI KRISHNA
46	U15MB124	MURALI N
47	U15MB125	MURUGAN NANDHINI
48	U15MB126	MURUGESAN M
49	U15MB127	ANEES FATHIMA M
50	U15MB128	NANDHINI S
51	U15MB129	NEERAJ K S
52	U15MB130	NELLORE ROHITHA REDDY
53	U15MB131	NIRANJVIKNESH R K
54	U15MB132	NITISH KUMAR S
55	U15MB133	NIVEDHA M
56	U15MB134	PADMA PRIYA P



COURSE FEEDBACK FORM

Date: 11/06/19

Course Title: Certificate Course in Anaesthesia Technician

Name: Kishore.G

RegNo: U15MB097

Department: Anaesthesia

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations					✓
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Signature

Thank you

COURSE FEEDBACK FORM

Date: 12/06/19

Course Title: Certificate Course in Anaesthesia Technician

Name: Nivetha .m

RegNo: U15MB133

Department: Anaesthesia

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course					
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Nivetha.M.
Signature

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, AARON RAJ K has completed the value added course on Certificate Course in Anaesthesia Technician conducted by Anaesthesia at Sree Balaji Medical College & Hospital, Chennai held during 6/11/2019.

Dr.W M S Johnson

Dean, SBMCH

5/19/2019

Chennai

From

The Course Coordinator

Certificate Course in Medicine Information

Department of Community Medicine

Sree Balaji Medical College

Bharath Institute of Higher Education and Research,

Chennai

To

The Dean

Sree Balaji Medical College

Bharath institute of Higher Education Research,

Chennai

Sub: -Permission to conduct value- added course: Certificate Course in Medicine Information

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Certificate Course in Medicine Information

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 5/22/2019

R. No 329/ SBMCH/2019

CIRCULAR

Notification for Value added courses offered by the Department of Community Medicine

The Department of **Community Medicine** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Course in Medicine Information from 6/18/2019 for a period of 3 weeks. Interested students can approach the Head of Community Medicine department and Course Coordinator, for registration and for further details on or before 6/11/2019.

Eligibility-MBBS STUDENTS

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

CERTIFICATE PROGRAM ON HEALTH INFORMATION

Health Informatiomis a course which aims to upskill the participants by providing them with essential knowledge of IT in Health including entities and tools like but not limited to - HMIS, EMR, EHR, Medical Records, Telemedicine, Clinical Data, Health Insurance etc. which have shown trends, and will be the de facto standards of the Health and Hospital industry in the near future..

Course Objectives

- Explored how technology can be used to improve health care delivery in health care organizations and in public health
- . Acquired breadth of knowledge of the principles of health informatics
- . Developed basic skills in using health informatics principles to improve practice
  . Acquired a conceptual and theoretical framework of the design, development, and implementation of health information systems.
- Acquired a basic understanding of educational and instructional design theory and principles and how the principles can be applied to deliver effective training to users of health information systems.

Course Duration : 30 Hours

Course Coordinator : Professor/ Assoc. Prof of Department of Community Medicine

S.No	Topics	Duration	Faculty
1	Overview of Health Informatics	2 hours	Asst Prof : Dept of Community Medicine
2	Electronic Health Records and Data Standards and Exchange	2 hours	Assoc Prof : : Dept of Community Medicine
3	Workflow Analysis and Process Redesign	2 hours	Asst Prof : Dept of Community Medicine
4	Usability and Human Factors	2 hours	Assoc Prof : : Dept of Community

			Medicine
5	Systems Design and Designing for Safety	2 hours	Asst Prof : Dept of Community Medicine
6	Effective Training for HIT	2 hours	Assoc Prof : : Dept of Community Medicine
7	Discuss the advantages and disadvantages (unintended consequences) of Clinical Decision Support Systems (CDSS) in terms of cognitive support.	2 hours	Asst Prof : Dept of Community Medicine
8	principles underlying the design of healthcare systems for safety.	2 hours	Assoc Prof : : Dept of Community Medicine
9	common sources of error documented in research studies in medicine.	2 hours	Asst Prof : Dept of Community Medicine
10	principles of sound design to support usability.	2 hours	Assoc Prof : : Dept of Community Medicine
11	systematic approach to developing an effective lesson plan	2 hours	Asst Prof : Dept of Community Medicine
12	process for developing and implementing an instructional needs assessment	2 hours	Assoc Prof : : Dept of Community Medicine
13	workflow diagram based upon the application of a systematic approach	2 hours	Asst Prof : Dept of Community

	to workflow analysis.		Medicine
14	Viva Voce	2 hours	Assoc Prof : : Dept of Community Medicine
15	Assessment	2 hours	Asst Prof : Dept of Community Medicine

Certificate Course in Medicine Information

S. No	Regn. No.	Name
1	U17MB145	PAVITHRA RESHMA S
2	U17MB146	PAVITHRA S
3	U17MB147	PEER MOHAMMED K
4	U17MB148	PONBARATHY V M
5	U17MB149	POOJA P
6	U17MB150	PRADAKSHINE S
7	U17MB151	PRADEEP G
8	U17MB152	PRADEEP M
9	U17MB153	PRADEEP KUMAR S
10	U17MB154	PRADHA RANJAN
11	U17MB155	PRAJIT N
12	U17MB156	PRANAV R P
13	U17MB157	PRAVEEN S
14	U17MB158	PRAVEENKUMAR S
15	U17MB159	PREETHI N
16	U17MB160	PREMALATHA R
17	U17MB161	PRITHA R J
18	U17MB162	PRIYADHARSHINI S
19	U17MB163	PRIYANKA KUMARI B
20	U17MB164	PRIYANKA T
21	U17MB165	PRIYANKHA R
22	U17MB166	PUSHPA PREETHI A
23	U17MB167	RAGHUL PRASATH R
24	U17MB168	RAHUL P NAIR
25	U17MB169	RAIHANA
26	U17MB170	RAKSAI VARTH S
27	U17MB171	RAMALINGAM MADHUMITHA
28	U17MB172	RESHMA S
29	U17MB173	RESHMI E
30	U17MB174	RITAMBHARA JOSHI
31	U17MB175	RIYA KANT
32	U17MB176	RIZWAN FIZAL R
33	U17MB177	ROHINI R
34	U17MB178	ROHITH V
35	U17MB179	ROSHAN PAUL S
36	U17MB180	ROSHINI S
37	U17MB181	RUDRA D R
38	U17MB182	RUHANI SULTANA SHAIK A
39	U17MB183	SAHINI SNEHA
40	U17MB184	SAI SIDDARTH M
41	U17MB185	SAKSHI RANA
42	U17MB186	SALONI KUMARI
43	U17MB187	SANTHOSH KUMAR V M
44	U17MB188	SARAVANA PRIYAN T
45	U17MB189	SARAVANAPANDIYAN B
46	U17MB190	SELVABHARATHI M
47	U17MB191	SENTHIL KUMARAN S
48	U17MB192	SHAKTHI PARAMESH T
49	U17MB193	SHALINI K
50	U17MB194	SHANA PRASTHARAN S
51	U17MB195	SHANE HANS
52	U17MB196	SHANMUGA PRASAD C
53	U17MB197	SHEMA S N



COURSE FEEDBACK FORM

Date: 17/06/19

Course Title: Certificate Course in medicine Information

Name: Premalatha. R

RegNo: U17MB160

Department: Community medicine

S.NO	Particulars	1	2	3	4	5
(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)						
1.	Objectives of the course clear to you				✓	
2.	The course contents met with your expectations				✓	
3.	The lecture sequence was well planned					✓
4.	The lecturers were clear and easy to understand					✓
5.	The teaching aids were effective				✓	
6.	The instructors encourage interaction and were helpful				✓	
7.	The level of the course					✓
(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)						
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Premalatha. R
Signature

Thank you

COURSE FEEDBACK FORM

Date: 19/06/19

Course Title: Certificate Course in medicine Information

Name: Preethi.N

RegNo: U17MB159

Department: Community medicine

S.NO	Particulars	1	2	3	4	5
	(1. Very Unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied)					
1.	Objectives of the course clear to you					✓
2.	The course contents met with your expectations					✓
3.	The lecture sequence was well planned				✓	
4.	The lecturers were clear and easy to understand				✓	
5.	The teaching aids were effective					✓
6.	The instructors encourage interaction and were helpful					✓
7.	The level of the course				✓	
	(1. Very poor 2. Poor 3. Average 4. Good 5. Excellent)					
8.	Overall rating of the course:	1	2	3	4	5

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Preethi
Signature

Thank you

Bharath Institute of Higher Education and Research
Sree Balaji Medical College & Hospital

CERTIFICATE

This is to certify that Mr./Ms, ABHISHEK ARORA has completed the value added course on Certificate Course in Medicine Information conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 6/18/2019.

Dr.W M S Johnson

Dean, SBMCH

Sri Lakshmi Narayana Institute of Medical Sciences

Date: 02.05.2018

From
Dr. Nithianandam
Professor and Head,
Department of Anaesthesia
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Puducherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry

Sub: Request for Permission to conduct value-added course: Comprehensive Pain Care

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Comprehensive Pain Care for undergraduates from July -Dec 2018. We solicit your kind permission for the same.

Kind Regards

Dr. NITHIANANDAM. S

Head of Dept Anaesthesiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502.

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr A.SUGUMARAN

The HOD: Dr.NITHIANANDAM. S

The Expert: Dr M KALASREE

The committee has discussed about the course and is approved.

Dean

Subject Expert

HOD

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE
OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605 502

Head of Dept Anaesthesiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

08.06.2018

Sub: Organizing Value-added Courses: Comprehensive Pain Care- reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research**, is organizing **"Comprehensive Pain Care"** course in July-Dec 2018. The course content is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 15/06/2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KUDAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content.

COURSE PROPOSAL

Course Title: COMPREHENSIVE PAIN CARE

Course Objective:

1. To enable the students to learn about definition of pain and the pain pathway. It will also focus on different types of pain and to treat them both pharmacologically and using other methods.

2. To learn about newer modalities of pain management

Course Outcome:

On successful completion of the course the students will have skill in understanding the different pain mechanisms, causes and management modalities for pain.

Course Audience: II year MBBS students

Course Coordinator: Dr Sugumaran

Course Faculties with Qualification and Designation:

1. Dr Kalasree- Associate Professor
2. Dr. Thirilogasundari-Associate Professor

Course Curriculum/Topics with schedule (Min of 30 hours)

S.No	Date	Topic	Time	Hours	Faculty
1	14.07.2018	Introduction to course and definition	2-4PM	2	Dr Kalasree
2	21.07.2018	Anatomy, pathology and pharmacology of pain	2-4PM	2	Dr. Thirilogasundari
3	28.07.2018	Clinical methods and history taking	2-4PM	2	Dr Kalasree
4	04.08.2018	Evaluation of patients with pain	2-4PM	2	Dr. Thirilogasundari
5	11.08.2018	investigations	2-4PM	2	Dr Kalasree
6	18.08.2018	Drug therapy- WHO ladder	2-4PM	2	Dr. Thirilogasundari
7	25.08.2018	opioids- cornerstone of pain control	2-4PM	2	Dr Kalasree
8	01.09.2018	Nutritional physiotherpy	2-4PM	2	Dr. Thirilogasundari
9	08.09.2018	Interventional pain management	2-4PM	2	Dr Kalasree
10	15.09.2018	Headache and their management	2-4PM	2	Dr. Thirilogasundari
11	22.09.2018	Low back pain	2-4PM	2	Dr Kalasree
12	29.09.2018	Physiotherapy modalities	2-4PM	2	Dr. Thirilogasundari
13	06.10.2018	Ozone therapy	2-4PM	2	Dr Kalasree
14	13.10.2018	Steroids in management of pain	2-4PM	2	Dr. Thirilogasundari
15	20.10.2018	Non pharmacological methods in management of pain	2-4PM	2	Dr Kalasree

REFERENCES

1) Howe L, Peppercorn J. Early palliative care in cancer treatment: rationale, evidence and clinical implications. There Adv Med Oncol 2013.

2) WHO Definition of Palliative Care. Available online, www.who.int/cancer/palliative/definition/en

3) Sternward J, Clark D. Palliative medicine-a global perspective. In: Doyle D, Hanks G, Cherny N, et al, editors. Oxford textbook of palliative medicine, 3rd ed. Oxford: Oxford University Press, 2004

VALUE ADDED COURSE

1. Name of the program & Code

COMPREHENSIVE PAIN CARE, ANAES 07

2. Duration & Period

30 hrs: July 2018- December 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled:

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate of Participation:

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 Time JULY 2018-DEC 2018

8. Year of discontinuation: 2018

9. Summary report of each program year-wise

Value Added Course- JULY 2018-DEC 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	ANAES 07	COMPREHENSIVE PAIN CARE	DR. KALASREE	II MBBS	20

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605 502

DR. KALASREE

COORDINATOR

Dr S NITHIANANDAM

Head of Dept - Anaesthesiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502.

COMPREHENSIVE PAIN CARE

INTRODUCTION

Pain is defined by the InternationalAssociation for the Study of Pain as “an unpleasant sensoryand emotional experience associated with actual orpotential tissue damage, or described in terms of suchdamage”.

Pain can be divided into 2 categories: physiological (acute) and pathological (chronic). Physiological pain is transient and necessary for alarm system that warns the individual and helps to protect the body from tissue damage. While pathological pain is usually persistent and unnecessary. In many pathological conditions pain has lost its protective role and mayinstead cause substantial suffering. Disorders resulting in persistent pain are among the most prevalent forms of chronic illnesses like cancer, arthritis, diabetes, migraine, AIDS etc. To develop novel therapeutic strategies for pathological pain, a better understanding of the molecular and cellular mechanisms underlying is required to fundamentally inhibit its induction and maintenance.

Pain is a subjective experience with two complementary aspects: one is a localized sensation in a particular body part; the other is an unpleasant quality of varying severity commonly associated with behaviors directed at relieving or terminating the experience.

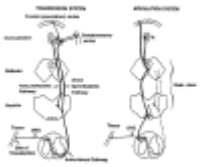
Pain has much in common with other sensory modalities (National Academy of Sciences, 1985). First, there are specific pain receptors. These are nerve endings, present in most body tissues, that only respond to damaging or potentially damaging stimuli. Second, the messages initiated by these noxious stimuli are transmitted by specific, identified nerves to the spinal cord. The sensitive nerve ending in the tissue and the nerve attached to it together form a unit called the primary afferent nociceptor. The primary afferent nociceptor contacts second-order pain-transmission neurons in the spinal cord. The second-order cells relay the message through well-defined pathways to higher centers, including the brain stem reticular formation, thalamus, somatosensory cortex, and limbic system. It is thought that the processes underlying pain perception involve primarily the thalamus and cortex.

In this chapter we review the anatomy and physiology of pain pathways. We also discuss some of the physiological processes that modify the pain experience and that may contribute to the development of chronicity. For obvious reasons, most of this information comes from animal experiments. However, in recent years, experimental studies of human subjects using physiological, pharmacological, and psychophysical methods indicate that much of what has been learned in animals is applicable to humans (National Academy of Sciences, 1985). Research into basic mechanisms underlying pain is an increasingly exciting and promising area. However, most of what is known about the anatomy and physiology of pain is from studies of experimentally induced cutaneous (skin) pain, while most clinical pain arises from deep tissues. Thus, while experimental studies provide fairly good models for acute pain, they are poor models for clinical syndromes of chronic pain. Not only do they provide little information about the muscles, joints, and tendons that are most often affected by chronically painful conditions, but they do not address the vast array of psychosocial factors that influence the pain experience profoundly. To improve our understanding and treatment of pain we will need better animal models of human pain and better tools for studying clinical pain.

Pain Processes

Figure 7-1 illustrates the major components of the brain systems involved in processing pain-related information. There are four major processes: transduction, transmission, modulation, and perception. Transduction refers to the processes by which tissue-damaging stimuli activate nerve endings. Transmission refers to the relay functions by which the message is carried from the site of tissue injury to the brain regions underlying perception. Modulation is a recently discovered neural process that acts specifically to reduce activity in the transmission system. Perception is the subjective awareness produced by sensory signals; it involves the integration of many sensory messages into a coherent and meaningful whole. Perception is a complex function of several processes, including attention, expectation, and interpretation.

Figure 7-1



Diagrammatic outline of the major neural structures relevant to pain. The sequence of events leading to pain perception begins in the transmission system with transduction (lower left), in which a noxious stimulus produces nerve impulses in the primary (more...)

Transduction, transmission, and modulation are neural processes that can be studied objectively using methods that involve direct observation. In contrast, although there is unquestionably a neural basis for it, the awareness of pain is a perception and, therefore, subjective, so it cannot be directly and objectively measured. Even if we could measure the activity of pain-transmission neurons in another person, concluding that that person feels pain would require an inference based on indirect evidence.

Transduction

Three types of stimuli can activate pain receptors in peripheral tissues: mechanical (pressure, pinch), heat, and chemical. Mechanical and heat stimuli are usually brief, whereas chemical stimuli are usually long lasting. Nothing is known about how these stimuli activate nociceptors. The nociceptive nerve endings are so small and scattered that they are difficult to find, let alone study. Nonetheless, there have been some studies of the effects of chemicals on the firing frequency of identified primary afferent nociceptors.

A variety of pain-producing chemicals activate or sensitize primary afferent nociceptors (Bisgaard and Kristensen, 1985; Juan and Lembeck, 1974; Keele, 1966). Some of them, such as potassium, histamine, and serotonin, may be released by damaged tissue cells or by the circulating blood cells that migrate out of blood vessels into the area of tissue damage. Other chemicals, such as bradykinin, prostaglandins, and leukotrienes, are synthesized by enzymes activated by tissue damage (Armstrong, 1970; Ferreira, 1972; Moncada et al., 1985; Vane, 1971). All of these pain-producing chemicals are found in increased concentrations in regions of inflammation as well as pain. Obviously, the process of transduction involves a host of chemical processes that probably act together to activate the primary afferent nociceptor. In theory, any of these substances could be measured to give an estimate of the peripheral stimulus for pain. In practice, such assays are not available to clinicians.

It should be pointed out that most of our knowledge of primary afferent nociceptors is derived from studies of cutaneous nerves. Although this work is of general importance, the bulk of

clinically significant pain is generated by processes in deep musculoskeletal or visceral tissues. Scientists are beginning to study the stimuli that activate nociceptors in these deep tissues (Cervero, 1982, 1985; Coggeshall et al., 1983; National Academy of Sciences, 1985). In muscle, there are primary afferent nociceptors that respond to pressure, muscle contraction, and irritating chemicals (Kumazawa and Mizumura, 1977; Mense and Meyer, 1985; Mense and Stahnke, 1983). Muscle contraction under conditions of ischemia is an especially potent stimulus for some of these nociceptors.

Despite progress in our understanding of the physiology of musculoskeletal nociceptors, we still know very little about the mechanisms underlying common clinical problems such as low back pain. Even when there is degeneration of the spine and compression of a nerve root—a condition generally acknowledged to be extremely painful—we do not know which nociceptors are activated or how they are activated. Neither do we know what it is about the process that leads to pain.

Transmission

Peripheral Nervous System

The nociceptive message is transmitted from the periphery to the central nervous system by the axon of the primary afferent nociceptor. This neuron has its cell body in the dorsal root ganglion and a long process, the axon, that divides and sends one branch out to the periphery and one into the spinal cord (Figure 7-2). The axons of primary afferent nociceptors are relatively thin and conduct impulses slowly.



Figure 7-2

The primary afferent nociceptor. This is the route by which the central nervous system is informed of impending or actual tissue damage. Its peripheral process runs in peripheral nerves, and its peripheral terminals are present in most body structures (more...)

It is possible to place an electrode into a human peripheral nerve and record the activity of primary afferent nociceptors (Fitzgerald and Lynn, 1977; Torebjork and Hallin, 1973). The nociceptor is characterized by its response to noxious heat, pressure, or chemical stimuli. The "pain" message is coded in the pattern and frequency of impulses in the axons of the primary afferent nociceptors. There is a direct relation between the intensity of the stimulus and the frequency of nociceptor discharge (Figure 7-3). Furthermore, combined neurophysiological and psychophysical studies in humans have shown a direct relation between discharge frequency in a primary afferent nociceptor and the reported intensity of pain (Fitzgerald and Lynn, 1977; LaMotte et al., 1983). Blocking transmission in the small-diameter axons of the nociceptors blocks pain, whereas blocking activity of the larger-diameter axons in a peripheral nerve does not. These identified primary afferent nociceptors are thus necessary for detecting noxious stimuli.

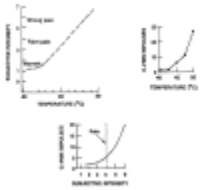


Figure 7-3

The relation of discharge frequency in primary afferent nociceptors to subjective pain intensity in human subjects. Top left: The skin of human subjects was subjected to brief, calibrated temperature increases. Subjects began to identify the temperature (more...)

Monitoring activity in identified primary afferent nociceptors is a potential tool for the evaluation of certain types of clinical pain. In fact, this method has been used clinically to demonstrate pain-producing neural activity arising from a damaged nerve (Nystrom and Hagbarth, 1981). At present, this method should be considered just a research tool; however, it is technically feasible and is of great potential value for evaluating pain patients. It raises the possibility of actually demonstrating nociceptor activity coming from a painful area. This method could be an advance over other correlative techniques for assessing pain because it measures the presumed noxious input, that is, the neural activity that ordinarily causes pain. Most of the other measures assess responses that could be, but are not necessarily, caused by noxious stimuli.

It is important to point out that (1) there can be pain without activity in primary afferent nociceptors, and (2) there can be activity in primary afferent nociceptors without pain. These phenomena occur when there has been damage to the central or peripheral nervous systems. In addition, the modulating system can suppress central transmission of activity elicited by nociceptor input. Thus, there is a variable relation between nociceptor input and perceived pain intensity. For this reason the method of recording primary afferent nociceptors could be used to confirm the presence of an input, but it could not be used to prove that pain was not present.

Besides these theoretical limitations of trying to assess subjective pain intensity by recording primary afferent nociceptors, there are important practical problems in measuring either pain-producing substances or primary afferent nociceptor activity. One is that the largest group of patients disabled by pain localize it to musculoskeletal structures in the lower back. Because the nerves innervating these structures are not near the skin, they are difficult to find. Another problem is that pain arising from deep structures is often felt at sites distant from where the tissue damage occurs. In contrast to the pain produced by skin damage, which is sharp or burning and well localized to the site of injury, the pain that arises from deep tissue injury is generally aching, dull, and poorly localized (Lewis, 1942). When the damage to deep tissues is severe or long lasting, the sensation it produces may be misperceived as arising from a site that is distant from the actual site of damage (Head, 1893; Kellgren, 1938; Lewis, 1942; Sinclair et al., 1948). This phenomenon, known as *referred pain*, helps to explain the frequent discrepancy between physical findings and patient complaints. The mechanism of referred pain is unknown for any particular case.

Referred pain can be a major source of confusion in the examination of patients complaining primarily of pain. The fact that pain is referred from visceral internal organs to somatic body structures is well known and commonly used by physicians. For example, the pain of a heart attack is not always localized to the heart but commonly is felt diffusely in the chest, the left arm, and sometimes in the upper abdomen. Less widely recognized is the fact that irritable spots, such as myofascial trigger points, in skeletal muscles also cause feelings of pain in locations distant from the irritable spot. This was demonstrated experimentally in muscle and fascia by Kellgren in the late 1930s (Kellgren, 1938). Specific patterns of pain referred from particular muscles

have been described clinically (Travell and Rinzler, 1952; Travell and Simons, 1983). (See Chapter 10 and Appendix.)

At least four physiological mechanisms have been proposed to explain referred pain: (1) activity in sympathetic nerves, (2) peripheral branching of primary afferent nociceptors, (3) convergence projection, and (4) convergence facilitation. The latter two involve primarily central nervous system mechanisms.

1.Sympathetic nerves may cause referred pain by releasing substances that sensitize primary afferent nerve endings in the region of referred pain (Procacci and Zoppi, 1981), or possibly by restricting the flow of blood in the vessels that nourish the sensory nerve fiber itself.
2.Peripheral branching of a nerve to separate parts of the body causes the brain to misinterpret messages originating from nerve endings in one part of the body as coming from the nerve branch supplying the other part of the body.
3.According to the convergence-projection hypothesis, a single nerve cell in the spinal cord receives nociceptive input both from the internal organs and from nociceptors coming from the skin and muscles. The brain has no way of distinguishing whether the excitation arose from the somatic structures or from the visceral organs. It is proposed that the brain interprets any such messages as coming from skin and muscle nerves rather than from an internal organ. The convergence of visceral and somatic sensory inputs onto pain projection neurons in the spinal cord has been demonstrated (Milne et al., 1981; Foreman et al., 1979).
4.According to the convergence-facilitation hypothesis, the background (resting) activity of pain projection neurons in the spinal cord that receive input from one somatic region is amplified (facilitated) in the spinal cord by activity arising in nociceptors originating in another region of the body. In this model, nociceptors producing the background activity originate in the region of perceived pain and tenderness; the nerve activity producing the facilitation originates elsewhere, for example, at a myofascial trigger point. This convergence-facilitation mechanism is of clinical interest because one would expect that blocking sensory input in the reference zone with cold or a local anesthetic should provide temporary pain relief. One would not expect such relief according to the convergence-projection theory. Clinical experiments have demonstrated both kinds of responses.

This phenomenon of referred pain can present a serious problem to both patients and physicians when it goes unrecognized. Because the source of the pain lies overlooked at a distant location, the lack of any demonstrable lesion at the site of pain and tenderness often leads to the suspicion that the pain has a strong psychological component. When health professionals insist that there is no reason for the pain, patients sometimes begin to wonder whether the pain is "all in their head." As is discussed in later chapters, this can exacerbate anxiety and other psychological reactions to the pain, is likely to frustrate both the doctor and the patient, and may lead to "doctor shopping" and inappropriate treatment.

Pain Pathways In the Central Nervous System

Primary afferent nociceptors transmit impulses into the spinal cord (or if they arise from the head, into the medulla oblongata of the brain stem). In the spinal cord, the primary afferent nociceptors terminate near second-order nerve cells in the dorsal horn of the gray matter (Willis, 1985). The primary afferent nociceptors release chemical transmitter substances from their spinal terminals. These transmitters activate the second-order pain-transmission cells. The identity of these transmitters has not been established, but candidates include small polypeptides such as substance P and somatostatin, as well as amino acids such as glutamic or aspartic acid.

The axons of some of these second-order cells cross over to the opposite side of the spinal cord and project for long distances to the brain stem and thalamus. The pathway for pain transmission lies in the anterolateral quadrant of the spinal cord. Most of our information about the anatomy and physiology of pain-transmission pathways in the central nervous system is derived from animal studies. However, it is known that in humans, lesions of this anterolateral pathway permanently impairs pain sensation and that electrical stimulation of it produces pain (Cassinari and Pagni, 1969; White et al., 1950; Willis, 1985).

There are two major targets for ascending nociceptive axons in the anterolateral quadrant of the spinal cord: the thalamus and the medial reticular formation of the brain stem. Our knowledge is most extensive for the spinal cells whose axons project directly to the thalamus, that is, the spinothalamic tract cells. The spinothalamic pathway is implicated in human pain perception because lesions of it, at any level, produce lasting impairments of pain sensation.

Studies of the properties of spinothalamic tract cells have been carried out in several species. In all these species, a major proportion of spinothalamic neurons respond maximally to noxious stimulation. Furthermore, there is a direct relationship in spinothalamic tract cells of firing frequency to stimulus intensities in the noxious range for human subjects (Kenshalo et al., 1980; Willis, 1985). These observations, coupled with decades of careful clinical studies, strongly implicate the spinothalamic tract as a major pathway for pain in humans.

The other major ascending nociceptive pathway in the anterolateral quadrant is the spinoreticular tract. The medullary reticular formation receives a major direct projection from the spinal cord as well as from branches of some of the spinal neurons that project to the thalamus (Kevetter and Willis, 1984; Mehler, 1962).

At the thalamic level, pain pathways have two major sites of termination: ventrocaudal and medial. The ventrocaudal thalamus receives nociceptive input directly from projecting spinal neurons. Neurons in the ventrocaudal thalamus project directly to the somatosensory cortex (Willis, 1985). The medial thalamus receives some indirect input from the spinal cord, but in addition, it receives a major input from the region of the brain stem reticular formation to which the nociceptive spinoreticular neurons project. The medial thalamus projects to widespread areas of the forebrain, including the somatosensory cortex (Jones and Leavitt, 1974). Thus there are two major ascending pathways for pain: a direct lateral spinothalamic pathway and an indirect medial spinoreticulothalamic pathway. It is thought that the lateral pathway from the spinal cord to the ventrocaudal thalamus and to the cortex is responsible primarily for sharp, well-localized pains that arise near the body surface. In contrast, the medial spinoreticulothalamic pathway responds more to stimuli of deep somatic and visceral structures.

There is some evidence for further functional differences between medial and lateral thalamic pathways. Lesions of the ventrocaudal thalamus and somatosensory cortex produce long-lasting deficits in the sensory aspects of pain that are very similar to those produced by lesions of the anterolateral spinal cord pathway. Lesions of the medial thalamus have very little effect on pain sensation per se; pain threshold is unaffected, as are the other sensory aspects of the pain experience. In contrast, the emotional or reactive aspects may be totally abolished (Barber, 1959).

Sensory Versus Affective Aspects of Pain

The processes set in motion by noxious stimuli can be divided into two broad categories. On one hand, there are the sensory processes that lead to the detection and identification of the stimulus. On the other hand, presumably because of the tissue-damaging potential of the noxious stimulus, aversive behavioralsequelae such as withdrawal and escape can terminate the stimulus and protect the organism. Correlated with these two categories of response are two subjective aspects of pain: sensory and affective.

The sensory aspects concern detecting, localizing, assessing the intensity of, and identifying the stimulus. Focusing on the sensory aspects, a person might describe his or her pain as a mild burning pain located on the back of the hand. In contrast, the affective or unpleasantness aspect of pain correlates with the aversive drive to terminate the noxious stimulus and is described by terms that are not specifically tied to a sensory experience, for example, nagging, uncomfortable, or excruciating. The affective aspects would also be accompanied by mood changes such as anxiety and depression, which are usually considered psychological rather than sensory.

The difference between the sensory and affective aspects of pain can be illustrated further by distinguishing between pain threshold and pain tolerance. For example, if one delivers calibrated thermal stimuli to the skin, most people will report that the sensation becomes painful over a narrow range of skin temperatures (43-46ºC) (LaMotte et al., 1983; Willis, 1985). The temperature that is called painful 50 percent of the time would be the pain detection or sensory threshold.

In contrast to this relatively reproducible pain-detection threshold, *tolerance* for pain differs widely among individuals. For example, subjects immersing their hands in ice water fall into distinct groups those who keep their hands in for over 5 minutes and those who pull them out after less than 90 seconds (Turk and Kerns, 1983-1984). The tolerance for pain is a complex function that may be modified by personality traits, attitudes, previous experience, economic factors, gender, and the particular circumstance under which the pain is experienced. Tolerance may be thought of as a response threshold. Pain of a certain intensity and duration may be ignored, whereas a somewhat more intense pain might induce some people to take painkillers, stay home from work, or consult a physician. The particular behavior elicited by pain of a given intensity is highly individual and greatly influenced by what the patient believes will be helpful

and how serious he or she thinks the situation is. For example, most people with headaches do not seek medical attention because headaches are not considered indicative of serious disease (and usually are not). In contrast, a person whose father died recently from a brain tumor might be very frightened by even a mild headache and seek medical attention (see Chapter 8).

Tolerance is also tied to the cognitive and affective aspects of pain. For patients with cancer, pain may be a sign that the tumor has recurred or spread and that death is near. For such patients, the suffering is due not only to the pain's intensity but also to its meaning. Anguish, suffering, and anxiety commonly accompany pain.

In the 1950s many patients with severe pain due to malignancy were given frontal lobotomies (Barber, 1959). These operations disrupt the projections to the frontal lobe from the medial spinoreticulothalamic pathway. In such patients, pain intensity and threshold were unaffected, but the emotional aspects (suffering and anguish) were abolished. Unfortunately, the severe personality changes that accompanied the elimination of suffering made this an unacceptable approach to the treatment of pain. However, these clinical observations show that the affective component of pain has a separate anatomical substrate from the sensory component.

Modulation

The abovementioned processes were discussed in terms of a highly reliable pain-transmission system, the assumption being that pain intensity is a direct function of nociceptor activity. In fact, the excellent correlation among stimulus intensity, impulses in primary afferent nociceptors, and reported pain intensity demonstrated in human subjects under experimental conditions often does not apply to the clinical situation. The most remarkable observations are those in which patients subjected to injuries that ought to be very painful report no significant pain (Beecher, 1959).

An hypothesis for spontaneous analgesia emerged when it was discovered that electrical stimulation of certain brain regions blocks responses to noxious stimulation in laboratory animals (Basbaum and Fields, 1978). This phenomenon, stimulation-produced analgesia (SPA), became more than a laboratory curiosity when it was shown that stimulating homologous brain regions provided relief for patients suffering from chronic pain (Hosobuchi et al., 1977; Richardson and

Akil, 1977). SPA has been demonstrated in a variety of animal species and in hundreds of patients.

SPA can be elicited from well-defined brain stem sites. A body of evidence now indicates that SPA is mediated by a discrete neuronal network running from the midbrain to the medulla and then to the spinal cord (Figure 7-1) (Basbaum and Fields, 1978, 1984). This descending, pain-modulating pathway projects to regions of the spinal cord that contain pain-transmission neurons. Stimulation at brain stem sites that produce behavioral analgesia also selectively inhibits identified nociceptive spinothalamic tract neurons. This inhibition may underly the behavioral and clinical analgesia produced by brain stem stimulation.

In addition to electrical stimulation, the analgesia network can be activated by morphine and other opiate analgesic drugs (Yaksh, 1978). The brain stem sites for SPA and the spinal cord are both sensitive to directly applied opiates. The weight of evidence indicates that opiates produce analgesia in part by activating these pain-modulating networks.

One of the most important discoveries in pain research was that the brain contains substances that have the same pharmacological properties as plant-derived opiates and synthetic opioid drugs. These substances, called endogenous opioid peptides, axe present within nerve cells of the peripheral and central nervous systems (Palkovits, 1984). Of particular importance for our discussion is the presence in high concentrations of these peptides in those brain stem sites implicated in pain suppression (Basbaum and Fields, 1984). As discussed in Chapter 9, these findings have led to some promising new psychopharmacological applications.

Studies of this endorphin-mediated analgesia system in laboratory animals have shown that it can be activated by a variety of stressful manipulations, including painful stimuli (Basbaum and Fields, 1984). Clinical studies indicate that it is activated after surgery and can have a significant analgesic effect (Fields and Levine, 1984; Levine et al., 1979). The important point is that there is a well-defined network for controlling pain transmission. Current evidence indicates that this network accounts for some of the striking variability of reported pain intensity in different patients who have had apparently similar noxious stimuli.

It has been suggested that failure of the pain-suppression system accounts for certain types of chronic pain states (Sicuteri et al., 1984; Terenius, 1985), but most pain experts consider this

conclusion premature. Much more work is needed to determine the extent to which this pain-modulating network operates on chronic pain.

Go to:

Physiological Processes That Enhance Pain and May Lead to Chronicity

One of the most troublesome issues for patients, clinicians, and disability examiners is how to account for pain experiences that seem disproportionate to physical findings or objectively verifiable disease or injury. Although it is well known and well accepted that various psychosocial factors may enhance pain, the role of several physiological processes in amplifying and maintaining pain is perhaps not adequately taken into account when assessing patients' complaints.

Sensitization

Tissue damage initiates a variety of processes that sustain and amplify pain. With repeated stimuli, the thresholds of primary afferent nociceptors progressively decrease, so that normally innocuous stimuli become painful (Campbell et al., 1979; Gybels et al., 1979; LaMotte et al., 1983). For some primary afferent nociceptors, repeated noxious stimuli may induce continuous activity lasting for hours (National Academy of Sciences, 1985). The most familiar example of this is sunburn, in which the skin becomes a source of pain; hot water applied to the skin is perceived as unbearably painful and a friendly slap on the back is excruciating. Other examples are the tenderness of a sprained ankle or an arthritic joint. In these situations it is painful to bear weight or even move the affected joint. Sensitization is a major feature of many and perhaps most clinically significant pains, but its cellular mechanism is unknown.

Hyperactivity of the Sympathetic Nervous System: Reflex Sympathetic Dystrophy

Patients with relatively minor injuries occasionally develop pain disproportionate to their injuries. Such pain often becomes progressively worse rather than following the usual course of lessening with time. It is important to stress that the pain persists well beyond the time when the original tissue-damaging process has ended. Furthermore, the location of the pain may be quite different from the site of the precipitating pathology.

In some of these patients hyperactivity of the sympathetic nervous system clearly plays a major role in sustaining the pain because selective blockade of the sympathetic outflow produces immediate and dramatic relief. The pain is usually accompanied by signs of sympathetic hyperactivity, such as a cold (vasoconstricted), sweaty limb. In addition, the skin may be hypersensitive to touch, as if the nociceptors were sensitized. With time, osteoporosis, arthritis, and muscle atrophy may set in and a permanent impairment of function may ensue. This condition, called *reflex sympathetic dystrophy*, usually responds to sympathetic blocks and physical therapy (De Takats, 1937; Livingston, 1943; Procacci et al., 1975). Physiological studies in animals indicate that the sympathetic outflow can induce discharge of primary afferent nociceptors. This is most prominent in damaged and regenerating afferents (Devor, 1984) but also occurs in undamaged, sensitized afferents (Roberts, 1986) (Figure 7-4).

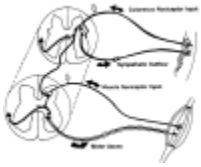


Figure 7-4

Reflex activation of nociceptors in self-sustaining pain. There are two important reflex pathways for pain. The top loop illustrates the sympathetic component. Nociceptor input activates sympathetic reflexes, which activate or sensitize nociceptor terminals. (more...)

The reflex sympathetic dystrophy syndrome is relatively uncommon in its full-blown form, but sympathetic activity could be a common factor in sustaining or amplifying pain that would ordinarily fade as the injured tissues heal. If this were the ease, local signs of increased sympathetic activity could help provide objective evidence that a pain-producing pathological process is present.

Muscle Contraction

Nociceptor activity results in sustained contraction in muscles. In limbs, this muscle contraction produces flexion, a form of primitive withdrawal that is presumably a protective movement. Disease in the abdominal viscera (e.g., gut, liver) produces tension in the muscles of the abdominal wall. Pain arising from musculoskeletal structures also produces contraction and

tenderness in other muscles innervated by the same spinal segment (Head, 1893; Kellgren, 1938).

There is some evidence that this spreading muscle contraction plays an important role in clinically significant pains. In patients with persistent pain it is common to find small areas in muscles that are quite tender. Pressure over these myofascial trigger points can reproduce the patient's pain, and locally anesthetizing the points (or other manipulations of them) can give relief lasting days to months (Simons and Travell, 1983). The physiological basis of these trigger points is unknown, but the clinical evidence suggests that they are often involved in sustaining pain in the absence of ongoing tissue damage.

Self-Sustaining Painful Processes: Livingston's "Vicious Circle"

From the material just discussed, clinical observations clearly indicate that several processes are set in motion by tissue-damaging stimuli that activate nociceptors. In the peripheral tissues, pain-producing substances are released that sensitize the nociceptors so that normally innocuous stimuli can activate them. In addition, nociceptors themselves release factors such as substance P that in turn cause vasodilation, edema, and the release of sensitizing substances from nonneural cells (Lembeck, 1983). Presumably, these processes play a role in the activation of host defenses against infection or toxins. However, they do prolong and amplify pain.

For example, a noxious stimulus to the skin would activate nociceptors. These nociceptors then activate spinal reflexes that produce sustained muscle contraction with consequent activation of muscle nociceptors (Figure 7-4). In this case, the production of a second site of noxious input in muscle is due to a spinal reflex. In some cases (e.g., reflex sympathetic dystrophy), the nociceptive input also activates the sympathetic nervous system, which can feed back to the periphery to sensitize or even activate nociceptive primary afferents. Livingston (1943) was the first to emphasize the clinical importance of these positive feedback loops; that is, the pain produces muscle contraction and sympathetic outflow that in turn activate nociceptors, which produce more sympathetic outflow and muscle contraction, and so on (Figure 7-4). The point is that painful injuries set in motion secondary processes, not associated with tissue damage, that cause a prolongation and spread of nociceptive input and may contribute to chronicity. These

secondary processes set up foci of nociceptive input that are independent of the original site of injury. The pain acquires, so to speak, a life of its own.

Although there is no question that these factors contribute to the pain in some cases, it is not clear what proportion of patients with chronic pain have it because of these factors. This would obviously be an important area for future research on chronic pain.

Neuropathic Pain

Damage to the peripheral or central nervous systems can produce chronic pain. For example, in some diseases that affect peripheral nerves, such as diabetes mellitus or alcohol toxicity, pain is very common. Traumatic injury to a peripheral nerve is rarely painful, but when it is, it may be dramatically so. Causalgia (heat pain) is an example of pain induced by traumatic injury to a peripheral nerve. Causalgia is a syndrome characterized by severe burning pain and signs of sympathetic nervous system hyperactivity (Mitchell, 1965; Roberts, 1986). Similarly, lesions of the central nervous system are rarely painful, but when they are, the pain is severe and resistant to treatment (Cassinari and Pagni, 1969; Riddoch, 1938).

There are certain characteristics of neuropathic pain. It frequently begins several days to weeks after the injury that produces it and tends to worsen before stabilizing. It is usually accompanied by sensory abnormalities, including, paradoxically, deficits in pain sensation and painful hyperreactivity to ordinarily innocuous stimuli (Noordenbos, 1959; Ochoa, 1982).

The mechanisms of neuropathic pain are not completely understood, but there are several factors that could contribute to them (Ochoa, 1982). Damaged primary afferents, presumably including nociceptors, acquire certain properties when they begin to regenerate. These include spontaneous activity, mechanical sensitivity, and sensitivity to sympathetic nervous system activity (Ochoa, 1982; Scadding, 1981).

Note that under these circumstances there can be pain either without any stimulus or with a very gentle, non-tissue-damaging stimulus.

In addition to the peripheral sources of pain, damage to primary afferents produces changes in the pain-transmission neurons to which they project in the central nervous system. These cells

become spontaneously active and could be a source of pain, again in the absence of any noxious stimuli (Lombard and Larabi, 1983; Roberts, 1986).

Trigeminal neuralgia and post-herpetic neuralgia are among the most common types of neuropathic pains. These conditions tend to strike older individuals, many of whom are retired. This may be why patients with pains that are obviously neuropathic account for only a small proportion of those who seek disability benefits. On the other hand, some patients with low back pain might have an element of nerve damage that adds to the painfulness of their problem as well as to its chronicity and resistance to conventional treatment. Further research on this issue is clearly needed, as are better methods for detecting injuries to nerves that innervate deep structures.

Acute Versus Chronic Pain

Is there any physiological basis for differentiating between acute and chronic pain? Little is known about the effects of prolonged pain on the central nervous system. There is some evidence that the transition from acute pain to chronic pain alters patients' neurophysiology in a way that makes them somewhat different from people with acute pain. In arthritic rats, for example, there are changes in the peripheral nerves that alter their range of response to applied stimuli, and there may be changes in the central pathways for pain transmission as well (Guilbaud et al., 1985; Kayser and Guilbaud, 1984). Experiments with rats in which nerves have been injured and observed over time have shown changes in the central nervous system, but it is not known how these changes relate to pain (Markus et al., 1984).

People with recurrent headaches, arthritis, low back pain, angina, or low-grade malignancies may have had pain for years. The complaints, treatment, and patients' reactions may be different for each of these conditions. In some cases, psychological factors loom large. These factors are particularly prominent in patients with low back pain, facial pain, and headaches and seem to be more prominent the longer the pain persists.

Psychological and somatic factors are not completely separate in maintaining pain. For example, stress and anxiety increase both muscle contraction and sympathetic outflow and would be expected to exacerbate any ongoing pain problem to which they contribute. Conversely, any treatment that induces relaxation will reduce these factors and lessen pain. This may be one

important connection between the psychosocial and the somatic factors that influence pain tolerance.

Go to:

Potential Methods of Physiological Monitoring

In this chapter we have briefly surveyed the anatomy, physiology, and pharmacology of nociceptive transduction, transmission, and modulation. These are objective and potentially observable phenomena initiated by stimuli that damage or threaten tissue.

As we learn more about the transduction process, it may be feasible to measure the concentration of substances in regions of ongoing tissue damage that activate or sensitize primary afferent nociceptors. This could give an estimate of the level of stimulation of chemically sensitive nociceptors. The most promising technique at present is direct recording of the electrical activity in primary afferents. This is technically feasible and has been used in research, but it is not presently available for general clinical use.

The monitoring of central pain transmission pathways is not practical with the technology available. Although it is theoretically possible, recording single units within the human nervous system requires a potentially dangerous surgical procedure. Multiunit, or evoked-potential, studies do not have the required specificity or spatial resolution to permit collecting meaningful data about clinical pain. It is technically possible to measure the chemicals released at spinal synapses by primary afferent nociceptors. If the concentration of such chemicals in the cerebrospinal fluid could be shown to correlate with either the activity of the primary afferent nociceptors or with the severity of clinical pain, this could provide evidence similar to that derived from recording the activity of the primary afferents. However, at the present time, the transmitter or transmitters for the primary afferent nociceptors are unknown.

Another approach is to use positron emission tomography (PET) to monitor metabolic activity in central nervous system pain pathways. PET is a noninvasive scanning technique that can provide evidence of focal brain activity and of the concentration of certain chemicals. This technique requires that enough neurons be active in a large enough region for a long enough period of time to be detected. Because of the topographical organization of the cortex, this technique might be

used to monitor the somatosensory cortex. A precise map of the body surface spreads over many millimeters of the cortex. Representation of the face and hand on this map is very large, so it might be possible to detect ongoing activity produced by nociceptive input from these regions. At present, there is no evidence that such measurements show anything in patients with chronic pain.

Indirect measures, such as those of sympathetic nervous system activity (skin temperature or skin resistance) or of muscle contraction in painful areas might be helpful in providing objective evidence of sustained nociceptive input. The measurement of skin temperature over extensive areas of the body surface, thermography, is being used clinically but is still not widely accepted as a reliable indicator of pain. Although they are simple, painless, and safe indicators of sympathetic function, indirect measures of painful input like thermography could be misleading. Sympathetic changes could be produced by nonspecific factors such as surprise or anxiety that do not involve pain. On the other hand, if the changes in sympathetic activity are highly localized, persistent, and consistent with the reported location of the patients' pain, routine evaluation of sympathetic function with techniques like thermography in patients with chronic pain might provide clues about the mechanisms sustaining the pain.

Ultimately, the presence of pain in another individual is always inferred. Even if we could measure pain directly, such a measure would not be adequate to describe the experience of pain, and it is the experience that affects functioning, including the ability to work.

Pain can be treated with invasive or non-invasive methods. Pharmacologic treatment, mostly systemic administration, uses non-invasive methods. Definite targeted invasive treatments, such as a percutaneous osteoplasty for metastasized bone fractures, or endoscopic discectomy for compressed nerves, have a definite advantage over broad-spectrum systemic analgesics in that they remove the source of the pain. If it is impossible to correct or remove the source of pain, non-invasive administration of systemic analgesics is the second choice.

First of all, recognition of the source of the pain is the first step in choosing analgesics. When the origin of the pain is classified, it is preferable to use the International Association for the Study of Pain definition of pain [1]. Therefore, it can be divided into the emotional component, caused by potential tissue damage, and the sensory component, caused by actual tissue damage. The sensory component of pain is also divided into nociceptive (somatic and visceral) and neuropathic pain (positive and negative) (**Table 1**).

Table 1

Classification of Pain and Recommendable Appropriate Analgesics

Emotional pain	Anxiolytics (minor tranquilizers)	Benzodiazepines	Clonazepam, diazepam, midazolam
		Etifoxine (etafenoxine)	
	Antidepressants	Typical	Nortriptyline, amitriptyline,
		Atypical	SSRIs, SSNRIs
	Antipsychotics (major tranquilizers)	First generation	Haloperidol, chlorpromazine
		Second generation	Quetiapine, risperidone, olanzapine
Sensory pain	Nociceptive pain	Somatic (Superficial and deep[a])	NSAIDs, APAP, ASA, and steroids
		Visceral[a]	Opioids: weak and strong
	Neuropathic pain	Positive symptoms	Anticonvulsants
		Negative symptoms	Antidepressants: nortriptyline, amitriptyline

SSRIs: selective serotonin reuptake inhibitors, SSNRIs: selective serotonin norepinephrine reuptake inhibitors, NSAIDs: non-steroidal anti-inflammatory drugs, APAP: N-acetyl-para-aminophenol, ASA: acetyl salicylic acid.

[a]Deep somatic and visceral pain may present referred pain or radiating pain including radicular pain.

Somatic nociceptive pain, which can be divided into superficial and deep categories, shows a good response to non-steroidal anti-inflammatory drugs (NSAIDs), acetaminophen (Paracetamol®, N-acetyl-para-aminophenol [APAP]), acetylsalicylic acid (ASA), and steroids. Visceral nociceptive pain usually responds to opioids. Deep nociceptive and visceral pain may sometimes present as referred pain and radiating pain, which create great confusion in deciding the origin of the pain.

Neuropathic pain can be divided into positive and negative symptom categories. Neuropathic pain with positive symptoms shows a good response to anticonvulsants, while neuropathic pain with negative symptoms responds well to antidepressants [2-5].

Most analgesics, except some which exhibit a therapeutic ceiling, such as NSAIDs, APAP, and ASA, need dose and dosage titration for seeking the appropriate analgesic blood level, which can control persistent pain, but not breakthrough pain.

The three steps for analgesic administration and pain management are pain relief at night, bed rest in the daytime, and active movement during daily life. In addition, the principle of polypharmacy is focused on increasing therapeutic effects (analgesia) while reducing adverse reactions (ADRs), based on the source of the pain.

This review provides appropriate choices of analgesics for the treatment of pain, based on the supposed origins of the pain.

Go to:

MAIN BODY

1. Sensory component of pain

Nociceptive pain arises from actual or threatened damage to non-neural tissue, due to the activation of nociceptors. On the other hand, neuropathic pain is caused by a lesion or disease of the somatosensory nervous system, which exhibits abnormal function [6].

1) Nociceptive pain

Superficial somatic nociceptive pain exhibits well-demarcated, sharp, aching pain, while deep somatic nociceptive pain presents ill-demarcated, dull pain. Visceral pain shows poorly-demarcated, heavy, dull pain. Deep somatic and visceral nociceptive pain may have referred pain or radiating pain characteristics (including radicular pain).

Basically, the borders of the somatic and visceral structures are the dura in the head, the pleura and pericardium in the chest, the peritoneum in the abdomen, and the (potential) retroperitoneum (retroperitoneal space) behind the abdominal cavity in the pelvis.

Well-known referred pain from the visceral structures includes left shoulder pain from myocardial infarctions, and right supraclavicular pain from hepatobiliary disorders. Examples of representative referred pain from the deep somatic structures can be found in spinal joint pain from the atlanto-occipital and atlanto-axial joints, classic cervical, thoracic, and lumbar facet joints, and sacroiliac joints.

It has already been demonstrated that substance P, calcitonin gene-related peptide, and protein gene product 9.5 containing nerve fibers, exist in the cervical facet joints in a cadaveric study [7]. This means that anti-inflammatory drugs may be effective through either systemic administration or local infiltration. Therefore, in the case of inflamed knee joints, as with the diarthrodial joints, it seems more effective to use direct intra-articular injections than innervating nerve branch blocks [8-10].

The medial branch also innervates bones, including the posterior lamina and spinous process, ligaments, including the supraspinous ligament, interspinous ligament, and ligament flavum, erect muscles, skin, and subcutaneous tissues, as well as the facet joints [11]. Therefore, the diagnostic value of medial branch blocks can be diluted, and the therapeutic effect may be lower than with facet joint injections.

(1) Non-steroidal systemic analgesics

① NSAIDs

The name NSAIDs includes analgesic drugs, which are not in the class of steroids and have an anti-inflammatory property. The NSAIDs reduce pain and inflammation, as well as fever. In addition, ASA also has the ability to reduce itching. However, APAP can only reduce pain and fever, not inflammation. Therefore, APAP is not an NSAID because it does not reduce inflammation. So, if there is inflammation, anti-inflammatory drugs which act by peripheral mechanisms are needed. Otherwise, if there is no inflammation, APAP, which acts on central mechanisms, can replace the NSAIDs.

The action mechanism of NSAIDs is usually explained by cyclo-oxygenase (COX). The COX is traditionally divided into the constitutive COX-1 isoform in the normal condition and the inducible COX-2 isoform in the inflammatory condition. However, controversially, the COX-1 and -2 isoforms are widely found in the human body, such as the central nervous system, peripheral nervous system, cardiovascular system, gastrointestinal system, endocrine system, and reproductive system under normal conditions. In addition, the COX-2 is especially found in the brain, kidney, and female reproductive system [12].

All currently available NSAIDs have 3 common representative therapeutic effects, namely, an analgesic, anti-inflammatory, and antipyretic effect, and also have 3 common representative ADRs, specifically gastric damage, renal damage, and an antiplatelet function. Therefore, it is better to choose and prescribe a familiar NSAID only for a short period of inflammation, while considering its half-life.

Common ADRs of NSAIDs in detail are (1) gastrointestinal problems related to gastrointestinal mucosa damage, due to decreased prostaglandin (PG) E_2 resulting from COX-1 inhibition, such as dyspepsia, and gastric erosion, ulceration, perforation, and bleeding, (2) renal problems related to sodium and water retention, hypertension, and hemodynamic acute renal injury due to

decreased PG E_2 and PGI_2, resulting from COX-1 and COX-2 inhibition, and (3) cardiovascular and platelet aggregation problems, such as stroke and myocardial infarction due to decreased PGI_2, resulting from greater COX-2 and lesser COX-1 inhibition, and increased bleeding tendency due to decreased thromboxane (TX) A_2, resulting from COX-1 inhibition.

Relative COX-1 and COX-2 selectivity (COX-1/COX-2 half maximal inhibitory concentration [IC_{50}] value) for commonly used NSAIDs and ASA in order of value would be ketorolac, ketoprofen, indomethacin, ASA, naproxen, ibuprofen, piroxicam, meloxicam, diclofenac, celecoxib, valdecoxib, etoricoxib, rofecoxib, and lumiracoxib [13].

NSAIDs, APAP, and ASA have a ceiling effect, in which the fixed maximal therapeutic effect is achieved, but ADRs continue to worsen, as their doses increase. Finally, they increase the risk to benefit ratio, developing a ceiling effect.

② *ASA*

ASA has been commercially available from 1899 under the name Aspirin® (Bayer AG, Leverkusen, Germany). In addition to the 4 representative therapeutic effects already mentioned, a low dose of ASA has been used for reducing the risk of heart attack and stroke [14]. Long-term medication for at least 10-20 years may be effective in cancer prevention, especially with colorectal cancer [15], but also with endometrial [16], breast [17], and prostate cancer [18].

After Vane's discovery of COX in 1971, the mechanisms of action of non-opioid analgesics, including ASA, NSAIDs, and steroids, have been apparent [19,20]. However, ASA, unlike other NSAIDs, is known to produce a unique, irreversible inactivation of COX, since it covalently modifies both COX-1 and COX-2 by acetylating serine residue within the COX active sites. This irreversible inactivation of COX-1 results in a representative ADR, gastrotoxicity, ranging from gastritis to peptic ulcers and gastrointestinal bleeding [21-23].

In addition, COX-1 is the main form in the mature platelets in the blood, where it transforms arachnoid acid via the intermediates PG G/H to TX A_2 (vasoconstrictor and platelet activator). This inhibition of TX A_2 explains the antithrombotic properties of ASA [14,21-23].

There is a theory related to a clinical benefit in which ASA turns off COX-2's production of PGs, but switches on COX-2's ability to produce novel protective lipid mediators (ASA-triggered lipoxins). In other words, ASA, in a different way from NSAIDs, converts COX-2 into a protective mediator-generating system with anti-inflammatory and pro-resolving properties [23].

③ *APAP*

APAP is used to treat pain and fever (but not inflammation or itching) after being synthetized in 1877 and being marketed as Tylenol® or Panadol® in 1955 [24,25]. Its weak anti-inflammatory property is probably due to its poor effectiveness in high peroxide concentrations at the inflammatory site [26,27].

As with ASA, which has a history of more than 100 years, the mechanism of action of APAP is still unclear. Potential analgesic mechanisms of APAP are (1) positive effects on the serotonergic descending inhibitory pain pathway, and (2) interactions with opioid systems, eicosanoid systems, and nitric oxide containing pathways [27,28].

(2) Steroids

Steroids have the ability to inhibit both COX and lipoxygenase, resulting in a reduction of PGs and leukotrienes (LTs).

LTs are inflammatory mediators, and include the di-hydroxy acid LT (LTB4) and the cysteinyl LTs (CysLTs; LTC4, LTD4, LTE4). The high-affinity LTB4 receptors are known as BLT1, the LTC4, and LTD4 receptors as CysLT1 and CysLT2, and the LTE4 receptors as GPR99. BLT1 signaling stimulates the degranulation, chemotaxis, and phagocytosis of neutrophils, and CysLT1 and CysLT2 signaling induces airway inflammation by bronchial smooth muscle contraction and increasing vascular permeability. Therefore, these LTs are involved in chronic inflammatory disorders, such as asthma, atopic dermatitis, psoriasis, atherosclerosis, arthritis, obesity, cancer, and age-related degeneration [29,30].

Steroids in palliative care are indicated for special conditions, such as spinal cord compression, increased intracranial pressure, and bowel obstruction, and for responding to general conditions, such as reducing pain, stimulating appetite, suppressing nausea, and alleviating fatigue. Generally, inhibition of PG and LT synthesis by steroids leads to reducing pain, inflammation, and vascular permeability (edema) [31].

(3) Opioids

Opioids for analgesia have been used for over 5,000 years. Opioids are substances that acts on the opioid receptors, such as the mu, kappa, and delta receptors. According to the action on the opioid receptors, opioids can be divided into agonists, antagonists, and partial agonists/antagonists. Opioid agonists bind to G-protein coupled receptors, and cause cellular hyperpolarization [32].

Opioid up-titration may be needed due to cancer progression from a visceral origin. However, in cases of newly-developed invasions into other structures, non-opioid analgesics are helpful to manage the somatic pain, and anticonvulsants and antidepressants are effective to control the neuropathic pain.

Opioids are effective for both somatic and visceral nociceptive pain; however, they should only be started in patients with chronic non-malignant disorders if physicians are confident, they can taper and then discontinue them. Extra caution should be used in giving immediate-release opioids to young patients with chronic non-malignant disorders, especially chronic pancreatitis (visceral pain), complex regional pain syndrome (neuropathic pain), or bony fracture (somatic pain). Thanks to the development of the diagnosis and treatment of cancer, patients who experience complete recovery from cancer may be candidates for opioid addiction.

Methadone was approved by the U.S. Food and Drug Administration in 1972 for the treatment of opioid addiction. It has 2 enantiomers found in equal amounts in a racemic mixture; the active R enantiomer has a half-life of 36-48 hours and the inactive S enantiomer has a half-life of approximately 16 hours. Therefore, it is rapidly absorbed by the oral route with a delayed onset of action (with peak level at 2-4 hr) and with sustained levels maintained over 24 hours. It also has N-methyl-D-aspartate (NMDA) receptor antagonist properties. The initial dose starts with 20-40 mg/day, then the dose is gradually increased by 10 mg every 4-7 days [33].

Conventional opioids activate 2 intracellular signaling pathways: the G protein pathway induces analgesia, while the beta-arrestin pathway is responsible for the opioid-related ADRs. An academically ideal oliceridine (TRV130) has been studied for its role in both activation of the G protein pathway for analgesia and deactivating the beta-arrestin pathway for reducing ADRs [34]. Clinicians await the launch of this novel opioid with lesser ADRs.

2) Neuropathic pain

Pharmacologic treatment of neuropathic pain begins from the translation of symptoms and signs in patients into the underlying mechanisms, and simply classifying them as positive or negative (**Table 2**) [2,5].

Table 2

Recognition of Neuropathic Pain: Sensory Symptoms and Signs of Neuropathic Pain, Clinical and Laboratory Tests, and Underlying Mechanisms

Sensory symptom and sign	Bedside examination	Laboratory examination	Mechanism
1. Negative sensory symptoms and signs			
1) Reduced touch	Touch skin with cotton wool	Graded von Frey hair	Aβ fibers
2) Reduced pin prick	Prick skin with a pin single stimulus	von Frey hair specific (e.g., 100-g)	Aδfibers
3) Reduced cold and warm	Thermal response to cold and warm objects (20℃ and 45℃)	Detection of pain threshold for warm and cold objects	Aδ/C fibers

Sensory symptom and sign	Bedside examination	Laboratory examination	Mechanism
4) Reduced vibration	Tuning fork on the medial malleolus	Vibrometer	Aβ fibers
2. Positive sensory symptoms and signs			
1) Spontaneous pain			
(1) Paresthesia	Grade (0-10)	Area in cm^2 grade (0-10)	Spontaneous activity in long-term Aβ afferent fibers
(2) Dysesthesia	Grade (0-10)	Area in cm^2 grade (0-10)	Spontaneous activity in Aδ/C afferent fibers
(3) Paroxysms	Grade (0-10)	Threshold for evocation	Spontaneous activity in C nociceptors
(4) Superficial	Grade (0-10)	Area in cm^2 grade (0-	Spontaneous activity in C

Sensory symptom and sign	Bedside examination	Laboratory examination	Mechanism
burning pain		10)	nociceptors
(5) Deep pain	Grade (0-10)	Area in cm^2 grade (0-10)	Spontaneous activity in joint/muscle nociceptors
2) Evoked pain			
(1) Touch evoked hyperalgesia	Stroking skin with brush	None	Central sensitization: C fiber input and loss of C fiber input
(2) Static hyperalgesia	Gentle mechanical pressure	Evoked pain to pressure	Peripheral sensitization
(3) Punctate hyperalgesia	Pricking skin with a pin	von Frey hair	Central sensitization: Aδ afferent fibers input

Sensory symptom and sign	Bedside examination	Laboratory examination	Mechanism
(4) Punctate repetitive hyperalgesia (windup-like pain)	Pricking skin with a pin 60 times/30 sec	von Frey hair	Central sensitization: Aδ afferent fibers input
(5) Aftersensation	Measurement of pain duration after stimulation	Measurement of pain duration after stimulation	Central sensitization
(6) Cold hyperalgesia	Stimulation skin with cool metal roller	Evoked pain to cold stimuli	Central sensitization and disinhibition
(7) Heat hyperalgesia	Stimulation skin with warm metal roller	Evoked pain to heat stimuli	Peripheral sensitization
(8) Chemical hyperalgesia	Topical capsaicin	Topical capsaicin	Peripheral sensitization

Sensory symptom and sign	Bedside examination	Laboratory examination	Mechanism
(9) Sympathetic maintained pain	Sympathetic blockade	Modulation of sympathetic outflow	Sympathetic afferent coupling

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Reproduced from the article of Jensen and Baron (Pain 2003; 102: 1-8) [2].

Representative negative sensory symptoms and signs in neuropathic pain (with their underlying mechanisms) are a reduced sensation of (1) touch (Aβ fiber abnormalities), (2) vibration (Aβ fiber abnormalities), (3) pin prick (Aδfiber abnormalities), and (4) cold and heat (Aδ/C fibers abnormalities).

On the other hand, positive symptoms and signs can be divided into spontaneous or evoked pain according to the absence or presence of stimuli. Spontaneous pain (and its underlying spontaneous activity) includes (1) paresthesia (low threshold Aβ afferents), (2) dysesthesia (Aδ/C afferents), (3) paroxysms (C-nociceptors), (4) superficial burning pain (C-nociceptors), and (5) deep pain (joint/muscle nociceptors). Evoked pain includes (1) touch evoked hyperalgesia (central sensitization related to C fiber input), (2) static hyperalgesia (peripheral sensitization), (3) punctate hyperalgesia (central sensitization related to Aδfiber input), (4) punctate repetitive hyperalgesia (windup-like pain, central sensitization related to Aδfiber input), (5) aftersensation (central sensitization), (6) cold hyperalgesia (central sensitization and disinhibition), (7) heat hyperalgesia (peripheral sensitization), (8) chemical hyperalgesia (peripheral sensitization), and (9) sympathetic maintained pain (sympathetic afferent coupling). In summarizing positive neuropathic pain, spontaneous pain includes paresthesia, dysesthesia, paroxysms, superficial burning pain, and deep pain; evoked pain includes various kinds of hyperalgesia, aftersensation, and sympathetic maintained pain [5].

The representative evoked positive symptoms of neuropathic pain are mechanical (dynamic, punctate, and superficial or deep static) and thermal (cold and heat) hyperalgesia and allodynia [5].

Several available clinical assessment tools for neuropathic pain have been developed for evaluation of the neuropathic pain component ratio among patients' whole pain, and for comparison of neuropathic pain scores before and after non-invasive or invasive treatment. Common screening tools for neuropathic pain are (1) the neuropathic pain questionnaire (NPQ), (2) douleurneuropathique en 4 (DN4), (3) Leeds assessment of neuropathic symptoms and signs (LANSS), (4) ID pain, (5) painDETECT (**Table 3**), as well as (6) the neuropathic pain symptom inventory (NPSI) questionnaire (**Table 4**) [4,5,35-42].

Table 3

Summary of Various Neuropathic Pain Questionnaires

NPQ [38]	DN4 [39]	LANSS [40]	ID pain [41]	painDETECT [42]
1. Burning × 0.006	Question 1[a]	Pain questionnaires	1. Pins and needles (Yes: 1, No: 0)	1. Grading of pain (0: never, 1: hardly, 2: slightly, 3: moderately, 4: strongly, or 5: very strongly noticed)
2. Overly sensitive to touch × 0.005	1. Burning	1. Dysesthesia (Yes: 5, No: 0)	2. Hot/burning sensation (Yes: 1, No: 0)	2. The pain course pattern (0: persistent pain with slight fluctuations, –1: persistent pain with pain attacks, +1: persistent pain without pain between attacks, or +1: persistent pain with pain between attacks)
3. Shooting pain × 0.005	2. Painful cold	2. Color change of the skin in the painful area (Yes: 5, No: 0)	3. Numbness (Yes: 1, No: 0)	3. Radiating pain (+2: yes, or 0: no)
4. Numbness ×	3. Electric	3. Abnormal	Electric	The total score varies

NPQ [38]	DN4 [39]	LANSS [40]	ID pain [41]	painDETECT [42]
0.020	shocks	sensitivity to touch in the affected skin (Yes: 3, No: 0)	shocks (Yes: 1, No: 0)	from 0 to 8.
5. Electric pain × – 0.008	Question 2[a]	4. Abnormal skin temperature change in the painful area (Yes: 2, No: 0)	Worsening with touch (Yes: 1, No: 0)	
6. Tingling × 0.010	4. Tingling	5. Abnormal skin temperature change (Yes: 1, No: 0)	Limited to the joints (Yes: –1, No: 0)	
7. Squeezing × – 0.004	5. Pins and needles	The sensory testing	The total score varies from –1 to 5.	
8. Freezing × 0.004	6. Numbness	1. Allodynia (Yes: 5, No: 0)		
9. Unpleasant ×	7. Itching	2. An altered pin-prick threshold		

NPQ [38]	DN4 [39]	LANSS [40]	ID pain [41]	painDETECT [42]
0.006		(Yes: 3, No: 0)		
10. Overwhelming × –0.003		The total score varies from 0 to 24.		
11. Tactile hyperalgesia × 0.006	Question 3[b]	If the score < 12, neuropathic mechanisms are unlikely to be contributing to the patient's pain.		
12. Increased pain due to weather changes × –0.005	8. Hypoesthesia to touch	If the score ≥ 12, neuropathic mechanisms are likely to be contributing to the patient's pain.		
If the total score minus 1.408 is below 0, it predicts non-neuropathic	9. Hypoesthesia to pinprick			

NPQ [38]	DN4 [39]	LANSS [40]	ID pain [41]	painDETECT [42]
pain.				
On the contrary, if the total score minus 1.408 is at or above 0, it predicts neuropathic pain.	Question 4[b] 10. Pain caused by or increased by brushing Yes = 1, No = 0 Patient's score = □/10			

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NPQ: neuropathic pain questionnaire, DN4: douleurneuropathique en 4, LANSS: Leeds assessment of neuropathic symptoms and signs.

[a]From interview of the patient. [b]From examination of the patient.

Table 4

Neuropathic Pain Symptom Inventory Questionnaire

Neuropathic pain symptom inventory	Interpretation of pain	Score

Neuropathic pain symptom inventory	Interpretation of pain	Score
Q1. Burning	Superficial spontaneous pain	0-10
Q2. Squeezing	Deep spontaneous pain	0-10
Q3. Pressure		0-10
Q4. Spontaneous pain during the past 24 hr		Permanently
		8-12 hr
		4-7 hr
		1-3 hr
		< 1 hr
Q5. Electric shocks	Paroxysmal pain	0-10

Neuropathic pain symptom inventory	Interpretation of pain	Score
Q6. Stabbing		0-10
Q7. Pain attacks during the past 24 hr		> 20 times/day
		11-20 times/day
		6-10 times/day
		1-5 times/day
		0 times/day
Q8. Pain provoked by or increased by brushing on the painful area	Evoked pain	0-10
Q9. Pain provoked by or increased by pressure on the painful area		0-10

Neuropathic pain symptom inventory	Interpretation of pain	Score
Q10. Pain provoked by or increased by contact with something cold on the painful area		0-10
Q11. Pins and needles	Paresthesia/Dysesthesia	0-10
Q12. Tingling		0-10

Results

Total intensity score	Sub-scores	0-100
Q1 = Superficial spontaneous pain	/1 = 0-10 × 2	0-20
Q2 + Q3 = Deep spontaneous pain	/2 = 0-10 × 2	0-20
Q5 + Q6 = Paroxysmal pain	/2 = 0-10 × 2	0-20
Q8 + Q9 + Q10 = Evoked pain	/3 = 0-10 × 2	0-20

Neuropathic pain symptom inventory	Interpretation of pain	Score
Q11 + Q12 = Paresthesia/Dysesthesia	/2 = 0-10 × 2	0-20

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0 means no pain, but 10 means maximal pain imaginable.

Modified from the article of Bouhassira et al. (Pain 2004; 108: 248-57) [5].

The NPQ includes 12 items scored from 0 to 100 and its coefficient: (1) burning × 0.006, (2) overly sensitive to touch × 0.005, (3) shooting pain × 0.005, (4) numbness × 0.020, (5) electric pain × –0.008, (6) tingling × 0.010, (7) squeezing × –0.004, (8) freezing × 0.004, (9) unpleasant × 0.006, (10) overwhelming × –0.003, (11) tactile hyperalgesia × 0.006, and (12) increased pain due to weather changes × –0.005. If the total score minus 1.408 is below 0, it predicts non-neuropathic pain. On the contrary, if the total score minus 1.408 is at or above 0, it predicts neuropathic pain [37].

The DN4 is composed of 10 question items (yes: 1, no: 0) with 2 categories. First, from the interview of the patient, question 1 includes pain characteristics: (1) burning, (2) painful cold, and (3) electric shocks. Question 2 includes the presence of these combined symptoms: (4) tingling, (5) pins and needles, (6) numbness, and (7) itching. From the examination of the patient, question 3 includes the presence of hypoesthesia: (8) hypoesthesia to touch, and (9) hypoesthesia to pinprick. Question 4 is whether (10) the pain can be caused by or increased by brushing the painful area [39].

The LANSS pain scale includes a pain questionnaire and sensory testing. The pain questionnaire includes (1) unpleasant sensations such as pricking, tingling, or pins and needles (yes: 5, no: 0), (2) different appearance of the skin in the painful area, such as mottled or a red/pink appearance (yes: 5, no: 0), (3) abnormal sensitivity to touch (yes: 3, no: 0), (4) pain appearing suddenly and in bursts for no apparent reason, such as electric shocks, jumping, and bursting (yes: 2, no: 0), and (5) abnormal skin temperature change, such as feeling hot or a burning sensation (yes: 1, no: 0). The sensory testing for the presence of allodynia and an altered pinprick threshold includes (6) allodynia (yes: 5, no: 0) and (7) an altered pinprick threshold (yes: 3, no: 0). The total score varies from 0 to 24. If the score < 12, neuropathic mechanisms are unlikely to be contributing to the patient's pain. If the score ≥ 12, neuropathic mechanisms are likely to be contributing to the patient's pain [40].

The ID pain score includes 6 items scoring from –1 to 5: (1) pain feeling like pins and needles (1/0), (2) hot/burning sensation (1/0), (3) numbness (1/0), (4) electric shocks (1/0), (5) worsening with touch (1/0), and (6) pain limited to the joints (–1/0) [41].

The painDETECT was developed to assess the neuropathic pain component in low back pain. It includes 3 items with (1) grading of pain (0: never, 1: hardly, 2: slightly, 3: moderately, 4: strongly, or 5: very strongly noticed), (2) the pain course pattern (0: persistent pain with slight

fluctuations, –1: persistent pain with pain attacks, +1: persistent pain without pain between attacks, or +1: persistent pain with pain between attacks), and (3) radiating pain (+2: yes, or 0: no). The total score varies from 0 to 8 [42].

The NPSI is recommendable for evaluating the change of intensity of neuropathic pain before and after treatment. It includes positive symptoms and signs of neuropathic pain, including spontaneous pain (superficial burning and deep pain [squeezing and pressure], paresthesia or dysesthesia [pins/needles and tingling], as well as paroxysmal pain [electric shocks and stabbing]) and evoked pain (by brushing, pressure, and contact) (**Table 4**) [5].

(1) Carbamazepine

Carbamazepine (Tegretol®) is still considered the first-line drug for the treatment of trigeminal neuralgia [43,44]. According to the White and Sweet diagnostic criteria of trigeminal neuralgia, the pain should be (1) paroxysmal, (2) provoked by light touch to the face, (3) confined to the trigeminal zone, and (4) unilateral, with (5) showing a normal clinical sensory test in the painful area [45].

In addition, according to the diagnostic criteria for classical and symptomatic trigeminal neuralgia of the International Classification of Headache Disorders (second edition) by the International Headache Society, classical trigeminal neuralgia shows (1) a paroxysmal attack of facial pain which last a few seconds to less than 2 minutes, affecting one or more divisions of the trigeminal nerve, (2) intense, sharp, superficial, or stabbing pain, or pain precipitated from trigger areas or by trigger factors, (3) stereotyped attacks in the individual patient, (4) no abnormal neurologic deficit, and (5) that it is not attributed to another disorder [46].

The metabolite of carbamazepine, carbamazepine-10,11-epoxide, plays an important role for ADRs of carbamazepine. For the safer use of carbamazepine, (1) a monotherapy prescription (if possible), (2) adequate dose titration with monitoring plasma concentration, and (3) routine laboratory check-up, such as complete blood count and liver function test, are recommended [47].

(2) Oxcarbazepine

Oxcarbazepine (Trileptal®) has been developed from carbamazepine through structural variation to avoid metabolites causing ADRs. However, oxcarbazepine is different from carbamazepine; (1) The mode of action of both drugs consists mainly of a blockade of sodium currents. However, in comparison to calcium channel blockade, oxcarbazepine or monohydroxy derivate expresses its effect *via* N-, P-, and/or R-type calcium currents, instead of the L-type calcium currents in carbamazepine. (2) It increases neither 5-hydroxytriptamine (HT) release nor acetylcholine receptor blockade. (3) It does not inhibit the cytochrome P 450 enzymes, and it reduces the concentration of gamma-glutamyltransferase in the serum [48].

Oxcarbazepine and its metabolites are mostly excreted in the urine; an ability of renal clearance is important to determine the dose of administration. In patients with an impaired glomerular filtration rate below 30 mL/mo, (1) the daily dose should be halved to 4-5 mg/kg (almost 300 mg/day), (2) slower dose increases should be made, and (3) the dosing interval should be prolonged [48].

There is no evidence that oxcarbazepine is more effective than other medications in the treatment of diabetic neuropathy, radiculopathy, or postherpetic neuralgia [49]. First-line therapy for trigeminal neuralgia is still considered to be carbamazepine (600-1,200 mg/day), or if not, oxcarbazepine (600-1,800 mg/day) [4].

(3) Gabapentin

When we think of neuropathic pain, except trigeminal neuralgia, gabapentin and pregabalin are the first-line medications. Pain physicians consider these drugs to be neuropathic medications rather than anticonvulsants. Most medications are effective for specific symptoms and signs, not specific disorders or diseases. Gabapentin and/or pregabalin are effective for positive symptoms of neuropathic pain in various disorders or diseases. The current consensus for pain management includes not only opioid and non-opioid analgesics, as major analgesics, but also anticonvulsants and antidepressants, as adjuvants. Chronic pain results from subacute pain followed by acute pain, due to extensive tissue damage or the presence of neuropathic pain. Therefore, evaluation of pain characteristics is essential at the beginning of pain treatment.

Gabapentinoids $\alpha_2\delta$ ligands, are derived from gamma aminobutyric acid (GABA) which blocks $\alpha_2\delta$ subunit-containing voltage-dependent calcium channels. Currently available gabapentinoids include gabapentin (Neurontin®), pregabalin (Lyrica®), mirogabalin (Tarlige®, DS-5565) used in Japan since 2019 [50], and gabapentin enacarbil (Horizant®, Regnite®) [51].

(4) Pregabalin

The next generation anticonvulsant for neuropathic pain, which followed gabapentin, is pregabalin. Pregabalin shows a stronger and longer action duration than gabapentin. However, it is necessary to change from gabapentin to pregabalin in patients with intractable neuropathic pain who are taking a high single dose of gabapentin (over 900 mg), which causes lower bioavailability (a high dose administration of oral gabapentin excretes directly into the stool). An increased frequency of oral intake with a different dose may be needed in prescriptions for both gabapentin and pregabalin for reducing pain and ADRs in initial titration (**Table 5**) [52].

Table 5

Different Titration Methods and Conversion of Gabapentin and Pregabalin for Patients with Intractable Pain Requiring a Rapid Dose Increase

Day	Gabapentin	Pregabalin

	TID				QID					BID			TID	
	7A	1P	7P	Total daily dose	7A	1P	7P	11P	7A	7P	7A	Total daily dose	3P	11P
1	-	-	300	300	-	-	-	300	50	50	100	25	25	50
2	300	-	300	600	100	100	100	300	75	75	150	50	50	50
3	300	300	300	900	200	200	200	300	100	100	200	50	50	100
4-6	400	400	400	1,200	300	300	300	300	150	150	300	75	75	150
7-10	500	500	500	1,500	300	300	300	600	200	200	400	100	100	200
11-	60	60	60	1,80	40	40	40	600	25	250	500	125	125	250

	Gabapentin								Pregabalin					
Day	TID			Total daily dose	QID				BID		Total daily dose	TID		
	7A	1P	7P		7A	1P	7P	11P	7A	7P	7A		3P	11P
14	0	0	0	0	0	0	0		0					
15	800	800	800	2,400	600	600	600	600	300	300	600	150	150	300

TID: ter in die; three times a day, QID: quarter in die; four times in a day, BID: bis in die; twice in a day, -: not available.

Modified from the article of Yang et al. (Korean J Anesthesiol 2013; 65: 48-54) [52].

The maximal dose recommended by the manufacture is 600 mg/day; however, many patients with intractable neuropathic pain during the period of up-titration may need a higher dose to achieve adequate pain relief with tolerable ADRs [53].

(5) Mirogabalin

Both gabapentin and pregabalin have been known to act non-specifically on the $\alpha_2\delta$-1 and -2. Binding to the $\alpha_2\delta$-1 may produce analgesic effects, whereas binding to the $\alpha_2\delta$-2 may be related to ADRs of the central nervous system, such as somnolence. Mirogabalin has been known to show more selective binding and slower dissociation to the $\alpha_2\delta$-1. Maximal plasma concertation

after oral intake is achieved at around 1 hour. The plasma protein binding of mirogabalin is relatively low at 25%. It is largely excreted in the urine [54,55].

The equianalgesic dose of 30 mg/day mirogabalin, for achieving over 50% pain relief (when the number needed to treat is around 5) in the treatment of diabetic peripheral neuropathy, is considered to be roughly 600 mg/day of pregabalin, over 1,200 mg/day of gabapentin, and 60 mg/day of duloxetine. However, the ADRs of mirogabalin are lower than the other 3 drugs [55,56].

(6) Nefopam

Nefopam (fenazocine, Acupan®) is a non-opioid, non-steroidal, centrally acting analgesic drug. The mechanism of analgesic action is similar to those of the triple neurotransmitters (serotonin, dopamine, and norepinephrine), uptake inhibitors (antipsychotics or antidepressants), and anticonvulsants. Therefore, it is suitable to use for neuropathic pain intravenously (continuous infusion), intramuscularly, or orally. It should be given intravenously, slowly, over 15-20 minutes, or intramuscularly, due to preventing known ADRs, such as cold sweating, dizziness, tachycardia, and drowsiness. It is also convenient to convert from intravenous medication during hospitalization into oral medication after discharge. The recommended dose of intravenous administration is 60-120 mg/day, and oral administration for 3 to 6 times totaling 90-180 mg/day [57].

(7) Antidepressants

Antidepressants have been used for the treatment of negative neuropathic pain, based on 6 mechanisms; (1) blockade of norepinephrine and serotonin, (2) blockade of sodium channels, (3) antagonism of NMDA glutamate receptors, (4) sympathetic blockade, (5) effects on visceral nerve fibers, and (6) effects on mood [58].

Antidepressants can be divided into first generation and second generation antidepressants. Nortriptyline has been chosen among the first generation antidepressants (tricyclic antidepressants, including amitriptyline, imipramine, and desipramine), due to the same strong analgesic effect with norepinephrine and serotonin reuptake inhibition, but lesser ADRs, such as anticholinergic effects (dry mouth), postural hypotension, and sedation. On the other hand, amitriptyline may be chosen due to its strong sedative effect in cases of insomnia (**Table 6**) [59].

Table 6

Antidepressants Commonly Used to Treat Pain

Antidepressant	Analgesia	Reuptake inhibition	Adverse effects	Elimination of

								half-life of parent drug (hr)
		NE	**SE**	**Anticholinergic effects**	**Postural hypotension**	**Sedation**	**Cardiac arrhythmia**	
Nortriptyline	+++	++	++	++	+	+	+++	18-48
Amitriptyline	+++	++	++	+++	+++	+++	+++	9-46
Imipramine	+++	++	++	+++	+++	++	+++	6-28
Desipramine	++	+++	0	+	++	+	+++	12-28
Paroxetine	+	0	+++	0	0	0	0	21
Citalopram	+	0	+++	0	0	0	0	24
Venlafaxine	?	++	+++	0	0	0	0	4

NE: norepinephrine, SE: serotonin.

Modified from Max and Gilron (Antidepressants, muscle relaxants, and N-methyl-D-aspartate receptor antagonists. In: Bonica's Management of Pain. 3rd ed. Edited by Loeser JD; 2000, pp. 1710-26) [59].

2. Emotional component of pain

In addition to the sensory component of pain originating from actual tissue damage, the emotional component of pain from potential tissue damage should also be treated. While treating all sensory components of pain, including nociceptive and neuropathic pain, patients may complain of mysterious and vague generalized pain [59].

Available medications for the emotional component of pain are antipsychotics, anxiolytics, and antidepressants. There are 3 major neurotransmitters in the human brain: serotonin, norepinephrine, and dopamine. These neurotransmitters have their own functions: (1) serotonin is charged with the control of cognitive impulse and relaxation with memory, (2) norepinephrine has a relation to alertness, concentration, socialization, and energy, and (3) dopamine is deeply engaged in pleasure, motivation, reward, pain avoidance, and reality [59].

It is difficult to quantify each emotional item and to supply a deficit in the clinical field. However, not only the sensory component, but also the emotional component should be considered in the treatment of pain.

1) Antipsychotics

Antipsychotics are effective in pain patients with positive psychotic symptoms (related to the mesolimbic pathway), not negative, affective, and cognitive symptoms (related to the mesocortical pathway) [59].

The antipsychotics can be divided into typical and atypical categories. The typical antipsychotics act on the D_2 receptor; however, they produce extrapyramidal symptoms (dystonia, pseudo-parkinsonism, akathisia, and tardive dyskinesia) related to the nigrostriatal pathway and produce elevated serum prolactin levels.

In order to reduce the extrapyramidal symptoms and hyperprolactinemia, atypical antipsychotics have been developed through a decreased D_2 receptor binding affinity, but an increased 5-HT_{2A} receptor binding effect. Certain atypical antipsychotics, such as risperidone, ziprasidone, sertindole, clozapine, olanzapine, zotepine, aripiprazole, and quetiapine, produce somnolence effect related to the 5-HT_{2A} receptor binding. On the contrary, sulpiride and amisulpride, like the typical antipsychotic haloperidol, do not produce somnolence. In addition, they increase the risk of metabolic syndromes, such as weight gain, diabetes, or dyslipidemia.

Antipsychotic equivalent oral doses, based on a daily oral dose of 100 mg of chlorpromazine, are similar to 2 mg (1-5 mg) of haloperidol, 100 mg (30-150 mg) of clozapine, 2 mg (0.5-3 mg) of risperidone, 75 mg of quetiapine, 5 mg of olanzapine, and 7.5 mg of aripiprazole [59].

2) Anxiolytics

If antipsychotics are called as major tranquilizers (neuroleptics), anxiolytics are known as minor tranquilizers. Representative anxiolytic agents are GABAergics, such as benzodiazepines, barbiturates, and etifoxine.

The GABAA receptor consists of 5 subunits, two $\alpha_{(1-6)}$, two $\beta_{(1-3)}$, and one $\gamma_{(1-3)}$. Benzodiazepines are binding at the interfaces between the α_1 and γ_2 subunit, and barbiturates bind at the interfaces between the α_1 and β_2 subunit. Etifoxine directly acts on the β_2 or β_3 subunit, and indirectly activates the 18 kDatranslocator protein. It shows lesser ADRs of anterograde amnesia, sedation, impaired psychomotor performance, and withdrawal syndromes than those of benzodiazepines [58].

3. Transition from intravenous patient-controlled analgesia into oral medication inpatients with intractable pain

Patients with intractable pain need hospitalization for the investigation of the origin of the pain, the treatment of correctable causes, and the transition of analgesia from intravenous to oral medication for discharge. Available intravenous medications for analgesia are morphine, ketorolac, nefopam, dexmedetomidine, midazolam, steroids, and antiemetics (ramosetron, palonosetron, or ondansetron).

The first dose of each medication is determined by the origin and intensity of the pain. While escalating the daily dose of oral medication, the dose of intravenous medications with patient-controlled analgesia can be diluted with normal saline to half of the initial dose every 3 days.

After 4 cycles of dilution at 12 days, the transition to oral from intravenous medications is completed, using such medications as oral morphine, NSAIDs, nefopam, anxiolytics (antidepressant or antipsychotic), anticonvulsants, antidepressants, and steroids. Patients can be discharged from the hospital at 14 days after confirmation of having tolerable pain and ADRs.

Go to:

CONCLUSIONS

Most analgesics, except NSAIDs, ASA, or APAP, need the process of dose-up and -down titration. In order to achieve the 3 steps including reducing (1) night pain, (2) resting pain during the day, and (3) daily activity, the initial dose at night should be larger, even though the daily total dose is the same. Simultaneously, it is emphasized that the ADRs, such as orthostatic hypotension and dizziness, may develop at night. Dose-up titration is finished when both pain and ADRs are tolerable. When down-titration for discontinuing the analgesics begins, the dose at night should be the last to be reduced or discontinued.

According to the origin of the pain, an effective analgesic drug should be chosen. 1) For an unpleasant emotional experience, an antipsychotic, antidepressant, or anxiolytic is considered. 2) Various analgesics are needed for the control of an unpleasant sensory experience. (1) An NSAID, ASA, or APAP is effective for somatic nociceptive pain. (2) An opioid is helpful to relieve visceral nociceptive pain. (3) An anticonvulsant is used to control positive neuropathic

pain. (4) On the contrary, an antidepressant should be chosen to relieve negative neuropathic pain.

Chronic pain, which has 2 or more pain components, needs combined therapy using these analgesics. Chronification of pain comes from a greater intensity of tissue damage or an existence of neuropathic pain. Therefore, chronic pain may include sensory component (nociceptive and/or neuropathic pain), as well as, emotional component which has developed from the beginning and/or may develop during the chronification of pain. In summary, various combination of analgesics, such as NSAIDs for somatic pain, opioids for visceral pain, anticonvulsants and/or antidepressants for neuropathic pain, and antipsychotics and/or anti-anxiety drugs for emotional component, should be used properly and/or simultaneously. Polypharmacy is enhancing therapeutic analgesic effects while reducing ADRs. It is unreasonable to assume that opioids rather than NSAIDs are more effective or stronger for somatic pain.

When multiple analgesics are used for the treatment of pain (emotional and/or sensory components), the general and special condition of the patients and inter-analgesic medications should be considered.

Diagnosis is the most important part in any branch of clinical practice for management of patient's complaints. Similarly we cannot choose the correct treatment modality unless we identify the pain generator correctly and understand the pathophysiology behind it.

In modern medicine with the advent of sophisticated imaging, there are tendencies of ignoring history part in clinical examination. Many times we jump directly into the magnetic resonance imaging (MRI) or other scans ignoring the importance of proper history in diagnosis of pain. But we must remember that some abnormality in MRI may not be indicative of the source of pain.

In making a clinical diagnosis there are three essential steps: History taking, clinical examination, and investigations. In establishing diagnosis of painful conditions, there is another special subheading under investigation part, called diagnostic interventions or diagnostic nerve blocks, which help us in finding pain generators.

Proper targeted history taking may help us in avoiding unnecessary costly investigations. History taking is an art, which makes physician and patients to have a good rapport and helps us to find the pain generator. Sufficient time should be given to the patients who are anxious, depressed, or overtly frightened, feels hopeless from medical science that their pain can be treated and may not be able to express the present situation. Repeated history taking of more patients gives us

experience and teaches us to handle situation, which may confuse us at the beginning.

Analysis of history is also very important in making many other decisions such as history suggestive of red flags in back pain or headache prompt us to go for more invasive investigations or management. For example, history of bladder and bowel dysfunction, weakness of legs, increasing numbness, history of malignancy, and history of trauma in low back pain and leg pain, all point to the red flags of low back pain.

The history part of patient evaluation can be divided as follows:

Pain at different locations as chief presenting complaints.
Ruling out red flags or warning signals.
Past history.
Personal history, including sleep, bladder/bowel habit.
Treatment history.
Family history.

During history taking we must remember the following:

- Adequate time must be given to express their problems and the reasons for seeking advice from pain clinic care.
- We need to listen carefully without distractions in order to obtain and interpret the clinical information provided by the patient.
- Physician should be empathetic.
- Patient should believe that my physician is accepting my complaint.

Comprehensive history taking is usually done on first consultation. This will be more time consuming and laborious. Preconsultation questionnaire can help in overcoming this problem. This can be used as baseline reference about the patient in all aspects of pain. While taking history we should concentrate to get answers for two questions. First is to find out the source of

pain and other to find out the type of pain.

Pain History

The chief complaint can be dealt with in the following steps:

1. Quantity or severity of pain.
2. Quality or nature of pain.
3. Mode of onset and location.
4. Duration and chronicity.
5. Provocative and relieving factors.
6. Special character.
7. Timing of pain.
8. In relation to posture.
9. Associated complaints.

Quantity or Severity or Intensity of Pain

Pain is a subjective experience. Like many diseases, such as hypertension or diabetes, there is no objective measurement for a patient's pain intensity. Unfortunately we do not have thermometer-like device to measure pain so we need to rely on the patients' statements. Pain is a complex neurobehavioral problem affected by psychological, cultural, and environmental factors. The variables to be measured are current pain intensity and average pain intensity over a specified period of time, for example, last 1 week or 4 weeks. It is the average pain intensity, which is the usual target for pain treatment both by the clinician and the patient. The goal of treatment in chronic pain is to reduce pain intensity as much as possible while avoiding side effects. Numerous pain scales for practical assessment of pain intensity in clinical studies have been developed. The chosen one should be appropriate for patient's abilities and preferences. These

scales are more appropriate for detecting change within individuals rather than comparison between individuals.

Types of Pain Intensity Assessment

Pain can be assessed in two ways, by either unidimensional or multidimensional instruments. Pain should be assessed upon movement, not just like that when the patient is lying still to minimize discomfort.

Unidimensional instruments

1. *Verbal Rating Scales (VRS)*

In VRS, pain is described as none, mild, moderate, or severe. This is the usual way a patient express pain. This scale is short, easy to administer, and understand especially in elderly patients. Lack of reproducibility makes this one less suitable for research purposes. [1]

2. *The Binary Scale:*

The patient is asked to answer for the question like - is your pain 60% relieved? "Yes or No." This is short, easy to administer, and easy to understand. This can mislead the patient; along with lack of reproducibility make this less suitable for research purposes.

3. *The Numerical Rating Scale (NRS):*

It is the most commonly used. In this the two extremes of the pain experience is noted and has a numerical scale between "no pain" and "worst pain imaginable." "Zero" corresponds to no pain and "10" corresponds to the worst pain imaginable [Figure 1].

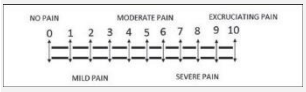

Figure 1: Numerical rating scale

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The advantage of this scale is that it easy for the patients to understand. The disadvantage is that the digital scale reduces the capacity to detect subtle changes as the digits act as anchoring points. A reduction of 30% or 2 points and more from baseline in patient on treatment indicates positive response for treatment.

4. *The Faces Rating Scale:*

It is commonly used. The patient is asked to point to various facial expressions ranging from a smiling face (no pain) to an extremely unhappy one (the worst possible pain). It can be used in patients with whom communication may be difficult.

5. *The Visual Analog Scale (VAS):*

It is similar to the numerical rating scale. There is a 10-cm horizontal line labeled "no pain" at one end and "worst pain imaginable" on the other end. The patient is asked to mark on this line where the intensity of the pain lies. The distance from "no pain" to the patient's mark numerically indicates the severity of the pain. Slide rule-like devices are also available that make measurement easier. The device has a line on the patient side and a numeric score on the clinician side. The VAS is a simple, efficient, valid, and minimally intrusive method that correlates well with other reliable methods.

The disadvantage is it is more time consuming than other instruments. There is some difficulty in using and understanding this scale in elderly patients.

Multidimensional Instruments

1. *The McGill Pain Questionnaire (MPQ)*[2],[3]

It was developed by Melzack and Torgerson. It is a checklist of words describing symptoms. Unlike other scales, it attempts to define the pain in three major dimensions by 20 sets of descriptive words divided as follows:

a. Ten sets describe sensory - discriminative (nociceptive pathway).
b. Five sets describe motivational - affective (reticular and limbic structures).
c. One set describes cognitive - evaluative (cerebral cortex).
d. Four sets describe miscellaneous dimensions.

The patient selects the sets that apply to his or her pain, and circles the words in each set that best describe the pain. The words in each class are given rank according to severity of pain. It is translated to multiple languages. The advantage is that it is reliable and can be completed in 5-15 min and it helps in the diagnosis as the choice of descriptive words that characterize the pain correlates well with pain syndromes. The disadvantage is that high levels of anxiety and psychological disturbance can obscure the MPQ's discriminative capacity.

2. *Brief Pain Inventory (BPI):*[4]

It measures both the intensity of pain (sensory dimension) and the interference of pain in the patient's life (reactive dimension).

It is translated to multiple languages.

Advantages:

a. It is a reliable and valid for the cancer pain and many pain syndromes and can be completed in 5-15 min.
b. It shows good sensitivity to treatment effects (mostly in pharmacological treatments).

3. *West Haven-Yale Multi-dimensional Pain Inventory (WHYMPI):*[5],[6]

Technique:

It is composed of 56 items with three parts:

a. Five dimensions covering the experience of pain and suffering, interference with family, social and work functions.
b. The patient's perception of the pain with determining the responses or significant other displays to pain.
c. The degree to which the patient engages in common daily activities.

Patients respond to the questions on a 7-point scale.

Advantages:

a. It is valid in many pain syndromes.
b. It shows good sensitivity to treatment effects.

4. *Medical Outcome Study 36-item Short-form Health Survey (SF-36):*[7],[8]

It consists of eight subscales including

1. Physical functioning.
2. Limitations due to physical problems.
3. Social functioning.
4. Bodily pain.

5. Role limitations due to emotional problems.
6. General mental health.
7. Vitality.
8. General health perceptions.

Advantages:

a. It is the most widely used instrument to measure multiple dimensions of quality of life.
b. It is used in almost every diseases or conditions imaginable.
c. It is easy to administer, taking about 10 min to complete.

Assessment of Quality or Nature of Pain

It is one of the most important components in making diagnosis, particularly if we want to diagnose the nature or character of pain whether it is nociceptive or neuropathic or a mixed variety. There are different validated questionnaire-based tools, which helps us in identifying neuropathic pain conditions. And most of these tools are based on analysis of history. Even when we are not using such tools, proper history can guide us in making diagnosis of neuropathic pain. Simple questions like whether there is burning sensation, tingling, numbness, sensations such as crawling of ants, cramping, electric shock-like pain, and so on, can guide us to understand whether there is neuropathic component in pain. Allodynia can also be assessed by history, when touching parts of body with clothes or simple touch with fingers is evoking the pain. Nociceptive pain is somewhat easy to manage. Neuropathic pain if it is not diagnosed and treated properly in time, then it can lead to catastrophic stage where no options are available to treat.

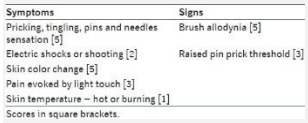
Neuropathic pain has been defined by the Special Interest Group on Neuropathic Pain (*NeuPSIG*) as "*pain arising as a direct consequence of a lesion or disease affecting the somatosensory system.* " [9] It is a common type of pain associated with suffering, depression, anxiety, disturbed sleep, and impaired quality of life. Because these components require different pain management strategies, correct diagnosis is highly desirable. [10] The presence of validated

tools to diagnose neuropathic pain is therefore required as improper assessment is frequently associated with undertreatment, underdiagnosis, and increased cost to the patient and society as a whole. A number of screening tools in the form of questionnaires have been developed and validated in the past decade to address the above purpose.

Screening tools for neuropathic pain

1. Leeds Assessment of Neuropathic Symptoms and Signs (LANSS)

LANSS, first described in 2001, [11] was the first screening test to identify pain of neuropathic origin. It is a simple tool consisting of five symptoms addressing pain quality and triggers and two signs [Table 1]. Each item is a binary response (yes or no) to the presence of symptoms (five items) or clinical signs (two items). It is easy to score in clinical settings and has been tested and validated in a number of neuropathic pain conditions since then with a sensitivity and specificity ranging from 82% to 91% and 80% to 94%, respectively. [12],[13],[14],[15]



Symptoms	Signs
Pricking, tingling, pins and needles sensation [5]	Brush allodynia [5]
Electric shocks or shooting [2]	Raised pin prick threshold [3]
Skin color change [5]	
Pain evoked by light touch [3]	
Skin temperature – hot or burning [1]	

Scores in square brackets.

Table 1: Leeds Assessment of neuropathic symptoms and signs[16]

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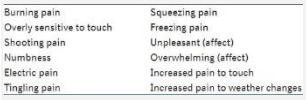
Score < 12/24 indicates that the pain is unlikely to be neuropathic in origin and *Score ≥ 12/24* indicates that the pain is likely to be neuropathic in origin. The need for clinical examination and pin prick testing limits its use in clinical setting. To overcome this drawback, a self-report tool, *S-LANSS* has been developed and validated to identify patients whose pain is dominated by neuropathic mechanisms. [17]

2. *Neuropathic Pain Questionnaire (NPQ)*

It was administered to 382 patients of whom 149 had neuropathic pain and 233 patients had nonneuropathic pain. [18] It is a *self-questionnaire* consisting of 12 items: 10 related to sensations and two related to affect [Table 2]. Each item is scored on a scale of *0 (no pain)* to *100 (worst*

possible pain). The sensitivity and specificity have been demonstrated to be 66% and 75%, respectively, compared with clinical diagnosis. A *short form* of NPQ has been described consisting of three items: numbness, tingling, and pain increase in response to touch. [19]



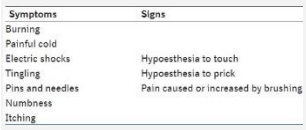
Burning pain	Squeezing pain
Overly sensitive to touch	Freezing pain
Shooting pain	Unpleasant (affect)
Numbness	Overwhelming (affect)
Electric pain	Increased pain to touch
Tingling pain	Increased pain to weather changes

Table 2: Neuropathic pain questionnaire

Click here to view

3. *DouleurNeuropathique en 4 questions (DN4)*

It consists of seven items related to symptoms and three items related to physical examination [Table 3]. [20] Each item is scored 1 (yes) or 0 (no) and sum of all 10 items is taken as total score with a score of ≥4 as neuropathic pain. It was developed in 160 patients: 89 with nerve lesions and 71 without nerve lesions. Sensitivity and specificity of 83% and 90%, respectively, has been demonstrated, respectively. The seven sensory descriptors can be used as a self-reported questionnaire with similar results.



Symptoms	Signs
Burning	
Painful cold	
Electric shocks	Hypoesthesia to touch
Tingling	Hypoesthesia to prick
Pins and needles	Pain caused or increased by brushing
Numbness	
Itching	

Table 3: Douleurneuropathique en 4 questions

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4. *Pain DETECT*

It is a simple patient-based self-report questionnaire consisting of nine items: seven sensory descriptors and two related to spatial (radiating) and temporal characteristics [Table 4]. [21],[22] The sensory descriptors are scored on a scale of 0 (no) to 5 (very strongly) and radiating pain as 1 (yes) or 0 (no). A score of ≥19 indicate neuropathic pain likely and ≤12 neuropathic pain unlikely. It does not require a clinical examination. It was validated in 392 patients: 228 with predominantly neuropathic origin and 164 with nociceptive origin. [23] Sensitivity and specificity of 85% and 80%, respectively, has been demonstrated.

Symptoms	Pain course: four items
Burning (stinging nettles)	Persistent pain with slight fluctuations
Tingling or pricking	Persistent pain with slight attacks
Is light touching painful?	Pain attacks without pain between them
Sudden pain attacks such as electric shocks	Pain attacks with pain between them
Is cold or heat occasionally painful?	Radiation
Numbness	Radiating pain
Does slight pressure trigger pain?	

Table 4: PainDETECT

Click here to view

5. *ID-Pain*

It is a self-questionnaire consisting of five sensory descriptors and one item regarding pain located in the joints (to identify nociceptive pain) and does not require a clinical examination [Table 5]. [24] Scoring is from 1 to 5 with higher score indicating neuropathic pain. It was validated in 307 patients: 105 with neuropathic pain, 104 mixed, and 98 with nociceptive pain.

Pins and needles	Electric shocks
Hot/burning	Is the pain made worse with touch of clothing or bed sheets?
Numb	Is the pain limited to your joints? (-1)

Table 5: ID-Pain

Click here to view

Mode of Onset and Location

Mode of onset and location is very important for the etiology of pain. It may be sudden or gradual onset. Sudden onset of severe pain without any provocation, for example, severe intolerable headache may be due to subarachnoid hemorrhage and sudden severe pain on patients with pre-existing pain, for example, severe back pain in elderly patients with pre-existing back pain may be due to spinal carcinoma metastases. Both these conditions indicate red flag, considered. Site of onset gives better idea in finding out primary reason, for example, lumbar facet joint arthropathy patient gives history of pain on lower back, buttock, and thigh but on enquiry they will show onset on paramedial region and later distributed to other regions. It is not uncommon for patient to link pain to trauma in the past or present, which may not be relevant. Detailed enquiry may reveal pain-free period after trauma.

Chronicity (Duration and Frequency)

The duration is important to an extent, if patient is having chronic pain of 20 years duration; it is not risky, in other aspect if new symptoms or sudden increase of pain occurs in already existing problem warrant's exclusion of malignancy or metastasis. Duration and frequency history plays a vital role in the diagnosis, for example, in migraine, the unilateral pain is frequently throbbing and may last for hours to days. Cluster headaches, in contrast, are named for their periodicity. In short, duration and frequency history ease our diagnosis. Patient with long history of pain, physical provocative test may become negative, for example, straight leg raise test in lumbar radiculopathy may be negative on long course. In this case, history of pain in leg with neuropathic character, exaggerated on exertion and relieved by rest may be only clue for its diagnosis. Very important in chronic pain conditions, always remember that sympathetic system (central sensitization) will become the main pain mediator, which may explain diffuse the nature of pain in patient and failure to respond to conventional (interventional) treatment.

Provocative and Felieving Factors

Assessing what provokes or relieves the pain provides valuable clues to the diagnosis. Leg and back pain due to spinal stenosis has a characteristic pattern of worsening with walking or standing, with the pain being totally relieved with sitting or lying down for less than 10 min. Neuropathic pain can present with spontaneous pain or pain can be provoked by different stimuli such as cold, light touch, or the brushing of sheets. It is usually improved with heat, often the opposite of inflammatory pain. Patient with pain generator very near to each other, for example, lower lumbar facet and sacroiliac joint may have similar history but provocative and relieving factors will give good idea for diagnosis as sitting relieve pain in facet joint syndrome not in sacroiliac joint arthropathy in which sitting may provoke pain.

Special Character

Between pain character and severity, considerable overlap can be identified. For examples, in cluster headache the pain usually will be deep, boring, wrenching, and the pain is most severe

while vascular headache tends to be throbbing, pulsatile, and severe in intensity. For facial pain the character and severity tends to be different for different conditions, in idiopathic trigeminal neuralgia pain tends to be unilateral, paroxysmal, sharp, shooting, and lancinating along one or more branches of trigeminal nerve, whereas the pain of temporomandibular joint dysfunction tends to be unilateral, dull aching, and around the affected joint. It is exacerbated by bruxism, eating, and yawning. Postherpetic neuralgia pain may be burning and aching superimposed on paroxysms of shocks and jabs. It is associated with dysesthesias, and allodynia (unpleasant sensation even with the slightest touch over the skin).

Timing of Pain

Pain and stiffness felt in the morning hours persisting for more than hours may be inflammatory arthropathy, whereas pain after any inactivity persisting less than half an hour or after prolonged activity goes more in favor of degenerative arthropathy. Severe headache occurring regularly at a particular time, particular season may give clue for cluster headache. Neuropathic pain can be more severe in the night.

Relation with Posture

Pain on sitting on floor may be because of sacroiliac(SI) joint arthropathy, whereas cross-legged sitting may be painful in piriformis syndrome, and others. Pain on change of posture such as turning in bed, standing from sitting position goes more in favor facet joint syndrome. Prolonged sitting produces more pain in discogenic pain. Patients with spinal canal stenosis have more pain on standing and walking.

Associated Complaints

Associated complains such as weakness, numbness may indicate neurologic deficits. Fever may indicate infections, nausea/vomiting also have diagnostic value in migraine, space occupying lesion of brain, and so on.

Understanding Red Flags or Warning Signals

We must be very cautious in dealing certain painful conditions, which can be potentially dangerous. We must be having multidisciplinary approach to deal with these patients. These vary in different anatomical locations, but the following features (not limiting to the followings) in general can be serious.

- Pain with major trauma
- Suspecting tumor
- Suspecting infection with fever, rigor, vomiting, and so on
- Unconsciousness
- Motor weakness
- Progressive sensory deficit
- Loss of vision
- Loss of bladder control with retention and incontinence
- Loss of bowel control with inability to force to pass stool
- Sudden onset pain, which is progressing rapidly
- Not relieved by analgesic within few days.

Past History

Past history includes any pain events mimicking present, ask for progress, diagnosis, and any treatment taken and procedure/operation done. Past history help in making diagnosis, for example, history of rash, vesicles in the same dermatome as of present

neuropathic pain can confirm postherpetic neuralgia. Some diseases have periodic occurrence and they can have multiple same type of previous episodes before presenting to us at present, for example, cluster headache. Patient with multiple episodes of pain can have associated significant cognitive disturbance. Patient can have some disease, which can influence the manifestation of pain (eg, dementia) or it can interfere with treatment (organ damage). History targeted on finding etiology of pain can help in finding other pain manifestations of a disease (eg, multiple sclerosis). Diabetes, hypertension, thyroid disorder, dementia, *Parkinsonism* More Details, liver and kidney compromise, inflammatory disorders should be given more importance on its presence.

Personal History Including Sleep, Bladder/Bowel Habit

Patient with pain can have some psychological disorders, such as anxiety and depression, which occurs primarily because of pain, leads to patient's less tolerance to pain and decreased coping capacity and some disorders, such as dementia, bipolar disorder, Post Traumatic Stress Disorder (PTSD) and Attention Deficit Hyperactivity Disorder (ADHD). A lot of tools are available for mental status assessment, which includes

- PHQ-9
- Beck Depression Inventory [25]
- Hamilton Depression Scale [25],[26]
- Zung Self-Rating Depression Score [25]
- Hospital Anxiety and Depression Scale (HADS) [27]
- Pain Catastrophizing Scale (PCS) [28]
- The Tampa Scale of Kinesophobia. [29]

1. *PHQ-9*

	Not at all	Several days, but less than half a month	Several days, more than half a month	Nearly everyday
A. Little interest or pleasure in doing things	0	1	2	3
B. Feeling down, depressed, or hopeless	0	1	2	3
C. Trouble falling or staying asleep or sleeping too much	0	1	2	3
D. Feeling tired or having little energy	0	1	2	3
E. Poor appetite or overeating	0	1	2	3
F. Feeling bad about yourself or that you are a failure or have let yourself or your family down	0	1	2	3
G. Trouble concentrating on things such as reading the newspaper or watching television	0	1	2	3
H. Moving or speaking so slowly or so restlessly that other people could have noticed	0	1	2	3
I. Thoughts that you would be better off dead, or thoughts of hurting yourself in some way	0	1	2	3

Maximum score is 27. Score 1-4/27 indicates minimal depression, 5-9/27 indicates mild depression, 10-14/27 indicate moderate depression, 15-19/27 indicate moderately severe depression, and 20-27/27 indicate severe depression.

2. *Beck Depression Inventory*[25]

This have 21 parameters and each are graded from 0 to 3 thus have total score of 63. Result will be inferred as below

- 1-10 - Ups and downs are considered normal.
- 11-16 - Mild mood disturbance.
- 17-20 - Borderline clinical depression.
- 21-30 - Moderate depression.
- 31-40 - Severe depression.
- >40-Extreme depression

3. Hamilton Depression Scale.[25],[26]

It includes 17 parameters with score grade of 4 items (symptom is absent, mild, moderate, severe and very severe), 2 items (symptom is absent, mild and definite). Total score of 0-7, 8-13, 14-18, 19-22, ≥ 23 indicates normal, mild, moderate, severe and very severe depression accordingly.

4. Zung Self-Rating Depression Score.[25]

It includes 20 parameters with grading ranging from 1 to 4, thus a total score of 20-80. Some parameters are given score from 1 to 4 for symptoms increasing in time duration and some are given in reverse.

5. *Hospital Anxiety and Depression Scale (HADS).*[27]

It includes 14 parameters with 2, 4, 6, 8, 11, 12, 14 for anxiety and 1, 3, 5, 7, 9, 10, 13 for depression.

Scoring is done as 3, 2, 1, 0 (for item 7 and 10 scoring is reversed). Score of 0-7 indicates noncase; 8-10 indicate borderline case; and 11 or above indicate case.

Pain Catastrophizing Scale (PCS) [28] **and The Tampa Scale of Kinesophobia** [29] helps in assessing personality disorder.

Sleep disorder and pain is highly interlinked together. Pain can cause sleep disorder in over 70% of patient. Pain may be interrupted, for example, posttraumatic stress disorder or patient can feel inadequate sleep on waking up, for example, in fibromyalgia. Some disorders associated with sleep such as obstructive sleep apnea can interfere with treatment and result, for example, treatment with opioids. Effective treatment of sleep disturbance will involve assessing and treating all of the contributing factors. Chance of pregnancy should be ruled out in women of child-bearing age. Bladder and bowel disturbance may be an associated component or etiology for present pain complaint. For example, history of inflammatory bowel disease may be a reason for seronegative inflammatory arthropathy, and irritable bowel disease may be an associated disease of fibromyalgia.

Treatment History

The initial questionnaire should allow the patient to list all the therapeutic modalities they are currently using or have used in the past. Chances of drug addiction should be ruled out before prescribing any drugs. Any drug allergy, any side effect/complication to past treatment or comorbid condition (renal, hepatic compromise) should be taken into consideration before prescribing medicine.

Family History

History of pain and diseases in family members can support in getting diagnosis as some diseases run among families, for example, rheumatoid arthritis, fibromyalgia, and others. History of family dispute should be ruled out in patients having disproportionate, irrelevant, and unusual manifestations.

Imaging Tests

Imaging tests are also called radiological tests. With these tests, the doctor uses different technologies to get a better picture of what's going on in the body—with the bones, soft tissues, and organs.
Here are the most common imaging tests:

- **X-ray:** These show the doctor your bony structures so that he or she can look for any abnormalities. For example, if the doctor suspects you have osteoarthritis in the knee, he or she may use x-ray to take a closer look at your joint.
- **CT scan:** A CT scan (which stands for computed tomography scan) is used to look at the soft tissues, as well as the bones. On a CT scan, the doctor can see ligaments, for example. For example, a CT scan can show a spinal herniated disc, which is a soft tissue. Looking the CT, the doctor can see if the herniated disc is pushing on a spinal nerve or the spinal cord.
- **MRI:** Similar to a CT scan, an MRI (which stands for magnetic resonance imaging) shows the relationship between soft tissues and the bones. Unlike CT scans, it doesn't use radiation (x-rays) to do this; instead an MRI uses magnetic fields and computers to produce high-resolution images of your bones and soft tissues.

Other imaging tests are myelograms, bone scans, and ultrasounds.

Remember, the doctor may not be able to see anything as a cause of your pain on imaging tests. Your structures may look completely normal—but that doesn't mean you aren't experiencing pain.

Nerve Tests

Nerve tests, which are part of the neurological exam process, can help your doctor see how well your nerves are working. Especially in neuropathic pain—such as diabetic peripheral neuropathy—nerve tests can provide important information about your nerves.
Here are the most common nerve tests:

- **Electromyography test:** This test, frequently abbreviated as EMG, tests how well your muscles respond to signals from the nerves, helping your doctor understand if those nerves going to the muscles are damaged. If they are damaged, then they won't send clear messages to the muscles, and the muscles won't respond well.
- **Nerve conduction velocity test:** This is abbreviated to NCV, and as suggested by the word *velocity* in the name, this nerve test measure how fast messages travel along the nerves. Since damaged nerves don't send signals as quickly, the doctor will be looking for messages that are slowed down.
- **Quantitative sensory testing:** That's a very big phrase for a few very basic tests. You have different nerves that transmit different messages—some transmit temperature messages and some send touch messages, for example. The doctor may assess how well you can feel temperature changes; if you can't feel the change from warm to cold, you may have a problem with your smaller peripheral nerves.

  Another test determines how much pressure you can feel, which tells the doctor how well your touch nerves are working.

  Also, the doctor may test your ability to feel vibrations. The nerves that send the vibration message are larger peripheral nerves, and they are especially important for balance.

Blood Tests
Complete blood count
ESR

In some cases, the doctor may want to have blood tests run on you. For example, if he or she suspects that you have rheumatoid arthritis (RA), you may have blood work done to see if you have the rheumatoid factor in your blood. That's an antibody often produced in people who have RA, so a doctor may order a blood test to check for it as part of the diagnostic process.

Blood tests can also be used to check for levels of inflammation in the body—important if the doctor thinks you may have some type of arthritis.

Labs and Diagnostic Tests Conclusion

The two most important things to keep in mind as you have tests done are that most likely, no one test will be able to diagnose the exact cause of your pain, and that you should fully understand the labs and diagnostic tests you're having. Ask questions, especially about the results of the tests so that you understand how it impacts your care.

Treatment of acute pain

The WHO pain relief ladder recommends a nonopioid such as acetaminophen or a nonsteroidal anti-inflammatory drug (NSAID) for the initial management of pain. Acute pain characteristics and patient risk factors should be considered when choosing

between acetaminophen and an NSAID (e.g., aspirin, other nonselective NSAIDs, cyclooxygenase-2 [COX-2] selective NSAIDs).

ACETAMINOPHEN

Acetaminophen, called paracetamol outside of the United States, is the first-line treatment for most mild to moderate acute pain.[8] The effectiveness of acetaminophen is similar to that of NSAIDs such as celecoxib (Celebrex), 200 mg; aspirin, 600 to 650 mg; and naproxen (Naprosyn), 200 to 220 mg.[8] It is generally well-tolerated, has few drug-drug interactions, is not associated with increased blood pressure (as with NSAIDs), can be used during pregnancy (U.S. Food and Drug Administration [FDA] pregnancy category B), and is the analgesic of choice for episodic use in patients with impaired renal function.[17] Although acetaminophen is less effective for acute low back pain than some NSAIDs, it is a reasonable first-line option because of its favorable safety and cost profiles.[18]

ASPIRIN

Aspirin effectively relieves mild to moderate acute pain. It is similar to the same dose of acetaminophen and is comparable to celecoxib, 200 mg.[9] Over a dose range of 500 to 1,200 mg, aspirin exhibits a dose-response relationship (i.e., a 1,200-mg dose of aspirin provides better pain relief than 600- to 650-mg doses).[9] Like NSAIDs, aspirin can cause gastrointestinal hemorrhage and ulcer.[19] Patients with chronic urticaria and asthma have a greater likelihood of salicylate hypersensitivity, which can manifest as bronchospasm (20% and 4%, respectively, compared with 1% in the general population).[6]

Aspirin, 900 to 1,000 mg, is as effective for acute migraine pain as oral sumatriptan (Imitrex), 50 mg.[10] Adverse events with aspirin use are generally mild and less common than with the use of sumatriptan, 100 mg.[9,10]

OTHER NONSELECTIVE NSAIDS

Nonselective NSAIDs inhibit both COX-1 and COX-2, whereas COX-2 selective NSAIDs have greater COX-2 selectivity. Inhibition of COX-2 is thought to mediate the analgesic properties of NSAIDs, whereas inhibition of COX-1 appears to be associated with gastrointestinal adverse effects. NSAIDs possess anti-inflammatory effects that are lacking with acetaminophen, and they can be especially useful for the treatment of acute pain associated with prostaglandin-mediated activity, such as dysmenorrhea or osteoarthritis.[11,12]

Because most NSAIDs have nearly identical analgesic effects, the choice is based on cost, dosing schedule, and the frequency or severity of adverse effects. Some NSAIDs (e.g., indomethacin [Indocin], mefenamic acid [Ponstel]) are now rarely used because of adverse effects. Ibuprofen and naproxen are among the most commonly used NSAIDs

in the United States because of their effectiveness, adverse effect profile, cost, and over-the-counter availability.[12,13]

There is a ceiling to the analgesic effects of NSAIDs but not to their anti-inflammatory effects, although adverse effects may limit upward dosing titration. NSAIDs are more effective than placebo or acetaminophen for primary dysmenorrhea, but they are associated with a higher incidence of adverse effects such as headache, drowsiness, nausea, and indigestion.[12] In general, there are no differences among NSAIDs in terms of effectiveness or adverse effects.

For osteoarthritis, NSAIDs provide significantly better pain relief than acetaminophen, but with more gastrointestinal adverse events.[11] Some evidence suggests that NSAIDs and acetaminophen may be comparable for mild osteoarthritis pain, whereas NSAIDs may be better for moderate to severe osteoarthritis pain.[11]

Acetaminophen and NSAIDs are equally effective for acute low back pain, although NSAIDs are associated with a higher incidence of adverse effects.[13,18] There is no difference in effectiveness among NSAIDs, narcotic analgesics, and muscle relaxants for acute low back pain.[13] Adding a muscle relaxant to an NSAID regimen does not provide further relief for acute low back pain and is associated with more adverse effects.[13]

Topical NSAIDs are more effective than placebo for treating acute pain (e.g., from strains, sprains, contusions, or overuse injuries) in superficial locations, and the incidence of local and systemic adverse events is similar to placebo.[20] Based on the number needed to treat, topical indomethacin is not as effective as topical diclofenac (Solaraze), ibuprofen, ketoprofen, or piroxicam (not available in the United States), which are similarly effective.[20]

COX-2 Selective NSAIDs. Celecoxib is the only COX-2 selective NSAID still available in the United States, where it is approved for bone or dental pain, dysmenorrhea, headache, osteoarthritis, rheumatoid arthritis, and ankylosing spondylitis. Meloxicam (Mobic) is sometimes referred to as a COX-2 selective NSAID but is classified as a nonselective NSAID. COX-2 selective NSAIDs are considered second-line medications for mild to moderate pain because they have similar effectiveness to nonselective NSAIDs but with a greater cost.[13] COX-2 selective NSAIDs and traditional NSAIDs are similarly effective for acute low back pain, but COX-2 selective NSAIDs have fewer adverse effects.[13]

NSAID Complications. NSAIDs should be used cautiously in several patient populations. Risk factors for gastrointestinal bleeding and peptic ulcer disease associated with NSAID use include a history of gastrointestinal bleeding, peptic ulcer, older age, smoking or alcohol use, and longer duration of NSAID use. Indomethacin and ketorolac should not be used in older adults because of the increased risk of these

gastrointestinal adverse effects.[21] Concomitant use of NSAIDs and low-dose aspirin is associated with an increased risk of upper gastrointestinal bleeding.[22]

Studies of patients with rheumatoid arthritis or osteoarthritis, who were not taking low-dose aspirin and who did not have risk factors for gastrointestinal bleeding or peptic ulcers, have shown that celecoxib, NSAIDs, and acetaminophen have similar analgesic effects.[23–25] Althoughcelecoxib was associated with fewer gastrointestinal effects, the researchers concluded that this relatively small reduction does not justify the extra cost of celecoxib.[24] Celecoxib alone and an NSAID plus a proton pump inhibitor (e.g., diclofenac plus omeprazole [Prilosec], naproxen plus lansoprazole [Prevacid]) have the same probability of causing recurrent ulcer bleeding or recurrent gastric or duodenal ulcer complications in those at high risk of these complications.[26,27] However, a cost analysis suggests that in patients 75 years or older with a history of gastrointestinal bleeding or peptic ulcers, celecoxib treatment is less expensive than treatment with an NSAID plus misoprostol (Cytotec) or a proton pump inhibitor.[24]

In recent years, the concern about COX-2 selective NSAIDs and, to a lesser extent, nonselective NSAIDs has centered on their cardiovascular adverse effects (i.e., stroke, myocardial infarction, and thrombus formation),[13] and these drugs include an FDA boxed warning regarding these risks. An analysis of six randomized, placebo-controlled trials evaluating the cardiovascular risk associated with celecoxib use showed that the risk increases with dose and that patients with higher baseline cardiovascular risk are more likely to experience a cardiovascular event while taking celecoxib.[28] The cardiovascular risk is also thought to be greater with greater COX-2 selectivity (celecoxib>diclofenac> ibuprofen > naproxen).[29]

Renal insufficiency associated with NSAID use is related to inhibition of renal prostaglandin synthesis, which can present as azotemia and hyperkalemia. Use of NSAIDs in patients with impaired renal function, decreased creatinine clearance, or azotemia can result in acute renal failure.

Additional Pharmacotherapy

OPIOID COMBINATIONS

If nonopioid medications such as acetaminophen or NSAIDs do not adequately control pain, the next step of the WHO pain relief ladder includes considering an opioid, with or without a nonopioid.[5] Opioids such as hydrocodone and oxycodone are typically combined with acetaminophen or an NSAID. In 2010, hydrocodone/acetaminophen was the most commonly dispensed medication in the United States.[30] Opioid combinations are more effective than any one opioid for postoperative pain.[14,15] In a meta-analysis of double-blind randomized controlled trials, patients who received an opioid, such as morphine, with an NSAID had significantly lower pain scores and needed significantly less of the opioid for pain control.[31] Adding codeine, 60 mg, to acetaminophen, 600 to

1,000 mg, resulted in only 10% to 15% more patients achieving at least 50% pain relief compared with the same dose of acetaminophen alone.[15]

The FDA has been concerned about the potential for acetaminophen-induced hepatic injury,[32] and in 2011 requested that manufacturers of prescription products limit the amount of acetaminophen in each dosage unit to no more than 325 mg and to include a boxed warning about the risk of severe hepatic injury.[33] This does not affect over-the-counter products, although patients should not exceed 4,000 mg per day and should be cautioned about using prescription and over-the-counter products containing acetaminophen.

FULL OPIOID AGONISTS

Full opioid agonists, such as morphine, are potent analgesics that may be used if opioids combined with acetaminophen or NSAIDs are insufficient to control moderate to severe pain.[14,15,31] There is a lack of good evidence to suggest any one opioid is more effective or has a better adverse effect profile than morphine.[34] The exception is codeine. There is good evidence that codeine is less effective than morphine and other opioid agonists because of its low affinity for opioid receptors.[35] Some opioids commonly used in the past are now unavailable (e.g., propoxyphene [Darvon]) or no longer widely used (e.g., meperidine [Demerol], pentazocine [Talwin]).

Adverse effects of opioids include nausea, vomiting, constipation, sedation, pruritus, urinary retention, and respiratory depression. Opioid-induced emesis is mediated by histamine release and can be treated with antihistamines or selective serotonin antagonists (e.g., ondansetron [Zofran]), if needed. Opioids rarely cause gastroparesis, which can present as persistent vomiting. If the opioid cannot be discontinued, opioid-induced gastroparesis can be treated with a gastric motility agent, such as metoclopramide (Reglan). However, caution should be used because metoclopramide can cause extrapyramidal adverse effects. There is no good evidence that adverse effects vary among the different opioids given at equianalgesic doses.[36] If the initial opioid does not provide adequate pain relief or the patient experiences intolerable adverse effects, trying an alternative opioid may be reasonable. However, this has not been well studied in acute noncancer pain.[37]

Recent clinical guidelines recommend that the duration of opioid agonist therapy be limited if used to relieve low back pain.[18] Reassessment, other treatment options, or specialist referral should be considered if the patient's pain does not improve.[18]

DUAL-ACTION MEDICATIONS

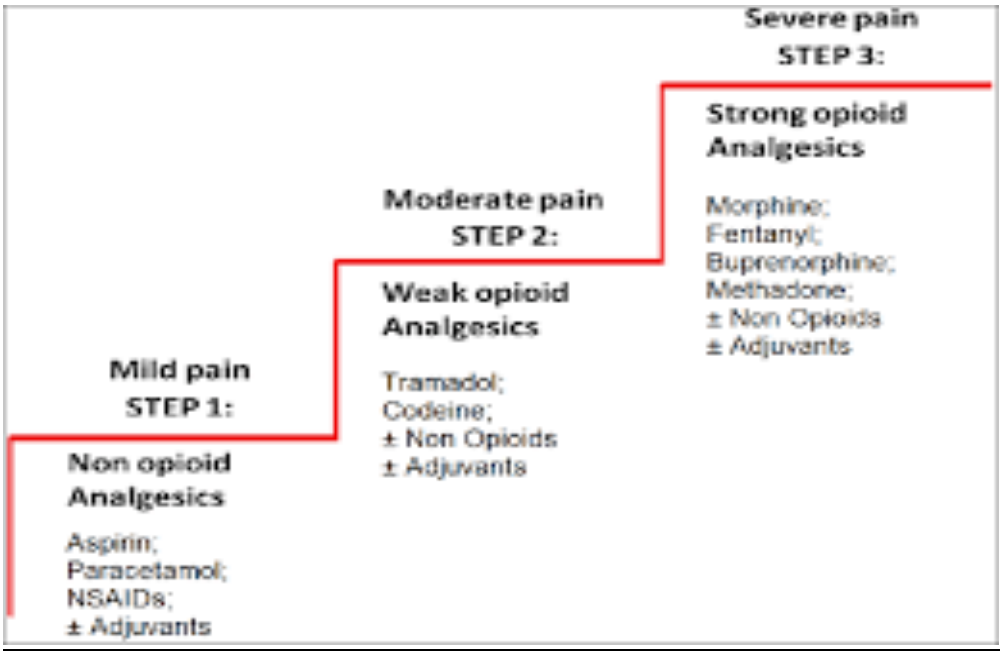
Tapentadol (Nucynta), a Schedule II controlled substance, is a muopioid receptor agonist and norepinephrine reuptake inhibitor that can be used orally for relief of moderate to severe acute pain. It has similar effectiveness as oxycodone for acute pain, with a significantly lower incidence of nausea, vomiting, and constipation.[38] Tapentadol

should be used cautiously with serotonergic medications because of the risk of serotonin syndrome.

Tramadol (Ultram) is not federally controlled but is a Schedule IV controlled substance in some states; its designation is currently being reviewed. It is a weak muopioid receptor agonist and a weak inhibitor of norepinephrine and serotonin reuptake in the central nervous system. It is effective for acute pain (e.g., osteoarthritis) in clinical trials, but the benefits are small and it is considered a second-tier medication.[16,39] Among patients presenting to the emergency department with acute musculoskeletal pain, hydrocodone/acetaminophen, 5 mg/500 mg, provided statistically and clinically significant reductions in pain at all time points compared with tramadol, 100 mg.[39] Tramadol should be used cautiously, if at all, in patients at risk of seizures.

Diversion and Addiction Risks

Opioids should be used cautiously because of the risk of diversion and addiction, even with short-term use. A study showed that in 2010, 2 million persons used prescription pain relievers nonmedically in the prior year; this was second only to marijuana.[40] Among individuals who reported the nonmedical use of a prescription analgesic, 55% obtained the drug from a friend or relative, 79% of whom obtained the prescription from a physician, and another 17% obtained the prescription directly from a physician.[40] Among patients hospitalized for opioid dependence, 51% first started using the drug to treat pain (e.g., after a surgery, dental procedure, or injury).[41] Patients should be counseled to safely dispose of any unused medication.[42]



WHO ladder

Treatment of chronic pain

There are several categories of medications that are used for the treatment of chronic pain. In general, your primary physician, patient management specialist, or pharmacist may be to answer any questions about the dosage and side effects from these medications. The most commonly used medications can be divided into the following broad categories:

1. **Nonsteroidal Anti-inflammatory Drugs and Acetaminophen**: There are many different types of nonsteroidal anti-inflammatory medications (NSAIDs), some of them (such as ibuprofen) may be obtained over-the-counter. NSAIDs can be very effective for acute muscular and bone pain as well as some types of chronic pain syndromes. When taken for an extended period of time or in large quantities, they may have negative effects on the kidneys, clotting of blood, and gastrointestinal system. Bleeding ulcers is a risk of these medications. Long-term use of cyclooxygenase II (COX II) inhibitors may be associated with an increase in cardiovascular (heart) risks. Acetaminophen is easily obtained over-the-counter, however, care should be taken not to take more than 4000 mg in 24 hours; otherwise, several liver failure may occur. There are some opioid medications that combine acetaminophen within the medication. You should be aware that many over-the-counter medications have acetaminophen as one of their ingredients and when taken in combination with prescribed medication, this may result in an overdose of acetaminophen.
2. **Antidepresssants**: Some of the older categories of antidepressants may be very helpful in controlling pain; specifically the tricyclic antidepressants. The pain relieving properties of these medications are such that they can relieve pain in doses that are lower than the doses needed to treat depression. These medications are not meant to be taken on an "as needed" basis but must be taken every day whether or not you have pain. Your physician may

attempt to lessen some of the side effects, particularly sedation, by having you take these medications at night. There are some other side effects like dry mouth that can be treated with drinking water or fluids. These medications may not be given to patients with certain types of glaucoma. In addition, these medications should never be taken in larger doses than are prescribed.

3. **Anticonvulsants (Anti-seizure) Medications**: These medications can be very helpful for some kinds of nerve type pain (such as burning, shooting pain). These medications also are not meant to be taken on an "as needed" basis. They should be taken every day whether or not you feel pain. Some of them may have the side effect of drowsiness which often improves with time. Some have the side effect of weight gain. If you have kidney stones or glaucoma, be sure to tell your doctor as there are some anticonvulsants that are not recommended to be given under those conditions. The newer anticonvulsants do not need liver monitoring but required caution if given to patients with kidney disease.
4. **Muscle Relaxants**: These medications are most often used in the acute setting of muscle spasm. The most common side effect seen with these medications is drowsiness.
5. **Opioids**: When used appropriately, opioids may be very effective in controlling certain types of chronic pain. They tend to be less effective or require higher doses in nerve type pain. For pain is present all day and night, a long acting opioid is usually recommended. One of the most frequent side effects is constipation, which if mild may be treated by drinking lots of liquids, but may need to be treated with medications. Drowsiness is another side effect which often gets better over time as you get used to the medication. Excessive drowsiness should be discussed with your physician. Nausea is another side effect which may be difficult to treat and may require changing to another opioid.

Opioids play a unique role in society. They are widely feared compounds, which are associated with abuse, addiction and the dire consequences of diversion; they are also essential medications, the most effective drugs for the relief of pain and suffering (Portenoy et al, 2004). Historically, concerns about addiction have apparently contributed to the undertreatment of disorders widely considered to be appropriate for opioid therapy, including cancer pain, pain at the end-of-life, and acute pain (Field and Cassel, 1997; Schnoll& Weaver, 2003; Portenoy& Lesage, 1999; Breitbart et al. 1998; Smith et al., 2008). The use of opioids for chronic non-malignant pain (CNMP) remains controversial (Manchikanti, 2008; McQuay, 1999). Following publication of reports on the safety and efficacy of opioids prescribed to small numbers of patients with CNMP (e.g., Portenoy and Foley, 1986; Nyswander and Dole, 1986) and the publication of a seminal article entitled “The Tragedy of Needless Pain”, (Melzack, 1990), the use of opioids to treat CNMP began to be more widely practiced and incorporated into clinical guidelines. Nevertheless, despite the advances in pain medicine and the wider use of opioids for various chronic pain conditions, there is still

considerable controversy surrounding the type of conditions that should be treated, whether the treatment can be generally safe and effective in selected patients, and what the clinical goals should be (Ballantyne& Forge, 2007; Streltzer& Johansen, 2006; Stretzler&Kosten 2003).

Go to:

History of Opioids

The Sumerians in Mesopotamia were among the first people identified to have cultivated the poppy plant around 3400 BC. They named it *Hul Gil*, the "joy plant" (Booth, 1986). It eventually spread throughout the ancient world to every major civilization in Europe and Asia and was used to treat pain and many other ailments (Schiff, 2002; Askitopoulou, Ramoutsaki, &Konsolaki, 2002; Booth, 1986; Dikotter, Laaman, &Xun, 2004).

Developments in the 19th century transformed the practice of medicine and initiated the tension between the desire to make available the medicinal benefits of these drugs and recognition that the development of abuse and addiction can lead to devastating consequences for individuals and for society at large (Booth, 1986; Musto, 1999):

- In 1803 morphine, an opioid analgesic, was extracted from opium by Friedrich Serturner of Germany;
- Dr. Charles Wood, a Scottish physician, invented the hyperdermic needle and used it to inject morphine to relieve pain from neuralgia;
- Dr. Eduard Livenstein, a German physician, produced the first accurate and comprehensive description of addiction to morphine, including the withdrawal syndrome and relapse, and argued that craving for morphine was a physiological response.
- Diacetylmorphine (brand name heroin) was synthesized and briefly promoted as more effective and less addictive than morphine. In the early 20th century, when heroin was legally marketed in pill form, it was used by young Americans to elicit

intense euphoria by crushing the heroin pills into powder for inhalation or injection (Katz et al., 2007, c.f. Meldrum, 2003; Hosztafi, 2001).

Beginning in the twentieth century, there were many research advances and major changes in the way opioids were used for the treatment of pain and addiction (Ballantyne, 2006; Corbett et al., 2006). These included attempts among several nations and international organizations to control the distribution and use of opioids (Musto, 1999); the introduction of opioid maintenance therapy for the treatment of opioid addiction (first with morphine and later with methadone, LAAM (levo-alpha acetyl methadol) and sublingual buprenorphine) (Courtwright, Joseph & Des Jarlais, 1989; Strain &Stitzer, 2006); the discovery of the endogenous opioids (Hughes, Smith, Kosterlitz, Fothergill, Morgan & Morris, 1975); and the recognition that pain is a debilitating and destructive disease and that opioids are essential for the treatment of many forms of acute and chronic pain.

During most of the twentieth century, the widely held perception among professionals in the United States was that the long-term use of opioid therapy to treat chronic pain was contraindicated by the risk of addiction, increased disability and lack of efficacy over time. During the 1990's, a major change occurred, driven by a variety of medical and nonmedical factors (see below). The use of opioids for chronic pain began to increase, showing a substantial year-to-year rise that continues today. This increased use of opioids for legitimate medical purposes has been accompanied by a substantial increase in the prevalence of nonmedical use of prescription opioids (Zacny, et al., 2003). The National Survey on Drug Use and Health reported that the number of first time abusers of prescription opioids increased from 628,000 in 1990 to 2.4 million in 2004, that emergency room visits involving prescription opioid abuse increased by 45% from 2000 to 2002, and that treatment admissions for primary abuse of prescription opioids increased by 186% between 1997 and 2002 (SAMHSA, 2004a, 2004b). Opioid abuse indices rose most for two frequently prescribed opioids, hydrocodone and controlled-release (CR) oxycodone (Cicero, Inciardi, Munoz, 2005). Although the increase in prescription drug abuse is likely to be multifactorial, it is likely to reflect, in part, changes in available drug formulations and prescribing practices of opioid

medication (Compton and Volkow, 2006). This link between increased medical use and increased abuse has driven some of the re-examination of the medical role of these drugs. The challenge, of course, is to reduce the likelihood of opioid misuse while not imposing barriers on the legitimate use of opioid medications, acknowledging both that increased abuse is probably inevitable when a psychoactive drug becomes more accessible and that attempts to control abuse can have the unintentional effects of discouraging treatment and placing severe restrictions on the medical profession.

Go to:

Brief Overview of Opioids: Neurobiology and Mechanism of Action

The term *opioid* refers to all compounds that bind to opiate receptors. Conventionally, the term *opiate* can be used to describe those opioids that are alkaloids, derived from the opium poppy; these include morphine and codeine. Opioids include semi-synthetic opiates, i.e., drugs that are synthesized from naturally occurring opiates (such as heroin from morphine and oxycodone from thebaine), as well as synthetic opioids such as methadone, fentanyl, and propoxyphene. The term *narcotic* is a legal designation and should not be used in the clinical setting; it refers to opioids and a few other drugs that are grouped with the opioids by law enforcement.

In the United States, numerous opioids have been commercialized for oral, transdermal and intravenous administration. Oral and transdermal formulations are usually administered for pain in the ambulatory setting. These include combination products, such as those containing hydrocodone and acetaminophen (Vicodin®, Lorset®) or ibuprofen (Vicoprofen®), tramadol and acetaminophen (Ultracet®), oxycodone and acetaminophen or aspirin (Percocet® or Percodan®), and those containing codeine and acetaminophen or aspirin. The single entity formulations on the market include those containing morphine (Avinza®, Kadian®, MS Contin®, MSIR®), oxycodone (OxyContin®), fentanyl (Duragesic®, Actiq®, Fentora®), hydromorphone (Dilaudid®), oxymorphone (Opana®), and methadone.

Opioids act by binding to specific proteins, called opioid receptors. Receptors are widely distributed. Those involved in pain modulation are situated in both the central nervous

system and the peripheral nervous system. These receptors also bind endogenous opioid peptides (endorphins), which are involved in pain modulation and numerous other functions in the body. Among these functions are those mediated by deep structures of the brain, which are involved in the modulation of reinforcement and reward mechanisms, mood and stress. Opioid receptors are also found on cells from the immune system (Bidlack, 2000). In studies with rats, activation of these receptors with morphine is associated with varied effects, including sensitization of afferent nerves to noxious stimuli (Raghavendra, Rutkowski, &DeLeo, 2002).

When an opioid given for pain binds to receptors, analgesia may be accompanied by any of a diverse array of side effects related to the activation of receptors involved in other functions. These may include effects mediated by peripheral or by peripheral and central mechanisms, such as reduced peristalsis (leading to constipation) and itch, or primary central nervous system effects, such as miosis, (pupillary constriction) somnolence, mental clouding, and respiratory depression (Jaffe & Jaffe, 2004; Jaffe & Martin, 1990). Central mechanisms also lead to changes associated with hyperalgesia and decreased responsiveness to opioids (tolerance) and it has been speculated that opioid-induced hyperalgesiamay be a clinically-relevant phenomenon leading to increased pain in some situations (Deleo, Tanga, &Tawfik, 2004). Activation of other central nervous system pathways by opioids also may produce mood effects, either dysphoria or euphoria.

Presumably, binding to those receptors involved in reinforcement and reward also occurs whenever an opioid is taken. In most individuals, when opioids are taken to treat pain, there appears to be no overt effect from change in these systems. In some cases, however, powerful reinforcement occurs, expressed as efforts to repeat the administration and these reinforcing outcomes may be associated with craving and with positive mood effects such as euphorigenic or pleasurable effects (Di Chiara, 2002; Koob& Bloom, 1988). These outcomes, which are uncommon but potentially serious when they occur (driving the development of an addictive pattern of use), can occur in the presence or absence of pain. Although these effects could be associated with iatrogenic addiction, they appear to be rare in patients who do not have risk factors

suggesting the existence of the biological substrate for opioid-induced craving (see below).

Although several types of opioid receptors exist (e.g., mu, kappa and delta), opioid drugs largely produce their analgesic and reinforcing effects via activation of the mu opioid receptor; thus, opioids used for pain are often described as, “mu agonists”. Mu drugs that have the ability to fully activate opioid receptors (e.g., higher doses produce greater receptor activation in a dose-dependent manner) are referred to as opioid agonists or full mu agonists (such as morphine, oxycodone and methadone). Those opioids that occupy, but do not activate, receptors are referred to as opioid antagonists (e.g., naltrexone, naloxone); they can reverse the effects of mu opioid agonists. Those opioids that either have a low intrinsic activity at the mu receptor, or are agonists at another receptor and antagonists at the mu receptor are called agonist-antagonist drugs. Those with a low intrinsic activity are called partial opioid agonists and are characterized by a ceiling on most agonist activity, such that increases in dose will increase the drug’s physiological and subjective effects only to a certain level and further dose increases produce no additional effects (Jaffe & Martin, 1990).

These differences in mu receptor interactions are clearly related to the clinical use of opioid drugs and their abuse liability. Agonist-antagonist drugs are less attractive than pure mu agonists to individuals with addiction and no pain. Although other biochemical and molecular processes are presumably relevant to variation in these effects, relatively little is known about the interactions among these processes in humans.

The clinical use of opioid drugs is influenced by a variety of other characteristics, including pharmacokinetics. With the notable exception of methadone and buprenorphine, most opioids have relatively short half-lives and this has necessitated the development of new delivery systems designed to provide prolonged effects and a longer dosing interval.

Clinically-relevant physical dependence and tolerance (see below) may occur with short-term or long-term use of an opioid compound, particularly a pure mu agonist. These phenomena, which vary greatly in the clinical setting, represent neuroadaptational processes. The neurophysiology of physical dependence and

tolerance are closely related to each other and to the phenomenon of opioid-induced hyperalgesia (Mao, 2002). The possibility that opioid administration, particularly at relatively high doses, may lead to increased pain has contributed to the controversy about opioid therapy for non-cancer pain, notwithstanding the limited evidence that this phenomenon occurs in clinical settings.

Go to:

Brief Overview of Chronic Pain

Chronic pain has been described as pain that has persisted for at least 1 month following the usual healing time of an acute injury, pain that occurs in association with a nonhealing lesion, or pain that recurs frequently over a period of months. In most clinical and research reports, chronic pain is typically defined as pain that has persisted for at least 3 months (Verhaak, Kerssens, Dekker, Sorbi, & Sensing, 1998).

The prevalence of chronic pain in the general population is believed to be quite high, although published reports have varied greatly. Cautious cross-national estimates of chronic pain range from 10% (Verhaak et al., 1998) to close to 20% (Gureje, Simon, & Von Korff, 2001), which would represent 30 to 60 million Americans. A national survey of 35,000 households in the US, conducted in 1998, estimated that the prevalence among adults of moderate to severe non-cancer chronic pain was 9% (American Pain Society, 1999). A large survey (N=18,980) of general populations across several European countries reported that the prevalence for chronic painful physical conditions was 17.1% (Ohayon&Schatzberg, 2003).

Chronic pain is a highly complex phenomenon, which may or may not be primarily driven by tissue injury. Conventionally, the most common forms of chronic pain are divided into those labeled “nociceptive”, or pain caused by ongoing stimulation of pain receptors by tissue damage, and those labeled “neuropathic”, or pain presumed to be related to damage to or dysfunction of the peripheral or central nervous system. These categories of pain simplify a complex reality in which both acute and chronic pain are induced by multiple peripheral and central mechanisms, which continually interact with each other and with numerous pain modulating systems. The perturbations that

ultimately results in pain perception are caused by neurophysiological processes and other related systems. For example, recent evidence has begun to highlight the role of neuroimmune activation following a tissue injury as an important mechanism in the development of chronic pain (DeLeo, 2006). The role of cytokines and other inflammatory mediators is obvious in inflammatory nociceptive pains, such as some types of arthritis, but new data suggest an equally salient role in the development of chronic neuropathic pain associated with central sensitization of neural pathways following peripheral injury (Deleo, 2006).

All chronic pain is profoundly influenced by psychological processing and responses (Turk &Melzack, 2001). Pain severity and pain-related functional impairment are often found to be associated with psychological and social factors, and patients with identical diseases associated with pain, such as degenerative disk disease, may vary greatly in their reports of pain severity and pain behaviors (Aronoff, 1999). There is an extensive literature documenting the importance of operant conditioning factors (Fordyce, 1976) and cognitive-behavioral factors (Turk, Meichenbaum, &Genest, 1983) in the maintenance of chronic pain behaviors.

Chronic pain also is influenced by psychosocial and psychiatric disturbances, such as cultural influences, social support, comorbid mood disorder, and drug abuse (Gatchel, Peng, Peters, Fuchs & Turk, 2007). Classic studies of pain behavior indicate that cultural differences in the beliefs and attitudes towards pain (e.g., Zbrowski, 1969) and the social/environmental context of the pain (e.g., Beecher, 1959) have a significant impact on pain behaviors.

The contribution of psychological, social and psychiatric factors should not lead to the conclusion that a pain syndrome is primarily psychogenic. Pain related exclusively or primarily to psychological factors occurs, but is far less prevalent than pain associated with organic processes that are powerfully influenced by psychosocial mediators and psychiatric comorbidities (Portenoy, Payne, &Passik, 2004).

The “pattern of suffering” or the pain-related disability that often occurs in concert with persistent pain commonly touches on all domains of function. Patients with chronic pain may demonstrate pain-related interference with ability to perform usual activities at

home, work, or school; maladaptive or dysfunctional behaviors, social isolation, and poor sleep patterns; and frequent health care utilization (Dworkin& Sherman, 2001). The recognition that acute pain can compromises health has led major medical associations and accreditation committees to designate pain severity as a “fifth vital sign”, along with blood pressure, temperature, heart rate, and respiration (Fishman, 2005). Further recognition of the increased interest in the assessment and management of pain is underscored by the U.S. Federal Law (Pain Relief Promotion Act of 2000) that declared the first decade of the 21st century as the Decade of Pain Control and Research (Gatchel et al., 2007).

Chronic pain is a major public health problem, which is associated with devastating consequences to patients and families, a high rate of health care utilization, and huge society costs related to lost work productivity. The existing treatments for chronic pain are unable to address the problem and better therapies are urgently needed. The need for these therapies is the backdrop for the expanding use of opioid drugs. An extensive clinical experience indicates that long-term opioid therapy is able to help selected patients have a better quality of life, less use of health care, and improved productivity. The medical community is no longer debating the reality of these outcomes, but rather, is now focused on a more fruitful debate about patient selection and the benefits and burdens of these drugs in varied subpopulations. Whether the frame of reference is the individual patient and family, or society-at-large, the issue is about balancing the potential benefits of these drugs in the large and diverse population with chronic pain with its potential risks.

Go to:

Terminology of Opioid Abuse: Dependence, Tolerance, Addiction

Concerns that addiction is a frequent iatrogenic consequence of the medical use of opioids may partially be attributed to confusion over terminology, as a well as failure to recognize that both addiction and chronic pain have a multifactorial etiology. In an effort to develop universal agreement on terminology related to addiction, the American Academy of Pain Medicine (AAPM), the American Pain Society (APS), and the

American Society of Addiction Medicine (ASAM) approved a consensus document that clarified this terminology (ASAM, 2001; Savage, 2003).

According to the consensus document, *tolerance* is defined as a decreased subjective and objective effect of the same amount of opioids used over time, which concomitantly requires an increasing amount of the drug to achieve the same effect. Although tolerance to most of the side effects of opioids (e.g., respiratory depression, sedation, nausea) does appear to occur routinely, there is less evidence for clinically significant tolerance to opioids– analgesic effects (Collett, 1998; Portenoy et al., 2004). For example, there are numerous studies that have demonstrated stable opioid dosing for the treatment of chronic pain (e.g., Breitbart, et al., 1998; Portenoy et al., 2007) and methadone maintenance for the treatment of opioid dependence (addiction) for extended periods (Strain and Stitzer, 2006). However, despite the observation that tolerance to the analgesic effects of opioid drugs may be an uncommon primary cause of declining analgesic effects in the clinical setting, there are reports (based on experimental studies) that some patients will experience worsening of their pain in the face of dose escalation (Ballantyne, 2006). It has been speculated that some of these patients are not experiencing more pain because of changes related to nociception (e.g. progression of a tissue-injuring process), but rather, may be manifesting an increase in pain as a result of the opioid-induced neurophysiological changes associated with central sensitization of neurons that have been demonstrated in preclinical models and designated opioid-induced hyperalgesia (Mao, 2002; Angst & Clark, 2006). Analgesic tolerance and opioid-induced hyperalgesia are related phenomena, and just as the clinical impact of tolerance remains uncertain in most situations, the extent to which opioid-induced hyperalgesia is the cause of refractory or progressive pain remains to be more fully investigated. *Physical dependence* represents a characteristic set of signs and symptoms (opioid withdrawal) that occur with the abrupt cessation of an opioid (or rapid dose reduction and/or administration of an opioid antagonist). Physical dependence symptoms typically abate when an opioid is tapered under medical supervision. Unlike tolerance and physical dependence which appear to be predictable time-limited drug effects, *addiction* is a chronic disease that “represents an idiosyncratic

adverse reaction in biologically and psychosocially vulnerable individuals" (ASAM, 2001).

The distinction between physical dependence and addiction is not always made clear in the pain literature (Ferrell, McCaffery, Rhiner, 1992). Most patients who are administered opioids for chronic pain behave differently from patients who abuse opioids and do not ever demonstrate behaviors consistent with craving, loss of control or compulsive use (e.g., Cowan et al., 2001). Of course, pain and addiction are not mutually exclusive and some patients who are treated for pain do develop severe behavioral disturbances indicative of a comorbid addictive disorder.

Some patients who are treated with opioids for pain display problematic behaviors that, on careful assessment, do not reflect addiction, but rather, appear to relate to a different process. This may be another psychiatric disorder associated with impulsive drug-taking, an unresolved family issue, a disorder of cognition, or criminal intention. In addition, there appear to be some patients who engage in problematic behaviors related specifically to desperation about unrelieved pain. The term *pseudoaddiction* was coined to describe the latter phenomenon (Weissman&Haddox, 1989).

Behaviors that may represent pseudoaddiction and behaviors that reflect addiction or some other serious psychopathology can occur simultaneously, and presumably, one type of phenomenon may incite the others. The diagnosis of these and other conditions may be challenging and requires a careful assessment of clinical phenomenology, specifically a range of drug-related behaviors during treatment with a potentially abusable drug (Portenoy, 1994, Lue, Passik, &Portenoy, 1998).

The term *aberrant drug-related behaviors* has been used to indicate the broad array of problematic nonadherencebehaviors (Passik, Kirsh, Donaghy, &Portenoy, 2006), the nature of which is uncertain until a diagnosis can be developed based on astute clinical assessment. Some aberrant drug-related behavior strongly suggests the existence of addiction. These may include the use of alternative routes of administration of oral formulations (e.g., injection or sniffing), concurrent use of alcohol or illicit drugs, and repeated resistance to changes in therapy despite evidence of adverse effects; examples of aberrant behavior less suggestive of addiction are drug hoarding during

periods of reduced symptoms, occasional unsanctioned dose escalation, and aggressive complaining about the need for more drugs (Portenoy, 1994).

Go to:

Distinction between Withdrawal and Chronic Pain

Because addiction is associated with psychological distress and physical discomfort in the form of opioid withdrawal symptoms, it may be difficult to distinguish primary chronic pain complaints from withdrawal pain. Withdrawal also may have the potential to increase baseline pain related to other processes. For example, based on anecdotal evidence from chronic pain patients, withdrawal from opioids can greatly increase pain in the original pain site. These phenomena suggest the need to carefully assess the potential for withdrawal during long-term opioid therapy (e.g, at the end of a dosing interval or during periods of medically-indicated dose reduction).

These phenomena notwithstanding, there also is evidence that experienced drug abusers are able to distinguish withdrawal pain from chronic pain. For example in studies of methadone maintenance patients, both the phenomenology and correlates of chronic pain were different than for withdrawal pain (Karasz et al., 2004; Rosenblum et al., 2003). Chronic pain is typically localized (e.g., back pain, headache) and persists (although with varying degrees of severity) for long periods of time (Gureje, Von Korff, Simon &Gater, 1998). Although certain subjective experiences of withdrawal (e.g., muscle ache) are similar to some distinct pain syndromes, other withdrawal experiences such as yawning, sweating and hot and cold flashes are likely to be more commonly associated with subjective drug withdrawal than with primary pain conditions. Moreover, the constellation of words used to describe withdrawal pain is likely to be different than words used to describe other painful disorders. Qualitative studies of addicts going through withdrawal typically refer to the experience as “being sick” (similar to a moderate to severe flu-like illness) and not as representing a distinct pain (Farrell, 1994). The subjective experience of withdrawal can be validly measured with an instrument such as the Subjective Opiate Withdrawal Scale (SOWS; Handelsman, et al., 1987). Withdrawal from short-acting opioids, such as heroin, is typically short-lived;

physical symptoms are likely to reach their maximum intensity over a 36–72 hour period and to reduce in intensity after that (Farrell, 1994).

Go to:

Co-occuring Chronic Pain and Opioid Addiction

The prevalence of addictive disorders among chronic pain patients is difficult to determine (Covington and Kotz 2003). One 1992 literature review found only seven studies that utilized acceptable diagnostic criteria and reported that estimates of substance use disorders among chronic pain patients ranged from 3.2% – 18.9% (Fishbain, Rosomoff, &Rosomoff, 1992). A Swedish study of 414 chronic pain patients reported that 32.8% were diagnosed with a substance use disorder (Hoffmann, Olofsson, Salen, &Wickstrom, 1995). In two US studies, 43 to 45% of chronic pain patients reported aberrant drug-related behavior; the proportion with diagnosable substance use disorder is unknown (Katz et al., 2003; Passik et al., 2004). All these studies evaluated patients referred to pain clinics and may overstate the prevalence of substance abuse in the overall population with chronic pain.

A relatively high prevalence of substance abuse disorders among persons with chronic pain can also be inferred by the high co-occurrence of these two disorders. There have been several reports that the prevalence of chronic pain among persons with opioid and other substance use disorders is substantially higher than the pain prevalence found in the general population (Breitbart, et al., 1996; Brennan, Schutte, & Moos, 2005; Jamison, Kauffman, & Katz, 2000; Rosenblum et al., 2003; Sheu, et al., 2008).

Go to:

Opioid Treatment for Chronic Pain

Opioid therapy is the mainstay approach for the treatment of moderate to severe pain associated with cancer or other serious medical illnesses (Patt& Burton, 1998; World Health Organization, 1996). Although the use of opioid analgesics for the treatment of CNMP has been increasing in recent years (Joranson, Ryan, Gilson & Dahl, 2000) and has been endorsed by numerous professional societies (AAPM, APS, 1997; American

Geriatric Society, 1998; Pain Society, 2004), the use of opioids remains controversial due to concerns about side effects, long-term efficacy, functional outcomes, and the potential for drug abuse and addiction. The latter concerns are especially evident in the treatment of CNMP patients with substance use histories (Savage, 2003).

Other concerns that may contribute to the hesitancy to prescribe opioids may be related to perceived and real risks associated with regulatory and legal scrutiny during the prescribing of controlled substances (Office of Quality Performance, 2003). These concerns have propelled extensive work to develop predictors of problematic behaviors or frank substance abuse or addiction during opioid therapy. Questionnaires to assist in this prediction and monitoring have been developed and used in research and field trials. Examples include the Prescription Drug Use Questionnaire (PDUQ; Compton et al., 1998); the Pain Assessment and Documentation Tool (PADT; Passik et al., 2004) and the Current Opioid Misuse Measure (COMM; Butler et al., 2007). These instruments are not used in practice settings at this time.

Narrative reports on the use of opioids for CNMP have underscored the effectiveness of opioid therapy for selected populations of patients and there continues to be a consensus among pain specialists that some patients with CNMP can benefit greatly from long-term therapy (Ballantyne& Mao, 2003; Trescot et al., 2006). This consensus, however, has received little support in the literature. Systematic reviews on the use of opioids for diverse CNMP disorders report only modest evidence for the efficacy of this treatment (Trescot et al., 2006; 2008). For example, a review of 15 double-blind, randomized placebo-controlled trials reported a mean decrease in pain intensity of approximately 30% and a drop-out rate of 56% only three of eight studies that assessed functional disturbance found improvement (Kalso, Edwards, Moore, &McQuay, 2004). A meta-analysis of 41 randomized trials involving 6,019 patients found reductions in pain severity and improvement in functional outcomes when opioids were compared with placebo (Furlan, Sandoval, Mailis-Gagnon, &Tunks, 2006). Among the 8 studies that compared opioids with non-opioid pain medication, the six studies that included so-called “weak” opioids (e.g., codeine, tramadol) did not demonstrate efficacy, while the two that included the so-called “strong” opioids (morphine, oxycodone) were associated

with significant decreases in pain severity. The standardized mean difference (SMD) between opioid and comparison groups, although statistically significant, tended to be stronger when opioids were compared with placebo (SMD = 0.60) than when strong opioids where compared with non-opioid pain medications (SMD = 0.31). Other reviews have also found favorable evidence that opioid treatment for CNMP leads to reductions in pain severity, although evidence for increase in function is absent or less robust (Chou, Clark, &Helfand, 2003; Eisenberg, McNicol, & Carr, 2005). Little or no support for the efficacy of opioid treatment was reported in two systematic reviews of chronic back pain (Deshpande, Furlan, Mailis-Gagnon, Atlas, & Turk, 2007; Martell, et al., 2007). Because patients with a history of substance abuse typically are excluded from these studies, they provide no guidance whatsoever about the effectiveness of opioids in these populations.

Adding further to the controversy over the utility of opioid analgesics for CNMP is the absence of epidemiological evidence that an increase in the medical use of opioids has resulted in a lower prevalence of chronic pain. Noteworthy is a Danish study of a national random sample of 10,066 respondents (Eriksen, Sjøgren, Bruera, Ekholm, & Rasmussen, 2006). Denmark is known for having an extremely high national usage of opioids for CNMP and this use has increased by more than 600% during the past two decades (Eriksen, 2004). Among respondents reporting pain (1,906), 90% of opioid users reported moderate to very severe pain, compared with 46% of non-opioid users; opioid use was also associated with poor quality of life and functional disturbance (e.g., unemployment).

Although this epidemiological study may be interpreted as demonstrating that opioid treatment for CNMP has little benefit, the authors acknowledge that these disquieting findings do not indicate causality and could be influenced by the possibility of widespread undertreatment, leading to poorly managed pain. This latter interpretation is supported by a commentary on the Ericksen et al. study (Keane, 2007). Keane notes that among the 228 pain patients receiving opioids only 57 (25%) were using strong opioids, while the remainder was using weak opioids. European (as well as United States) clinical guidelines generally recommend long-acting formulations of strong

opioids for the treatment of chronic moderate to severe pain, which may be supplemented with short-acting opioids for breakthrough pain (Pain Society, 2004; OQP, 2003; Gourlay, 1998; Vallerand, 2003; Fine &Portenoy, 2007).

The possibility of inappropriate opioid treatment is further supported by another Danish study that assigned pain patients who were on opioid therapy to either a multidisciplinary pain center (MPC) or to general practitioners (GP) who had received initial supervision from the MPC staff (Eriksen, Becker, &Sjegren, 2002). At intake, a substantial number of patients in both groups were apparently receiving inappropriate opioid therapy for chronic pain (60% were being treated with short-acting opioids and 49% were taking opioids on demand). At the 12 month follow-up, 86% of MPC patients were receiving long-acting opioids and 11% took opioids on demand. There was no change in the administration pattern in the GP group. These findings suggest that a significant proportion of opioid-treated CNMP patients may be receiving inappropriate opioid treatment and that educating general practitioners in pain medicine may require more than initial supervision.

It is generally acknowledged that there is a wide degree of variance in the prescribing patterns of opioids for chronic pain (Lin, Alfandre, & Moore, 2007; Trescot et al., 2006). Some opioid treatment practices persist despite evidence that they might be harmful or have little benefit, such as the over-prescribing of propoxyphene among the elderly (Barkin, Barkin, &Barkin, 2006; Singh, Sleeper, & Seifert, 2007). Nursing home patients being treated with opioids have been found to be inadequately assessed for pain and to be more likely treated with short-acting rather than long acting opioids (Fujimoto &Coluzzi, 2000). A substantial number of physicians are reluctant or unwilling to prescribe long-acting opioids to treat CNMP, even when it may be medically appropriate (Nwokeji, et al., 2007).

Controversy about the long-term effectiveness of opioid treatment also has focused on the potential clinical implications of opioid-induced hyperalgesia. As noted earlier, exposure to opioids can result in an increased sensitivity to noxious stimuli in animals, and an increased perception of some types of experimental pain in humans (c.f., Koppert&Schmeltz, 2007; Angst & Clark, 2006). Anecdotal reports of hyperalgesia

occurring with very high or escalating doses of opioids (Angst & Clark, 2006) has been viewed as a clinical correlate of these experimental findings. The extent to which this phenomenon is relevant to the long-term opioid therapy administered to most patients with chronic pain is unknown. Although experimental evidence suggests that opioid-induced hyperalgesia might limit the clinical utility of opioids in controlling chronic pain (Chu, Clark, &Angst., 2006), there have been no reports of observations in the clinical literature to suggest that it should be a prominent problem. More research is needed to determine whether the physiology underlying opioid-induced hyperalgesia may be involved in a subgroup of patients who develop problems during therapy, such as loss of efficacy (tolerance) or progressive pain in the absence of a well defined lesion.

Outcome studies of long term use of opioids are compromised by methodological limitations which make it difficult to acquire evidence of efficacy (Noble, Tregear, Treadwell, &Schoelles, 2007). Methodological limitations may be unavoidable because of the ethical and practical challenges associated rigorous studies such as randomized controlled trials. Guidelines for opioid therapy must now be based on limited evidence; future evidence may be acquired by utilizing other study designs (Noble et al., 2007) such as practical clinical trials (Tunis, Stryer, & Clancy, 2003). These studies should include at least three criteria to reflect a positive treatment response: i.e., reduction of pain severity (derived from subjective reports or scores on pain scales), recovery of function (improved scores on instruments that measure some aspect of function), and quality of life.

Guidelines for the use of opioids for the treatment of chronic pain have been published (AAFP et al., 1996–2002; OQP, 2003), and recent guidelines have emphasized the need to initiate, structure and monitor therapy in a manner that both optimizes the positive outcomes of opioid therapy (analgesia and functional restoration) and minimize the risks associated with abuse, addiction and diversion (Portenoy et al., 2004). These guidelines discuss patient selection (highlighting the likelihood of increased risk among patients with prior histories of substance use disorders), the structuring of therapy to provide an appropriate level of monitoring and a presumably lessened risk of aberrant drug-related behavior, the ongoing assessment of drug-related behaviors and the need

to reassess and diagnose should these occur, and strategies that might be employed in restructuring therapy should aberrant behaviors occur and the clinician decide to continue treatment. They also note that therapy should be undertaken initially as a trial, which could lead to the decision to forego more therapy, and that an "exit strategy" must be understood to exist should the benefits in the individual be outweighed by the burdens of treatment.

The relatively recent recognition that guidelines for the opioid treatment of chronic pain must incorporate both the principles of prescribing as well as approaches to risk assessment and management may represent an important turning point for this approach to pain management. Acknowledging that prescription drug abuse has increased during the past decade, a period during which the use of opioid therapy by primary care physicians and pain specialists has accelerated, pain specialists and addiction medicine specialists now must collaborate to refine guidelines, help physicians identify the subpopulations that can be managed by primary care providers, and discover safer strategies that may yield treatment opportunities to larger numbers of patients.

Go to:

Treating Patients with Addictive Disorders

Safe and effective pain treatment is especially important for persons with a drug use history because inadequate treatment or lack of treatment for pain may have problematic consequences, such as illicit drug use (e.g., heroin), misuse of prescription opioids and other pain medications (e.g., benzodiazipines), psychiatric distress, functional impairment and a tendency for health providers to attribute pain complaints and requests for pain medication to an addictive disorder rather than to a pain disorder (Gureje, et al., 2001; Scimeca, Savage, Portenoy, &Lowinson, 2000). Undertreatment of pain among addicted persons may lead to the adverse medical, social and personal consequences associated with continued drug-seeking behavior (Savage, 1996). Pain complaints may be most problematic among persons with opioid addiction, as this group may have lower tolerance for pain than other addicted populations (Compton,

1994; Compton, Charuvastra, & Ling, 2001). Pain and opioid addiction may be further intertwined among persons who have a history of abusing controlled opioid pain medications, such as oxycodone or hydrocodone.

Go to:

A Possible Role on the use of Buprenorphine for the Treatment of Chronic Pain

Increasing interest in developing clinical protocols for opioid treatment of chronic pain in the population with substance abuse histories has highlighted the role of opioid medications that may have lower abuse potential. One medication that is beginning to be examined is buprenorphine, a partial opioid mu agonist that is well recognized as an analgesic (Johnson, Fudala, & Payne, 2005). In 2002, a sublingual tablet (both in mono form – Subutex® - and combined with naloxone - Suboxone®) was approved by the U.S Food and Drug Administration as a Schedule III medication for the treatment of opioid dependence. In numerous controlled clinical trials, it has been demonstrated to be highly efficacious in reducing illicit opioid use and promoting treatment retention among opioid abusers (e.g., Johnson, Strain, & Amass, 2003; Kakko, Svanborg, Kreek, Heilig, 2003; O'Connor et al., 1998; Fudala et al., 2003). In opioid addicts, it suppresses the craving and withdrawal symptoms associated with opioid use and also blocks the euphoric effects of subsequent opioid use (See Bickel & Amass, 1995 for a review).

As a partial mu-agonist, buprenorphine has a ceiling effect on its agonist activity (Lewis, 1985; Walsh, Preston, Bigelow &Stitzer, 1995). It is less likely than a full agonist to cause respiratory depression in opioid-naïve patients (Cowan, Lewis & Macfarlane, 1977). This property of buprenorphine increases its safety profile by reducing the risk of accidental overdose (Walsh, Preston, Stitzer, Cone & Bigelow, 1994). The partial agonism of buprenorphine would presumably yield a ceiling effect for analgesia as well, which would limit the clinical use of the drug in pain management, but there is some question about the extent of this ceiling effect in practice (Dahan, et al., 2006).

Although the combination buprenorphine/naloxone tablet (Suboxone) may precipitate withdrawal in opioid-tolerant persons if it is injected, making it relatively unattractive for diversion (CSAT, 2004), there is nevertheless evidence of diversion, as would be

expected with any psychoactive drug that has hedonic properties (Cicero &Inciadi, 2005; Smith, Bailey, Woody, &Kleber, 2007). Rates of abuse are relatively low compared to full mu agonists and buprenorphine rarely is endorsed as a primary drug of abuse (Cicero, Suratt, &Inciardi, 2007; Rosenblum et al., 2007; SAMHSA, 2006).

In Europe, a transdermal formulation of buprenorphine has been approved for the treatment of chronic pain (e.g., Griessinger, Sittl, &Likar, 2005; Sittl, 2005). In post-marketing surveillance studies and in a multicenter randomized controlled clinical trial, the transdermal patches were reported to be effective and well-tolerated in the treatment of cancer and non-cancer chronic pain (Griessinger et al., 2005; Sittl, 2005; Sorge and Stittl, 2004; Sittl, Nuijten, &Nautru, 2006). A transdermal formulation of buprenorphine is not presently available in the United States.

The off-label use of sublingual buprenorphine tablets to treat chronic pain has been described in two clinical reports, one describing its use in a series of chronic pain patients who were responding poorly to other opioid analgesics (Malinoff et al., 2005) and the other describing the response of patients with both pain and addiction (Heit&Gourlay, 2008). In both of these reports, the authors reported that their patients were successfully treated with buprenorphine, e.g., pain relief and improved mood and functioning.

In a similar manner, two earlier publications describe the open-label use of the parenteral formulation of buprenorphine administered sublingually to treat patients with chronic pain (Adriaensen, Mattelaer, &Vanmeenen, 1985; Nasar, McLeavy, & Knox, 1986). Although most patients were followed up for less than one month, both studies reported good analgesia and low incidence or time-limited unwanted side effects. There is also evidence from several preclinical studies and one study with human subjects that, in contrast to pure mu-agonists, buprenorphine exerts a lasting anti-hyperalgesic effect (Hans, 2007; Koppert, et al., 2005). The transdermal trials conducted in Europe, the anecdotal reports of sublingual administration in North America, and buprenorphine's comparatively high safety profile suggest that it would be valuable to systematically study buprenorphine as a treatment of pain in patients with substance use disorders.

Go to:

Conclusion

Opioids are among the most effective medications for moderate to severe pain. Although there is a consensus on their utility as a treatment for chronic cancer pain, their long-term use for chronic non-malignant pain remains controversial. Several medical professional organizations acknowledge the utility of opioid therapy and many case series and large surveys report satisfactory reductions in pain, improvement in function and minimal risk of addiction. However, the clinical trials that have been conducted do not provide adequate evidence of long-term effectiveness. Despite the consensus of pain specialists, and the eminently ethical and medically justified commentaries to consider opioid therapy in the armamentarium of treatments for moderate to severe pain (Brennan, Carr, & Cousins, 2007), there is concern that the pendulum has swung from undertreatment to overtreatment (White &Kehlen, 2007). This controversy is enhanced by the increased prevalence of prescription opioid abuse, which has developed concomitantly with an increase in opioid administration in the clinic. The resolution of this controversy will require much more research and the acceptance of treatment guidelines that recognize the dual obligations of the prescriber: to optimize the balance between analgesia and side effects, and promote other favorable outcomes, while concurrently assessing and managing the risks associated with abuse, addiction and diversion. At this juncture, it is important that the opioid treatment debate evolve from a discussion focused on “too little” or “too much” to one focused on identification and training of best treatment practices. Improvement in opioid therapy can occur through research and training to aid practitioners to determine the appropriate patient subpopulations and treatment protocols to achieve satisfactory outcomes.

Finally, it is imperative to advance a research agenda that leads to the identification of methods that would enhance pain relief while reducing the likelihood of addiction and other adverse events when opioids are selected for therapy. This should include the testing of novel medications that may be safer or more differentially effective for select treatment populations (as the proposal to test buprenorphine with high risk patients,

discussed above) and the evaluation of treatment protocols incorporating risk management techniques.

Data from the 2012 National Health Interview Study showed that more than 25 million American adults had pain every day for the preceding three months.

1 Chronic pain can be debilitating and have a significant socioeconomic impact.

2 Beyond surgery and other interventions, both prescription and nonprescription medications have been standard protocol to help mitigate chronic pain. Long-term use of pharmacologics can have unwanted side effects and a high risk of addiction, especially with opioids. Pain is one of the leading reasons Americans turn to complementary healing modalities such as yoga, massage, meditation, and nutritional supplements that may help attenuate pain.

Many individuals with chronic pain have elevated levels of proinflammatory cytokines in blood and tissues, a normal biologic process in response to injury, infection, or irritation.

If the inflammatory process persists, it can develop into a chronic condition associated with chronic pain. Emerging literature suggests certain nutrients may help alleviate chronic pain through management of inflammation via oxidative stress. As many whole foods comprise bioactive compounds with anti-inflammatory effects, diet and nutrition should be integrated in the approach to treating older adults with chronic pain.

Anti-Inflammatory Diet

The United States' food supply is flooded with empty-calorie processed foods containing unhealthful fats, refined carbohydrates, sugar, and sodium. This Western diet is low in fiber, micronutrients, and antioxidants, and is considered proinflammatory. Studies looking at the influence of diet on inflammatory markers show that consumption of foods

high in fiber, healthful oils, fruits, vegetables, and those low in sugars, starchy carbohydrates, and unhealthful fats can reduce inflammation and disease.3

Consumption of fruits and vegetables, which contain many vitamins, minerals, and antioxidants, is inversely associated with inflammation and oxidative stress; the higher the intake of plant foods, the lower the occurrence of oxidative stress.4

Specifically, to reduce proinflammatory cytokines and reactive oxygen species, a minimum daily intake of five servings of fruits and vegetables is recommended.

High–glycemic index foods such as white bread are rapidly digested, cause substantial increases in blood sugar levels after being eaten, and may contribute to oxidative stress and low-grade inflammation, both in acute and chronic pain.

Whole grain foods have a low glycemic index and are rich in bioactive compounds (eg, polyphenols, phytic acid, and lignin) with anti-inflammatory properties, including the reduction of free radicals and the activation of antioxidant enzymes. A recent study confirmed that a low–glycemic index diet was more effective in reducing chronic inflammation as measured by lower concentrations of C-reactive protein than was a high–glycemic index diet.4

Extra virgin olive oil (EVOO) is the main source of fat in the Mediterranean diet. The high concentration of monounsaturated fat and many bioactive compounds such as polyphenols in EVOO characterize its anti-inflammatory and antioxidant properties. (Seed oils don’t have the same benefit as EVOO.) This could explain why the incidence of cancer and heart diseases is lower in the Mediterranean basin than in other geographic areas. When phenolic phytochemicals were extracted from EVOO and evaluated for their nutraceutical properties, they were found to be effective in treating knee pain in early-stage knee osteoarthritis.4

Omega-3 and omega-6 polyunsaturated fatty acids (PUFAs) are essential and must be obtained from the diet. Western diets tend to be higher in omega-6 PUFAs than omega-3s (ranging from a 10:1 to 20:1 ratio or higher), with each PUFA having an

opposite function along the cyclooxygenase pathway—the enzymatic route that converts fatty acids to prostaglandins that mediate inflammation and pain.

Omega-6 PUFAs stimulate inflammation, whereas omega-3 PUFAs decrease inflammation. The predominant omega-6 PUFA is linoleic acid, which is found in corn, sunflower, safflower, soybean, and sesame oils, as well as in nuts and seeds. In a randomized controlled trial involving 56 patients, omega-3 fats were increased and omega-6 fats were decreased, resulting in reduced headache pain,3 although there are few other studies that suggest a diet higher in omega-6 PUFAs compared with omega-3 PUFAs increases chronic inflammation.5

The most potent omega-3 PUFAs—EPA and DHA—are found mainly in cold-water fish, such as salmon, mackerel, tuna, herring, pompano, swordfish, trout, and sardines. Another omega-3 fat, alpha-linolenic acid (ALA), is found in vegetable oils (eg, soybean, canola), nuts (especially walnuts), ground flaxseed and flaxseed oil, leafy vegetables, and some animal fat, especially from grass-fed livestock. The human body generally uses ALA for energy, because it's inefficient in converting it into EPA and DHA,6 especially in aging.4

The strongest evidence for the dietary benefits of omega-3 fats pertains to their ability to reduce potentially fatal arrhythmias.7 Omega-3 fats also lower blood pressure and heart rate, improve blood vessel function, and—at higher doses than those typically found in the diet—may lower triglycerides and ease inflammation. There's evidence that omega-6 fats also positively influence cardiovascular risk factors, but, as they are ubiquitous in the diet, it's only prudent to increase consumption of omega-3 fats.

Dietary guidelines recommend eating 8 oz (approximately two servings) of seafood per week, particularly fatty, darker meat fish that are richer in EPA and DHA.

There are many nutritional supplements that offer omega-3 fats, but the source, dosage, and interactions with medications all should be considered. Various research has found that subjects used fewer NSAIDs when they were treated with omega-3 fats for rheumatoid arthritis, and an analgesic effect has been shown with supplementation for

inflammatory joint pain.3 Omega-3 supplement doses used in many studies range from 3,000 to 4,000 mg of combined EPA and DHA, which usually can be found in 6,000 to 8,000 mg of fish oil. In most good-quality microdistilled fish oil preparations, EPA and DHA combined will be about one-half the amount of the dosage. For example, a 1,000-mg capsule may have 230 mg of EPA and 270 mg of DHA for a total of 500 mg of the omega-3 PUFAs.

High red meat consumption is associated with elevated plasma concentrations of inflammatory biomarkers. An eight-week intervention in which two groups of subjects were given either meat or legumes for protein showed a significant difference in the inflammatory marker for high sensitivity C-reactive protein from -1.3 (meat) to 1.7 (legumes, $p=0.019$).4 Legumes and other plant foods high in water-insoluble fiber are also beneficial for any patient with chronic pain who may suffer from opioid-induced constipation. Red wine is rich in numerous molecules that fight inflammation and oxidation, in particular flavonoids.3 Moderate consumption—a 5-oz glass daily for women (up to 2 for men)—merits consideration in the absence of opioid use.

Turmeric and ginger are related tubers that have been studied extensively for their anti-inflammatory properties. A systematic review of ginger concluded that it's a powerful anti-inflammatory that's useful in treating pain because it disrupts the cyclooxygenase-2 pathway that promotes inflammation.3

Although curcumin, the active component of turmeric, has been found to have effects similar to those of ibuprofen for osteoarthritis of the knee and to be useful for postoperative pain,3 several well-controlled clinical studies have failed to show clinical benefits with curcumin.8 The bioavailability of curcumin may explain differing research outcomes. Formulations of bioavailability-enhanced curcumin have been shown to overcome absorption issues and are now the most commonly used types of curcumin supplements.9 The turmeric root or rhizome made into a powder or extract appears to be the active form (compared with the leaf and flower) with a suggested dose of 1,000 mg. The optimal dose of curcumin hasn't yet been established.

Nutritional Supplements

Glucosamine and chondroitin are naturally occurring substances in the body and are the major structural components of cartilage, the tough, elastic connective tissue found in joints.

Although consumers commonly use them as nutritional supplements for knee pain, research is mixed on the efficacy of glucosamine and/or chondroitin for reducing pain, perhaps due to the variation that exists among different trial protocols. A 16-week double-blinded, randomized, placebo-controlled trial of 34 males found that a combination of glucosamine hydrochloride (1,500 mg/day) and chondroitin sulfate (1,200 mg/day) relieved symptoms of degenerative joint disease of the knee and lower back.10 The visual analog scale for pain recorded at clinic visits decreased by 26.6%. Similarly, a systematic meta-analysis showed that glucosamine and chondroitin was efficacious for treatment of osteoarthritis.11

However, another randomized controlled trial of 205 subjects with knee osteoarthritis showed that glucosamine was no more effective than placebo.12 In addition, a multicenter, double-blinded, placebo-controlled trial evaluated 1,583 randomly assigned patients with symptomatic knee osteoarthritis, but neither glucosamine nor chondroitin sulfate reduced pain effectively overall in the group of patients with knee osteoarthritis.13

Another similar multicenter trial randomly assigned 605 patients with chronic knee pain to four groups taking glucosamine, chondroitin, both, or a placebo.14 All four groups demonstrated a reduction in knee pain, with the glucosamine and chondroitin combination group demonstrating significant reduction in joint space narrowing at the two-year follow-up visit. Overall, a critical review of the use of these nutritional supplements summarized that treatment produced conflicting evidence.2 Taken in appropriate amounts, glucosamine and chondroitin generally are considered safe for healthy people not taking any other medications. In some individuals, glucosamine can

cause gastrointestinal discomfort, drowsiness, skin reactions, and headache, while chondroitin occasionally can cause stomach upset.13

Vitamins, Minerals, and Water

Deficiencies of vitamin D have been consistent among populations within the Northern Hemisphere and appear to be more common in the elderly.15,16 Those with chronic pain have more significant deficiencies.17,18 Data from literature have explained the link between vitamin D and chronic pain, demonstrating that low levels of vitamin D are associated with increased central hypersensitivity, such as increased sensitivity to mechanical pain and severity of somatic symptoms in chronic pain patients.4 An improvement in pain has been shown with mere supplementation of vitamin D.19 The Recommended Dietary Allowances (RDAs) for both men and women aged 70 and older increase from the recommendation for those under age 70 of 600 IU to 800 IU per day, with the Tolerable Upper Intake Level set at 4,000 IU per day.20

Vitamin B12 is required for proper red blood cell formation, neurological function, and DNA synthesis.21 Deficiencies of vitamin B12 are well known to contribute to neurologic dysfunction and chronic pain.3 Recent human studies have shown that the intramuscular injection of vitamin B12 is significantly important for the treatment of localized pain in the spine.4

In food, vitamin B12 is bound to protein but is released during digestion by the activity of hydrochloric acid and gastric protease in the stomach. It then combines with intrinsic factor, a glycoprotein secreted by the stomach's parietal cells, for absorption. Older people are at an increased risk of vitamin B12 deficiency for several reasons. Atrophic gastritis affects 10% to 30% of older adults and decreases secretion of hydrochloric acid in the stomach, resulting in decreased absorption of vitamin B12. Pernicious anemia, a condition that affects 1% to 2% of older adults, is characterized by a lack of intrinsic factor; thus, individuals cannot properly absorb B12 in the gastrointestinal tract. Pernicious anemia typically is treated with intramuscular vitamin B12. However,

approximately 1% of oral vitamin B12 can be absorbed passively in the absence of intrinsic factor, suggesting that high oral doses also may be an effective treatment.

Older individuals with gastrointestinal disorders, such as celiac or Crohn's disease, or those who have had gastrointestinal surgery, may also be at risk of vitamin B12 deficiency. The Institute of Medicine recommends that adults older than 50 obtain most of their vitamin B12 from vitamin supplements or fortified foods, though some elderly patients with atrophic gastritis require doses much higher than the RDA to avoid subclinical deficiency. Vitamin B12 injections in patients with pain who weren't B12 deficient resulted in reduced pain scores and less analgesic use in both active treatment arms of a double-blinded, placebo-controlled crossover trial.3

Magnesium is an abundant mineral in the body and naturally present in many foods, but older adults have lower intakes, and magnesium absorption from the gut decreases while renal magnesium increases with age. In addition, some medications (including bisphosphonates, antibiotics, diuretics, and protein pump inhibitors) can alter magnesium status, which can further decrease risk of magnesium depletion.22

Magnesium deficiency is related to factors that promote migraine headaches, including neurotransmitter release and vasoconstriction. Although research on the use of magnesium supplements to prevent or reduce symptoms of migraines is limited, the American Academy of Neurology and the American Headache Society concluded that magnesium therapy is "probably effective" for migraine prevention.23 Magnesium also is being studied for its role in neuropathic pain.3

In clinical trials, most authors confirmed that magnesium reduces opioid consumption and alleviates postoperative pain scores while not increasing the risk of side effects after opioids.4 Nuts, legumes, spinach, and cereals are all good sources of magnesium in the diet that help meet the RDA for older adults; men need 420 mg per day, and women need 320 mg per day.

Water is an essential nutrient and indispensable as a universal solvent for all physiological processes and biochemical reactions. The aging process alters important

physiological control systems associated with thirst and satiety, as sensitivity of thirst receptors declines with age. Thus, dehydration is a common problem for older adults. Hydration status is significantly correlated with pain, although it's unclear whether the mechanism of action involves a cerebrovascular response or an increase in blood cortisol concentration.24 Regardless, adequate water intake for the elderly is particularly important in the presence of chronic pain.

Management of Chronic Pain: A Food Pyramid

Given the anti-inflammatory properties of many food constituents and the fact that lower markers of inflammation and oxidative stress correspond with lower chronic pain, a recent research review evaluated existing evidence to determine whether there was an optimal diet therapy for the management of chronic pain.4 Results from an analysis of 172 scientific papers led study authors to design a hypothetical nutritional pyramid to serve as an integrative tool in the treatment of chronic pain as well as to help other researchers focus on the often-ignored possible connections between nutrition and chronic pain. The eating pattern described in this pyramid recommended for chronic pain is very similar to the Mediterranean diet. The base of the pyramid recommends 1.5 to 2 L of water daily. From there, foods are recommended in descending order of priority and inclusion: vegetables and fruits, nutrient-dense carbohydrates and whole grains, EVOO, red wine, yogurt, spices, seeds and nuts, legumes, fish, eggs, fresh cheese, poultry, red or processed meat, and sweets, along with daily nutritional supplements of vitamins B12 and D and omega-3.

Drug–Nutrient Interactions and the Microbiome

NSAIDs may contribute to nutritional deficiencies from intestinal malabsorption and disruption of the microbiome, the masses of microorganisms that inhabit the body and outnumber an individual's human cells by 10:1.3 The balance of microorganisms may influence health or disease by affecting the absorption of nutrients, causing or preventing excessive gut permeability, affecting the function of the immune system, and stimulating unhealthy fermentation within the gut. They also may be responsible for

some forms of abdominal pain. The microbiome is also adversely affected by processed foods and many other drugs commonly used in physical medicine and rheumatology practices, such as protein pump inhibitors, antibiotics, steroids, and hormones. Consuming yogurt daily can help prevent the alteration of the microbiotaby opioid therapy as well as counteract the inflammatory state that characterizes chronic pain patients.4

Diet and Nutrition in Patient Evaluation

Nutrition is an important element of health in the older population and can affect the aging process. Older adults often have reduced appetite and energy expenditure, which, coupled with a decline in biological and physiological functions such as reduced lean body mass, changes in cytokine and hormonal levels, and changes in fluid electrolyte regulations, delay gastric emptying and diminish senses of smell and taste.25 Across the health continuum, a Mediterranean-type diet—deemed the 2019 diet of the year by ***U.S. News & World Report***—appears to have the most benefits.26 Thus, implementing the Mediterranean diet as MNT in the management of chronic pain in older adults can be only beneficial. In addition, a good-quality daily multivitamin and one or a few other individual nutritional supplements may be indicated.

The vast majority of injections done for the diagnosis or treatment of chronic pain are performed on an outpatient basis. Some are performed on inpatients, who may be already hospitalized for other reasons. All of them may be performed under fluoroscopic (x-ray) guidance but are sometime performed in the office without x-ray. For any nerve block, you need to tell your doctor if you are allergic to contrast dye or if you think you may be pregnant. Below is a brief description of some of the more commonly performed nerve blocks by pain management specialists.

- **Epidural Steroid injection**: Epidural steroid injection is an injection performed in the back or neck in an attempt to place some anti-inflammatory steroid with or without a local anesthetic into the epidural space close to the inflamed area that is causing the pain. These injections are generally done for pain involving the back and leg or the

neck and arm/hand. They may be done under x-ray guidance. Common side effects include soreness of the back or neck at the point where the needle enters the skin, there may be some temporary numbness in the involved extremity but persistent numbness or weakness (lasting over 8 hours) should be reported to your doctor. Epidural steroid injections may be placed in the lumbar (low back), thoracic (mid back), or cervical (neck) regions.

- **Facet Joint Injection**: The facet joints assist with movement of the spine both in the neck and back. Injection into these joints can provide relief of neck and back pain; these injections are always performed under x-ray guidance. Common side effects include soreness in the neck or back when the needle was inserted. You will be on your stomach for this injection if it is done for back pain; however you may either be on your stomach or back if the injection is performed for neck pain, depending on the preference of the physician. A needle is placed in your neck or back and advanced to the level of the joint under x-ray visualization. Contrast dye is used if the needle is put within the joint, and sometimes used if the injection is designed to numb the nerves to the joint. This block is often a diagnostic block and a more long lasting injection may be indicated if you have significant pain relief from this injection.
- **Lumbar Sympathetic Block**: A lumbar sympathetic nerve block is performed for pain in the leg that is thought to be caused by complex regional pain syndrome type I (or CRPS I). These injections are often performed under fluoroscopic (x-ray) guidance. Local anesthetic is placed near to the lumbar sympathetic chain in order to relieve the pain. Your leg will likely become warm immediately following the injection: this is an expected effect and not a complication. Back soreness is one of the more common side effects. If you feel any sharp pains down your leg or to your groin during the injection, you should let the physician know immediately. There may be some temporary numbness following the injection but if there is persistent numbness or weakness (> 8 hours) the doctor should be notified. You will be lying on your stomach for this injection. The injection is done from the back, in the lower aspect of the back. A needle is placed, often under x-ray guidance, to a spot just to the side and approaching the front part of the spine where the ganglion is located. If it is done under x-ray, a small amount of dye is injected to make sure the needle is in

the right spot. After the doctor is satisfied that the contrast dye is in the right place, they will inject numbing medicine then remove the needle.

- **Celiac Plexus Block**: A celiac plexus block is generally performed to relieve pain in patients with cancer of the pancreas or other chronic abdominal pains. A needle is placed via your back that deposits numbing medicine to the area of a group of nerves called the celiac plexus. This injection is often performed as a diagnostic injection to see whether a more permanent injection may help with the pain. If it provides significant pain relief then the more long lasting injection may be done. This injection is usually performed under x-ray guidance. You will be lying on your stomach for this injection. The needle is place via the mid back and placed just in front of the spine. Contrast dye is injected to confirm that the needle is in the right spot; followed by some numbing medicine.
- **Stellate Ganglion Block**: A stellate ganglion block is an injection that can be performed for the diagnosis of complex regional pain syndrome of the arm or hand or for treatment of pain to that area. It can also be used to help to improve blood flow to the hand or arm in certain conditions that result in poor circulation of the hand. Side effects may include soreness in the neck where the needle was placed. In some instances the side effects may include droopiness of your eyelid on the side that is injected, along with a temporarily stuffy nose and sometimes temporary difficulty in swallowing. This injection is performed with or without x-ray guidance. You will be lying on your back for this injection with your mouth slightly open. It is very helpful to the doctor if you try not to swallow during the injection. If this injection is performed under x-ray the doctor will first inject a small amount of contrast to confirm the placement of the needle then inject some numbing medicine.

Headache is one of the most common reasons patients seek help from family physicians. The estimated lifetime prevalence of headache is 66%: 14% to 16% for migraine, 46% to 78% for tension-type headache, and 0.1% to 0.3% for cluster headache.[1–3] In Canada, at least 2.6 million adult women and nearly 1 million men experience migraine.[4] About 90% of migraine sufferers report moderate to severe pain, with 75% reporting impaired function and 33% requiring bed rest during an attack.[5] The economic effects of headache are also substantial. It is estimated that headache accounts for 20% of work absences.[6]

Vast quantities of over-the-counter medications are taken for headache disorders, and treatment is often suboptimal.[1,7] Although most migraine sufferers use acute treatment to relieve their headaches, a substantial number of people who might benefit from prophylactic therapy do not receive it—more than 1 in 4 migraineurs are candidates for preventive therapy.[5,8]

Better information and education for patients and health professionals is essential to improving management of headache in primary care, which should lead to prompt diagnosis and more effective treatment.[9] To help address this, a consortium of organizations and clinicians from Alberta developed the *Guideline for Primary Care Management of Headache in Adults.*[10]

Go to:

Scope

The Alberta guideline is intended to assist any primary care practitioner responsible for the assessment and management of headaches in adults. The guideline's main focus is primary headache disorders (eg, migraine, tension-type, and cluster headache) and medication-overuse headache. Some advice is also provided for the diagnosis and investigation of secondary headache disorders and the management of cervicogenic headache and temporomandibular joint disorder. The guideline will be helpful to a range of primary health care professionals, including family physicians, physical therapists, occupational therapists, nurses, nurse practitioners, pharmacists, psychologists, and chiropractors.

Go to:

Development

Leadership

The lead organizations involved in developing the guideline were Toward Optimized Practice (TOP), which develops and disseminates primary care guidelines in Alberta, and the Institute of Health Economics (IHE). Three multidisciplinary committees were formed to coordinate guideline production.

- The Steering Committee provided operational oversight.
- The Guideline Development Group (GDG) formulated the recommendations and comprised 9 family physicians, 2 neurologists, an osteopathic physician, a chiropractor, 2 physical therapists, an occupational therapist, a nurse, a pharmacist, 2 psychologists, and a health technology assessment specialist.
- The Advisory Committee advised the Steering Committee on strategic matters and included representatives from the Alberta College of Family Physicians, the Alberta College of Physicians and Surgeons, Alberta Health Services, Alberta Health, the Pain Society of Alberta, and a chronic pain patient advocacy group, as well as experts in guideline development and dissemination.

A research team of health technology assessment researchers with methodologic expertise from the IHE assisted the Steering Committee and GDG.[11]

Literature review

The Alberta guideline was developed using a guideline adaptation process, which takes advantage of existing high-quality guidelines and allows guideline developers to modify the recommendations from these seed guidelines to meet the needs of the local health care setting.[12] Guideline adaptation is a popular alternative to de novo guideline development owing to the need to reduce duplication and constrain costs in the creation of evidence-informed guidelines.[13–15]

The research team collaborated with experienced medical librarians to systematically search for existing clinical practice guidelines (CPGs) published between January 2000 and May 2011. The search identified 64 guidelines, 18 of which were deemed relevant after application of specific selection criteria developed by the research team and content experts from the GDG.[11] The quality of the guidelines was appraised independently by 2 reviewers (C.M. and N.A.S.) using the AGREE (Appraisal of Guidelines for Research and Evaluation) instrument,[16,17] which was modified to reduce the subjectivity of the item scoring and to enable the differentiation of good- from poor-quality guidelines.[18] Although an updated AGREE tool was published in May 2009,[19,20] the research team elected to use the original instrument in order to maintain consistency with previous guidelines produced by TOP and the IHE. Of the 18 potentially eligible guidelines, 6 were scored as good quality and were chosen as seed guidelines.

Two reviewers (C.M. and N.A.S.) extracted the following information into standardized evidence tables: the source of the guideline, the recommendations, the number and types of studies used to create the recommendations (eg, 5 randomized controlled trials), and the strength of the recommendations. A total of 187 recommendations were tabulated. Discordant recommendations were highlighted in the tables.

Practice recommendations

The GDG reviewed the 6 seed guidelines, their companion documents, and the evidence tables during 13 half-day meetings: 1 face-to-face meeting and 12 Web conferences using WebEx (Cisco Systems Inc), which allowed all GDG members to view documents simultaneously and to register their preferences using an online voting system. The 2 GDG cochairs (W.J.B. and P.T.) led all sessions and conducted roundtable discussions for every recommendation to ensure that each GDG member had a voice in the process.

In some cases, the GDG requested additional evidence to resolve uncertainties or disagreements regarding interpretation of the evidence from the seed guidelines or when new interventions were considered that had not been included in the seed guidelines. These “parking lot” requests triggered examination of individual research studies cited by the seed guidelines, as well as additional systematic reviews on headache disorders identified by a supplementary search for literature published between January 2000 and October 2010.[11] The parking lot items were referred for further analysis to ad hoc GDG subcommittees that included one or both cochairs, one IHE researcher, and at least one volunteer from the GDG with expertise in the relevant area. Consensus-based decisions made by the subcommittees were then presented to the GDG for final approval. Occasionally new recommendations were generated from parking lot item discussions. A special GDG subcommittee, which included a neuroradiologist, was created for the diagnostic

imaging recommendations. The 23-month guideline development process resulted in 91 draft recommendations.

Each recommendation in the Alberta guideline came from 1 or more seed guidelines, was based on evidence from systematic reviews or quasi-systematic reviews, or was created by the GDG members, based on their collective professional opinion and an analysis of relevant evidence. The original wording of the recommendations was retained whenever possible, and designations were used (eg, *SR* for systematic review, *CS* for case series) to maintain a link to the evidence cited by the seed guidelines. The principles outlined in the GuideLineImplementability Appraisal tool, which is designed for appraising the implementability of CPGs, were used as a guide when crafting the recommendations.[21],[22] Standardized definitions for the types of recommendations made in the Alberta CPG were constructed from the evidence-rating scales used by the seed guidelines. The recommendations were categorized as *do* when the evidence supported the intervention, *do not do* when the evidence suggested the intervention was ineffective or harmful, or *do not know* when the evidence was equivocal, conflicting, or insufficient.

A series of companion documents were created, adapted, or adopted to support the implementation of the guideline. These included a quick reference algorithm, a summary document, patient education sheets, and practice tools (a medication table, a headache history form, a patient diary, and a video demonstrating physical examination of the neck).[10]

The draft guideline was reviewed by the Advisory Committee, a focus group of primary care physicians, and attendees at 2 Alberta physician conferences. The patient information sheets were reviewed by focus groups of patients and laypeople. The feedback was incorporated into the final documents, which were approved by the GDG in February 2012.

Go to:

Main message

The seed guidelines are listed in Table 1.[23–31] The Alberta guideline's 91 recommendations are organized into 6 sections. The full guideline and accompanying documents are available from the TOP website.[10] The quick reference algorithm* information is provided in Figure 1 and Tables 2 2 to to44.[10] Some general practice points are summarized in **Box 1**.

Box 1.

General practice points for managing primary headache in adults

The following are general practice points for the management of primary headache in adults:

- Rule out secondary headache when diagnosing a primary headache disorder
- Neuroimaging is not indicated in patients with recurrent headache with the clinical features of migraine, normal neurologic examination findings, and no red flags

- Neuroimaging, sinus or cervical spine x-ray scans, and electroencephalograms are not recommended for the routine assessment of patients with headache: history and physical and neurologic examination findings are usually sufficient to make a diagnosis of migraine or tension-type headache
- Migraine is by far the most common headache type in patients seeking help for headache from physicians
- Migraine is historically underdiagnosed and undertreated; many patients with migraine are not diagnosed with migraine when they consult a physician
- Migraine should be considered in patients with recurrent moderate or severe headaches and normal neurologic examination findings
- Patients consulting for bilateral headaches that interfere with their activities are likely to have migraine rather than tension-type headache and might require migraine-specific medication
- Consider a diagnosis of migraine in patients with a previous diagnosis of recurring "sinus" headache
- Medication overuse is considered to be present when patients with migraine or tension-type headache use combination analgesics, opioids, or triptans on ≥ 10 d/mo or acetaminophen or NSAIDs on ≥ 15 d/mo
- Comprehensive migraine therapy includes management of lifestyle factors and triggers, acute and prophylactic medications, and migraine self-management strategies
- A substantial number of people who might benefit from prophylactic therapy do not receive it

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NSAID—nonsteroidal anti-inflammatory drug.

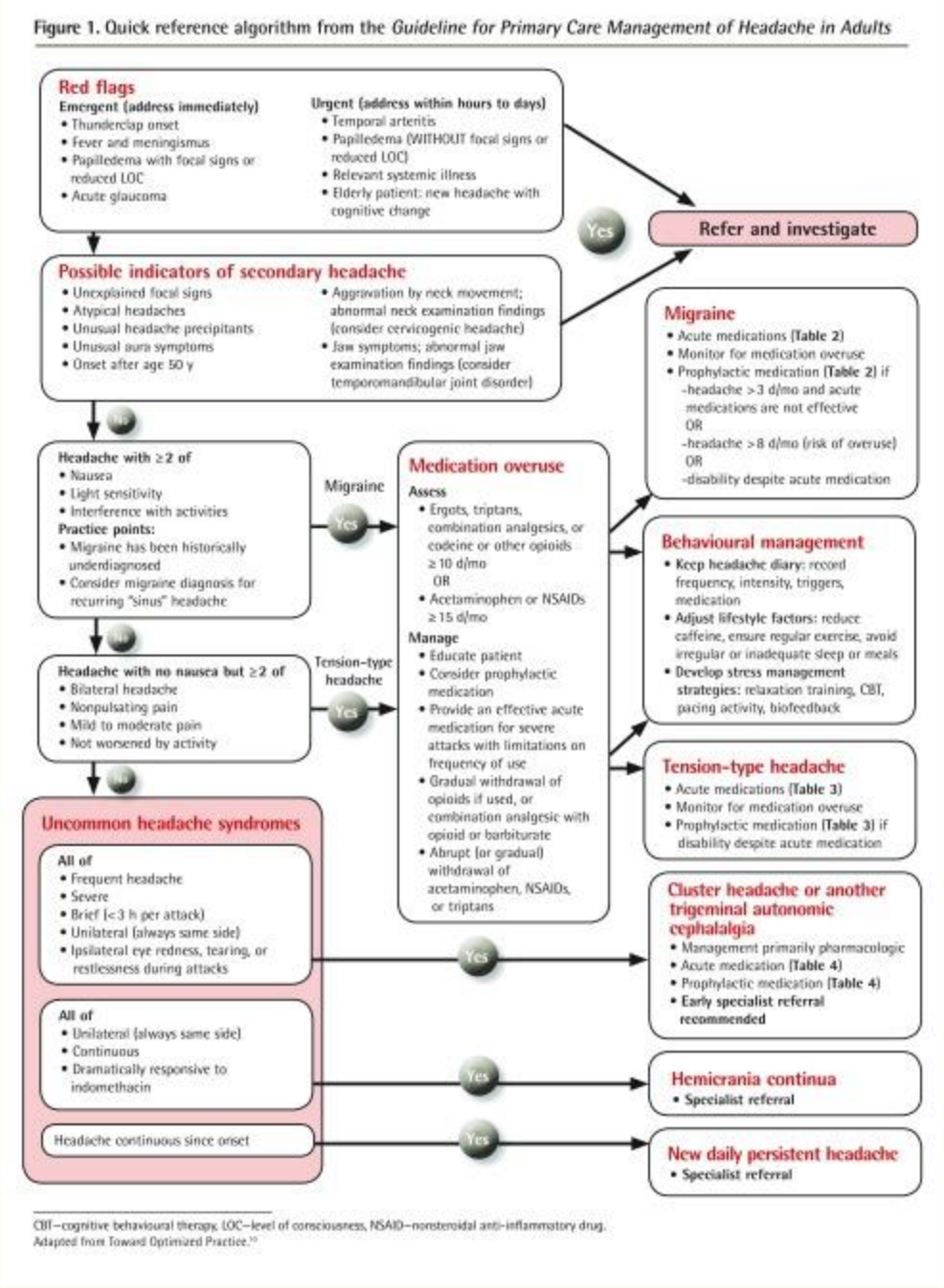

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Figure 1.

Quick reference algorithm from the *Guideline for Primary Care Management of Headache in Adults*

CBT—cognitive behavioural therapy, LOC—level of consciousness, NSAID—nonsteroidal anti-inflammatory drug.

Adapted from Toward Optimized Practice.[10]

Table 1.

US Headache Consortium,[23]–[26] 2000	US: Neuroimaging in patients with nonacute headache[23]; pharmacologic management of acute migraine attacks[24]; pharmacologic prevention of migraine[25]; behavioural and physical treatment of migraine[26]

Table 2.

Migraine medications: *A) Acute migraine medications. B) Prophylactic migraine medications.*

A)

TYPE	ACUTE MEDICATIONS
First line	Ibuprofen 400 mg, ASA 1000 mg, naproxen sodium 500–550 mg, acetaminophen 1000 mg
Second line	Triptans: oral sumatriptan 100 mg, rizatriptan 10 mg, almotriptan 12.5 mg, zolmitriptan 2.5 mg, eletriptan 40 mg, frovatriptan 2.5 mg, naratriptan 2.5 mg • Subcutaneous sumatriptan 6 mg if the patient is vomiting early in the attack. Consider for attacks resistant to oral triptans • Oral wafer: rizatriptan 10 mg or zolmitriptan 2.5 mg if fluid ingestion worsens nausea • Nasal spray: zolmitriptan 5 mg or sumatriptan 20 mg if patient is nauseated

A)

TYPE	ACUTE MEDICATIONS
	Antiemetics: domperidone 10 mg or metoclopramide 10 mg for nausea
Third line	Naproxen sodium 500–550 mg in combination with a triptan
Fourth line	Fixed-dose combination analgesics (with codeine if necessary; not recommended for routine use)

B)

PROPHYLACTIC MEDICATIONS	STARTING DOSE	TITRATION,* DAILY DOSE INCREASE	TARGET DOSE OR THERAPEUTIC RANGE†	NOTES
First line				
• propranolol	20 mg twice daily	40 mg/wk	40–120 mg twice daily	Avoid in asthma

A)

TYPE	ACUTE MEDICATIONS			
• metoprolol	50 mg twice daily	50 mg/wk	50–100 mg twice daily	Avoid in asthma
• nadolol	40 mg/d	20 mg/wk	80–160 mg/d	Avoid in asthma
• amitriptyline	10 mg at bedtime	10 mg/wk	10–100 mg at bedtime	Consider if patient has depression, anxiety, insomnia, or tension-type headache
• nortriptyline	10 mg at bedtime	10 mg/wk	10–100 mg at bedtime	Consider if patient has depression, anxiety, insomnia, or tension-type headache

A)

TYPE	ACUTE MEDICATIONS			
Second line				
• topiramate	25 mg/d	25 mg/wk	50 mg twice daily	Consider as a first-line option if the patient is overweight
• candesartan	8 mg/d	8 mg/wk	16 mg/d	Few side effects; limited experience in prophylaxis
• gabapentin	300 mg/d	300 mg every 3–7 d	1200–1800 mg/d divided into 3 doses	Few drug interactions
Other				

A)

TYPE	ACUTE MEDICATIONS			
• divalproex	250 mg/d	250 mg/wk	750–1500 mg/d divided into 2 doses	Avoid in pregnancy or when pregnancy is possible
• pizotifen	0.5 mg/d	0.5 mg/wk	1–2 mg twice daily	Monitor for somnolence and weight gain
• onabotulinumtoxin A	155–195 units	No titration needed	155–195 units every 3 mo	For chronic migraine only (headache on ≥ 15 d/mo)
• flunarizine	5–10 mg at bedtime	No titration needed	10 mg at bedtime	Avoid in patients with depression

A)

TYPE	ACUTE MEDICATIONS			
• venlafaxine	37.5 mg/d	37.5 mg/wk	150 mg/d	Consider for migraine in patients with depression
Over the counter				
• magnesium citrate	300 mg twice daily	No titration needed	300 mg twice daily	Effectiveness might be limited; few side effects
• riboflavin	400 mg/d	No titration needed	400 mg/d	Effectiveness might be limited; few side effects
• butterbur	75 mg twice daily	No titration needed	75 mg twice daily	Effectiveness might be limited; few side effects

A)

TYPE	ACUTE MEDICATIONS			
• coenzyme Q10	100 mg 3 times daily	No titration needed	100 mg 3 times daily	Effectiveness might be limited; few side effects

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ASA—acetylsalicylic acid.

*Dosage can be increased every 2 wk to avoid side effects. For most drugs, slowly increase to the target dose; a therapeutic trial requires several months. The expected outcome is reduction not elimination of attacks.
†If the target dose is not tolerated, try a lower dose. If the medication is effective and tolerated, continue it for at least 6 mo. If several preventive drugs fail, consider a specialist referral.

Adapted from Toward Optimized Practice.[10]

Table 3.

Medications for tension-type headache

MEDICATION	DOSE
Acute	
Ibuprofen	400 mg
ASA	1000 mg

MEDICATION	DOSE
Naproxen sodium	500–550 mg
Acetaminophen	1000 mg
Prophylactic	
First line	
• amitriptyline	10–100 mg/d
• nortriptyline	10–100 mg/d
Second line	
• mirtazapine	30 mg/d
• venlafaxine	150 mg/d

ASA—acetylsalicylic acid.

Adapted from Toward Optimized Practice.[10]

Table 4.

Medications for cluster headache: *Consider early specialist referral.*

MEDICATION	DOSE
Acute	
Subcutaneous sumatriptan	6 mg
Intranasal zolmitriptan	5 mg
100% oxygen	12 L/min for 15 min through non-rebreathing mask
Prophylactic*	
First line	
• verapamil	240–480 mg/d (higher doses might be required)
Second line	
• lithium	900–1200 mg/d

MEDICATION	DOSE
Other	
• topiramate	100–200 mg/d
• melatonin	Up to 10 mg/d

*If the patient has more than 2 attacks daily, consider transitional therapy while verapamil is built up (eg, 60 mg of prednisone for 5 d, then reduced by 10 mg every 2 d until discontinued).

Adapted from Toward Optimized Practice.[10]

Section 1: headache diagnosis and investigation

Box 2 presents important elements of the history for patients presenting with first-time headache or a change in headache pattern. **Box 3** presents an approach to the physical examination specifically for primary care providers.[29] **Box 4** presents red flags and other potential indicators of secondary headache.[29] Table 5 presents a simplified strategy for diagnosing primary headache disorders.[32],[33]

Box 2.

Important elements of the headache history in patients presenting with headache for the first time or those with a change in headache pattern

Explore the following important elements of the headache history:

- Headache onset (thunderclap, head or neck trauma), previous attacks (progression of symptoms), duration of attacks (< 3 hours, > 4 hours, continuous), days per month with headache
- Pain location (unilateral, bilateral, associated neck pain, etc)
- Headache-associated symptoms (nausea, vomiting, photophobia, conjunctival injection,

rhinorrhea, etc)

- Relationship of headache attacks to precipitating factors (stress, posture, cough, exertion, straining, neck movement, jaw pain, etc)
- Headache severity and effect on work and family activities
- Acute and preventive medications tried, response, and side effects
- Presence of coexistent conditions that might influence treatment choice (insomnia, depression, anxiety, hypertension, asthma, and history of heart disease or stroke)

Based on expert opinion of the Guideline Development Group.

Box 3.

Approach to the physical examination of a patient presenting with headache for the first time or with a change in headache pattern

The physical examination should incorporate the following elements:

- Screening neurologic examination
    - -general assessment of mental status
    - -cranial nerve examination
        - —fundoscopy, pupils, eye movements, visual fields, evaluation of facial movements for asymmetry and weakness
    - -assessment for unilateral limb weakness, reflex asymmetry, and coordination in the arms
    - -assessment of gait, including heel-toe walking (tandem gait)
- Neck examination
    - -posture, range of motion, and palpation for muscle tender points
- Blood pressure measurement
- If indicated by other neurologic symptoms or signs on screening examination, a focused

neurologic examination (eg, lower cranial nerve examination in a patient with dysarthria, or plantar responses in a patient with reflex asymmetry)

- If indicated by associated jaw complaints, an examination for temporomandibular disorders
    - -assessment of jaw opening
    - -palpation of muscles of mastication for tender points

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Based on the Scottish Intercollegiate Guidelines Network guideline[29] and expert opinion of the Guideline Development Group.

Box 4.

Red flags and other potential indicators of secondary headache: *Appropriate referral or investigation should be considered.*

Red flags: emergent (address immediately)

- Thunderclap onset
- Fever and meningismus
- Papilledema with focal signs or reduced level of consciousness
- Acute glaucoma

Red flags: urgent (address within hours to days)

- Temporal arteritis
- Papilledema without focal signs or reduced level of consciousness
- Relevant systemic illness
- Elderly patient: new headache with cognitive change

Other possible indicators of secondary headache (less urgent)

- Unexplained focal signs
- Atypical headaches (not consistent with migraine or tension-type headache)
- Unusual headache precipitants
- Unusual aura symptoms
- Onset after age 50 y
- Aggravation by neck movement; abnormal neck examination findings (consider cervicogenic headache)
- Jaw symptoms; abnormal jaw examination findings (consider temporomandibular joint disorder)

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Based on the Scottish Intercollegiate Guidelines Network guideline[29] and expert opinion of the Guideline Development Group.

Table 5.

Diagnosing primary headache syndromes

DESCRIPTION	HEADACHE SYNDROME

Patients with recurrent headache attacks and normal neurologic examination findings (in some patients other clinical symptoms might also need to be considered)*	• Diagnose migraine without aura (migraine with aura if an aura is present) if they have at least 2 of the following:
	  • -nausea during the attack
	  • -light sensitivity during the attack
	  • -some of the attacks interfere with their activities
	• Diagnose episodic tension-type headache† if headache attacks are not associated with nausea,

DESCRIPTION	HEADACHE SYNDROME
	and have at least 2 of the following: • -bilateral headache • -nonpulsating pain • -mild to moderate intensity • -headache is not worsened by activity • Diagnose cluster headache or another trigeminal autonomic cephalalgia if headache attacks meet all the following criteria: • -frequent • -severe • -brief (duration < 3 h) • -unilateral • -ipsilateralconjunctival injection, tearing, or restlessness during the attacks (ipsilateral ptosis or miosis might be present on examination). Neurologist referral recommended
Patients with headache on ≥ 15 d/mo for > 3 mo and with normal neurologic examination findings‡	• Diagnose chronic migraine if headaches meet migraine diagnostic criteria (above) or are quickly aborted by migraine-specific medications (triptans or ergots) on ≥ 8 d/mo • -Chronic migraine with medication overuse if the patient uses ergots, triptans, opioids, or combination analgesics on ≥

DESCRIPTION	HEADACHE SYNDROME
	10 d/mo or uses plain acetaminophen or NSAIDs on ≥ 15 d/mo • -Chronic migraine without medication overuse if patients do not have medication overuse as defined above • Diagnose chronic tension-type headache if headaches meet episodic tension-type headache diagnostic criteria (above), except mild nausea might be present
Patients with continuous daily headache for > 3 mo with normal neurologic examination findings[§]	• Diagnose hemicrania continua[‖] (neurologist referral recommended) if the headache • -is strictly unilateral • -is always on the same side of the head (ptosis or miosis might be present on examination) • -responds dramatically to indomethacin • Diagnose new daily persistent headache[‖] if the headache is unremitting since its onset. It is important to consider secondary headaches in these patients. Neurologist referral recommended

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NSAID—nonsteroidal anti-inflammatory drug.

[*]Modified from the International Classification of Headache Disorders[32]; data from Lipton et al[33]; and based on expert opinion of the Guideline Development Group.
[†]If patients do not meet migraine diagnostic criteria.
[‡]Modified from the International Classification of Headache Disorders[32] and based on expert opinion of the Guideline Development Group.

[§]Modified from the International Classification of Headache Disorders[32] and based on expert opinion of the Guideline Development Group.
[‖]This less common headache syndrome should be considered in patients with continuous headache.

Section 2: migraine

A comprehensive approach to migraine management is summarized in **Box 5**. Section 2 of the guideline contains recommendations for lifestyle management, acute treatment, prophylaxis, menstrual migraine, and migraine treatment during pregnancy. The full guideline provides a detailed medication table for migraine that includes available formulations, usual doses, relative and absolute contraindications, and adverse events. **Boxes 6** and **7** show the indications and considerations for prescribing prophylactic drugs for migraine.[28],[29] Recommended medications are outlined in Table 2.[10]

Box 5.

Comprehensive migraine management

Consider the following when managing patients with migraine:

- Pay attention to lifestyle and specific migraine triggers in order to reduce the frequency of attacks. Lifestyle factors to avoid include the following:
    - -irregular or skipped meals
    - -irregular or too little sleep
    - -a stressful lifestyle
    - -excessive caffeine consumption
    - -lack of exercise
    - -obesity
- Use acute pharmacologic therapy for individual attacks
- Use prophylactic pharmacologic therapy, when indicated, to reduce attack frequency
- Use nonpharmacologic therapies
- Evaluate and treat coexistent medical and psychiatric disorders

- Encourage patients to participate actively in their treatment and to employ self-management principles:
    - -self-monitoring to identify factors influencing migraine
    - -managing migraine triggers effectively
    - -pacing activity to avoid triggering or exacerbating migraine
    - -maintaining a lifestyle that does not worsen migraine
    - -practising relaxation techniques
    - -maintaining good sleep hygiene
    - -developing stress management skills
    - -using cognitive restructuring to avoid catastrophic or negative thinking
    - -improving communication skills to talk effectively about pain with family and others
    - -using acute and prophylactic medication appropriately

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Based on expert opinion of the Guideline Development Group.

Box 6.

Pharmacologic prophylaxis for migraine

Prophylactic medication is indicated in the following circumstances:

- Recurrent migraine attacks are causing considerable disability despite optimal acute drug therapy
- Frequency of acute medication use is approaching levels that place the patient at risk of medication-overuse headache
    - -acute medications are used on ≥ 10 d/mo for triptans, ergots, opioids, and combination analgesics

- -acute medications are used on ≥ 15 d/mo for acetaminophen and NSAIDs

- Recurrent attacks with prolonged aura are occurring (hemiplegic migraine, basilar-type migraine, etc)

- Contraindications to acute migraine medications are making symptomatic treatment of migraine attacks difficult

NSAID—nonsteroidal anti-inflammatory drug.

Based on expert opinion of the Guideline Development Group.

Box 7.

Pharmacologic prophylaxis for migraine

Consider the following when prescribing prophylactic medication:

- Educate patients on the need to take the medication daily and according to the prescribed frequency and dosage

- Ensure that patients have realistic expectations as to what the likely benefits of pharmacologic prophylaxis will be:

    - -Headache attacks will likely not be abolished completely

    - -A reduction in headache frequency of 50% is usually considered worthwhile and successful

    - -It might take 4–8 wk for substantial benefit to occur

    - -If the prophylactic drug provides substantial benefit in the first 2 mo of therapy, this benefit might increase further over several additional months of therapy

- Evaluate the effectiveness of therapy using patient diaries that record headache frequency, drug use, and disability levels

- For most prophylactic drugs, initiate therapy with a low dose and increase the dosage gradually to minimize side effects

- Increase the dose until the drug proves effective, until doselimiting side effects occur, or

until a target dose is reached

- Provide an adequate drug trial. Unless side effects mandate discontinuation, continue the prophylactic drug for at least 6–8 wk after dose titration is completed
- Because migraine attack tendency fluctuates over time, consider gradual discontinuation of the drug for many patients after 6 to 12 mo of successful prophylactic therapy, but preventive medications can be continued for much longer in patients who have experienced substantial migraine-related disability

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Based on Géraud et al[28] and the Scottish Intercollegiate Guidelines Network guidelines.[29]

Section 3: tension-type headache

This section contains recommendations on lifestyle, acute and prophylactic drug therapy, and management of tension-type headache during pregnancy. Recommended medications are outlined in Table 3.[10]

Section 4: medication-overuse headache

Migraine sufferers are particularly prone to developing medication-overuse headache. Recommendations for diagnosis and management of medication-overuse headache are shown in **Boxes 8** and **9**.[29]

Box 8.

Diagnosis of medication-overuse headache

Consider the following in the diagnosis of medication-overuse headache:

- Consider a diagnosis of medication overuse headache in patients with headache on ≥ 15 d/mo and assess patients for possible medication overuse (use of triptans, ergots, combination analgesics, or opioid-containing medications on ≥ 10 d/mo, or use of acetaminophen or NSAIDs on ≥ 15 d/mo)
- When medication-overuse headache is suspected, the patient should also be evaluated for the presence of the following:
    - -psychiatric comorbidities (depression and anxiety); these might need to be

considered in planning an overall treatment strategy

- -psychological and physical drug dependence
- -use of inappropriate coping strategies. Rather than relying on medication as a main coping strategy, patients with suspected medication overuse might benefit from training in and development of more adaptive self-management strategies (eg, identification and management of controllable headache triggers, relaxation exercises, effective stress management skills, and activity pacing)

- Headache diaries that record acute medication intake are important in the prevention and treatment of medication-overuse headache

NSAID—nonsteroidal anti-inflammatory drug.

Based on the Scottish Intercollegiate Guidelines Network guideline[29] and expert opinion of the Guideline Development Group.

Box 9.

Management of medication-overuse headache

Treatment plans for patients with medication-overuse headache should include the following:

- Patient education. Patients need to understand that
  - -acute medication overuse can increase headache frequency
  - -when medication overuse is stopped, headache might worsen temporarily and other withdrawal symptoms might occur
  - -many patients will experience a long-term reduction in headache frequency after medication overuse is stopped
  - -prophylactic medications might become more effective
- A strategy for cessation of medication overuse
  - -abrupt withdrawal should be advised for patients with suspected medication-overuse headache caused by simple analgesics (acetaminophen, NSAIDs) or

triptans; however, gradual withdrawal is also an option

    - -gradual withdrawal should be advised for patients with suspected medication-overuse headache caused by opioids and opioid-containing analgesics

- Provision of a prophylactic medication while medication overuse is stopped. While many prophylactic agents are used (tricyclics, β-blockers, etc), drugs with the best evidence for efficacy in chronic migraine with medication overuse are

    - -onabotulinumtoxinA, 155 units to 195 units injected at intervals of 3 mo by clinicians experienced in its use for headache

    - -topiramate with slow titration to a target dose of 100 mg/d

- A strategy for the treatment of remaining severe headache attacks with limitations on frequency of use (eg, a triptan for patients with analgesic overuse, dihydroergotamine for patients with triptan overuse, etc)

- Patient follow-up and support

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NSAID—nonsteroidal anti-inflammatory drug.

Based on the Scottish Intercollegiate Guidelines Network guideline[29] and expert opinion of the Guideline Development Group.

Section 5: cluster headache

Cluster headache is managed with a number of pharmacologic therapies. These can be initiated and monitored in primary care, but early specialist referral is recommended because this headache type is uncommon, disabling, and challenging to manage. Recommended medications are outlined in Table 4.[10]

Section 6: other headache disorders

This section of the guideline focuses on hemicrania continua, cervicogenic headache, and headache secondary to temporomandibular joint disorders. Treatment of these conditions will likely involve referral to an appropriately trained therapist or specialist.

Go to:

Implementation and update plans

The guideline has been disseminated through presentations and workshops at provincial, regional, and national conferences. It is also listed in the CMA Infobase,[34] where it was among

the 10 most downloaded guidelines for nearly 6 months. It also appears on the Michael G. DeGroote National Pain Centre website[35] and is listed by the US National Guideline Clearing House.[36] A pilot project is under way at the University of Calgary in Alberta to present the headache guideline using interactive webinars.

The evidence base for the Alberta CPG will be assessed annually and will be updated when new evidence is found that changes the recommendations.

Go to:

Limitations

The guideline adaptation process precluded an in-depth analysis of the validity or a formal assessment of the strength and quality of the underlying empirical evidence, which made categorizing the strength and type of recommendations problematic. To counter this problem, standardized definitions were constructed for the types of recommendations made in the Alberta CPG (eg, what constituted a *do* or *do not do* recommendation) from the overlapping evidence-rating scales used by the seed guidelines, and designations were used (eg, *SR* for systematic review) to maintain a link to the evidence type referenced by the seed guidelines in support of their recommendations.[10,11]

The lack of high-quality scientific evidence for headache investigations, diagnosis, red flags, and specialist referral meant that many recommendations in these areas relied on the opinions of the GDG or the experts who developed the seed guidelines. However, these issues were overcome by using credible seed guidelines, scrupulously listing the evidence type and source for all recommendations, and clearly documenting the subjective contextualization process.

Adaptation processes are limited by the time lag between the publication of primary studies and their incorporation into guidelines, which means that recently published evidence was not necessarily incorporated into the Alberta CPG and that not all of the treatment options available were covered by the seed guidelines. To help offset this, the research team updated searches regularly throughout the Alberta guideline adaptation process.

There was debate among the GDG members about incorporating newly emerging headache treatments that were not identified in the seed guidelines. A conservative approach was adopted whereby a recommendation for an emerging intervention was created only if it had been assessed in a systematic review.

None of the seed guidelines included formal economic evaluations or cost analyses, nor did they discuss the economic implications of their recommendations. Owing to time and resource constraints, a formal cost analysis or economic evaluation of the effect of the Alberta CPG was not conducted. However, any statements on economic aspects made by the seed guidelines were noted in the accompanying background document.[11]

Go to:

Conclusion

The format and brevity of the *Guideline for Primary Care Management of Headache in Adults* reflects its intent—to provide Canadian primary care providers across multiple disciplines

with a comprehensive suite of resources for assessing and managing headaches in adults. A guideline summary and algorithm, as well as practice tools and patient information sheets, are provided to support comprehensive headache management that emphasizes patient engagement and self-management, as well as evidence-informed interventions.

Most persons will experience acute low back pain during their lifetime. The first episode usually occurs between 20 and 40 years of age. For many, acute low back pain is the first reason to seek medical care as an adult. Pain can be moderate to severe and debilitating, causing anxiety. Many cases are self-limited and resolve with little intervention.

However, 31 percent of persons with low back pain will not fully recover within six months,1 although most will improve. Recurrent back pain occurs in 25 to 62 percent of patients within one to two years, with up to 33 percent having moderate pain and 15 percent having severe pain.2-4 Acute low back pain can be defined as six to 12 weeks of pain between the costal angles and gluteal folds that may radiate down one or both legs (sciatica). Acute low back pain is often nonspecific and therefore cannot be attributed to a definite cause. However, possible causes of acute low back pain (e.g., infection, tumor, osteoporosis, fracture, inflammatory arthritis) need to be considered based on the patient's history and physical examination. Table 1 presents the differential diagnosis of acute low back pain.5,6 The goals of treatment for acute low back pain are to relieve pain, improve function, reduce time away from work, and develop coping strategies through education. Optimizing treatment may minimize the development of chronic pain, which accounts for most of the health care costs related to low back pain.7

History and Physical Examination

An accurate history and physical examination are essential for evaluating acute low Acute low back pain is one of the most common reasons for adults to see a family physician. Although most patients recover quickly with minimal treatment, proper evaluation is imperative to identify rare cases of serious underlying pathology. Certain

red flags should prompt aggressive treatment or referral to a spine specialist, whereas others are less concerning. Serious red flags include significant trauma related to age (i.e., injury related to a fall from a height or motor vehicle crash in a young patient, or from a minor fall or heavy lifting in a patient with osteoporosis or possible osteoporosis), major or progressive motor or sensory deficit, new-onset bowel or bladder incontinence or urinary retention, loss of anal sphincter tone, saddle anesthesia, history of cancer metastatic to bone, and suspected spinal infection. Without clinical signs of serious pathology, diagnostic imaging and laboratory testing often are not required. Although there are numerous treatments for nonspecific acute low back pain, most have little evidence of benefit. Patient education and medications such as nonsteroidal anti-inflammatory drugs, acetaminophen, and muscle relaxants are beneficial. Bed rest should be avoided if possible. Exercises directed by a physical therapist, such as the McKenzie method and spine stabilization exercises, may decrease recurrent pain and need for health care services. Spinal manipulation and chiropractic techniques are no more effective than established medical treatments, and adding them to established treatments does not improve outcomes. No substantial benefit has been shown with oral steroids, acupuncture, massage, traction, lumbar supports, or regular exercise programs. (Am Fam Physician. 2012;85(4):343-350. Copyright © 2012 American Academy of Family Physicians.) ▲ Patient information: Handouts on this topic are available at http:// familydoctor.org/family doctor/en/diseasesconditions/low-back-pain. html and http://www. knowyourback.org/ Documents/acute_lbp.pdf. ILLUSTRATION BY CRAIG ZUCKERMAN Downloaded from the American Family Physician Web site at www.aafp.org/afp. Copyright © 2012 American Academy of Family Physicians. For the private, noncommercial use of one individual user of the Web site. All other rights reserved. Contact copyrights@aafp.org for copyright questions and/or permission requests. Table 1. Differential Diagnosis of Acute Low Back Pain Diagnosis Key clinical clues Intrinsic spine Compression fracture History of trauma (unless osteoporotic), point tenderness at spine level, pain worsens with flexion, and while pulling up from a supine to sitting position and from a sitting to standing position Herniated nucleus pulposus Leg pain is greater than back pain and worsens when

sitting; pain from L1-L3 nerve roots radiates to hip and/or anterior thigh, pain from L4-S1 nerve roots radiates to below the knee Lumbar strain/sprain Diffuse back pain with or without buttock pain, pain worsens with movement and improves with rest Spinal stenosis Leg pain is greater than back pain; pain worsens with standing and walking, and improves with rest or when the spine is flexed; pain may be unilateral (foraminal stenosis) or bilateral (central or bilateral foraminal stenosis) Spondylolisthesis Leg pain is greater than back pain; pain worsens with standing and walking, and improves with rest or when the spine is flexed; pain may be unilateral or bilateral Spondylolysis Can cause back pain in adolescents, although it is unclear whether it causes back pain in adults; pain worsens with spine extension and activity Spondylosis (degenerative disk or facet joint arthropathy) Similar to lumbar strain; disk pain often worsens with flexion activity or sitting, facet pain often worsens with extension activity, standing, or walking Systemic Connective tissue disease Multiple joint arthralgias, fever, weight loss, fatigue, spinous process tenderness, other joint tenderness Inflammatory spondyloarthropathy Intermittent pain at night, morning pain and stiffness, inability to reverse from lumbar lordosis to lumbar flexion Malignancy Pain worsens in prone position, spinous process tenderness, recent weight loss, fatigue Vertebral diskitis/ osteomyelitis Constant pain, spinous process tenderness, often no fever, normal complete blood count, elevated erythrocyte sedimentation rate and/ or C-reactive protein level Referred Abdominal aortic aneurysm Abdominal discomfort, pulsatile abdominal mass Gastrointestinal conditions: pancreatitis, peptic ulcer disease, cholecystitis Abdominal discomfort, nausea\vomiting, symptoms often associated with eating Herpes zoster Unilateral dermatomal pain, often allodynia, vesicular rash Pelvic conditions: endometriosis, pelvic inflammatory disease, prostatitis Discomfort in lower abdomen, pelvis, or hip Retroperitoneal conditions: renal colic, pyelonephritis Costovertebral angle pain, abnormal urinalysis results, possible fever Information from references 5 and 6. Acute Low Back Pain February 15, 2012 ◆Volume 85, Number 4 www.aafp.org/afp American Family Physician 345 back pain. Often, patients awaken with morning pain or develop pain after minor forward bending, twisting, or lifting. It is also important to note whether it is a first episode or a recurrent episode. Recurrent episodes usually are more painful with increased symptoms. Red flags are often used to distinguish a common, benign

episode from a more significant problem that requires urgent workup and treatment (Table 2). 5,6,8 A recent study shows that some red flags are more important than others, and that red flags overall are poor at ruling in more serious causes of low back pain.8 Patients with back pain in the primary care setting (80 percent) tend to have one or more red flags, but rarely have a serious condition.8 However, physicians should be aware of the signs and symptoms of caudaequina syndrome, major intra-abdominal pathology, infections, malignancy, and fractures (Tables 15,6 and 25,6,8). Caudaequina syndrome and infections require immediate referral. Family physicians should rely on a comprehensive clinical approach rather than solely on a checklist of red flags. Pain from spine structures, such as musculature, ligaments, facet joints, and disks, can refer to the thigh region, but rarely to areas below the knee. Pain related to the sacroiliac joint often refers to the thigh, but can also radiate below the knee. Irritation, impingement, or compression of the lumbar root often results in more leg pain than back pain. Pain from the L1-L3 nerve roots will radiate to the hip and/or thigh, whereas pain from the L4-S1 nerve roots will radiate below the knee. Neurologic examination of the lower extremities includes strength, sensation, and Acute low back pain is often nonspecific and therefore cannot be attributed to a definite cause. Table 2. Red Flags for Serious Etiologies of Acute Low Back Pain Possible etiology History findings Physical examination findings Cancer Strong: Cancer metastatic to bone Intermediate: Unexplained weight loss Weak: Cancer, pain increased or unrelieved by rest Weak: Vertebral tenderness, limited spine range of motion Caudaequina syndrome Strong: Bladder or bowel incontinence, urinary retention, progressive motor or sensory loss Strong: Major motor weakness or sensory deficit, loss of anal sphincter tone, saddle anesthesia Weak: Limited spine range of motion Fracture Strong: Significant trauma related to age* Intermediate: Prolonged use of steroids Weak: Age older than 70 years, history of osteoporosis Weak: Vertebral tenderness, limited spine range of motion Infection Strong: Severe pain and lumbar spine surgery within the past year Intermediate: Intravenous drug use, immunosuppression, severe pain and distant lumbar spine surgery Weak: Pain increased or unrelieved by rest Strong: Fever, urinary tract infection, wound in spine region Weak: Vertebral tenderness, limited spine range of motion NOTE: Presence of one or two weak or intermediate red flags may warrant observation because few

patients will be significantly harmed if diagnosis of a serious cause is delayed for four to six weeks. Presence of any strong red flag warrants more urgent workup and probable referral to a spine subspecialist. *—Fall from a height or motor vehicle crash in a young patient, minor fall or heavy lifting in a patient with osteoporosis or possible osteoporosis. Information from references 5, 6, and 8. Acute Low Back Pain 346 American Family Physician www.aafp.org/afp Volume 85, Number 4 ◆February 15, 2012 reflex testing (Table 3), even in the absence of significant sciatica. A straight leg raise test is positive for L4-S1 nerve root pain if it radiates below the knee. A reverse straight leg raise test (extending hip and flexing knee while in the prone position) is positive for L3 nerve root pain if it radiates into the anterior thigh. A central, paracentral, or lateral disk herniation may affect different nerve roots at the same level. Examination of the lumbosacral, pelvic, and abdominal regions may provide clues to underlying abnormalities relating to back pain (Table 15,6 and 25,6,8).

Diagnostic Workup

Imaging is not warranted for most patients with acute low back pain. Without signs and symptoms indicating a serious underlying condition, imaging does not improve clinical outcomes in these patients.9-11 Even with a few weaker red flags, four to six weeks of treatment is appropriate before consideration of imaging studies.8-10 If a serious condition is suspected, magnetic resonance imaging (MRI) is usually most appropriate. Computed tomography is an alternative if MRI is contraindicated or unavailable.10 Clinical correlation of MRI or computed tomography findings is essential because the likelihood of false-positive results increases with age.12-14 Radiography may be helpful to screen for serious conditions, but usually has little diagnostic value because of its low sensitivity and specificity.10 Laboratory tests such as complete blood count with differential, erythrocyte sedimentation rate, and C-reactive protein level may be beneficial if infection or bone marrow neoplasm is suspected. These tests may be most sensitive in cases of spinal infection because lack of fever and a normal complete blood count are common in patients with spinal infection.15 Because laboratory testing

lacks specificity, MRI with and without contrast media and, in many cases, biopsy are essential for accurate diagnosis.15

Treatment of Nonspecific Pain

Many treatments are available for acute low back pain, but strong evidence for their benefit is lacking. Based on the evidence, a reasonable approach to treatment is described in Table 4.

RECOMMENDED

Medications:Nonsteroidal anti-inflammatory drugs (NSAIDs) are often first-line therapy for low back pain. Low-quality evidence suggests that they are effective for short-term symptom relief, compared Table 3. Neurologic Examination Findings in Patients with Acute Low Back Pain Affected nerve root Motor deficit Sensory deficit Reflex Disk herniation Central Paracentral Lateral L3 Hip flexion Anterior/medial thigh Patella Above L2-L3 L2-L3 L3-L4 L4 Knee extension Anterior leg/medial foot Patella Above L3-L4 L3-L4 L4-L5 L5 Dorsiflexion\great toe Lateral leg/dorsal foot Medial hamstring Above L4-L5 L4-L5 L5-S1 S1 Plantar flexion Posterior leg/lateral foot Achilles tendon Above L5-S1 L5-S1 None Table 4. Approach to the Treatment of Nonspecific Acute Low Back Pain First visit Patient education Reassure the patient that the prognosis is often good, with most cases resolving with little intervention Advise the patient to stay active, avoiding bed rest as much as possible, and to return to normal activities as soon as possible Advise the patient to avoid twisting and bending Initiate trial of a nonsteroidal anti-inflammatory drug or acetaminophen Consider a muscle relaxant based on pain severity Consider a short course of opioid therapy if pain is severe Consider referral for physical therapy (McKenzie method and/or spine stabilization) if it is not the first episode Second visit* Consider changing to a different nonsteroidal anti-inflammatory drug Consider referral for physical therapy (McKenzie method and/or spine stabilization) if not done at initial visit Consider referral to a spine subspecialist if pain is severe or limits function *—Two to four weeks after the initial visit, if the patient has not significantly improved. Acute Low Back Pain February 15,

 with placebo.16 No patient characteristics at baseline can predict the success of NSAID therapy.17 Moderate evidence suggests that no one NSAID is superior, and switching to a different NSAID may be considered if the first is ineffective. Whether NSAIDs are more effective than acetaminophen is unknown, but the addition of an NSAID to acetaminophen therapy is no more beneficial than acetaminophen alone.16,18 Moderate-quality evidence shows that nonbenzodiazepine muscle relaxants (e.g., cyclobenzaprine [Flexeril], tizanidine [Zanaflex], metaxalone [Skelaxin]) are beneficial in the treatment of acute low back pain. Most pain reduction from these medications occurs in the first seven to 14 days, but the benefit may continue for up to four weeks.19,20 However, nonbenzodiazepine muscle relaxants do not affect disability status.19,20 Very low-quality evidence shows that a short course (up to five days) of oral diazepam (Valium) may also be beneficial for pain relief.19 Because all muscle relaxants have adverse effects, such as drowsiness, dizziness, and nausea, they should be used cautiously. Diazepam and carisoprodol (Soma) use should be brief to decrease the risk of abuse and dependence. There is also moderate-quality evidence that muscle relaxants combined with NSAIDs may have additive benefit for reducing pain.19 Opioids are commonly prescribed for patients with severe acute low back pain; however, there is little evidence of benefit. Three studies showed no difference in pain relief or time to return to work between oral opioids and NSAIDs or acetaminophen, and there is risk of harmful dose escalation over time with opioids, especially with purer formulations.16,21 Although epidural steroid injections are not beneficial for isolated acute low back pain, they may be helpful for radicular pain that does not respond to two to six weeks of noninvasive treatment. Transforaminal injections appear to have more favorable short- and long-term benefit than traditional interlaminar injections.22 Patient Education. Patient education involves a discussion of the often benign nature of acute back pain and reassurance that most patients need little intervention for significant improvement. Patients should be advised to stay as active as possible, within pain limits; to avoid twisting and bending, particularly when lifting; and to return to normal activities as soon as possible. The goal is to reduce worry about back pain and to teach ways to avoid worsening of pain or pain recurrence. High-quality evidence shows that individual

patient education of greater than two hours is more effective than no education or less-intense education for pain that persists for four weeks or more.23 Moderatequality evidence shows that less-intense individual education and advice to stay active have small benefits and are at least as effective as other back pain interventions.23,24 It is unclear whether patient education and advice for patients with acute low back pain are cost-effective.25

ACCEPTABLE

Physical Therapy. Physical therapists often recommend the McKenzie method or spine stabilization exercises for the treatment of low back pain. The McKenzie method is described at http://www.mckenziemdt.org/ approach.cfm, and a video demonstration is available at http://www.youtube.com/ watch?v=wBOp-ugJbTQ. The McKenzie method has been shown to be slightly more effective than other common low back pain treatments; however, the difference is not clinically significant,26,27 and evidence on its effect on disability is conflicting.26,27 There also do not appear to be good long-term benefits with the McKenzie method, other than decreased need for health care services.27 Spine stabilization exercises have been shown to decrease pain, disability, and risk of recurrence after a first episode of back pain.28 According to moderate-quality evidence, physical therapist–directed home exercise programs for acute back pain can reduce the rate of recurrence, increase the time between episodes of back pain, and decrease the need for health care services. Therefore, most of these exercise programs are cost-effective treatments for acute low back pain.29-31 Imaging is not warranted for most patients with acute low back pain. Acute Low Back Pain 348 American Family Physician www.aafp.org/afp Volume 85, Number 4 ◆ February 15, 2012 Application of Ice or Heat. Low-quality evidence shows that in the first five days of acute low back pain, the use of heat treatments may be more effective for reducing pain and disability than nonheat wraps, NSAIDs, or acetaminophen, but shows no difference between heat application and McKenzie therapy at seven days.32 A lowquality study found that heat therapy in conjunction with education or NSAIDs is more effective than

education or NSAIDs alone at 14 days.33 Ice and heat therapy have similar analgesic effects.32

UNSUPPORTED

Oral Steroids. A short course of oral corticosteroids has questionable benefit for patients with acute radicular leg pain.34 However, there are no studies to support the use of oral steroids for isolated acute low back pain. Acupuncture. Several low-quality trials show that acupuncture has minimal or no benefit over sham treatment, naproxen (Naprosyn), or the Chinese herbal therapy moxibustion.35,36 Although evidence to support its effectiveness is limited, acupuncture may be cost-effective in patients with pain lasting longer than four weeks.25 Exercise. Aerobic conditioning, strengthening exercises, flexibility exercises, or a combination of these exercises is no more effective than other treatments in patients with acute low back pain.37-39 Lumbar Support. It is unclear whether lumbar support is more effective than no intervention or other treatments for acute low back pain.40 Massage. There is insufficient evidence to recommend for or against massage therapy for acute low back pain.41,26 It is unlikely to be cost-effective.25 Spinal Manipulation and Chiropractic Techniques. Low-quality evidence shows that spinal manipulation may be more effective than sham treatments in the short-term reduction of pain (less than six weeks), but no more effective in reducing disability.18,20,42,43 There is little evidence that manipulation is costeffective for treating acute low back pain.25 Although chiropractic techniques are considered safe if performed by a well-trained chiropractor, a systematic review found that SORT: KEY RECOMMENDATIONS FOR PRACTICE Clinical recommendation Evidence rating References Red flags are common in patients with acute low back pain and do not necessarily indicate serious pathology; therefore, physicians should rely on a comprehensive clinical approach to evaluating red flags in these patients. C 5, 6, 8 Without findings suggestive of serious pathology, imaging is not indicated in patients with acute low back pain. C 8-11 Nonsteroidal anti-inflammatory drugs, acetaminophen, and muscle relaxants are effective treatments for nonspecific acute low back pain. A 16-20 Patient education that includes advice to stay active, avoid aggravating movements,

and return to normal activity as soon as possible and a discussion of the often benign nature of acute low back pain is effective in patients with nonspecific pain. B 23, 24 Although regular exercises may not be beneficial in the treatment of nonspecific acute low back pain, physical therapy (McKenzie method and spine stabilization) may lessen the risk of recurrence and need for health care services. B 26-31, 37-39 Spinal manipulation and chiropractic techniques are no more beneficial than established treatments for nonspecific acute low back pain, and their addition to established treatments does not improve outcomes. B 18, 20, 25, 42-44 Bed rest is not helpful for nonspecific acute low back pain. A 46 A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, diseaseoriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to http://www.aafp. org/afpsort.xml. Acute Low Back Pain February 15, 2012 ◆Volume 85, Number 4 www.aafp.org/afp American Family Physician 349 these techniques (e.g., manipulation, temperature modalities, exercises, mechanical devices, patient education) provide no clinically relevant improvement in pain or disability compared with other treatments.44 Traction. High-quality trials show no evidence of benefit with traction, as a single treatment or in combination with other treatments, in patients with acute or chronic back pain.45 There are no studies on acute low back pain alone.

INADVISABLE

Bed Rest. Bed rest should not be recommended for patients with nonspecific acute low back pain. Moderate-quality evidence suggests that bed rest is less effective at reducing pain and improving function at three to 12 weeks than advice to stay active.46 Prolonged bed rest can also cause adverse effects such as joint stiffness, muscle wasting, loss of bone mineral density, pressure ulcers, and venous thromboembolism

Introduction

Pain is generally the symptom that brings a person to a healthcare practitioner looking for relief. As informed by the American Pain Society, 45% of the American population seeks medical attention for chronic pain.1 Because complaints of pain are so varied, non-specific or diverse,2 what may be tolerable at one instance suddenly becomes unbearable to the same person in another circumstance. The exact same injury to two different persons has totally different responses. This is not easily explained as the nervous system, that is chiefly responsible for pain perception and awareness. The nervous system is connected to other systems and organs in an intricate network and the pain transmission methods are equally complex. There is constant mediation of higher centres that make it even more challenging to figure out.3

Physiotherapists attempt to utilise a combination of strategies to bring pain relief to their patients. They know that pain is not only subjective, but an objective experience.

Physiotherapy Examination Guidelines for Signs and Symptoms

Quite a few individuals with pain are referred for physiotherapy (physical therapy) for an instant cure or have resigned to accepting a lifetime of pain and disability. Often, secondary gains have a larger overlay on the physiology that is causing pain and this may prove to be the most difficult hurdle for the therapist to overcome. However, a thorough examination of the patient is essential to establishing a treatment plan with attainable goals.

Range of motion of the affected and unaffected parts this may be directly impacted due to anatomical insult or maybe impaired due to protective spasm, guarding or faulty positioning. Range of the joint is not limited to the peripheral joints but the therapist also may need to assess the joint mobility of the vertebral body(ies) in the various anatomically available ranges. A working knowledge of the available joint play in each direction for different levels of the spine is essential to determine a decrease in range of motion.

Posture/Gait Deviations Deviations from the typical gait and posture may be a result of pain or may actually cause the pain. Postural deviations should be assessed not only in

the supine or prone position but also in standing and sitting which are the more functional positions that impact the patient's performance.

Pain History and Presentation

This includes observation during and after the evaluation and includes the origin/onset, site, pattern, quality, intensity, radiation, characteristics, contributing and relieving factors, previous treatments and their effectiveness, and other visceral signs and symptoms.

Palpation determining the end-feel at the available movement allows the therapist to estimate the nature of the cause of the pain. Neurological function testing involves assessing tone, reflexes, sensations and coordination.

Orthopaedic testing for stability and mobility of joints and various signs to differentially diagnose the condition/pathology.

Neural tissue tension testing involves a pressure and stretch to determine the glide of the peripheral nerve trunk and assess possible restrictions along its course.

Functional assessment is probably the most important element that a physiotherapist needs to include in a patient's assessment; the impact that pain has on the person's functional abilities can uniquely be addressed by a physiotherapist. The patient's inability or difficulty to perform Activities of Daily Living (ADLs) must be the cornerstone of the patient evaluation. Simple activities such as sit-to-stand may be a problem due to low back pain or inability to dress/undress due to shoulder pain is usually the cause the patient is looking for a physiotherapist's services. Therefore, the functional assessment should be performed in the position that the patient performs the activity in. For example, if the patient reports pain in the low back after standing, an assessment in standing should be performed to understand the impact of gravity in the functional position. Preferably, the pain-causing activity/position should be used to best understand the pathophysiology using a kinesiological framework. A movement analysis

approach may be required to determine inappropriate firing of the muscles that impact the timing of the movement.

Objective Measures of Pain Used in Physiotherapy

Pain memory is not an accurate measure of pain intensity. Researchers have demonstrated that it is worse when it comes to assessing chronic pain.3 Therefore, an objective measurement of pain on an ongoing basis while under the care of the therapist is an integral part of patient care. In addition to the measured intensity, the duration, frequency, location and description of the pain should also become a part of the ongoing assessment. Typically, the therapist will assess these elements to determine the efficacy of the treatment.

Visual Analogue Scale (VAS) is an easily understood concept but it is not found to be reliable. Also, it cannot be used in patients that have cognitive impairments or those that cannot understand an abstract concept such as a linear representation of their pain4.

Simple Descriptive Pain Scale (SDPS) is used for patients that cannot abstractly understand a pain scale. FACES is usually best used with young children and those that are unable to express their pain verbally. "Pain Drawings" may also be used.

Conditions and Treatment

Physical this involves directing the treatment interventions to the physiological and anatomical aspects. Healing the tissue that was damaged due to injury, disuse, etc. is the main focus. This is often the target for relief in acute pain that is due to a very recent injury or recurrent and repetitive physiological stress. Such physical interventions are often passive and the effect may be limited to a short duration.

Cognitive are typically based on suggestions from the clinician that encourage the patient's active participation in the healing process. This is often used in chronic pain patterns that cannot break the cycle of pain à disability/disuseà pain. This must be initiated by the patient as it focusses on addressing the patient's perception of pain and its resulting limitations.

Behavioural changes on part of the patient are probably the most effective methods to bring about long term pain relief. Exercises, biofeedback, relaxation techniques, etc. are examples. There is a learning period where the patient is trained to perform these methods and when trained is able to perform them independently.

Physiotherapy treatment for pain using physical agents may be traced back to ancient Rig Veda talks of using light and heat to relieve pain. In early 250 A.D. Romans used electric eels to treat pain due to gout, headaches, etc. As technology advanced, we currently use various modalities in the form of LASERs, electrical stimulation, ultrasound and heat in addition to other manual therapy forms (Figure 1).

Laser used by physiotherapists are: Ruby, Gallium Arsenide (GaAs), diode with different wavelengths. The authors have used GaAs with pulsed Infrared (904nm wavelength with 1.5 to 2 cm depth of penetration) with good results. Laser causes release of ACTH and beta-endorphins, reduction of prostaglandin E and SOD activity, immunostimulant, balance of intra-extra cellular activities and accelerates ATP and collagen synthesis. Laser is contra indicated over eyes, cancerous lesions, pregnancy, pacemakers, thrombosis and photochemical drugs.

Commonly used physical agents in physiotherapy are heat, electricity, light, sound, and cold. Most of these agents are used to improve the lymphatic and blood circulation to the area due to a local vasodilation effect and possible muscle relaxation.

Thermotherapy or the use of heat is likely to decrease excitability of muscle spindles and increase activity of Golgi tendon organs and result in decreased muscle spasm. Sedation of sensory nerve endings if the heat is mild may also promote pain relief. Also, gating at the spinal cord level may raise the pain threshold level and therefore allow the

patient to perform with decreased difficulty.8 Several modalities may be used to deliver localised heat in a controlled and safe manner. Superficial heat can be delivered using conduction techniques such as moist heat packs or paraffin wax baths. The depth of penetration using such techniques is less than 1 cm. Fluidotherapy is an example of the use of convection heat that is produced when molecules are agitated and emit heat due to this excitation. This is generally used for hands and feet which are "immersed" in the machine that produces heat. Radiation may be used to heat large body parts that are not bony and infrared is commonly used examples of this.

Heat to deeper tissues can be delivered using energy conversion techniques such as diathermy or ultrasound. Shortwave diathermy uses a constantly reversing and oscillating magnetic field which heats up the tissue temperature. It is used generally for moderate to large body parts and is contraindicated in patients with underlying cancer, multiple sclerosis, any metallic implants including pacemakers. Its use is generally avoided during pregnancy or over growing epiphysis and over eyes.9 Ultrasound is sound waves transmitted at a high frequency of 1-3 MHz. The higher the frequency the lesser is the depth of penetration. It can heat up tissues 2-5 cm.10 depending on the frequency employed. The advantage of ultrasound is dual it has thermal effects in the treated area but also has non thermal effects due to the mechanical properties of the sound head being physically in contact with the body. Because of its effect on A and C fibres, it can provide pain relief and decrease muscle spasm.11 Since the conducer, or treatment head, is in close contact with the treated area, it is used to obtain localised relief. Ultrasound can cause micro streaming and this improves metabolic processes, enzyme activity and alters the ion exchange speed in the area treated. When pain-relieving ions are introduced using ultrasound, the technique is referred to as "phonophoresis". Commonly used chemicals introduced in this manner are lidocaine, hydrocortisone or NSAIDs like piroxicam for pain relief or decreasing inflammation. Medication molecules were found to travel up to tissue depth distances of two inches12. Cryotherapy, uses the physiological effects of cold, is generally considered in the treatment of acute inflammatory conditions and muscle spasm. Cooling causes the large myelinated and small unmyelinated nerve fibres to decrease their nerve

conductivity. Pain perception and contractility of the muscles, therefore, decreases and consequently, muscle spasm is diminished. Initially, the blood flow to the area decreases but after 15 minutes, it increases. It is contraindicated in patients with Raynaud's phenomenon and used cautiously when treating people with peripheral vascular disease, circulatory problems or sensory loss. Therapeutically, cryotherapy is used either by a direct application of a cold/ice pack or by a vapocoolant spray usually prior to manual therapy techniques deep friction tissue or stretching. The latter is generally used in treatment of trigger points. Cryotherapy has been found to be particularly helpful in acute rheumatoid arthritis by improving function.

Transcutaneous Electrical Nerve Stimulation (TENS), as the name suggests, employs electricity to control pain (Figure 2). While the exact mechanism of TENS is not sufficiently clear, the working theory is that the large diameter A beta fibres are specifically stimulated.13 The two mechanisms generally attributed for this physiological effect of electricity are the "gate control theory" or through the stimulation of tonic descending pathways that inhibit pain. Recent research has also demonstrated that low frequency TENS can increase the level of endogenous opiates in the nervous system. The gate control mechanism at the spinal cord level produces moderate paraesthesia when sensory-level TENS (high rate) is used.14 When low rate TENS is used, it may produce muscle contractions and this is thought to produce opiates in the CNS that can bring pain relief.15 This has been more beneficial in chronic pain as the pain relief lasts for a few days as compared to the high rate TENS where pain may be alleviated for a few hours. Therefore, adjusting the TENS parameters is essential to pain relief and an understanding of electrophysiology is necessary. It is contraindicated, like all electrical stimulation, in patients that have a pacemaker, and in patients that are pregnant. Patients that may have sensory disturbances, caution must be exercised and the patient closely monitored. One of the benefits of TENS is its ease of application and portability and therefore it can be taught to the patient or caregiver to use on a regular basis, without being dependent on the therapist.

Iontophoresis is a method to introduce chemical ions using a small electrical current through the skin (Figure 3). Chemical ions of medication are used in a gel form that is

applied to the skin and the direct current introduced via the electrode that is placed over the skin. Lidocaine, hydrocortisone, iodine, methyl salicylate, acetic acid are examples of chemical substances used for pain relief or reduction of muscle spasm. Allergic reaction to the medication is a contraindication of this method.16

Manual therapy techniques such as gentle massage have been used for centuries. It improves local circulation from the mechanical forces on the area treated and may also be eliciting the gating mechanism at the spinal cord level.17 Contraindications for massage include dermatological conditions, acute infection or thromboembolism. One of the techniques that have gained a lot of attention is lymphatic massage which is used for patients post mastectomy where pain and swelling can be disabling. Myofascial release is another specialised technique that works on realigning the fascia layers and allowing the myofascium to function properly.18 Joint mobilisation is one of the most commonly used manual therapy techniques by physiotherapists around the world. By guided and controlled passive oscillations in specific directions and amplitude, collagen fibres in the joint and surrounding areas are loosened. This produces pain relief and regains joint mobility to improve function. Based on the amplitude and force applied, mobilisation is characterised from Grade I to V. It is contraindicated in patients that may have osteoporosis, malignancy, vascular disease, acute infection in the area treated, etc.

Cognitive strategies such as relaxation techniques, body imaging, humour, hypnosis, etc. are also potentially used for pain relief and may be included modalities in addition to the physical agents.

While physical modalities and manual techniques are important, these are best used as adjuncts to an exercise programme. The most important aspect of a pain management programme that is developed and executed by a physical therapist is a patient-centred exercise programme. Range of motion, stretching, or strengthening exercises are all beneficial to improve mobility, strength and muscle tone. Aerobic exercises may be incorporated as well if cardiovascular fitness needs improvement. One of the other desirable effect of sufficient intensity of exercise is the release of beta-endorphin levels

which in turn can help alleviate pain and improve mood. Exercise programme may target specific muscles or muscle groups for strengthening or joints for stretching to improve mobility. To optimise compliance, it is necessary that the patient becomes an active partner in the development of the programme rather than a passive recipient. Exercises should be 'tailor made' to suit each individual. Pain relief that is aimed at improving the overall quality of life is the ultimate goal of a physical therapy programme. While temporary relief obtained with the use of modalities may appeal to most patients, the long term effect of exercise should be emphasised right from the first session of therapy. An intelligently designed exercise programme that is prescribed to the patient, with the patient's needs and lifestyle in mind, should become the cornerstone of a pain management programme.

Conclusion and Follow Up

Physiotherapy must be started as early as possible to minimise pain, stiffness, contractures and deformities. Ergonomic guidance must be followed regularly. Follow up is equally important specially for chronic spinal and arthritis pain. Exercises should be done under the guidance of qualified Physiotherapist and progressive exercises to be given as patient improves.

INTRODUCTION

Ozone (O_3), a gas discovered in the mid-nineteenth century, is a molecule consisting of three atoms of oxygen in a dynamically unstable structure due to the presence of mesomeric states. The gas is colorless, acrid in odour and explosive in liquid or solid form. It has a half-life of 40 min at 20°C and about 140 min at 0°C. Its basic function is to protect humans from harmful effects of UV radiation. Ozone occurs at less than 20 $\mu g/m^3$ from the Earth's surface at concentrations that are perfectly compatible with life. Although O_3 has dangerous effects, yet researchers believe it has many therapeutic effects.[1–3] The beginning of precise medical

O_3 generators has only recently allowed the mechanisms, action and possible toxicity of O_3 to be evaluated by clinical trials.[2] Ozone has a capacity to oxidize organic compounds,[4] and has well-known toxic effects on the respiratory tract when present in smog.[5–6] In medical use the gas produced from medical grade oxygen is administered in precise therapeutic doses, and never via inhalation, and advocates that it has excellent health benefits in dental caries, decrease blood cholesterol and stimulation of antioxidative responses, modifies oxygenation in resting muscle and is used in complementary treatment of hypoxic and ischemic syndromes.[7–10]

Go to:

HISTORY OF OZONE THERAPY

Ozone therapy has been utilized and extensively studied for many decades altogether. Its effects are proven, consistent and with minimal side effects. Medical O_3, used to disinfect and treat disease, has been around for over 150 years. Used to treat infections, wounds and multiple diseases, O_3's effectiveness has been well-documented. It has been used to disinfect drinking water before the turn of the last century. Ozone was known to treat as many as 114 diseases.[11] Ozone therapy has been in use since the 1800s and in 1896 the genius Nikola Tesla patented the first O_3 generator in the US, later forming the "Tesla Ozone Company."[12] During the first world war (1914-18) doctors familiar with O_3's antibacterial properties, and with few other medical resources available to them applied it topically to infected wounds and discovered O_3 not only remedied infection, but also had hemodynamic and anti-inflammatory properties.[13] In the late 1980s, reports had emerged that German physicians were successfully treating HIV patients with 03-AHT (Autohemotherapy). There was then no pharmaceutical treatment for HIV and a pandemic was feared, so Canadian authorities authorized the study to test safety and efficacy of 03-AHT in AIDS patients. Ozone had shown promise in *in vitro* testing. Ozone was seen effective at disinfecting extracorporeal blood samples of HIV; unfortunately for AIDS patients, 03-AHT proved to be an *in vivo* ineffective treatment[14–15] [Table 1].

Table 1

The chronological use of ozone in medicine

Year	Use/treatment of/with ozone
1987	Abscess, acne, AIDS, allergies, cerebral sclerosis, circulatory disturbances, cirrhosis of the liver, cystitis, bedsores, gangrene, hepatitis, herpes, high cholesterol, colitis, tumors, cancer, osteomyelitis, Parkinson's, rheumatism, Raynaud's disease, scars, inflammation of the vertebrae, stomatitis, joint dystrophy, phlebitis, open sores, urology, vascular surgery, wound healing.[16]
1988	Herpes, AIDS and flu, wounds, burns, Staphylococcus infections, fungal and radiation injuries, and gangrene. Fistulae, hemorrhoids and anal infections. Diabetes and arteriosclerosis. Used in periodontal disease, mixed in water and swallowed for use on gastric cancer, and applied as a wash in intestinal or bladder inflammation. Mixed with olive oil it is used on fungal growths and skin ulcers. Ozone baths are used to irrigate the skin, to disinfect and treat eczema and skin ulcers.[17]
1989	Influence on tumor metabolism was observed, hence subsequently used in treatment of cancer.[18] There was significant increase IgG levels, hence was evaluated for its immunostimulatory activity.[19]
1990	Ozone in combination with 5-fluorouracil was shown to be synergistic *in vitro* against tumor cell suspensions, derived from the breast and the colon.[20] Ozonation of blood was carried out to treat viral diseases. Ozonation of blood was found to increase the release of lymphokines and the stimulation of peripheral blood mononuclear cells.[21]
1991	Ozone was found to have germicidal activity by the virtue of its oxidative destruction of micro-organisms including viruses and bacteria[22]
1992	Ozone therapy was used in rhinoplasty and it was found that there was a significant reduction in the postoperative complications.[23]
1993	Ozonated saline used as irrigating solution and was found to reduce abscess formation in the rats with fecal slurry in the peritoneal cavity.[24]

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SARS AND OZONE

Ozone is a naturally occurring energy-rich molecule embodying unique physico-chemical and biological properties suggesting a possible role in the therapy of SARS, either as a monotherapy or, more realistically, as an adjunct to standard treatment regimens. Owing to the excess energy contained within the O_3 molecule, it is theoretically likely that O_3, unlike organism-specific antiviral options available today, will show effectiveness across the entire genotype and subtype spectrum of SARS.[25]

Go to:

MECHANISM OF ACTION

Inactivation of bacteria, viruses, fungi, yeast and protozoa: Ozone therapy disrupts the integrity of the bacterial cell envelope through oxidation of the phospholipids and lipoproteins. In fungi, O_3 inhibits cell growth at certain stages. With viruses, the O_3 damages the viral capsid and upsets the reproductive cycle by disrupting the virus-to-cell contact with peroxidation. The weak enzyme coatings on cells which make them vulnerable to invasion by viruses make them susceptible to oxidation and elimination from the body, which then replaces them with healthy cells.[26]

Stimulation of oxygen metabolism: Ozone therapy causes an increase in the red blood cell glycolysis rate. This leads to the stimulation of 2,3-diphosphoglycerate which leads to an increase in the amount of oxygen released to the tissues. Ozone activates the Krebs cycle by enhancing oxidative carboxylation of pyruvate, stimulating production of ATP. It also causes a significant reduction in NADH and helps to oxidize cytochrome C. There is a stimulation of production of enzymes which act as free radical scavengers and cell-wall protectors: glutathione peroxidase, catalase and superoxide dismutase. Production of prostacyline, a vasodilator, is also induced by O_3 [Figure 1].[25]

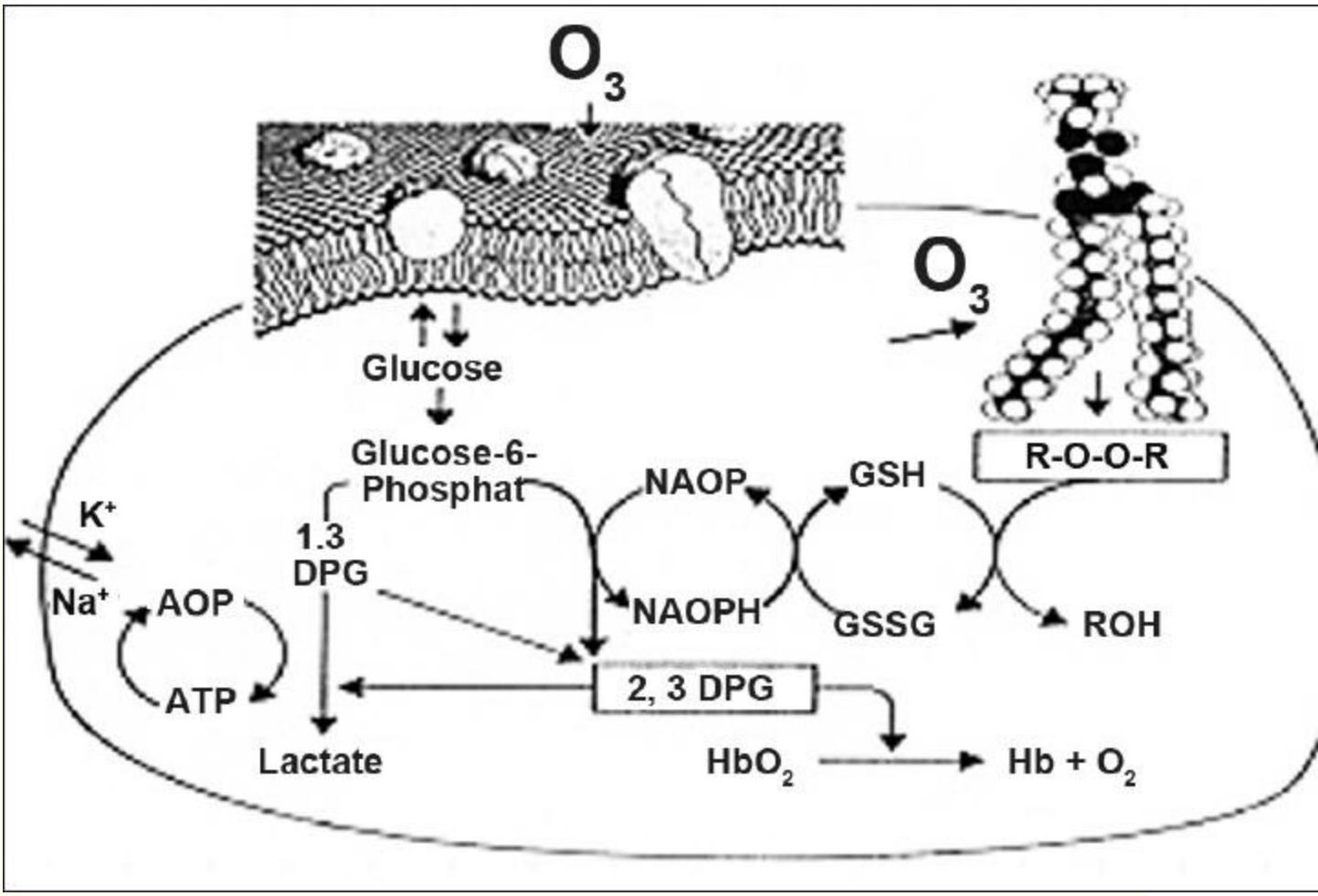

Figure 1

Action of ozone on RBC Metabolism[27]

Activation of the immune system: Ozone administered at a concentration of between 30 and 55 µg/cc causes the greatest increase in the production of interferon and the greatest output of tumor necrosis factor and interleukin-2. The production of interleukin-2 launches an entire cascade of subsequent immunological reactions.[27]

Mechanism of action of O_3 on the human lung: Ozone exposure induces a significant mean decrement in vital capacity. It significantly increases mean airway resistance and specific airway resistance but does not change dynamic or static pulmonary compliance or viscous or elastic

work. It also significantly reduces maximal transpulmonary pressure. And further more significantly increases respiratory rate and decreased tidal volume.[27]

Go to:

CLINICAL TRIALS

The study to evaluate effect of bimosiamose on O_3-induced sputum neutrophilia: Biomosiamose is an anti-inflammatory glycomimetic and selectin inhibitor.[28] It is found effective against disease states involving inflammatory cells like for example for asthma.[29] This drug, as per last updation, was in phase 2 trials and being evaluated for its efficacy and safety in treating chronic pulmonary obstructive disease (COPD), the study is sponsored by Revotar Biopharmaceuticals AG and was carried out by NCT00962481 (ClinicalTrials.gov Identifier).[30]

Evaluate the effects of the drug (SB-656933-AAA) on the body after a single dose in subjects who have inhaled O_3: Drug SB-656933-AAA was developed by GlaxoSmithKline which was found to exhibit good activity in treating COPD as well as cystic fibrosis. This action was found to be enhanced by administration of a single dose of O_3 before administration of the aforementioned drug. This drug until latest updated data was in phase 1 stage, study was carried out by NCT00551811.[31]

Intraarticular O_3 therapy for pain control in osteoarthritis of the knee: Ozone is being currently tested for its effectiveness in relieving the pain in patients suffering from osteoarthritis of the knee. The current status of the study is phase 2 which is sponsored by Ben-Gurion University of the Negev and the study being conducted by NCT00832312.[32]

The Effect of Ozone Therapy for Lumbar-Herniated Disc: Ozone is also being evaluated for its efficacy infiltration and its effectiveness in comparison with microdiscectomy in the treatment of lumbar-herniated disc with criteria for surgery. The study is currently in its phase 2 studies, which is sponsored by Kovacs Foundation and trials being carried out by NCT00566007. The study also evaluates the efficacy of infiltration in presence of corticoids, anesthetics, which is being compared by replacing O_3 by oxygen.[33–35]

Go to:

ADVANTAGES OF OZONE THERAPY

Diabetic complications are attributed to the oxidative stress in the body, O_3 was found to activate the antioxidant system affecting the level of glycemia. Ozone prevented oxidative stress by normalizing the organic peroxide levels by activating superoxide dismutase.[36–37] Ozone was found to completely inactivate the HIV *in vitro*, this action of O_3 was dose-dependent. Concentration used for inactivation was found to be non-cytotoxic. The inactivation was owing to the reduction of the HIV p24 core protein.[38] Ozone was also found to increase the host immunity by increasing the production of cytokine.[39] In an *in vitro* study, it was observed that O_3 is very effective in reducing the concentrations of *Acinetobacterbaumannii*, Clostridium difficile and methicillin-resistant *Staphylococcus aureus* in dry as well as wet samples, hence it can be used as a disinfectant. Oxygen/ O_3 mixture was also found to prolong the appearance of arrhythmia induced by potassium chloride, aconitine, etc., in laboratory animals like rats.[40]

Go to:

DISADVANTAGES OF OZONE THERAPY

An array of ill-effects are observed owing to the reactivity of O_3 viz oxidation, peroxidation or generation of free radicals and giving rise to cascade of reactions like peroxidation of lipids leading to changes in membrane permeability,[41] lipid ozonation products (LOP) act as signal transducer molecules.[42] The main reason for this being presence of unsaturated fatty acids in both lung lining fluid and pulmonary cell bilayers, O_3 reacts with unsaturated fatty acids to give their specific products i.e., LOP, which activates the lipases triggering the release of endogenous mediators of inflammation.[43] The loss of functional groups in enzymes leading to enzyme inactivation. These reactions further results in cell injury or eventual cell death. Combinations of O_3 and NO_2 occur in photochemical smog, have hazardous effects on lung alveoli and act additively or synergistically. Dietary antioxidants or free radical scavengers like vitamin E, C, etc., can prevent aforementioned effects of O_3.[44–45]

In an *in vitro* study it was observed that arachidonic acid was oxidized in presence to O_3 to give peroxides, viz. arachidonic acid peroxides (AAP), having activity comparable to prostaglandin endoperoxides. These peroxides were fond to show following actions contraction of rabbit aortic strips and rat fundus strips in presence on indomethacin and Vane's mixture of vasoactive

hormones at doses comparable to naturally formed prostaglandin peroxides. AAP also caused aggregation of human platelets in platelet-rich plasma, but these effects were not observed in presence of indomethacin and vitamin E, which indicated that these can be used to treat such toxicity of O_3.[46]

Go to:

RECENT DEVELOPMENT

Ozone was effectively used as an antibacterial agent to treat oral infections caused by *Actinomycesnaeslundii, Lactobacilli casei* and *Streptococcus mutans*. Exposure of about 60 s exhibited 99.9% killing efficiency, but exposure for such a long period showed degradation of saliva proteins. So exposure of 10 s to 30 s was proved effective to kill significant number of bacteria.[47]

A single subcutaneous injection of O_3 in mouse with spared nerve injury of the sciatic nerve was found to decrease the neuropathic pain-type behavior. Mechanism of this action is yet unclear but O_3 was observed to regulate the expression of the genes that play vital role in onset and maintenance of allodynia.

Steroids are among the most commonly used medications in palliative care. A Canadian study of ambulatory palliative care patients with cancer demonstrated that 40% of patients were receiving corticosteroids, and dexamethasone was the medication most commonly added by palliative care specialists.[1] This study echoes European studies in which corticosteroids were among the drugs most commonly prescribed by hospital-based palliative care services.

There is evidence for the use of corticosteroids for specific indications, such as spinal cord compression,[5] raised intracranial pressure,[6] and bowel obstruction.[7] Corticosteroids are also commonly used for broader indications, such as to control pain, stimulate appetite, suppress nausea, and alleviate fatigue. However, there is little objective evidence in the literature for this broader use of corticosteroids.

Pain management

An adjuvant pain medication should be considered at all stages of the World Health Organization's pain ladder for mild to severe pain.[10] Mr C. shows evidence of mixed bony and neuropathic pain.[11] Steroids are particularly useful as adjuvant therapy for metastatic bone pain, neuropathic pain, and visceral pain.[12] As adjuvant agents, corticosteroids can directly reduce pain, reduce pain in concert with opioid use, allow for reduction of opioid dose, and have beneficial symptomatic effects outside of pain relief.

Glucocorticoids reduce pain by inhibiting prostaglandin synthesis, which leads to inflammation, and reducing vascular permeability that results in tissue edema. Glucocorticoids are also lipophilic molecules that can cross the blood-brain barrier. Research has shown that steroid receptors are found in the central and peripheral nervous systems and are responsible for growth, differentiation, development, and plasticity of neurons.[13] In particular, corticosteroids have been shown to reduce spontaneous discharge in an injured nerve, which reduces neuropathic pain.[12]

Dexamethasone is the most commonly prescribed corticosteroid for pain, but prednisone or prednisolone can also be used. An advantage of prednisolone is that the side effect of myopathy is less common. Dexamethasone causes less fluid retention than other steroids owing to the fact that it has less mineralocorticoid effect. It is also relatively more potent and, owing to dexamethasone's longer half-life, it can be taken once daily. The most appropriate dose of dexamethasone has not been determined, but a range of 2 to 8 mg orally or subcutaneously once to 3 times daily is generally accepted.

Corticosteroids have a diverse side effect profile, and side effects are not uncommon; thus, the lowest effective dose should be used. Because side effects accumulate over the long term, corticosteroids are best used for short-term therapy (1 to 3 weeks).[8,11] In palliative care, corticosteroids are used for longer than 3 weeks for cases in which prognosis is in the short to medium term and side effects are unlikely to develop in the time remaining. For cases in which corticosteroids are used in the long term, their use

should be monitored closely.[2] There is concern expressed in the literature that corticosteroids are not monitored closely enough in palliative care settings.[9]

The most frequently encountered side effects of dexamethasone are summarized in Box 1.[9,11,15] For cases in which side effects are mild or corticosteroids remain necessary to alleviate pain in the long term, medications can be prescribed to counteract side effects (eg, adjustment of diabetic medications to counteract hyperglycemia).[9] In patients at high risk of gastric bleed, gastroprotection can be prescribed concurrently with steroids. The combination of a nonsteroidal anti-inflammatory drug and a steroid increases the risk of gastric bleeding 15-fold; therefore, this combination should be avoided, particularly in the frail elderly.[16] For cases in which the use of steroids over many months is anticipated, a bisphosphonate can be considered concurrently in elderly patients and patients at risk of osteoporosis.

Box 1.

Common side effects of dexamethasone

Most frequent side effects include the following:

- increased appetite or weight gain
- proximal muscle weakness
- insomnia
- gastrointestinal side effects
- psychiatric side effects, such as delirium, depression, anxiety, and psychosis
- osteoporosis with long-term use

Less frequent side effects include the following:

- infections

- hyperglycemia
- Cushing syndrome

Life-threatening side effects include the following:

- gastrointestinal bleeds
- thromboembolism

Data from Walsh et al,[9] Pereira,[11] and Sturdza et al.[15]

Of particular concern in palliative patients is the side effect of proximal muscle myopathy when added to the weakness from terminal illness. Acute steroid myopathy is rare and occurs with high-dose parenteral treatment in the first week of treatment. More commonly, myopathy occurs as an insidious process. The muscles of the lower limbs are affected first, and patients often complain of difficulty with stairs or rising from a chair as an early symptom. Fortunately, myopathy is most often reversible upon discontinuation of the steroid. Physiotherapy is also helpful.

In terms of drug interactions, anticonvulsants accelerate the metabolism of corticosteroids, and thus higher doses might need to be used in patients taking anticonvulsants. Corticosteroids might cause an increase or decrease in phenytoin and warfarin levels, and these should be monitored in patients on concurrent therapy. Live vaccines should not be given to patients taking corticosteroids owing to their impaired immune response.

Discontinuing corticosteroid use

After 2 weeks of therapy with a steroid it can be discontinued without any adverse effects.[11] However, even low doses of corticosteroids can suppress the hypothalamic-pituitary-adrenal axis in the long term. Longer periods of treatment require a taper, the length of which depends on the duration of therapy.[15] The most appropriate method of tapering has not been determined in the literature.[17]

If patients have required steroids up to the last days of life and are no longer able to swallow, the steroids should be prescribed at full dose or tapered using the parenteral route (dexamethasone is available intravenously and subcutaneously) rather than abruptly stopping this medication.[8] If a stressful event, such as a serious infection or surgery, occurs within 1 week after discontinuation of steroid therapy, stress-dose steroid should be provided.

It is important not to mistake withdrawal from corticosteroids for advancement of progressive disease in palliative care.[8] Withdrawal symptoms from corticosteroids include pain, nausea or vomiting, weight loss, depression, fatigue, fever, dizziness, and rebound symptoms that are unmasked when there is loss of symptom control once the corticosteroid is removed. Addisonian crisis is a life-threatening complication that can cause confusion, coma, cardiovascular shock, and even death. Notably in palliative patients, corticosteroid withdrawal is known to exacerbate terminal restlessness.

Paramedicine and the emergency medical services have been moving in the direction of advancing pharmaceutical intervention for the management of pain in both acute and chronic situations. This coincides with other areas of advanced life support and patient management strategies that have been well researched and continue to benefit from the increasing evidence. Even though paramedic practice is firmly focused on pharmacological interventions to alleviate pain, there is emerging evidence proposing a range of nonpharmacological options that can have an important role in pain management. This review highlights literature that suggests that paramedicine and emergency medical services should be considering the application of complementary and alternative therapies which can enhance current practice and reduce the use of pharmacological interventions.

1. Introduction

Pain is a common complaint among patients cared for by paramedics [1]. Cases attended by paramedics involve patients who report pain as their chief complaint and symptom that instigated an ambulance call for assistance. In other cases, the sensation of pain will be a component of a constellation of symptoms, and the patient's report of pain will be an important diagnostic cue that guides the clinical examination. Paramedics will also encounter patients who report persistent pain, but where the pain is unrelated to their current health crisis.

Paramedics have an important role in identifying and reducing the burden of pain. The alleviation of pain is important from a humanitarian perspective, with freedom from pain

considered as a basic human right [2]. Pain is also associated with significant morbidity, and as the study of pain evolves, the relationship between poorly managed acute pain and the development of chronic pain syndromes is becoming recognized [3].

Patients who seek medical care may understandably expect relief from pain, with a study of patients presenting to an emergency department finding a majority that expected relief from their pain, with a significant proportion expecting complete relief [4]. Regardless of the health care setting, pain is a frequently reported symptom. For paramedics, an encounter with a patient reporting pain is a common event [5].

The provision of reassurance and comfort for the relief of pain and distress has been described as a primary goal of paramedics and emergency medical services (EMS) [6]. However, reassurance alone may provide inadequate relief of pain. Prior to the introduction of advanced levels of training and clinical guidelines for the administration of analgesics, the management of pain in patients who were injured relied on techniques such as splinting fractures so that the immobilized limb was less likely to move and exacerbate tissue injury resulting in further pain. While there are still rudimentary skills used, paramedic practice has advanced and become more specialised and now includes the administration of a range of pharmacological agents to relieve or minimize pain [7, 8]. These now include opioids, nonsteroidal anti-inflammatories, paracetamol, NMDA-receptor antagonists, methoxyflurane, and local anaesthetics for nerve blocks. Morphine is commonly used for the treatment of pain, and this drug is considered the “gold standard” against which other analgesics are measured [9]. The efficacy of opioids such as morphine and fentanyl for the management of severe pain in the paramedic practice setting has been established [10].

Over the last two decades, this escalating reliance upon pharmaceuticals for pain management practice has been borne in part by the need to respond to societal expectations. In addition, pain management has been identified as a key performance indicator by some EMS. In Australia, the Council of Ambulance Authorities (CAA) has identified that the quality of pain relief is a surrogate measure of compassion and caring and has recently recommended that EMS develop and adopt clinical performance indicators that include the reduction of pain [22]. However, this is not a binding recommendation and national data relating to the adoption of pain management performance indicators by Australian EMS is not widely available.

The acknowledgement of pain management as an important component of paramedic practice is reflected by the use of evidence-based guidelines for the relief of pain. However, these almost exclusively focus on acute pain and pharmacological interventions. References to nonpharmacological therapies in Australian clinical guidelines for paramedics are uncommon, with the exception of traditional measures such as splinting, cooling, and reassurance. References to complementary and alternative therapies such as acupuncture are rare in the paramedic literature and resources that support paramedic education [23, 24]. Although uncommon in Australian paramedic curricula, nonpharmacological therapies for pain relief feature consistently in the practice of several allied health disciplines, with cognitive-behavioral and complementary therapies included in the International Association for the Study of Pain Core Curriculum for Health Professionals [25].

Nonpharmacological interventions to alleviate pain rely on the inhibition of pain signalling. Pain arises from nociceptive transmission through small afferents to the spinal cord and then to higher brain nuclei and the cerebral cortex. Nociceptive signals are mediated by peripheral and central components that may facilitate or inhibit this input [26]. These signals are modulated by midbrain networks which exert bidirectional control over nociceptive transmission through the spinal cord. Several neurotransmitters are involved in mediating nociceptive signals including substance P which facilitates transmission and endogenous opioid-based compounds that inhibit transmission [27]. Nonpharmacological analgesia therefore involves the inhibition of nociceptive input by activating separate antinociceptive outputs. Procedures such as transcutaneous electrical nerve stimulation (TENS) and acupoint stimulation rely on inhibiting the nociceptive signal to induce an analgesic effect.

Nonpharmacological approaches to the relief of pain are more commonly associated with nonacute settings and may be classified as follows:(i)psychological interventions (including distraction, stress management, hypnosis, and other cognitive-behavioral interventions),(ii)acupuncture and acupressure,(iii)transcutaneous electrical nerve stimulation,(iv)physical therapies (including massage, heat/cold, physiotherapy, osteopathy, and chiropractic).

These approaches to pain management may complement or indeed substitute pharmacological therapy in some types of pain. Chronic pain (which is also commonly encountered in paramedic practice) is one situation where a range of interventions may be used to manage complex health problems such as cancer pain, lower back pain, and specific diseases associated with pain such as endometriosis. Evidence of efficacy is variable, and this may be due to the type of pain, type of intervention, patient characteristics, skill and experience of the clinician, and heterogeneous study populations. For example, significant variability in the efficacy of acupuncture has been reported in the literature [28].

The use of these therapies to manage acute pain, such as pain arising from trauma or tissue injury associated with inflammation or ischemia, is rarely described in the literature. The role of alternatives in pharmacotherapy is acknowledged by the Australian and New Zealand College of Anaesthetists (ANZCA), albeit as adjunctive or complementary therapy [29]. When describing pain management in the emergency health setting, the ANZCA recommends “ice, elevation, and splinting for injuries” as well as reassurance as the mainstays of nonpharmacological management of pain [29].

This paper will appraise the current evidence of nonpharmacological interventions for pain management in the paramedic practice setting, either as complementary therapies or as alternatives to pharmacological interventions. Our review will focus upon acupuncture and acupressure, TENS, and the use of warming as all simple measures that may be implemented and would potentially complement current paramedic pain management guidelines. This contributes to the knowledge base for paramedic pain management practice and should inform future research that seeks to establish the role for nonpharmacological therapies in the relief of pain. For data sources, electronic literature searches were conducted using Medline, Embase, the

Cochrane Library, and Cinahl (EBSCO). The search terms used were “paramedic” OR “CAM” OR “acupuncture” OR “acupressure” OR “TENS.”

2. Transcutaneous Electrical Nerve Stimulation (TENS)

Alternative approaches to paramedic-initiated analgesia such as TENS have been reported in the literature [30, 31]. However, research into the use of nonpharmacological interventions in paramedic practice is limited. This lack of research may reflect the developing status of paramedic practice as an allied health profession. There may also be limited impetus for research in this area if nonpharmacological interventions are deemed to be inappropriate for the management of pain associated with acute trauma or health emergencies, particularly in an environment where the time taken for each interval in the patient care process is a closely monitored performance indicator. The drive to minimize time spent with each patient is designed to improve operational effectiveness, and this may restrict the use of nonpharmacological therapies that require extended time to deliver the care compared with the intravenous titration of opioids. Furthermore, attitudes among paramedics and service providers regarding the utility of nonpharmacological interventions to relieve pain may inhibit clinical trials that compare the efficacy of these therapies.

Although TENS has been clinically used for over three decades, the mechanisms by which analgesia is produced are only recently being described [32]. Gate control theory is the most common theory used to support the effect of inhibiting pain by TENS. Gate control theory describes how a stimulus that activates nonnociceptivefibers can inhibit pain. Pain is reduced when the area is rubbed or stimulated due to activation of nonnociceptivefibers inhibiting the nociceptive response in the dorsal horn of the spinal cord [33]. In TENS, nonnociceptivefibers are selectively stimulated with electrodes in order to produce this effect and thereby inhibit pain [33].

TENS appears to produce both segmental and descending pain inhibition since inhibition remains after spinalization (removal of descending inhibition) in the animal model [34]. Adenosine also appears to play a role in TENS analgesia since caffeine (adenosine receptor antagonist) significantly reduces the analgesic effect resulting from activation of large diameter fibers [35]. Additionally, concentrations of endogenous opioids have been shown to increase in cerebrospinal fluid following TENS procedure [36].

TENS uses electric current produced by a portable device to stimulate the nerves for therapeutic purposes. Previous intervention trials investigating the effect of TENS on pain are shown in Table 1. One randomized double-blinded study investigating TENS in an EMS setting showed that TENS intervention in female patients () with acute pelvic pain (salpingitis, ovarian cyst, dysmenorrhea, vaginal infection, and vaginal trauma) reduced pain, anxiety, heart rate, nausea, and arteriolar vasoconstriction with an improvement of overall patient satisfaction compared with those () treated with sham TENS [11]. The effect of TENS producing pain relief was further supported in another study in which patients suffering from acute posttraumatic hip pain felt less

pain and anxiety with TENS intervention compared with those treated with sham TENS [12]. These observations suggest that TENS could be an effective and fast-acting pain treatment with applications within paramedic practice.

Table 1
Intervention trials investigating the effect of TENS on pain.

3. Acupuncture, Electroacupuncture, and Acupressure

Stimulation of specific points on the body, commonly known as acupuncture, is widely recognized as a therapeutic procedure used to treat pain and illness [37, 38]. Acupoint stimulation such as manual acupuncture involves the penetration and manipulation of a fine needle through the skin into specified points on the body to evoke a sensation known as *de-qi* [39]. Treatment procedures that involve acupoint stimulation also include electroacupuncture and acupressure. Electroacupuncture requires delivery of electrical current through the inserted needle. Acupressure requires the use of fingers and hands to stimulate acupoints on the body to relieve pain and clinical symptoms [40]. More than 360 acupoints are located along 14 meridian channels that cover the body in a weblike interconnecting matrix [41]. Each acupoint is recognized as having a defined therapeutic action; however, a combination of acupoints is often stimulated to induce a therapeutic effect [41].

The potential mechanism for acupuncture analgesia is via the descending pain modulation pathways. The nucleus raphe magnus (NRM) in the midbrain is a significant neural site for descending analgesia via expression of serotonin [42]. NRM inhibits ascending pain signalling by projection neurons to the dorsal horn of the spinal cord. The NRM is part of a central pain modulatory system comprising the midbrain periaqueductal grey (PAG) and the ventromedial medulla (RVM) recruited to suppress or facilitate responses to noxious stimuli (PAG-RVM system). Endogenous opioid peptides are present in the neural soma and terminals of these nuclei. Electroacupuncture has been shown to enhance the expression of serotonin and reduce the release of substance P during electroacupuncture inhibition of acute nociceptive responses [43]. The dorsolateral pontinetegmentum is another midbrain site mediating spinal cord nociceptive signalling by providing noradrenergic innervations of the spinal cord. Involvement of noradrenergic receptors in rat spinal cord has also been demonstrated during electroacupuncture analgesia [44]. Together, these studies suggest that acupuncture evokes central pathways to inhibit the pain signal.

The World Health Organisation recommends the use of acupuncture for a substantial number of diseases [37]. The efficacy of acupuncture is formally endorsed by the National Institute of Health and recognized by the American Medical Association [45]. In a Cochrane Review paper on the efficacy of acupuncture for lower back pain, the results showed that acupuncture is more effective for pain relief than no treatment or sham procedure [46]. Moreover, when acupuncture is added with conventional therapy, it was shown to relieve pain and enhance function better than conventional therapies alone.

Acupressure works with the same acupoints and meridians as acupuncture. The only difference between two interventions is that acupressure stimulates the acupoints with finger pressure rather than by fine needles. Previous intervention trials investigating the effect of acupressure on pain are shown in Table 2. In the first known study to investigate the effects of acupressure on pain in the paramedic practice setting, researchers allocated adult patients () to one of three treatment arms. Group 1 used true acupressure points LI4 (Hegu), PC9 (Zhongchong), PC6 (Neiguan), BL60 (Kunlun), and GV20 (Baihui), while Groups 2 and 3 involved sham acupressure point and no acupressure, respectively [13]. Group 1 patients reported reduced pain and anxiety with these changes which was significantly greater than either Group 2 or Group 3. Group 1 patients also demonstrated a statistically significant decrease in heart rate compared with patients that were treated with sham acupressure () or did not receive the intervention (). Patient satisfaction scores after treatment were significantly better in Group 1.

Table 2
Intervention trials investigating the effect of acupressure on pain.

In a review paper on acupressure, it was shown that this procedure was effective for pain in patients with dysmenorrhea, during labour, and in trauma [47]. In accord with this, a randomized double-blinded study in 15 patients with distal radius fracture showed that acupressure on GV20 and LI4 lowered pain, anxiety, and heart rate and raised patient general satisfaction [17]. These findings suggest that stimulation with fingers on GV20 and LI4 may be a pain management option for patients with minor trauma during ambulance transportation to a hospital. Promoting and encouraging acupressure on other acupoints that fit within the context of analgesia may create a supportive environment of pain management and is possibly an easy skill to teach all levels of paramedics.

The related technique of auricular acupressure treats the entire body through pressure on a few points in the ear. In a randomized controlled study of 36 patients with gastrointestinal illnesses (gastritis, cholecystitis, pancreatitis, and diverticulitis), researchers compared acupressure in the ear with small plastic ball at the relaxation point with a sham intervention [14]. Although both interventions showed no significant changes in blood pressure and heart rate, greater improvements in anxiety and anticipated perception of hospital treatment were reported with acupressure.

A small, randomized study showed that acupressure in the ear with 1 mm acupressure plastic beads reduced the level of pain and anxiety as indicated by a reduced heart rate in patients () with hip fracture compared with patients () in the sham group [16]. These observations suggest that the application of pressure to auricular acupoints may offer benefits for improving pain and anxiety. Comparable to auricular acupressure, Korean hand acupuncture with hand patches consisting of a hard plastic ball was also effective in producing analgesia [15]. A randomized study involving 100 patients with minor trauma was conducted, with the groups divided evenly (per group) into intervention and sham acupressure groups. Significant improvements in nausea score, vasoconstriction, and overall patient satisfaction were achieved with Korean hand acupuncture bilaterally on K-K9 point located in the middle phalanx of the fourth finger. These

simple techniques could be quite easily taught to paramedic clinicians and we would propose further experimental studies in paramedic practice. The ear is usually an area that is not injured and is out of the way of body limbs, and gaining access to apply acupressure should not be hampered by the condition of the patient. The use of acupoint pressure on the ear may prove easily accessible in a range of situations that may have positive effects which assist in relieving pain.

4. Effect of Warming Interventions on Pain

Another type of intervention that may be implemented by paramedics for pain control in specific situations is active warming or resistive heating, and this has been examined in several studies (Table 3). As opposed to passive heating, in which there is no external source of heat used other than the person's own body heat, active or resistive heating involves using an external source of heat to warm the patient. This may be in the form of a heated blanket or increased ambient temperature. A single-blinded randomized study reported that fifty patients undergoing active warming with minor trauma including limited bleeding, fractures, or contusions experienced less pain and anxiety with increased overall patient satisfaction, thermal comfort, and core temperature compared with another fifty undergoing passive warming [18]. A subsequent study, involving patients with a diagnosis of cholelithiasis, showed that warming with an electric heating blanket over the abdomen reduced pain, anxiety, and heart rate [19]. The subcutaneous temperature increased accordingly with increasing skin temperature. Another study using this technique published by the same group of researchers showed that patients complaining of abdominal pain from renal colic experienced less pain, anxiety, nausea, and heart rate with overall improvement of patient satisfaction [20].

Table 3
Intervention trials investigating the effect of active warming on pain.

Lastly, in a study of female patients with pelvic pain from cystitis, urolithiasis, cholelithiasis, appendicitis, colitis, and rectal trauma, active warming over the abdomen caused less pain, anxiety, and nausea, compared to passive warming [21]. These suggest that active warming could be an adjunct to analgesic treatment at the emergency site.

5. Conclusion

There are many reasons why paramedicine and emergency care practice has been moving in the direction of advanced pharmacological interventions for the management of pain in both acute and chronic situations. This coincides with other areas of advanced life support and patient management strategies that have been well researched and continue to benefit from the increasing evidence. Even though paramedic practice is firmly focused on pharmacological interventions to alleviate pain, there is a developing literature suggesting that a range of nonpharmacological options may also have an important role in managing pain in individuals cared for by paramedics.

As a developing profession, paramedicine should investigate multiple modalities and consider complementary and alternative therapies that could be used to enhance pain relief and potentially also reduce the reliance on pharmacological interventions as the first-line approach to alleviating pain. If proven to be efficacious, the analgesic sparing effect may translate into cost reductions and better patient outcomes with less adverse reactions. However, further research is required to develop the level of evidence required to support changes to practice. From the research that has been conducted, we can see great potential value of conducting trials into the use of complementary therapies within paramedic practice and would strongly encourage further research specifically that looks into the use of simple techniques such as acupuncture (including electroacupuncture and acupressure), TENS, and active warming.

VALUE ADDED COURSE

COMPREHENSIVE PAIN CARE

Annexure II

STUDENT ENROLLMENT LIST (JULY-DEC 2018)

S.No.	University no	Name of the student	Year / CRRI	Signature
1.	U17MB331	MUSALE VENUGOPAL RAO	II nd	
2.	U17MB332	NAMITA THARANI	II nd	
3.	U17MB333	NAYANA NANDANAN M	II nd	
4.	U17MB334	NEHA KUMARI	II nd	
5.	U17MB335	NEHA KUMARI.B	II nd	
6.	U17MB336	NIDHI SUNIL KRISHNAN	II nd	
7.	U17MB337	NIJITH KRISHNADHAS RAHAEL	II nd	
8.	U17MB338	NIKITA VERMA	II nd	
9.	U17MB339	NILUTPAL DAS	II nd	
10.	U17MB340	NISHANT BHUSAN	II nd	
11.	U17MB341	PANEM SAMIUNNU	II nd	
12.	U17MB342	PARTHA PRATIM BARUAH	II nd	
13.	U17MB343	PAYAL MOHITE	II nd	
14.	U17MB344	POOJALAKSHMI.P	II nd	
15.	U17MB345	PRACHI KUMARI	II nd	
16.	U17MB346	PRASANNA.B	II nd	
17.	U17MB347	PRAVEEN.V	II nd	
18.	U17MB348	PRITAM SAHOO	II nd	
19.	U17MB349	PRIYA SAXENA	II nd	
20.	U17MB350	PRIYADARSHINI MAITHY	II nd	

RESOURCE PERSON

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605 502

DR. KALASREE

COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502.

Dr S NITHIANANDAM

Annexure III

MCQ: COMPREHENSIVE PAIN CARE

1. The following are process in pain relay information except
   a. Transduction
   b. Transmission
   c. Modulation
   d. Assessment

2. Following can activate pain receptors
   a. Pressure
   b. Heat
   c. Chemical
   d. All the above

3. All are pain mediators except
   a. Prostaglandins
   b. Leukotrienes
   c. Sodium
   d. Histamine

4. The following tract is involved in pain pathway
   a. Spinothalamic
   b. Corticospinal
   c. Spinoreticular
   d. Both A&C

5. Character of RSD are
   a. Pain dispropriatial to injury
   b. Progressive worsening of pain
   c. Presistence beyond the tissue damaging process
   d. All the above

6. Following are opioid except
   a. Morphine
   b. Cocaine
   c. Oxycodone
   d. Methadone

7. Example of opioid receptors
    a. H1
    b. HT1
    c. μ
    d. β

8. Chronic pain is
    a. Pain persisting for at least 1month following usual healing time
    b. Pain that recover frequently over a period of month
    c. Pain that occurs with non healing lesion
    d. All the above

9. Following are pain scale
    a. VAS
    b. FACES
    c. SDPS
    d. All the above

10. Causalgia is
    a. Severe burning pain & sign of ANS hyperactivity
    b. Pain at site different than injury
    c. Pain after cervical injury
    d. Pain affecting sleep wake cycle

B. Neha Kumari

Annexure III

8/10

MCQ: COMPREHENSIVE PAIN CARE

1. The following are process in pain relay information except
   a. Transduction
   b. Transmission
   c. Modulation
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   b. Pain at site different than injury
   c. Pain after cervical injury
   d. Pain affecting sleep wake cycle

Praveen. N

Annexure III

MCQ: COMPREHENSIVE PAIN CARE

9/10

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   b. Transmission
   c. Modulation
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   a. Prostaglandins
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   c. Sodium
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9. Following are pain scale
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10. Causalgia is
   a. Severe burning pain & sign of ANS hyperactivity
   b. Pain at site different than injury
   c. Pain after cervical injury
   d. Pain affecting sleep wake cycle

Annexure V
Student Feedback Form

Course Name: **COMPREHENSIVE PAIN CARE**

Subject Code: **ANAES 07**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Annexure V
Student Feedback Form

Course Name: **COMPREHENSIVE PAIN CARE**

Subject Code: **ANAES 07**

Name of Student: Musale Venugopal Rao Roll No.: U1TMB331

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear		✓			
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand			✓		✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Good.

Annexure V
Student Feedback Form

Course Name: **COMPREHENSIVE PAIN CARE**

Subject Code: **ANAES 07**

Name of Student: Priya Saxena Roll No.: VITMB349

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Satisfactory

Date: 05.12.2018

From
Dr M Kalasree
Head Of Department Incharge
Department of Anaesthesia
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry

Sub: Completion of value-added course: COMPREHENSIVE PAIN CARE

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Comprehensive Pain Care in July- Dec 2018 for 20 students. We solicit your kind action to send certificates for all the participants, whose name list is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. M Kalasree

Head of Dept. Anesthesiology
Sri Lakshmi Narayana Institute of Medical Sciences
Sri Lakshmi Nagar, Kottakuppam, Puducherry - 605 502

Encl: Certificates

Photographs

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that __NIKITA VERMA_____has actively participated in the Value Added Course on Comprehensive Pain Care held during July - December 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.KALASREE M

RESOURCE PERSON

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE
OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605 502

Dr. KALASREE M

COORDINATOR

Head of Dept. - Anaesthesiology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that ___NILUTPAL DAS_____ has actively participated in the Value Added Course on Comprehensive Pain Care held during July - December 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.KALASREE M
RESOURCE PERSON

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE
OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605 502

Dr.KALASREE M
COORDINATOR

Head of Dept. of Anaesthesiology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502


COMPREHENSIVE PAIN CARE
REDMI K20 PRO
AI TRIPLE CAMERA

Sri Lakshmi Narayana Institute of Medical Sciences

Date-20-06-2018

From
Dr. K. Harsha Vardhan
Professor and Head,
Department of Dermatology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Herpes Zoster

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled:**Herpes Zoster** on 20-07-2018. We solicit your kind permission for the same.

Kind Regards

Dr. K. Harsha Vardhan

FOR THE USE OF DEANS OFFICE

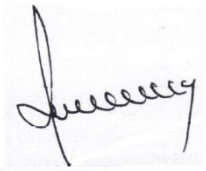
Names of Committee members for evaluating the course:

The Dean: Dr. A. Sugumaran

The HOD: Dr. K. Harsha Vardhan

The Expert: Dr. A. Buvanaratchagan

The committee has discussed about the course and is approved.



DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Dean Subject Expert HOD

Sri Lakshmi Narayana Institute of Medical Sciences

Date-20-06-2018

From
Dr. K. Harsha Vardhan
Professor and Head,
Department of Dermatology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

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The committee has discussed about the course and is approved.

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Dean

Dr. A. BUVANARATCHAGAN, MD.,
Reg. No: 37150
Asso. Professor, Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Koodapakkam, Puducherry-605 502

Subject Expert

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

HOD

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OFFICE OF THE DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

27.06.2018

Sub: Organising Value-added Course: Herpes Zoster (July 2018 – Oct 2018)

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Herpes Zoster"**. The course content is enclosed below."

The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 13-07-2018. Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

DEAN

Encl: Copy of Course content

Course Proposal

Course Title: **Herpes zoster**

Course Objective: **To review clinical presentation and management of herpes zoster to second year mbbs students**

Course Outcome: **Completed**

Course Audience: **second year mbbs students**

Course Coordinator: Dr. K. Harsha Vardhan

Course Faculties with Qualification and Designation:

1 . Dr. K. Harsha Vardhan
Professor , Department of Dermatology

2. Dr. Buvanaratchagan
Associate Professor , Department of Dermatology

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours	Lecture taken by
1	20-7-18	Introduction on herpes zoster	4 to 6 pm	2hours	Dr. K. Harsha Vardhan
2	24-7-18	Pathogenesis	4:30 to 6:30 pm	2hours	Dr. Buvanaratchagan
3	27-7-18	VSV	5 to 7 pm	2hours	Dr. K. Harsha Vardhan
4	31-7-18	Clinical features	4 to 6 pm	2hours	Dr. Buvanaratchagan
5	2-8-18	Investigation	4:30 to 6:30 pm	2hours	Dr. K. Harsha Vardhan
6	7-8-18	Treatment	5 to 7 pm	2hours	Dr. Buvanaratchagan
7	10-8-18	General measures in management	4 to 6 pm	2hours	Dr. K. Harsha Vardhan
8	15-8-18	Prophylaxis	4:30 to 6:30 pm	2hours	Dr. Buvanaratchagan
9	20-8-18	Post herpetic neuralgia	5 to 7 pm	2hours	Dr. K. Harsha Vardhan
10	24-8-18	Complications	4 to 6 pm	2hours	
11	29-8-18	Future aspects in treatment	4:30 to 6:30 pm	2hours	Dr. K. Harsha Vardhan
12	4-9-18	Herpes zoster vaccine	5 to 7 pm	2hours	Dr. Buvanaratchagan
13	11-9-18	Herpes zoster varied presentations	4 to 6 pm	2hours	Dr. K. Harsha Vardhan
14	14-9-18	Case discussion	4:30 to 6:30 pm	2hours	Dr. Buvanaratchagan
15	19-9-18	Q&A,MCQs	4 to 6 pm	2hours	Dr. K. Harsha Vardhan
			Total Hours	30	

REFERENCE BOOKS:

1. **Rooks Textbook of dermatology 9th edition**
2. **Fitzpatrick 's dermatology in general medicine 8th edition**

ABSTRACT- VALUE ADDED COURSE

1. Name of the programme & code

Herpes zoster and DR08

2. Duration & Period

30 hrs & July 2018 to Oct 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Course Feed Back

Enclosed as Annexure- IV

7. No. of times offered during the same

July 2018 to oct 2018

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- July 2018 to Oct 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	DR08	**Herpes zoster**	Dr. Buvanaratchagan	2nd year MBBS	15 (July 2018 - oct 2018)

10. Certificate model

Enclosed as Annexure- V

Dr. Buvanaratchagan

RESOURCE PERSON

Dr. K. Harsha Vardhan

COORDINATOR

ABSTRACT- VALUE ADDED COURSE

1. Name of the programme & code

Herpes zoster and DR08

2. Duration & Period

30 hrs & July 2018 to Oct 2018

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5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Course Feed Back

Enclosed as Annexure- IV

7. No. of times offered during the same

July 2018 to oct 2018

8. Year of discontinuation: 2019

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Value Added Course- July 2018 to Oct 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Yea**
1	DR08	**Herpes zoster**	Dr. Buvanaratchagan	2nd year MBBS	15 (July 2018 - oct 2018)

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Enclosed as Annexure- V

Dr. Buvanaratchagan

RESOURCE PERSON

Dr. A. BUVANARATCHAGAN, MD.,
Reg. No: 37150
Asso. Professor, Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. K. Harsha Vardhan

HEAD
TOLOGY
INSTITUTE OF

COORDINATOR

ANNEXURE-1

Herpes zoster



Participant handbook

Course details

Course title	Herpes zoster overview
Course code	DR08
Objective	• To learn about clinical features • To learn about diagnosis • To learn about treatment
Further learning opportunities	Recent advances in management
Key competencies	To make a diagnosis and provide adequate treatment
Target students	2nd year mbbs students
Duration	30 hrs July 2018 to october 2018
Theory session	10 hrs
Practical Session	20hrs
Assessment procedure	Mcqs

Herpes zoster is viral infection that occurs with reactivation of the varicella-zoster virus. It is usually a painful but self-limited dermatomal rash. Symptoms typically start with pain along the affected dermatome, which is followed in 2-3 days by a vesicular eruption. Classic physical findings include painful grouped herpetiform vesicles on an erythematous base. Treatment includes antiviral medications such as acyclovir, famciclovir, and valacyclovir given within 72 hours of symptom onset.

Reactivation of varicella-zoster virus (VZV) that has remained dormant within dorsal root ganglia, often for decades after the patient's initial exposure to the virus in the form of varicella (chickenpox), results in herpes zoster (shingles). [1] While usually a self-limited rash with pain, it can be far more serious; in addition, acute cases often lead to postherpetic neuralgia (PHN) and is responsible for a significant economic burden.

Signs and symptoms of herpes zoster

The clinical manifestations can be divided into the following three phases:

- Preeruptive phase (preherpetic neuralgia)
- Acute eruptive phase
- Chronic phase (PHN)

The preeruptive phase is characterized by the following:

- Sensory phenomena along 1 or more skin dermatomes, lasting 1-10 days (average, 48 hours)
- Phenomena usually are noted as pain or, less commonly, itching or paresthesias [3]
- Pain may simulate headache, iritis, pleurisy, brachial neuritis, cardiac pain, appendicitis or other intra-abdominal disease, or sciatica
- Other symptoms, such as malaise, myalgia, headache, photophobia, and, uncommonly, fever

The acute eruptive phase is marked by the following:

- Patchy erythema, occasionally accompanied by induration, in the dermatomal area of involvement
- Regional lymphadenopathy, either at this stage or subsequently
- Grouped herpetiform vesicles developing on the erythematous base (the classic finding)
- Cutaneous findings that typically appear unilaterally, stopping abruptly at the midline of the limit of sensory coverage of the involved dermatome
- Vesicular involution: Vesicles initially are clear but eventually cloud, rupture, crust, and involute
- After vesicular involution, slow resolution of the remaining erythematous plaques, typically without visible sequelae
- Scarring can occur if deeper epidermal and dermal layers have been compromised by excoriation, secondary infection, or other complications
- Almost all adults experience pain, typically severe
- A few experience severe pain without a vesicular eruption (ie, zoster sine herpete)
- Symptoms tend to resolve over 10-15 days
- Complete healing of lesions may require up to a month

PHN is characterized by the following:

- Persistent or recurring pain lasting 30 or more days after the acute infection or after all lesions have crusted (9-45% of all cases) [4]
- Pain usually is confined to the area of original dermatomal involvement
- The pain can be severe and incapacitating
- Pain can persist for weeks, months, or years
- Slow resolution of pain is especially common in the elderly [5]
- PHN is observed more frequently after cases of herpes zoster ophthalmicus (HZO) and in instances of upper-body dermatomal involvement
- Less common postherpetic sequelae include hyperesthesia or, more rarely, hypoesthesia or anesthesia in the area of involvement

Common features of herpes zoster ophthalmicus are as follows:

- Classic symptoms and lesions of herpes zoster
- Ophthalmic manifestations including conjunctivitis, scleritis, episcleritis, keratitis iridocyclitis, Argyll-Robertson pupil, glaucoma, retinitis, choroiditis, optic neuritis,

optic atrophy, retrobulbar neuritis, exophthalmos, lid retraction, ptosis, and extraocular muscle palsies

Other forms include the following:

- Herpes zoster of maxillary branch of cranial nerve (CN) V
- Herpes zoster of mandibular branch of CN V
- Herpes zoster oticus (Ramsay Hunt syndrome)
- Glossopharyngeal and vagal herpes zoster
- Herpes occipitocollaris (vertebral nerves C2 and C3 involvement)
- Herpes zoster encephalomyelitis
- Disseminated herpes zoster
- Unilateral herpes zoster involving multiple dermatomes
- Recurrent herpes zoster
- Herpes zoster involving urinary bladder, bronchi, pleural spaces, or gastrointestinal tract
- Herpes zoster with motor complications

Diagnosis

Diagnosis is based primarily on the history and physical findings. In most cases, confirming the diagnosis via laboratory testing has no utility. In select patient populations, however—particularly immunocompromised patients—the presentation can be atypical and may require additional testing.

Laboratory studies for VZV include the following:

- Direct fluorescent antibody (DFA) testing of vesicular fluid or a corneal lesion
- Polymerase chain reaction (PCR) testing of vesicular fluid, a corneal lesion, or blood
- Tzanck smear of vesicular fluid (lower sensitivity and specificity than DFA or PCR)

Management

Episodes of herpes zoster are generally self-limited and resolve without intervention; they tend to be more benign and mild in children than in adults.

Conservative therapy includes the following:

- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Wet dressings with 5% aluminum acetate (Burrow solution), applied for 30-60 minutes 4-6 times daily
- Lotions (eg, calamine)

Primary medications for acute zoster–associated pain include the following:

- Narcotic and nonnarcotic analgesics (both systemic and topical)
- Neuroactive agents (eg, tricyclic antidepressants [TCAs])
- Anticonvulsant agents

Steroid treatment is traditional but controversial. Typically, a substantial dose (eg, 40-60 mg of oral prednisone every morning) typically is administered as early as possible in the course of the disease and is continued for 1 week, followed by a rapid taper over 1-2 weeks.

Antiviral therapy may decrease the length of time for new vesicle formation, the number of days to attain complete crusting, and the days of acute discomfort. Usually, the earlier antiviral medications are started, the more effective they are in shortening the duration of zoster and in preventing or decreasing the severity of PHN. Ideally, therapy should be initiated within 72 hours of symptom onset.

Oral treatment with the following has been found beneficial:

- Acyclovir
- Famciclovir
- Valacyclovir

Hospital admission should be considered for patients with any of the following:

- Severe symptoms
- Immunosuppression
- Atypical presentations (eg, myelitis)
- Involvement of more than 2 dermatomes
- Significant facial bacterial superinfection
- Disseminated herpes zoster
- Ophthalmic involvement
- Meningoencephalopathic involvement

Prevention and treatment of postherpetic neuralgia

Prompt treatment of acute zoster and its associated pain (eg, with antiviral therapy) can prevent the development of PHN. Once PHN has developed, various treatments are available, including the following:

- Neuroactive agents (eg, TCAs) [6]
- Anticonvulsant agents (eg, gabapentin, [7] pregabalin)
- Narcotic and nonnarcotic analgesics, both systemic (eg, opioids) and topical

A live attenuated VZV vaccine introduced in 2005 (Zostavax) has demonstrated a reduction in the incidence rate of herpes zoster. It is approved for use in patients aged 50 years and older and has been judged to be cost-effective. [8] The new zoster vaccine recombinant (adjuvanted) (Shingrix) has been approved by the US Food and Drug Administration (FDA). It has been judged more effective than the current vaccine and has been deemed safe and effective for adults aged 50 years and older, based on two randomized, placebo-controlled, observer-blind clinical trials.

Annexure 2

Bharath Institute of Higher Education and Research

Sri Lakshmi Narayana Institute of Medical Sciences

Participant list of Value-added course: **HERPES ZOSTER -DR08**

(July 2018 – Oct 2018)

2nd Year MBBS Student			
Sl. No	**Name of the Student**	**Reg No**	**Signature**
1	SHACHI SHASTRI	U17MB371	
2	SHATAVISHA MUKHERJEE	U17MB372	
3	SHEDAM OMKAR MAHADEV	U17MB373	
4	SHIVA VEERANNA HOUSR	U17MB374	
5	SHIVAM ANMOL	U17MB375	
6	SHIVANI BISWAL	U17MB376	
7	SHREYA KUMARI	U17MB377	
8	SHUBHAM KAMDE	U17MB378	
9	SOTALA MANULIKHA CHOWDARI	U17MB379	
10	SOUNDHARYA.K	U17MB380	
11	SOURABH DAS	U17MB381	
12	SRI KAVYA G	U17MB382	
13	SRISHTI SINGH	U17MB383	
14	SRITAMA SAHA	U17MB384	
15	SYAMA SAJEEV	U17MB390	

Dr. A. BUVANARATCHAGAN, MD.,
Asso. Professor
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry-605 502.

Dr. Buvanaratchagan

RESOURCE PERSON

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

Dr. K. Harsha Vardhan

COORDINATOR

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SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

ANNEXURE III

HERPES ZOSTER

COURSE CODE :DR08

MULTIPLE CHOICE QUESTIONS

Answer all the questions:

1. Causative agent of herpes zoster infection
   A.Varicella zoster
   B.Herpes simplex virus
   C.Molluscum contagiosum
   D.Human pappiloma virus

2. Antiviral treatment for herpes zoster infection should start within how many hours of symptom onset?
   A. 24 hours
   B. 72 hours
   C. 12 hours
   D. 6 hours

3. What is the other name of herpes zoster oticus?
   A. Ramsay hunt syndrome
   B. Nethertan syndrome
   C. Sweet syndrome
   D. SAPHO syndrome

4. Herpesoccipito collaris affects which vertebrta ?
   A. C1 and C2
   B. T2 and T3
   C. C3 and C4
   D. T1 and T2

5. Another term for preherpetic neuralgia?
   A. Acute eruptive phase
   B. Chronic phase
   C. Pre eruptive phase
   D. None of the above

6. Condition in which patients experience severe pain without a vesicular eruption in herpes zoster is called
   A. Ramsay hunt syndrome
   B. Zoster sine herpete
   C. Herpes zoster occipito collaris
   D. Disseminated herpes zoster

7. Name the new vaccine introduced in 2005 for herpes zoster infection?
   A. Zostavax
   B. Shingrix
   C. Cetvarix
   D. T-VEC

8. Name the main antiviral used in the herpes zoster infection?
   A. Acyclovir
   B. Zidovudine
   C. Efavirenz
   D. Indinavir

9. Which of the following is not a characteristic of pre eruptive phase of herpes zoster infection
   A. Sensory phenomenon along one or more skin dermatomes lasting 1-10 days
   B. Pain that stimulates headache,iritis,cardiac pain
   C. Patchy erutyhema, vesicular involutijn and regional lymphadenopathy
   D. Malaise,myalgia and photophobia

10. Hospital admission in herpes zoster is needed in conditions like
   A. Immunosuppresion
   B. Ophthalmic involvement
   C. Involvement of more than 2 dermatomes
   D. All of the above

ANNEXURE-3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

ANNEXURE III

HERPES ZOSTER

Shatavisha Mukherjee.

COURSE CODE :DR08

MULTIPLE CHOICE QUESTIONS

10/10 Vardhan ICH 19/9/18

Answer all the questions:

1. Causative agent of herpes zoster infection
   A.Varicella zoster
   B.Herpes simplex virus
   C.Molluscum contagiosum
   D.Human pappiloma virus

2. Antiviral treatment for herpes zoster infection should start within how many hours of symptom onset?
   A. 24 hours
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   D. 6 hours

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   B. Nethertan syndrome
   C. Sweet syndrome
   D. SAPHO syndrome

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   B. T2 and T3
   C. C3 and C4
   D. T1 and T2

5. Another term for preherpetic neuralgia?
   A. Acute eruptive phase
   B. Chronic phase
   C. Pre eruptive phase
   D. None of the above

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6. Condition in which patients experience severe pain without a vesicular eruption in herpes zoster is called
   A. Ramsay hunt syndrome
   B. Zoster sine herpete
   C. Herpes zoster occipito collaris
   D. Disseminated herpes zoster

7. Name the new vaccine introduced in 2005 for herpes zoster infection?
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   B. Shingrix
   C. Cetvarix
   D. T-VEC

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   C. Efavirenz
   D. Indinavir

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   B. Pain that stimulates headache,iritis,cardiac pain
   C. Patchy erutyhema, vesicular involutijn and regional lymphadenopathy
   D. Malaise,myalgia and photophobia

10. Hospiotal admission in herpes zoster is needed in conditions like
   A. Immunosuppresion
   B. Ophthalmic involvement
   C. Involvement of more than 2 dermatomes
   D. All of the above

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ANNEXURE-3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

ANNEXURE III

HERPES ZOSTER

COURSE CODE :DR08

Shivani Biswal

MULTIPLE CHOICE QUESTIONS

10/10

Vardhan K.S. 19-9-18

Answer all the questions:

1. Causative agent of herpes zoster infection
   A. Varicella zoster
   B. Herpes simplex virus
   C. Molluscum contagiosum
   D. Human pappiloma virus

2. Antiviral treatment for herpes zoster infection should start within how many hours of symptom onset?
   A. 24 hours
   B. 72 hours
   C. 12 hours
   D. 6 hours

3. What is the other name of herpes zoster oticus?
   A. Ramsay hunt syndrome
   B. Nethertan syndrome
   C. Sweet syndrome
   D. SAPHO syndrome

4. Herpesoccipito collaris affects which vertebrta ?
   A. C1 and C2
   B. T2 and T3
   C. C3 and C4
   D. T1 and T2

5. Another term for preherpetic neuralgia?
   A. Acute eruptive phase
   B. Chronic phase
   C. Pre eruptive phase
   D. None of the above

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6. Condition in which patients experience severe pain without a vesicular eruption in herpes zoster is called
   A. Ramsay hunt syndrome
   B. Zoster sine herpete
   C. Herpes zoster occipito collaris
   D. Disseminated herpes zoster

7. Name the new vaccine introduced in 2005 for herpes zoster infection?
   A. Zostavax
   B. Shingrix
   C. Cetvarix
   D. T-VEC

8. Name the main antiviral used in the herpes zoster infection?
   A. Acyclovir
   B. Zidovudine
   C. Efavirenz
   D. Indinavir

9. Which of the following is not a characteristic of pre eruptive phase of herpes zoster infection
   A. Sensory phenomenon along one or more skin dermatomes lasting 1-10 days
   B. Pain that stimulates headache,iritis,cardiac pain
   C. Patchy erutyhema, vesicular involutijn and regional lymphadenopathy
   D. Malaise,myalgia and photophobia

10. Hospiotal admission in herpes zoster is needed in conditions like
    A. Immunosuppresion
    B. Ophthalmic involvement
    C. Involvement of more than 2 dermatomes
    D. All of the above

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Annexure 4

Student Feedback Form

Course Name: **HERPES ZOSTER**

Subject Code: **DR08**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Signature

Date:19-09-2018

Annexure 4

Student Feedback Form

Course Name: **HERPES ZOSTER**

Subject Code: **DR08**

Name of Student: Shravan Biswal Roll No.: U17MB374

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear		✓			
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned		✓			
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful		✓			
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Shravan Biswal

Date:19-09-2018

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Annexure 4

Student Feedback Form

Course Name: **HERPES ZOSTER**

Subject Code: **DR08**

Name of Student: Shalini Mukherjee Roll No.: 17MB372

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear	✓				
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand	✓				
5	Teaching aids were effective		✓			
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	4	5

* Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2- Satisfactory; 1 – Non-Satisfactory

Suggestions if any:

Date:19-09-2018

Signature

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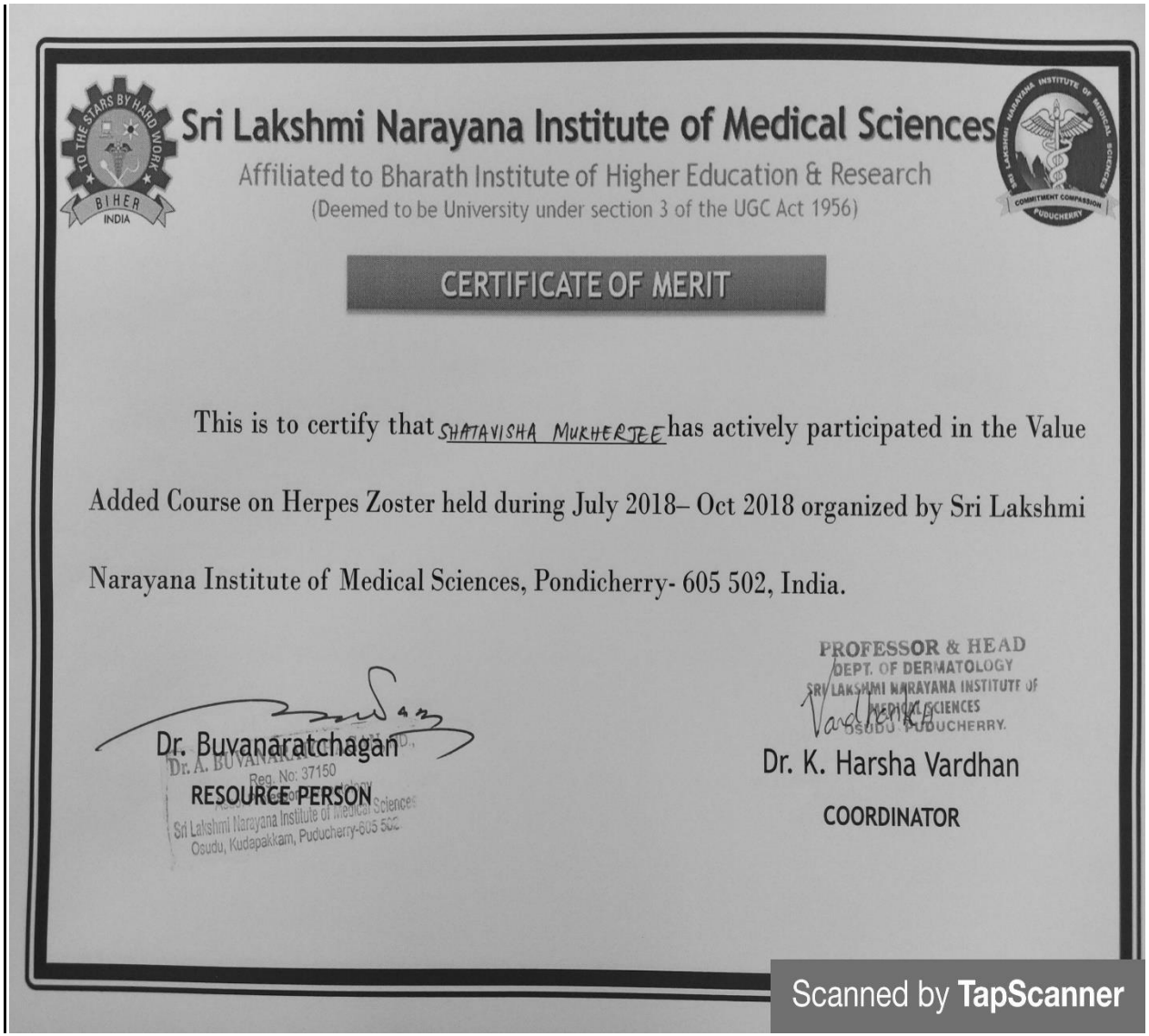

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SHATAVISHA MUKHERJEE has actively participated in the Value Added Course on Herpes Zoster held during July 2018– Oct 2018 organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Buvanaratchagan
RESOURCE PERSON

Reg. No: 37150
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

Dr. K. Harsha Vardhan
COORDINATOR

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ANNEXURE-5

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SHIVANI BISWAL has actively participated in the Value Added Course on Herpes Zoster held during July 2018– Oct 2018 organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Buvanaratchagan
RESOURCE PERSON

Dr. K. Harsha Vardhan
COORDINATOR

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Course completion letter Date-24-09-18

From
Dr. K. Harsha Vardhan
Department of Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Herpes zoster

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course title: **herpes zoster** on 20-7-18. We solicit your kind action to send certificates for the participants,that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. K. Harsha Vardhan

<HOD Sign and Seal>

Encl: Certificates

Photographs

Course completion letter

Date-24-09-18

From
Dr. K. Harsha Vardhan
Department of Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Herpes zoster

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course title: **herpes zoster** on 20-7-18. We solicit your kind action to send certificates for the participants,that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. K. Harsha Vardhan
<HOD Sign and Seal>

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

Encl: Certificates

Photographs



Sri Lakshmi Narayana Institute of Medical Sciences
Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

Date: 2nd Dec 2018

From
Dr. S.N. Rathod,
Professor and Head,
Department of Forensic Medicine,
Sri Lakshmi Narayana Institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Moral Narration

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Moral Narration** on Jan 2019 - June 2019. We solicit your kind permission for the same.

Kind Regards

Dr. S.N. Rathod

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. JAYALAKSHMI

The HOD: Dr SN Rathod

The Expert: Dr SN Rathod

The committee has discussed about the course and is approved.

Dean
(Sign & Seal)

Subject Expert
Dr SN Rathod
(Sign & Seal)
Professor & Head
Dept. of Forensic Medicine
Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

HOD
Dr SN Rathod
(Sign & Seal)
Professor & Head
Dept. of Forensic Medicine
Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

Sri Lakshmi Narayana Institute of Medical Sciences
Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

Circular

3rd Dec 2018

Sub: Organising Value-added Course: Moral Narration reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research**, is organizing **Moral Narration**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before December 15th 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Encl: Copy of Course content and Registration form.

Annexure 2 – Course Proposal

Course Title: Moral Narration

Course Objective:

1. What Is Narrative Medicine?
2. The Sources of Narrative Medicine
3. Bridging Health Care's Divides
4. Narrative Features of Medicine
5. Diagnostic Narration
6. Therapeutic Narration
7. Narratives of Illness
8. Developing Narrative Competence
9. Dividends of Narrative Medicine
10. A Narrative Vision for Health Care

Course Outcome: On successful completion of the course the students will be able to listen to narratives of illness, to understand what they mean, to attain rich and accurate interpretations of these stories, and to grasp the plights of patients in all their complexity.

Course Audience: 2nd year MBBS student

Course Coordinator: Dr. Jayalakshmi

Course Faculties with Qualification and Designation:

1. Dr. S.N. Rathod, MBBS, MD (Forensic Medicine),
Professor and head

Course Curriculum/Topics with schedule (Min of 30 hours)

S.No	Date	Topic	Time	Hours
1	19-01- 19	What Is Narrative Medicine?	2 pm to 5 pm	3
2	09-02- 19	The Sources of Narrative Medicine	2 pm to 5 pm	3
3	23-02- 19	Bridging Health Care's Divides	2 pm to 5 pm	3
4	09-03- 19	Narrative Features of Medicine	2 pm to 5 pm	3
5	23-03- 19	Diagnostic Narration	2 pm to 5 pm	3
6	13-04- 19	Therapeutic Narration	2 pm to 5 pm	3
7	27-04- 19	Narratives of Illness	2 pm to 5 pm	3
8	11-05-19	Developing Narrative Competence	2 pm to 5 pm	3

Annexure 3

Bharath Institute of Higher Education and Research

Participant list of Value added course: **Moral Narration on Jan 2019 - June 2019**

Sl.No	Reg.No	Name of the candidate
1.	U17MB380	SOUNDHARYA.K
2.	U17MB381	SOURABH DAS
3.	U17MB382	SRIKAVYA .G
4.	U17MB383	SRISHTI SINGH
5.	U17MB384	SRITAMA SAHA
6.	U17MB385	SUBHASHREE ABHIPSA GIRI
7.	U17MB386	SUMAN KUMAR SAHOO
8.	U17MB387	SURVE BHUSHAN SUNIL
9.	U17MB388	SURVESH PODDAR
10.	U17MB389	SURYAWANSHI SIDDHANT AJAY
11.	U17MB390	SYAMA SHAJEEV
12.	U17MB391	THIRUKKUMARAN J.T
13.	U17MB392	TWINKLE JAISWAL
14.	U17MB393	UDAY CHANDRA KARUMANCHI
15.	U17MB394	VIDHYA.V
16.	U17MB395	VISHAL.S
17.	U17MB396	VISHNU .K
18.	U17MB397	VIVEK AMAN SINGH
19.	U17MB398	YASHWANT RATHORE
20.	U17MB399	YAZHINI MURUGAN

Sri Lakshmi Narayana Institute of Medical Sciences
Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

Annexure 5

Date: 01-07-2019

From
Dr. S. N. Rathod
Forensic Medicine & Toxicology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Moral Narration

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled **Moral Narration** on Jan 2019 - June 2019. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. Jayalakshmi

Dr. S.N. Rathod

Professor & Head
Dept. of Forensic Medicine
Sri Lakshmi Narayana Institute of
Medical Sciences, Puducherry.

Encl: Certificates

Photographs

VALUE ADDED COURSE

1. Name of the programme & Code

Moral Narration & FMT VAC-05

2. Duration & Period

30hrs, from July 2018– December 2018 & January 2019 – June 2019.

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Mini CEX- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

(2) July 2018– December 2018 & January 2019 – June 2019.

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- July 2018 - June 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	FMT VAC05	Moral Narration	Dr. S.N. Rathod	2nd MBBS	20 (July 18 – Dec 18)
2	FMT VAC05	Moral Narration	Dr. S.N. Rathod	2nd MBBS	20 (Jan 19- June19)

10. Course Feed Back

Enclosed as Annexure- V

Dr S N Rathod

RESOURCE PERSON

PROFESSOR
Dept. of Forensic Medicine
Sri Lakshmi Narayana Institute of
Medical Sciences Puducherry

DEAN

COORDINATOR

Annexure- II

VALUE ADDED COURSE

Moral Narration and FMT VAC05

List of Students Enrolled Jan 2019 – Jun 2019

2nd Year MBBS Student		
Sl. No	**Name of the Student**	**Roll No**
1	SOUNDHARYA.K	U17MB380
2	SOURABH DAS	U17MB381
3	SRIKAVYA .G	U17MB382
4	SRISHTI SINGH	U17MB383
5	SRITAMA SAHA	U17MB384
6	SUBHASHREE ABHIPSA GIRI	U17MB385
7	SUMAN KUMAR SAHOO	U17MB386
8	SURVE BHUSHAN SUNIL	U17MB387
9	SURVESH PODDAR	U17MB388
10	SURYAWANSHI SIDDHANT AJAY	U17MB389
11	SYAMA SHAJEEV	U17MB390
12	THIRUKKUMARAN J.T	U17MB391
13	TWINKLE JAISWAL	U17MB392
14	UDAY CHANDRA KARUMANCHI	U17MB393
15	VIDHYA.V	U17MB394
16	VISHAL.S	U17MB395
17	VISHNU .K	U17MB396
18	VIVEK AMAN SINGH	U17MB397
19	YASHWANT RATHORE	U17MB398
20	YAZHINI MURUGAN	U17MB399

RESOURCE PERSON

Professor & Head
Dept of Forensic Medicine
Sri Lakshmi Narayana Institute of
Medical Sciences, Puducherry

COORDINATOR

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

MORAL NARRATION

MINI CLINICAL EXERCISE

Course Code: FMT VAC05

1. Take history from a cancer survivor
2. Discuss the management taking into consideration the religious and financial needs.
3. Take history from a victim of domestic violence

	Unsatisfactory			Satisfactory			Superior			*u/c
	1	2	3	4	5	6	7	8	9	
Patient assessment and preparation	0	0	0	0	0	0	0	0	0	0
Preparation for anesthesia	0	0	0	0	0	0	0	0	0	0
Management plan	0	0	0	0	0	0	0	0	0	0
Communication skills with patient	0	0	0	0	0	0	0	0	0	0
Communication skills with staff	0	0	0	0	0	0	0	0	0	0
Technical skills	0	0	0	0	0	0	0	0	0	0
Clinical judgment	0	0	0	0	0	0	0	0	0	0
Organization/efficiency	0	0	0	0	0	0	0	0	0	0
Professionalism	0	0	0	0	0	0	0	0	0	0
Overall clinical care	0	0	0	0	0	0	0	0	0	0
What did the trainee do well?										
Areas for improvement										
Agreed action										

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _____ has actively participated in the Value Added Course on "Moral Narration" held during Jan 2019 – Jun 2019 Organized by **Sri Lakshmi Narayana Institute of Medical Sciences**, Pondicherry-605 502, India.

Dr. S.N. Rathod
RESOURCE PERSON

Dr. Jayalakshmi
COORDINATOR

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Date: 04/06/2018

From
Dr. Aravind. C
Professor and Head,
Department of General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

Sub: Permission to conduct value-added course: ANTIMICROBIAL STEWARDSHIP

Respected Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Antimicrobial stewardship on 06/07/2018. We solicit your kind permission for the same.

Kind Regards

Dr. Aravind. C

Dr. C. ARAVIND, Reg.No:68432, Professor & HOD, General Medicine, Sri Lakshmi Narayana Institute of Medical Sciences, Osudu, Kudapakkam, Puducherry-605 502.

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. A. Sugumaran

The HOD: Dr. Aravind. C

The Expert: Dr. Arul Murugan

The committee has discussed about the course and is approved.

Subject Expert

HOD

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

DEPARTMENT OF GENERAL MEDICINE ... INSTITUTE OF MEDICAL SCIENCES ... PUDUCHERRY.

Reg.No:68432, Professor & HOD, General Medicine, Sri Lakshmi Narayana Institute of Medical Sciences, Osudu, Kudapakkam, Puducherry-605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

11/06/2018

Sub: Organising Value-added Course: ANTIMICROBIAL STEWARDHIP reg

With reference to the above-mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research**, is organisinga Value added course, titled, "ANTIMICROBIAL STEWARDSHIP" between July 2018 to November 2018. The course content is enclosed below.

The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 02/07/2018.Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN

Encl: Copy of Course content and Registration form.

COURSE PROPOSAL

Course Title: **Antimicrobial Stewardship**

Course Objective: To create an awareness among students of the 2nd year M.B.B.S about Antimicrobial stewardship; how it is the need of the hour.

Course Outcome: Improvement in the existing knowledge and awareness about Antimicrobial stewardship – what it is and how to practice it

Course Audience: A batch of 20 students belonging to the 2nd year of M.B.B.S

Course Coordinator: Dr. C. Aravind

Course Faculties with Qualification and Designation:

1. Dr. Arul Murugan
   Associate Professor
   Department of Medicine
2. Dr. Venkatasamy
   Professor
   Department of Medicine

Course Curriculum/Topics with schedule

SINo	Date	Topic	Time	Hours	Name of faculty
1.	06/07/2018	The discovery of antibiotics	5 pm to 8 pm	3 hours	Dr. Arul Murugan
2.	13/07/2018	The role of antibiotics in our society	4: 30 pm to 7: 30 pm	3 hours	Dr. Venkatasamy
3.	20/07/2018	Are we using or mis- using antibiotics?	4 pm to 7 pm	3 hours	Dr. Arul Murugan
4.	10/08/2018	Antibiotics in the farming and animal husbandry	4 pm to 7 pm	3 hours	Dr. Venkatasamy
5.	17/08/2018	What is antimicrobial stewardship?	5 pm to 8 pm	3 hours	Dr. Arul

					Murugan
6.	24/08/ 2018	Who all are the members of an Antimicrobial stewardship team?	4: 30 pm to 7: 30 pm	3 hours	Dr. Arul Murugan
7.	07/09/ 2018	How to initiate, escalate and de-escalate antibiotics?	5 pm to 7 pm	2 hours	Dr. Venkatasamy
8.	21/09/ 2018	Which antibiotics; what scenario	5 pm to 7 pm	2 hours	Dr. Arul Murugan
9.	12/10/ 2018	The possible consequences of antibiotic abuse	4 pm to 6 pm	2 hours	Dr. Arul Murugan
10.	26/10/ 2018	The chronology of antimicrobial resistance	4 pm to 7 pm	3 hours	Dr. Arul Murugan
11.	09/11/ 2018	Is antimicrobial stewardship practical?	4 pm to 7 pm	3 hours	Dr. C. Aravind
			Total Hours	30	

REFERENCE BOOKS:

1. HARRISON'S PRINCIPLES OF INTERNAL MEDICINE; 18th EDITION

2. ANTIMICROBIAL STEWARDSHIP – Principles and Practices

VALUE ADDED COURSE

1. Name of the programme and code

   ANTIMICROBIAL STEWARDSHIP; IM09

2. Duration & period

   30 hrs; between July 2018 to November 2018

3. Information Brochure and course content of value-added courses

   Enclosed as Annexure – I

4. List of students enrolled

   Enclosed as Annexure – II

5. Assessment procedures:

   Short notes – Enclosed as Annexure – III

6. Certificate model

   Enclosed as Annexure – IV

7. No. of times offered during the same year

   1; July 2018 to November 2018

8. Year of discontinuation

   2019

9. Summary report of each program year wise:

VALUE ADDED COURSE: July 2018 to November 2018					
Sl. No.	Course code	Course name	Resource persons	Target Students	Strength and year
1	IM09	ANTIMICROBIAL STEWARDSHIP	Dr. Arul Murugan Dr. Venkatasamy	2nd year MBBS	20 (July 2018 to November 2018)

10. Course feedback

    Enclosed as Annexure - V

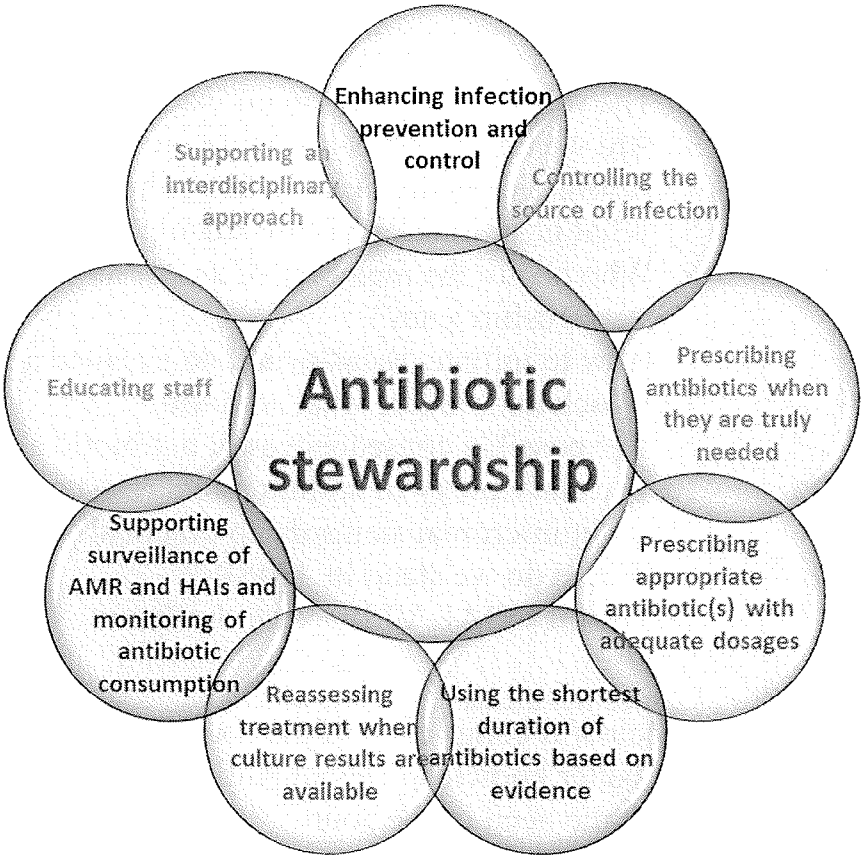
RESOURCE PERSON – Dr. Arul Murugan

COORDINATOR – Dr. C. Aravind

Dr. C. ARAVIND, MD.,
Reg No:68432
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

ANNEXURE – I

PARTICIPANT HANDBOOK



ANTIMICROBIAL STEWARDSHIP

VALUE ADDED COURSE (July 2018 to November 2018)

COURSE DETAILS

PARTICULARS	DESCRIPTION
Course title	ANTIMICROBIAL STEWARDSHIP
Course code	IM09
Objective	1. The discovery of antibiotics 2. The role of antibiotics in our society 3. Are we using or mis- using antibiotics? 4. Antibiotics in the farming and animal husbandry 5. What is antimicrobial stewardship? 6. Who all are the members of an Antimicrobial stewardship team? 7. How to initiate, escalate and de-escalate antibiotics? 8. Which antibiotics; what scenario 9. The possible consequences of antibiotic abuse 10. The chronology of antimicrobial resistance 11. Is antimicrobial stewardship practical? 12. Where do we stand in AMSPs? 13. The GLOBAL VISION for the future
Key competencies	On successful completion of the course, the students will have a better knowledge about Antimicrobial stewardship; how it is the need of the hour
Target students	2nd year MBBS
Duration	30 hours; between July 2018 – November 2018
Assessment procedure	Short note questions

ANTIMICROBIAL STEWARDSHIP

ALEXANDER FLEMING'S DISCOVERY OF PENICILLIN

Penicillin heralded the dawn of the antibiotic age. Before its introduction there was no effective treatment for infections such as pneumonia, gonorrhea or rheumatic fever. Hospitals were full of people with blood poisoning contracted from a cut or a scratch, and doctors could do little for them but wait and hope.

Antibiotics are compounds produced by bacteria and fungi which are capable of killing, or inhibiting, competing microbial species. This phenomenon has long been known; it may explain why the ancient Egyptians had the practice of applying a poultice of moldy bread to infected wounds. But it was not until 1928 that penicillin, the first true antibiotic, was discovered by Alexander Fleming, Professor of Bacteriology at St. Mary's Hospital in London.

Returning from holiday on September 3, 1928, Fleming began to sort through petri dishes containing colonies of Staphylococcus, bacteria that cause boils, sore throats and abscesses. He noticed something unusual on one dish. It was dotted with colonies, save for one area where a blob of mold was growing. The zone immediately around the mold—later identified as a rare strain of Penicillium notatum—was clear, as if the mold had secreted something that inhibited bacterial growth.

Fleming found that his "mold juice" was capable of killing a wide range of harmful bacteria, such as streptococcus, meningococcus and the diphtheria bacillus. He then set his assistants, Stuart Craddock and Frederick Ridley, the difficult task of isolating pure penicillin from the mold juice. It proved to be very unstable, and they were only able to prepare solutions of crude material to work with. Fleming published his findings in the British Journal of Experimental Pathology in June 1929, with only a passing reference to penicillin's potential therapeutic benefits. At this stage it looked as if its main application would be in isolating penicillin-insensitive bacteria from penicillin-sensitive bacteria in a mixed culture. This at least was of practical benefit to bacteriologists, and kept interest in penicillin going. Others, including Harold Raistrick, Professor of Biochemistry at the London School of Hygiene and Tropical Medicine, tried to purify penicillin but failed.

PENICILLIN RESEARCH AT OXFORD UNIVERSITY

It was Howard Florey, Ernst Chain and their colleagues at the Sir William Dunn School of Pathology at Oxford University who turned penicillin from a laboratory curiosity into a life-saving drug. Their work on the purification and chemistry of penicillin began in earnest in 1939, just when wartime conditions were beginning to make research especially difficult. To carry out a program of animal experiments and clinical trials the team needed to process up to 500 liters a week of mold filtrate. They began growing it in a strange array of culture vessels such as baths, bedpans, milk churns and food tins. Later, a customized fermentation vessel was designed for ease of removing and, to save space, renewing the broth beneath the surface of the mold. A team of "penicillin girls" was employed, at £2 a week, to inoculate and generally look after the fermentation. In effect, the Oxford laboratory was being turned into a penicillin factory.

Meanwhile, biochemist Norman Heatley extracted penicillin from huge volumes of filtrate coming off the production line by extracting it into amyl acetate and then back into water, using a countercurrent system. Edward Abraham, another biochemist who was employed to help step up production, then used the newly discovered technique of alumina column chromatography to remove impurities from the penicillin prior to clinical trials.

In 1940, Florey carried out vital experiments, showing that penicillin could protect mice against infection from deadly Streptococci. Then, on February 12, 1941, a 43-year old policeman, Albert Alexander, became the first recipient of the Oxford penicillin. He had scratched the side of his mouth while pruning roses, and had developed a life-threatening infection with huge abscesses affecting his eyes, face, and lungs. Penicillin was injected and within days he made a remarkable recovery. But supplies of the drug ran out and he died a few days later. Better results followed with other patients though and soon there were plans to make penicillin available for British troops on the battlefield.

War-time conditions made industrial production of penicillin difficult. A number of British companies, including Glaxo (now GlaxoSmithKline) and Kemball Bishop, a London firm later bought by Pfizer, took up the challenge.

HOW ARE ANTIBIOTICS IMPORTANT IN OUR LIVES ?

Any substance that inhibits the growth and replication of a bacterium or kills it outright can be called an antibiotic. Antibiotics are a type of antimicrobial designed to target bacterial infections within (or on) the body. This makes antibiotics subtly different from the other main kinds of antimicrobials widely used today:

Antiseptics are used to sterilise surfaces of living tissue when the risk of infection is high, such as during surgery.

Disinfectants are non-selective antimicrobials, killing a wide range of micro-organisms including bacteria. They are used on non-living surfaces, for example in hospitals.

Of course, bacteria are not the only microbes that can be harmful to us. Fungi and viruses can also be a danger to humans, and they are targeted by antifungals and antivirals, respectively. Only substances that target bacteria are called antibiotics, while the name antimicrobial is an umbrella term for anything that inhibits or kills microbial cells including antibiotics, antifungals, antivirals and chemicals such as antiseptics.

Most antibiotics used today are produced in laboratories, but they are often based on compounds scientists have found in nature. Some microbes, for example, produce substances specifically to kill other nearby bacteria in order to gain an advantage when competing for food, water or other limited resources. However, some microbes only produce antibiotics in the laboratory

THE PROBLEM OF ANTIBIOTIC RESISTANCE

Bacteria, not humans or animals, become antibiotic-resistant. These bacteria may infect humans and animals, and the infections they cause are harder to treat than those caused by non-resistant bacteria.

Antibiotic resistance leads to higher medical costs, prolonged hospital stays, and increased mortality.

The world urgently needs to change the way it prescribes and uses antibiotics. Even if new medicines are developed, without behaviour change, antibiotic resistance will remain a major

threat. Behaviour changes must also include actions to reduce the spread of infections through vaccination, hand washing, practising safer sex, and good food hygiene.

SCOPE OF THE PROBLEM

Antibiotic resistance is rising to dangerously high levels in all parts of the world. New resistance mechanisms are emerging and spreading globally, threatening our ability to treat common infectious diseases. A growing list of infections – such as pneumonia, tuberculosis, blood poisoning, gonorrhoea, and foodborne diseases – are becoming harder, and sometimes impossible, to treat as antibiotics become less effective.

Where antibiotics can be bought for human or animal use without a prescription, the emergence and spread of resistance is made worse. Similarly, in countries without standard treatment guidelines, antibiotics are often over-prescribed by health workers and veterinarians and over-used by the public.

Without urgent action, we are heading for a post-antibiotic era, in which common infections and minor injuries can once again kill.

WHAT CAUSES ANTIBIOTIC RESISTANCE ??

Antibiotics are important medications. It would be difficult to overstate the benefits of penicillin and other antibiotics in treating bacterial infections, preventing the spread of disease and reducing serious complications of disease.

But some medications that used to be standard treatments for bacterial infections are now less effective or don't work at all. When an antibiotic no longer has an effect on a certain strain of bacteria, those bacteria are said to be antibiotic resistant. Antibiotic resistance is one of the world's most pressing health problems.

The overuse and misuse of antibiotics are key factors contributing to antibiotic resistance. The general public, doctors and hospitals all play a role in ensuring proper use of the medications and minimizing the development of antibiotic resistance.

A bacterium resists a medication when the bacterium has changed in some way. The change either protects the bacterium from the action of the medication or neutralizes the medication.

Any bacterium that survives an antibiotic treatment can multiply and pass on its resistant properties. Also, some bacteria can transfer their medication-resistant properties to other bacteria — as if passing along a cheat sheet to help each other survive.

The fact that bacteria develop resistance to a medication is normal and expected. But the way that medications are used affects how quickly and to what extent resistance occurs.

Overuse of antibiotics

The overuse of antibiotics — especially taking antibiotics even when they're not the appropriate treatment — promotes antibiotic resistance. According to the Centers for Disease Control and Prevention, up to one-third to one-half of antibiotic use in humans is unnecessary or inappropriate.

Antibiotics treat bacterial infections but not viral infections. For example, an antibiotic is an appropriate treatment for strep throat, which is caused by the bacterium Streptococcus pyogenes. But it's not the right treatment for most sore throats, which are caused by viruses.

Other common viral infections that don't benefit from antibiotic treatment include:

- Cold
- Flu (influenza)
- Bronchitis
- Most coughs
- Some ear infections
- Some sinus infections
- Stomach flu

Taking an antibiotic for a viral infection:

- Won't cure the infection
- Won't keep other people from getting sick
- Won't help you or your child feel better
- May cause unnecessary and harmful side effects
- Promotes antibiotic resistance

If you take an antibiotic when you actually have a viral infection, the antibiotic attacks bacteria in your body — bacteria that are either beneficial or at least not causing disease. This misdirected treatment can then promote antibiotic-resistant properties in harmless bacteria

that can be shared with other bacteria, or create an opportunity for potentially harmful bacteria to replace the harmless ones.

Taking antibiotics responsibly

It's tempting to stop taking an antibiotic as soon as you feel better. But the full treatment is necessary to kill the disease-causing bacteria. Failure to take an antibiotic as prescribed can result in the need to resume treatment later and may promote the spread of antibiotic-resistant properties among harmful bacteria.

Consequences of antibiotic resistance

For many years, the introduction of new antibiotics outpaced the development of antibiotic resistance. In recent years, however, the pace of medication resistance has contributed to an increasing number of health care problems.

Approximately 2 million infections from antibiotic-resistant bacteria occur in the United States each year, resulting in 23,000 deaths.

Other consequences of medication-resistant infections include:

- More-serious illness
- Longer recovery
- More-frequent or longer hospitalization
- More doctor visits
- More-expensive treatments

ANTIBIOTIC STEWARDSHIP

The appropriate use of antibiotics — often called antibiotic stewardship — can help to:

- Preserve the effectiveness of current antibiotics
- Extend the life span of current antibiotics
- Protect people from antibiotic-resistant infections
- Avoid side effects from using antibiotics inappropriately

Many hospitals and medical associations have implemented new diagnostic and treatment guidelines to ensure effective treatments for bacterial infections and reduce inappropriate use of antibiotics.

The public also plays a role in antibiotic stewardship. You can help reduce the development of antibiotic resistance if you:

- Avoid pressuring your doctor to give you an antibiotic prescription. Ask your doctor for advice on how to treat symptoms.
- Practice good hygiene, to avoid bacterial infections that need antibiotic treatment.
- Make sure you and your children receive recommended vaccinations. Some recommended vaccines protect against bacterial infections, such as diphtheria and whooping cough (pertussis).
- Reduce your risk of getting a foodborne bacterial infection. Don't drink raw milk, wash your hands, and cook foods to a safe internal temperature.
- Use antibiotics only as prescribed by your doctor. Take the prescribed daily dosage, and complete the entire course of treatment.
- Never take leftover antibiotics for a later illness. They may not be the correct antibiotic and would not be a full course of treatment.
- Never take antibiotics prescribed for another person.

WHY WE NEED ANTIBIOTICS?

Nearly One half of the Hospitalized patients receive antimicrobial agents.

• Antibiotics are valuable Discoveries of the Modern
Medicine.

• All current achievements in Medicine are attributed to
use of Antibiotics

• Life saving in Serious infections.

WHAT WENT WRONG WITH ANTIBIOTIC USAGE

• Treating trivial infections / viral Infections with Antibiotics has become routine affair.

• Many use Antibiotics without knowing the Basic principles of Antibiotic therapy.

• Many Medical practioners are under pressure for short term solutions.

• Commercial interests of Pharmaceutical industry pushing the Antibiotics, more so Broad spectrum and Newer Generation antibiotics. as every Industry has become profit oriented.

• Poverty encourages drug resistance due to under utilization of appropriate Antibiotics.

WHAT IS ANTIBIOTIC STEWARDSHIP?

Antimicrobial stewardship is a coordinated program that promotes the appropriate use of antimicrobials (including antibiotics), improves patient outcomes, reduces microbial resistance, and decreases the spread of infections caused by multidrug-resistant organisms.

- A program that encourages judicious (vs injudicious) use of antibiotics
- Antibiotics are relatively so effective, non-toxic and inexpensive…so easy to use…that they are prone to abuse.
- When the diagnosis is uncertain, antibiotics are often prescribed…
- Stewardship strives to fine tune antibiotic Rx in regards to
- Efficacy
- Toxicity
- Resistance-induction
- *C. difficile*-induction
- Cost
- Discontinuation

Until this next giant step is achieved, those of us not developing new drugs have another job: conserve the antibiotics we have. In the hospital, antimicrobial stewardship teams are charged with this important initiative. Antimicrobial stewardship has been defined as "the optimal selection, dosage, and duration of antimicrobial treatment that results in the best clinical outcome for the treatment or prevention of infection, with minimal toxicity to the patient and minimal impact on subsequent resistance." The goal of antimicrobial stewardship is 3-fold.

The first goal is to work with health care practitioners to help each patient receive the most appropriate antimicrobial with the correct dose and duration. Joseph and Rodvold10 wrote about the "4 D's of optimal antimicrobial therapy": right Drug, right Dose, De-escalation to pathogen-directed therapy, and right Duration of therapy. The optimal care of an infected patient means treating with the correct, properly dosed antibiotic and one that has the least likelihood of causing collateral damage (ie, leading to resistance in the patient or his or her contacts). An added benefit of programs that aim to optimize antibiotic use is that they

generally experience cost savings because fewer doses of antibiotic are used and less expensive antibiotics are chosen.

The second goal is to prevent antimicrobial overuse, misuse, and abuse. In both the hospital and the outpatient setting, physicians use antibiotics when they are not necessary. Antibiotics are given to patients with viral infections, noninfectious processes (a classic example is the febrile patient with pancreatitis), bacterial infections that do not require antibiotics (such as small skin abscesses that will resolve with incision and drainage), and bacterial colonization (as in the case of a positive urine culture result in a patient with a bladder catheter). Antibiotics are also frequently misused, such as in the very common scenario of the use of broad-spectrum antibiotics that cover multidrug-resistant organisms in a patient whose infection was acquired in the community or the failure to adjust antibiotics according to culture data, thus maintaining the patient on a regimen to which the organism is not susceptible. Abuse of antibiotics is more difficult to define, but the term might be used to describe the use of one particular antibiotic preferentially over others by a physician as a result of aggressive detailing by the pharmaceutical representative or worse because of financial interest.

The third goal is to minimize the development of resistance. Both at the individual patient level and at the community level, antibiotic use changes susceptibility patterns. Patients exposed to antibiotics are at higher risk of becoming colonized or infected by resistant organisms. The most common cause of the development of *Clostridium difficile* diarrhea is exposure to antibiotics. Gram-negative resistance to carbapenems and cephalosporins has been shown to increase 10- to 20-fold with exposure to these broad-spectrum antimicrobials. In a recent systematic review and meta-analyses of outpatient prescribing practices, the use of common antibiotics was associated with significant increased risk of development of antibiotic resistance, up to 12 months after antimicrobial exposure (pooled odds ratio [OR], 1.33; 95% confidence interval [CI], 1.2-1.5). More importantly, antimicrobial resistance is associated with increased morbidity and mortality. Carbapenem-resistant *K pneumoniae* is associated with an increased attributable mortality compared with sensitive *Klebsiella* (OR, 4.69; 95% CI, 1.9-11.58; *P*=.001) and methicillin-resistant *S aureus* bacteremia, relative to methicillin-sensitive *S aureus* bacteremia, has a significantly greater mortality risk as well (OR, 1.93; 95% CI, 1.54-2.42; *P*=.001). These resistant organisms can become transmitted to other individuals within the hospital or in the patient's community. Antimicrobial resistance also has significant hospital and societal costs. A recent

study by Roberts et al estimated that the cost of an antimicrobial-resistant infection is $18,588 to $29,069 per patient, with an excess duration of hospital stay of 6.4 to 12.7 days and attributable mortality of 6.5% The third goal is to minimize the development of resistance. Both at the individual patient level and at the community level, antibiotic use changes susceptibility patterns. Patients exposed to antibiotics are at higher risk of becoming colonized or infected by resistant organisms.18-20 The most common cause of the development of Clostridium difficile diarrhea is exposure to antibiotics.21 Gram-negative resistance to carbapenems and cephalosporins has been shown to increase 10- to 20-fold with exposure to these broad-spectrum antimicrobials.22-24 In a recent systematic review and meta-analyses of outpatient prescribing practices, the use of common antibiotics was associated with significant increased risk of development of antibiotic resistance, up to 12 months after antimicrobial exposure (pooled odds ratio [OR], 1.33; 95% confidence interval [CI], 1.2-1.5).25 More importantly, antimicrobial resistance is associated with increased morbidity and mortality. Carbapenem-resistant K pneumoniae is associated with an increased attributable mortality compared with sensitive Klebsiella (OR, 4.69; 95% CI, 1.9-11.58; P=.001)22 and methicillin-resistant S aureus bacteremia, relative to methicillin-sensitive S aureus bacteremia, has a significantly greater mortality risk as well (OR, 1.93; 95% CI, 1.54-2.42; P=.001).26 These resistant organisms can become transmitted to other individuals within the hospital or in the patient's community. Antimicrobial resistance also has significant hospital and societal costs. A recent study by Roberts et al27 estimated that the cost of an antimicrobial-resistant infection is $18,588 to $29,069 per patient, with an excess duration of hospital stay of 6.4 to 12.7 days and attributable mortality of 6.5%.

SETTING UP AN ANTIBIOTIC STEWARDSHIP PROGRAM

Every hospital should work within its resources to create an effective team given its budget and personnel constraints. The stewardship team does not have to fit a particular mold, and it would be a mistake to delay implementation of a stewardship program because of a lack of availability of one or more of the typical team participants listed subsequently. Most stewardship teams include either an infectious disease physician or a pharmacist (with or without specialized training in infectious disease) or both. Sometimes a hospitalist with an interest in infectious disease serves in this role. Often the infection preventionist is an active member of the team. Close collaboration with the staff in the microbiology laboratory, hospital epidemiology, and administration is essential to a well-functioning program. A

working relationship with the information specialist can be especially helpful. Engaging hospital leadership will open doors to good relationships with other physician groups. Therefore, early involvement of thought leaders from hospital administration and the various practitioner groups will improve acceptance and implementation

GOALS OF AB STEWARDSHIP

• Optimizing clinical outcomes while minimizing unintended consequences of antimicrobial uses.

•*Toxicity*

•*Selection of Pathogenic organisms*

Emergence of Resistance

Secondary goal is also the reduction of health care costs without adversely impacting quality of care

ELEMENTS OF AN ANTIMICROBIAL STEWARDSHIP PROGRAM

- Active Antimicrobial Stewardship Strategies
- Supplemental Antimicrobial Stewardship Strategies Computer Surveillance and Decision Support
- Microbiology Laboratory Comprehensive
- Multidisciplinary Antimicrobial Management Programs
- Monitoring of Process and Outcome Measurements

ACTIVE ANTIMICROBIAL STEWARDSHIP STRATEGIES

1. PROSPECTIVE AUDIT WITH INTERVENTION AND FEEDBACK.

• A medium-sized community hospital resulted in a 22% decrease in the use of parenteral broad- spectrum antimicrobials.

• They also demonstrated a decrease in rates of *C. difficile infection & nosocomial infection* compared with the preintervention period.

2. FORMULARY RESTRICTION & PREAUTHORIZATION REQUIREMENTS FOR SPECIFIC AGENTS

1. Most hospitals have a pharmacy and therapeutics committee or an equivalent group
2. They evaluates drugs for inclusion on the hospital formulary on the basis of therapeutic efficacy, toxicity, cost
3. They also limit redundant new agents with no significant additional benefit.

3. SUPPLEMENTAL ANTIMICROBIAL STEWARDSHIP STRATEGIES

- *Education.*
- *Guidelines and clinical pathways.*
- *Antimicrobial cycling*
- *Antimicrobial order forms.*
- *Combination therapy.*
- *Streamlining or de-escalation of therapy.*
- *Dose optimization.*
- *Conversion from parenteral to oral therapy.*

MOST FREQUENTLY EMPLOYED INTERVENTIONS

- Educational efforts include passive activities
    1. conference/ presentation
    2. student and house staff teaching sessions
    3. provision of written guidelines
    4. e-mail alerts

However, education alone, without incorporation of active intervention, is only marginally effective and has not demonstrated a sustained impact

The role of combination antimicrobial therapy for the prevention of resistance is limited to those situations in which there is:

1. A high organism load
2. A high frequency of mutational resistance during therapy.

• Classic examples are tuberculosis or HIV infection.

CDC VISION FOR INPATIENT CARE

• Implementation of an antimicrobial stewardship program in a healthcare facility – regardless of inpatient setting – will help ensure that hospitalized patients receive the right antibiotic, at the right dose, at the right time, and for the right duration. As a result, there is reduced mortality, reduced risks of *Clostridium difficile*-associated diarrhea, shorter hospital stays, reduced overall antimicrobial resistance within the facility, and cost savings

COMPUTER SURVILLANCE:

• Computer physician order entry (CPOE) as 1 of the most important —leaps‖ that organizations can take to substantially improve patient safety.

• CPOE has the potential to incorporate clinical decision support and to facilitate quality monitoring.

Antibiotic prescribing practices and decreasing antibiotic resistance can be addressed through multifaceted strategies:

A. Use of ongoing education

B. Use of evidence-based hospital antibiotic guidelines and policies

C. Restrictive measures and consultations from infectious disease physicians, microbiologists and pharmacists.

PRACTICE RATIONALISM IN ANTIBIOTIC USE TO PROMOTE ANTIBIOTIC STEWARDSHIP

1. Antibiotic overuse contributes to the growing problems of *Clostridium difficile* infection and antibiotic resistance in healthcare facilities.

2. Improving antibiotic use through stewardship interventions and programs improves patient outcomes, reduces antimicrobial resistance, and saves money. Interventions to improve antibiotic use can be implemented in any healthcare setting—from the smallest to the largest.

3. Improving antibiotic use is a medication-safety and patient-safety issue.

IMPLEMENTATION OF WHONET CAN HELP TO MONITOR RESISTANCE

Legacy computer systems, quality improvement teams, and strategies for optimizing antibiotic use have the potential to stabilize resistance and reduce costs by encouraging heterogeneous prescribing patterns and use of local susceptibility patterns to individual patients.

HOSPITAL LEADERSHIP COMMITMENT

Support from the senior leadership of the hospital, especially the chief medical officer, chief nursing officer, and director of pharmacy, is critical to the success of antibiotic stewardship programs. A lack of necessary resources is commonly cited as the top barrier to success by stewardship programs. Hospital leadership can play a critical role in helping the stewardship program get the resources needed to accomplish its goals.

Priority examples of leadership commitment include:

- Giving stewardship program leader(s) time to manage the program and conduct daily stewardship interventions.
- Providing resources, including staffing, to operate the program effectively. Staffing suggestions for hospital antibiotic stewardship programs are available from the Veteran's Administration and a survey published in 2018.

- Having regular meetings with leaders of the stewardship program to assess the resources needed to accomplish the hospital's goals for improving antibiotic use.

- Appointing a senior executive leader to serve as a point of contact or "champion" for the stewardship program to help ensure that the program has resources and support to accomplish its mission.

- Reporting stewardship activities and outcomes (including key success stories) to senior leadership and the hospital board on a regular basis (e.g. including stewardship measures in hospital quality dashboard reports).

Other examples of leadership commitment include:

- Integrating antibiotic stewardship activities into other quality improvement and patient safety efforts, such as sepsis management and diagnostic stewardship.

- Having clear expectations for the leaders of the program on responsibilities and outcomes.

- Making formal statements of support for efforts to improve and monitor antibiotic use.

- Outlining stewardship-related duties in job descriptions and annual performance reviews for program leads and key support staff.

- Supporting training and education for program leaders (e.g. attendance of stewardship training courses and meetings) and hospital staff.

- Supporting enrollment in and reporting to the National Healthcare Safety Network (NHSN) Antimicrobial Use and Resistance (AUR) Module (20), including information technology support.

- Supporting participation in local, state, and national antibiotic stewardship quality improvement collaboratives.

- Ensuring that staff from key support departments (outlined below) have sufficient time to contribute to stewardship activities.

Annexure II

Bharath Institute of Higher Education and Research

Sri Lakshmi Narayana Institute of Medical Sciences

Participant list with signatures

Value added course: **ANTIMICROBIAL STEWARDSHIP (dated 06/07/2018)**

Sl.No	Reg.No	Name of the candidate	Signature
1.	U16MB251	AARTHI.A	
2.	U16MB252	ABILASHA.K	
3.	U16MB253	ABITHA RAJLIN J.S	
4.	U16MB254	ADAPALA PRIYANKA	
5.	U16MB255	ADHITHAYA RAJ .N	
6.	U16MB256	AJAY .N	
7.	U16MB257	AKSHYA .R	
8.	U16MB258	ALLARI KARTHIK ABHIROOP	
9.	U16MB259	AMAL ASHOK	
10.	U16MB260	AMIRTHAVARSHNI .R	
11.	U16MB271	AVIDI VENKATA SAISUSHMA	
12.	U16MB272	AVIRAL PATPATIA	
13.	U16MB273	BALACHANDRAN .A	
14.	U16MB274	BALAJI .S	
15.	U16MB275	BHASKARAN .K.C	
16.	U16MB276	BHAVANI . K.M	
17.	U16MB277	BLESSY AMALA RISHA .J	
18.	U16MB278	CAREENA DANIEL	

19.	U16MB279	CHANDRA PRAKASH.M	
20.	U16MB280	CHINJU S.R	

Annexure - III

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

ANTIMICROBIAL STEWARDSHIP

SHORT NOTES

Course Code: IM09

WRITE SHORT NOTES ON THE FOLLOWING:

1. Misguided use of antibiotics
2. Emergence of drug resistance
3. Antimicrobial stewardship programme
4. AMSP team

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

ANTIMICROBIAL STEWARDSHIP

SHORT NOTES

Student Name :

AMIRTHAVARSHNER

Course Code: IM09

WRITE SHORT NOTES ON THE FOLLOWING:

1. Misguided use of antibiotics
2. Emergence of drug resistance
3. Antimicrobial stewardship programme
4. AMSP team

8

10 + X

(Dr. CARAVIND)

1) Recent antibiotics use is a risk factor for infection or colonization ē resistant bacterial pathogens. Demand for antibiotics are to be affected by common knowledge attidue and practices. Patients bliive that taking antibiotics when they have cold, it will quickly get cured.

2) Antimicrobial resistance occurs naturally over time, usually through genetic changes. They can spread from person to person or between people & animals. including from food of animal origin The most important factor responsible for the development of multi resistance in bovine pathogens is mutation is irrational antibiotics.

3) Hospital epidemiologists — ASP director — Information services
IP physician — Director, pharmacy
ID section — ID pharmacist — Clinical microbiology laboratory manager
Pulmonary / specialists. — Dual trained pharmacy specialist

4) ASP/SP team is managed by team of academic & administration staff.
- Infectious disease physician
- Clinical pharmacist + infection disease training
- Clinical microbiologist
- An information systems specialist
- Infection control professional
- Hospital epidemiological.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

ANTIMICROBIAL STEWARDSHIP

SHORT NOTES

Student Name :

AARTHI . A

Course Code: IM09

WRITE SHORT NOTES ON THE FOLLOWING:

1. Misguided use of antibiotics
2. Emergence of drug resistance
3. Antimicrobial stewardship programme
4. AMSP team

6/10

(Dr. C. ARAVIND)

(1) * use of Antibiotic with no clinical indication.
* use of broad spectrum antibiotics when not indicated
* Inappropriate choice of empiric antibiotics.
* Inappropriate route, Duration.

(2) Modification of the Drug target. Several Drugs acts by their initial binding to a particular site within bacterial cells in order to initiate their bactericidal / bacteriostatic activity.
Somehow a Drug binding target is changed it may lead to development of resistance in bacteria against that drug.

(3) Antimicrobial stewardship is coordinated program that promotes the appropriate use of antimicrobials improves patient outcomes, reduce microbial resistance, and decreases the spread of infection caused by Multi Drug resistant organisms.

(4) The AMSP is manged by teamed academic and Administration staff. It also coordinates regional teams for provide local assistance for teachers and students across country.

ANNEXURE IV

Sri Lakshmi Narayana Institute of Medical Sciences

CERTIFICATE OF MERIT

This is to certify that ADAPALA PRIYANKA has actively participated in the Value Added Course on "AntiMicrobial Stewardship" between July 2018- November 2018, organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Arul Murugan
RESOURCE PERSON

Dr. C. Aravind
COORDINATOR



ANNEXURE – IV

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that AKSHYA .R has actively participated in the Value Added Course on "AntiMicrobial Stewardship" between July 2018- November 2018, organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Arul Murugan
RESOURCE PERSON

Dr. C. Aravind
COORDINATOR

Reg No:68432
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Kudapakkam, Puducherry-605 502.



ANNEXURE - V

Student Feedback Form

Course Name:**ANTIMICROBIAL STEWARDSHIP**

Subject Code: **IM09**

Name of Student: Aarthi. A Roll No.: 016MB251

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Aarthi

Signature

Date: 9/11/2018

ANNEXURE - V

Student Feedback Form

Course Name:**ANTIMICROBIAL STEWARDSHIP**

Subject Code: **IM09**

Name of Student: Ajay . N Roll No.: 016MB256

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date: 9/11/2018

Date: 12/11/2018

From
Dr. Aravind. C,
Professor and Head
Department of Internal Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

Sub: Completion of value-added course: Antimicrobial Stewardship

Respected Madam,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **"Antimicrobial Stewardship"** on 09/11/2018. We solicit your kind action to send certificates for the participants. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. Aravind. C

Dr. C. ARAVIND, MD.,
Reg.No:68432
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry

Encl: Photographs



Sri Lakshmi Narayana Institute of Medical Sciences

Date 3/6/2018

From
Dr K Balagurunathan,
Professor and Head,
General Surgery,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: SURGICAL PROCEDURES IN ACUTE EMERGENCY

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **SURGICAL PROCEDURES IN ACUTE EMERGENCY** 30 hours course on **July 2018-December 2018**. We solicit your kind permission for the same.

Kind Regards

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

DR K BALAGURUNATHAN

HOD, GENERAL SURGERY

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: DR A SUGUMARAN

The HOD: DR K BALAGURUNATHAN

The Expert: DR ASAYAS BOSCO CHANDRA KUMAR

The committee has discussed about the course and is approved.

Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kodapakkam, Puducherry-605 502

Dean

(Sign & Seal)

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Subject Expert

(Sign & Seal)

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

(Sign & Seal)

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affiliated to Bharath University, Chennai - TN]

Circular

07.06.2018

Sub: Organising Value-added Course: SURGICAL PROCEDURES IN ACUTE EMERGENCY

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing a value added course **"SURGICAL PROCEDURES IN ACUTE EMERGENCY"**.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 1ST JULY 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Course Proposal

Course Title: SURGICAL PROCEDURES IN ACUTE EMERGENCY

Course Objective:

1. Tracheostomy – Indications
2. Types Of Tracheostomy Tubes
3. Tracheostomy Procedure Demonstration
4. Complications Of Tracheostomy
5. Tracheostomy Care
6. Thoracocentesis – Indications,
7. Thoracocentesis Procedure Demostartion
8. Complications Of Thoracocntesis
9. Intercoastal Tube Drainage- Indications
10. Icd Procedure Demonstration
11, Complications Of Icd Insertion

Course Outcome:

Course Audience: MBBS UNDERGRADUATES

Course Coordinator: DR ASAYAS BOSCO CHANDRA KUMAR

Course Faculties with Qualification and Designation:

1. **Dr Asayas Bosco Chandra Kumar , Prof General Surgery**
2. **Dr K Balagurunatha, Prof and HOD General Surgery**
3. **Dr M Senthil Velan , Prof General Surgery**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours	Faculty
1.	14/7/2018	1. Tracheostomy – Indications	4-6PM	2	**Dr Asayas Bosco**
2.	16/7/2018	2. Types Of Tracheostomy Tubes	4-6PM	2	**Dr K Balagurunatha**
3.	18/7/2018	3. Tracheostomy Procedure Demonstration	4-7PM	3	**Dr Asayas Bosco**
4.	21/7/2018	4. Tracheostomy	4-6PM	2	**Dr M Senthil**

		Procedure Demonstration			**Velan**
5.	23/7/2018	5. Complications Of Tracheostomy	4-6PM	2	**Dr Asayas Bosco**
6.	25/7/2018	6. Tracheostomy Care	4-6PM	2	**Dr K Balagurunatha**
7.	27/7/2018	7. Thoracocentesis – Indications,	4-6PM	2	**Dr M Senthil Velan**
8.	4/8/2018	8. Thoracocentesis Procedure Demostartion	4-6PM	3	**Dr Asayas Bosco**
9.	6/8/2018	9. Thoracocentesis Procedure Demostartion	4-6PM	2	**Dr M Senthil Velan**
10.	9/8/2018	10. Complications Of Thoracocntesis	4-5PM	1	**Dr Asayas Bosco**
11.	11/8/2018	11. Intercoastal Tube Drainage- Indications	4-6PM	2	**Dr M Senthil Velan**
12.	14/8/2018	12. Icd Procedure Demonstration	4-6PM	2	**Dr Asayas Bosco**
13.	16/8/2018	13. Icd Procedure Demonstration	4-7PM	3	**Dr M Senthil Velan**
14.	21/8/2018	14. Complications Of Icd Insertion	4-6PM	2	**Dr Asayas Bosco**

REFERENCE BOOKS: (Minimum 2)

1. **Schwartz's Principles of Surgery, 11th Edition**
2. **Bailey And Love's Short Practice of Surgery 27th Ed**

VALUE ADDED COURSE

1. Name of the programme & Code

Surgical procedures in acute emergency & GS09

2. Duration & Period

30 hrs & JULY 2018 –DEC 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 TIME JULY 2018 –DEC 2018

8. Year of discontinuation: 2018

9. Summary report of each program year-wise

Value Added Course- JULY 2018 –DEC 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	GS09	Surgical procedures in acute emergency	Dr. ASAYAS BOSCO CHANDRA KUMAR	MBBS	20 (JULY 2018 –DEC 2018)

10. Course Feed Back

Enclosed as Annexure- V

Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

RESOURCE PERSON

DR ASAYAS BOSCO CHANDRAKUMAR

(PROF GENERAL SURGERY)

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

CO-ORDINATOR

DR K BALAGURUNATHAN

(HOD GENERAL SURGERY)

SURGICAL PROCEDURES IN ACUTE EMERGENCY

PARTICIPANTS HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	SURGICAL PROCEDURES IN ACUTE EMERGENCY
Course Code	GS09
Objective	1.Tracheostomy – Indications 2.Types Of Tracheostomy Tubes 3.Tracheostomy Procedure Demonstration 4.Complications Of Tracheostomy 5. Tracheostomy Care 6. Thoracocentesis – Indications, 7. Thoracocentesis Procedure Demostartion 8. Complications Of Thoracocntesis 9.Intercoastal Tube Drainage- Indications 10. Icd Procedure Demonstration 11, Complications Of Icd Insertion
Further learning opportunities	
Key Competencies	On successful completion of the course the students will have skill in emergency tracheostomy , thoracocentesis and other procedures
Target Student	MBBS Students
Duration	30hrs JULY 2018 –DEC 2018
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Multiple choice questions

TRACHEOSTOMY

Tracheostomy is making an opening in the anterior wall of trachea and converting it into a stoma on the skin surface.

Types'

- Emergency tracheostomy.
- Elective tracheostomy.
- Permanent tracheostomy.

High tracheostomy: Above the level of isthmus. It can cause tracheal stenosis. It is above second ring.

Mid tracheostomy: Ideal and commonly used. It through 2nd and 3rd rings behind isthmus. It is approached by dividing thyroid isthmus.

Low tracheostomy: Below the isthmus level. It is deep and impinges the suprasternal notch. It can cause torrectial bleed which is difficult to control.

Tracheostomy Tubes

1. **Fuller's bivalved tracheostomy tube**: It has got a outer tube and a inner tube. Outer tube is biflanged and so insertion is easier. Inner tube is longer with an opening on its posterior aspect. Inner tube can be removed and reinserted easily whenever required.

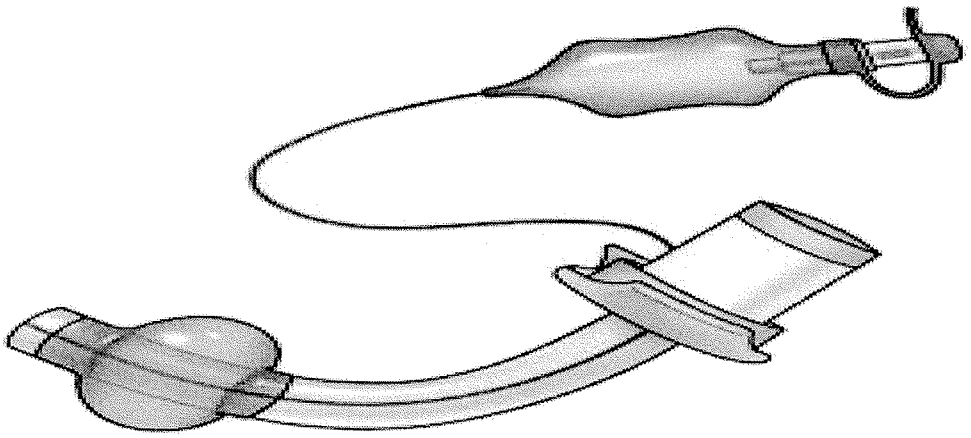
2. Jackson's tracheostomy tube: It has got outer tube, inner tube and an obturator.

3. Red-rubber tracheostomy tube.

4. PVC tracheostomy tube.

.

Modern tracheostomy tubes are made of plastic. They are soft, least irritant and disposable. They have inflatable cuff which makes it easier to give assisted ventilation. Cuff should be deflated at regular intervals to prevent tracheal pressure necrosis (For assisted ventilation, endotracheal tube can be kept for 7 days. Beyond that period patient needs tracheostomy for further ventilation).



Indications for Tracheostomy

- In head, neck and facial injuries.
- Tetanus.
- Tracheomalacia after thyroidectomy or bilateral recurrent laryngeal nerve palsy.
- Laryngeal oedema/spasm.
- Major head and neck surgeries like Commando's operation, block dissection.
- Acute laryngitis as in diphtheria.'
- Carcinoma larynx, foreign body larynx, burns mouth, pharynx, larynx.
- Respiratory paralysis like bulbar palsy.
- Respiratory failure due to asthma, ARDS.

Indications for tracheostomy respiratory obstruction due to

• Acute infections causing oedema laryx

• Trauma

• Neoplasms—benign/malignant

• Foreign body

• Bilateral abductor palsy

• Congenital causes Respiratory secretions due to

• Inability to cough—tetanus, head injury, neurological causes, strychnine poison

• Painful cough in chest injuries, pneumonia

• Aspiration of secretions Respiratory insufficiency due to chronic lung diseases like emphysema, chronic bronchitis, bronchiectasis

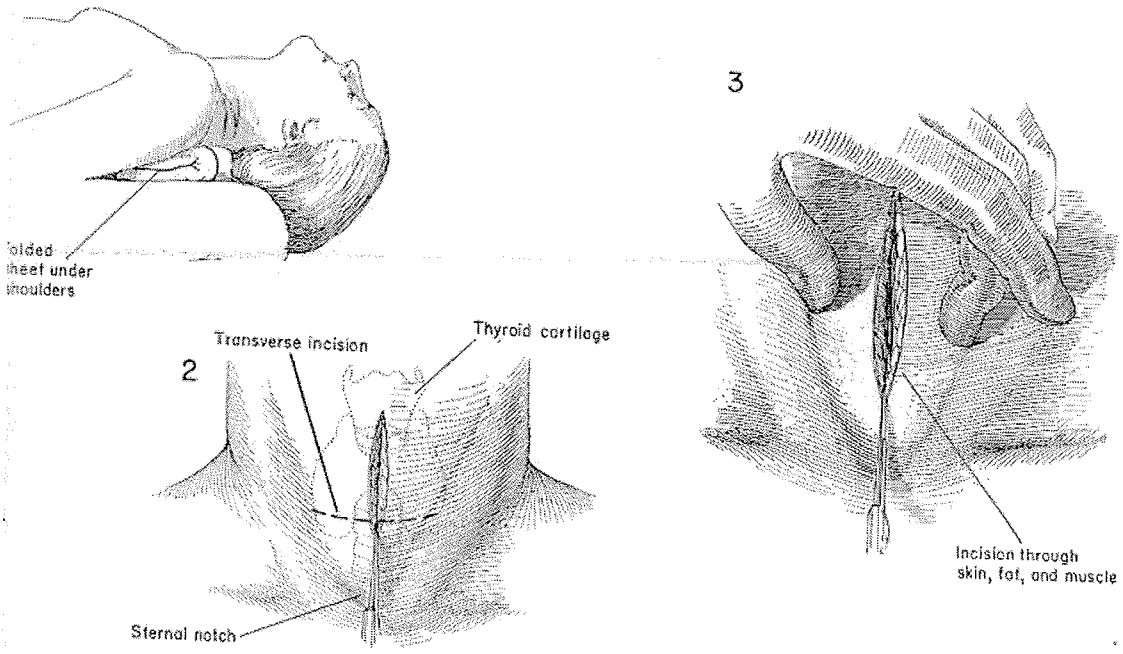
Technique of Tracheostomy

Neck of the patient is hyper extended by placing sand bags under the shoulder. Vertical (midline) or horizontal incision is made. Deep fascia is opened. Strap muscles are retracted laterally. Isthmus is divided or retracted upwards. A few drops of lignocaine are instilled into the trachea to suppress the cough reflex. Trachea is fixed with tracheal hook. Second and 3rd or 3rd and 4th tracheal rings are opened and circular opening is made. Tracheostomy tube is placed. It is tied around the neck. Note

• First tracheal ring should never be used to do tracheostomy as perichondritis of cricoid cartilage with stenosis can occur.

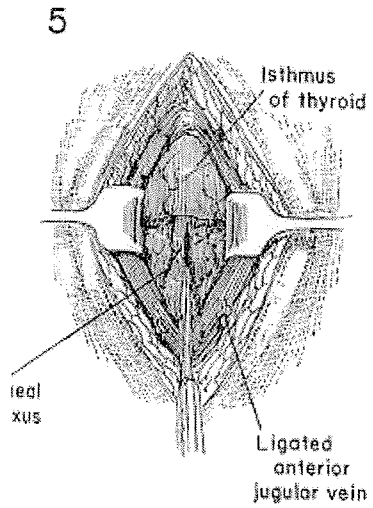
• Skin should not be sutured or loosely sutured to prevent development of subcutaneous emphysema.

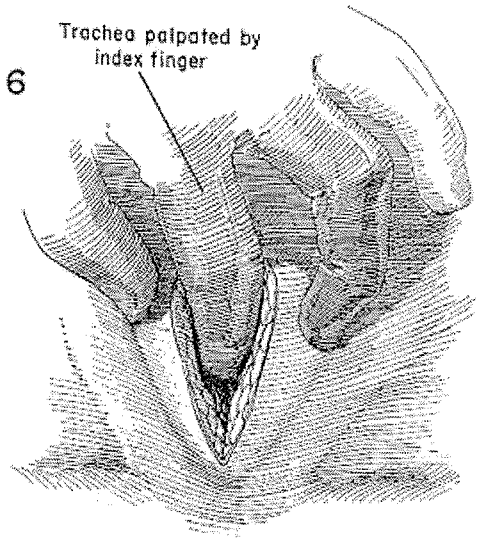
• Cautery should be used during tracheostomy as much as possible to prevent oozing/bleeding from places like muscles, tracheal cut edge. Often torrential haemorrhage known to occur which may need a re-exploration to control bleeding.

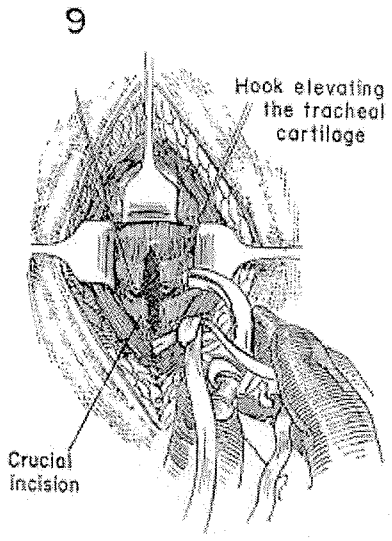

olded
heet under
houlders
2
Transverse incision
Thyroid cartilage
Sternal notch
3
Incision through
skin, fat, and muscle

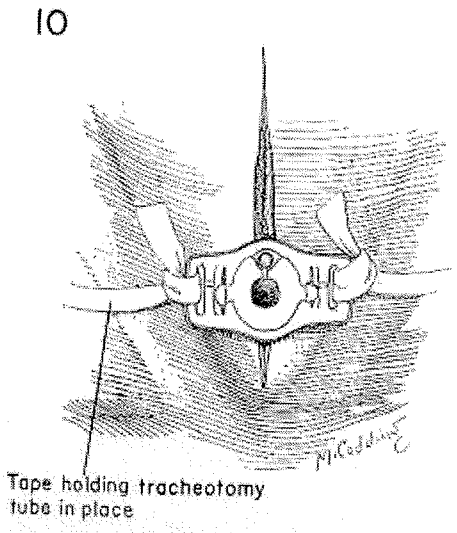
BIHER

SLIMS









Tracheostomy Care

• Regular suctioning of the tube.

• Cleaning of tracheostomy tube.

• Humidification of the inspired air using normal saline/ringer lactate/acetylcystine mucolytic agent to liquefy secretions or crusts so that to prevent blockage.

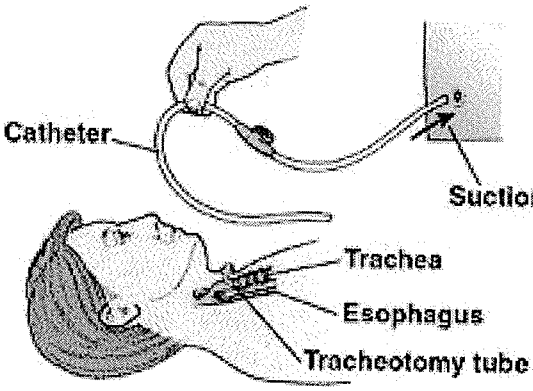
• Constant observation of the patient for block, bleeding.

• Periodic deflation of the cuff of the tube for short period to prevent pressure necrosis of tracheal mucosa.

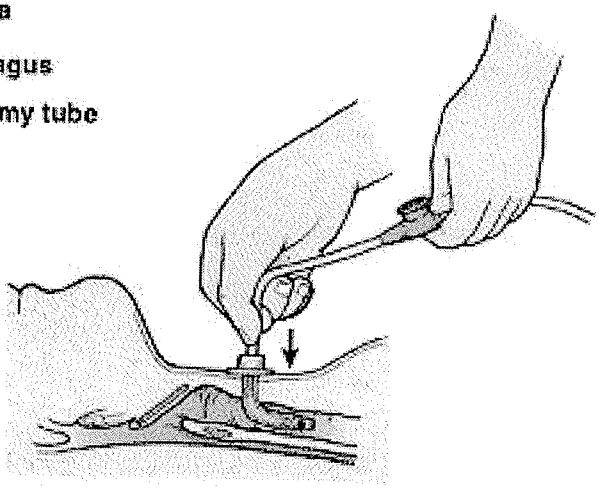
• Prevention of infection.

• Decannulation of tracheostomy should be done with care especially in children as sudden respiratory distress can occur and in such occasion emergency reinsertion of the tube should be done • Flexible brochoscopy may be needed to clear the lower air-way through the tracheostomy tube.

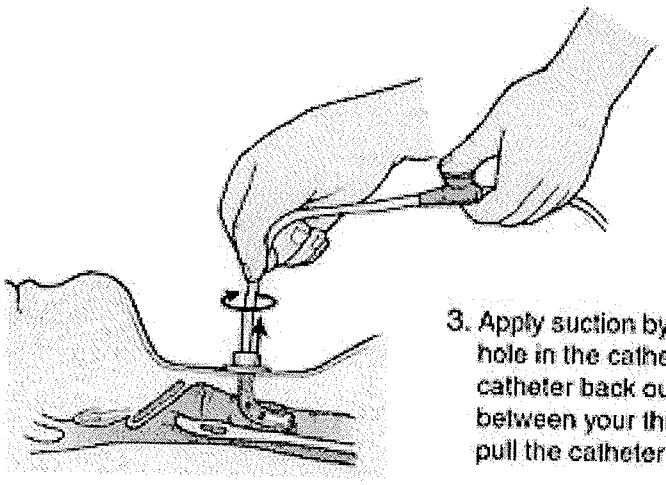
How to Suction a Tracheostomy Tube



1. Connect the catheter to the suction machine. Do not touch the end of the catheter that will go into the trach tube.



2. Insert the catheter the proper distance into the trach tube (usually the length of the trach tube plus 1/4 inch.)



3. Apply suction by putting your thumb over the hole in the catheter while you gently pull the catheter back out. Gently roll the catheter between your thumb and forefinger as you pull the catheter out.

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Functions of the tracheostomy

• Alternate pathway for respiration bypassing the upper air-way

• It decreases the dead space by 50% and reduces the resistance to airflow so as to improve the ventilation

• It prevents aspiration in bulbar palsy, coma, haemorrhage from larynx/pharynx

• In injuries of head, chest, abdomen, in respiratory paralysis lower airway is kept clean and patent by doing suction of the secretions through the tracheostomy tube

• Tracheostomy is better and ideal for intermittent positive pressure ventilation (IPPR)

• To give general anaesthesia when endotracheal intubation is not possible

Complications of Tracheostomy • Bleeding. • Aspiration, sudden apnoea. • Pneumothorax. • Surgical emphysema in the neck.• Mediastinal emphysema. • Injury to adjacent structures like oesophagus, recurrent laryngeal nerve, thyroid gland. • Tracheal stenosis. • Laryngeal stenosis due to perichondritis of cricoid cartilage. • Tracheitis/tracheo-bronchitis. • Displacement/blockage of the tube or erosion of the tube into major vessels. • Tracheo-oesophageal, tracheoarterial fistula.

• Consent should be taken.

• Materials like tracheostomy tubes, (8.5 size), sterile gown, drapes, gloves, cap, mask, tracheostomy sterile set, gauze, local anaesthetic agent, suction apparatus and tubes, connecting tubes to ventilator, sterile syringes should be kept ready. • During procedure the patient is monitored for vital signs.

• Proper nursing care of the tracheostomy tube is done like, humidifying, cleaning, suction, care of the wound, checking of cuff pressure.

• Tracheal dilator and additional tracheostomy tube should be kept ready at bedside in case of blockage of existing tube/balloon not getting inflated to replace

with a new one. • Absolute asepsis like scrubbing hands, using sterile equipments are essential. • Sterile suction tubes should be used.

• Care of inner tube is essential in case of metal tracheostomy tube. • Regular dressing of the wound is needed. Antibiotics are required to prevent pulmonary sepsis.

PLEURAL TAP (THORACOCENTESIS)

Indications'

• Pleural effusion both diagnostic as well as therapeutic. The fluid is sent for culture, cytology, microscopy, specific gravity, biochemical analysis like proteins for diagnosis of tuberculosis, malignancy.

• In empyema thoracis, for diagnostic purpose before placing an ICT.

• Intrapleural administration of drugs.

Position In sitting position, leaning forward over a wooden support.

Site : Tip of scapula at 7th intercostal space (posteriorly).

Procedure :

done in sitting and leaning forward over a support.

Tapping is done from behind.

After giving local anaesthesia wide bore needle (Abraham needle) is used to tap the fluid.

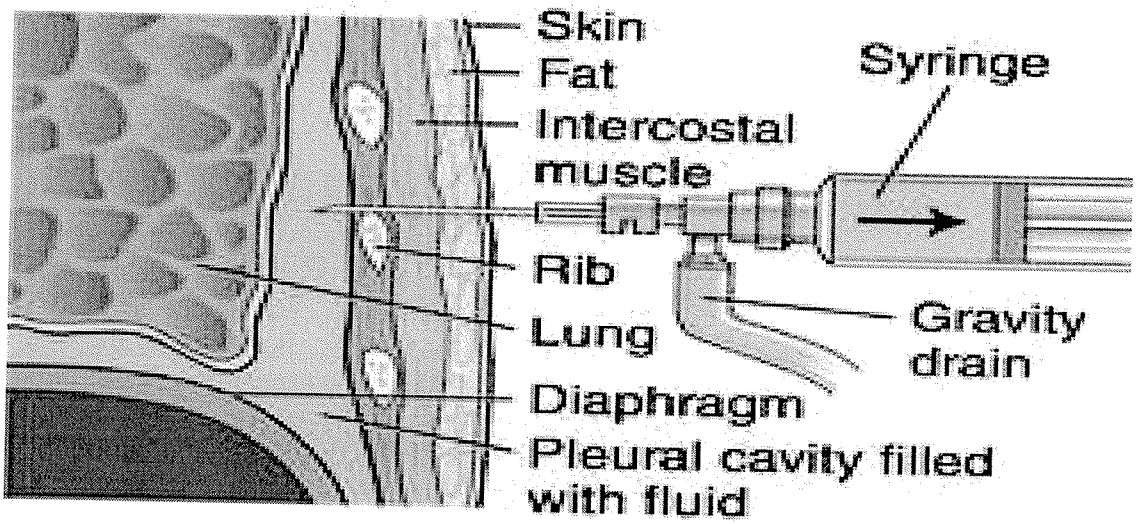
Needle with stopcock (3-way) is used.

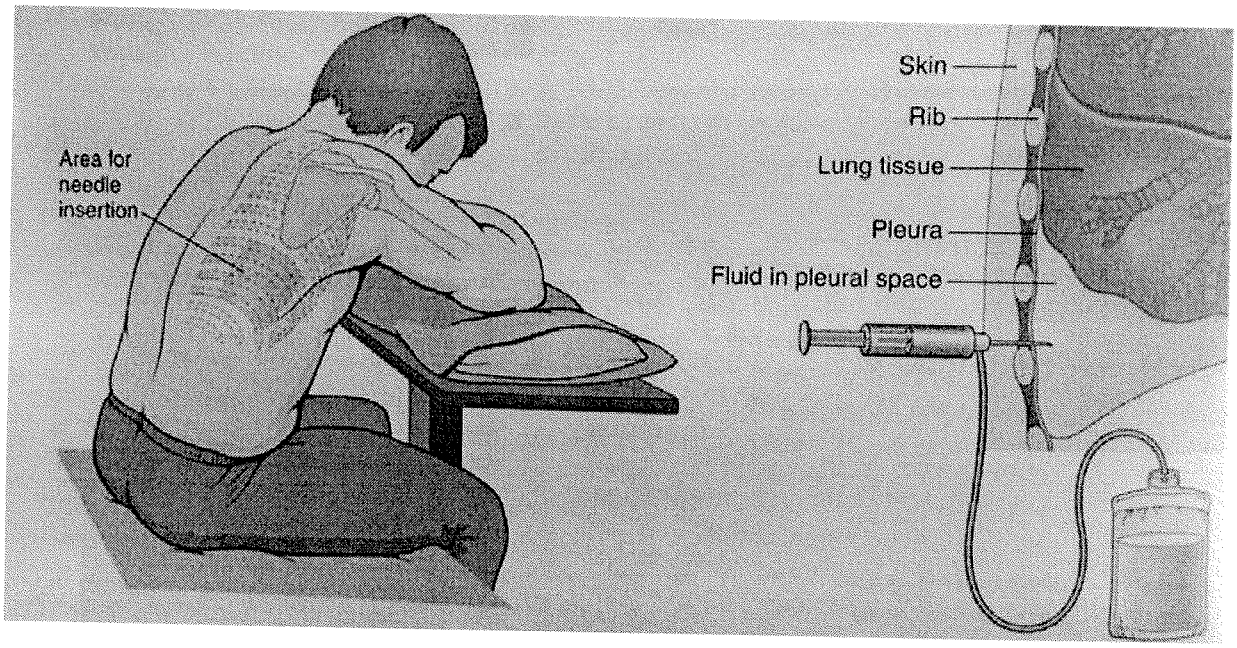
50 ml syringe is connected to the stopcock.

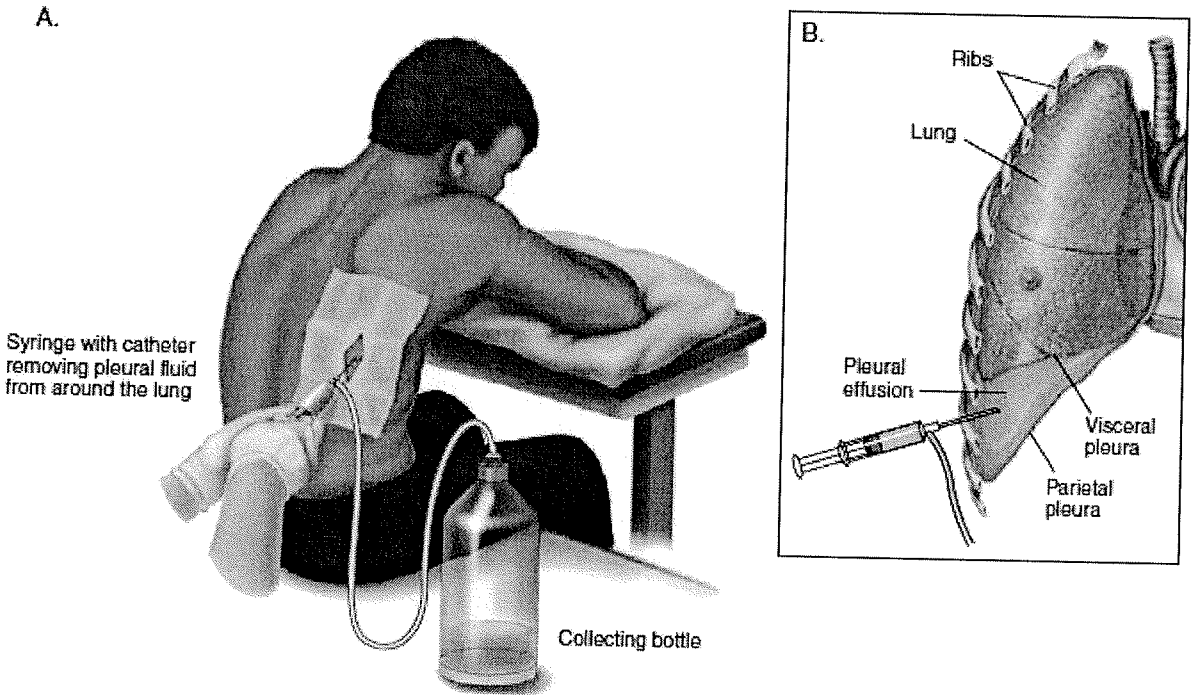
Fluid is aspirated to syringe from pleura with stopcock in straight position.

Then knob is turned right angle to empty the syringe to reservoir.

Procedure is repeated to clear the fluid.







For **diagnostic tap**, 50 ml of fluid is aspirated to send for biochemical/cytological analysis and culture.

For **therapeutic aspiration**— 750-1000 ml per day is aspirated. If more quantity is aspirated rapidly, pulmonary oedema may develop leading to often ARDS which may be life-threatening.

Complications

- Infection.
- Dry tap or bloody tap.
- Sudden vagal shock.
- Pain and respiratory distress.

BIHER SLIMS

INTERCOSTAL TUBE DRAINAGE (ICT DRAINAGE)

It is the method of draining collections in the pleural cavity safely so as to make the lung to expand

Indications

- Haemothorax.
- Pneumothorax.
- Haemopneumothorax
- Empyema thoracis.
- Traumatic lung contusion.
- After thoracotomy to drain pleural cavity.

Procedure

- Patient is in 45° partial lying positions with backrest support.

Under local anaesthesia (5 ml of 1% xylocaine injection), an ICT is placed in 6th or 8th intercostal space in case of haemothorax and pyothorax and in pneumothorax ICT is placed in 2nd or 3rd space.

• A small incision is made in midaxillary line (as the muscle bulk is less here and so passage of ICT is easier), parallel to intercostal space (above the rib, i.e. lower part of intercostal space to avoid injury to neurovascular bundle which are located in the groove in the lower part of rib).

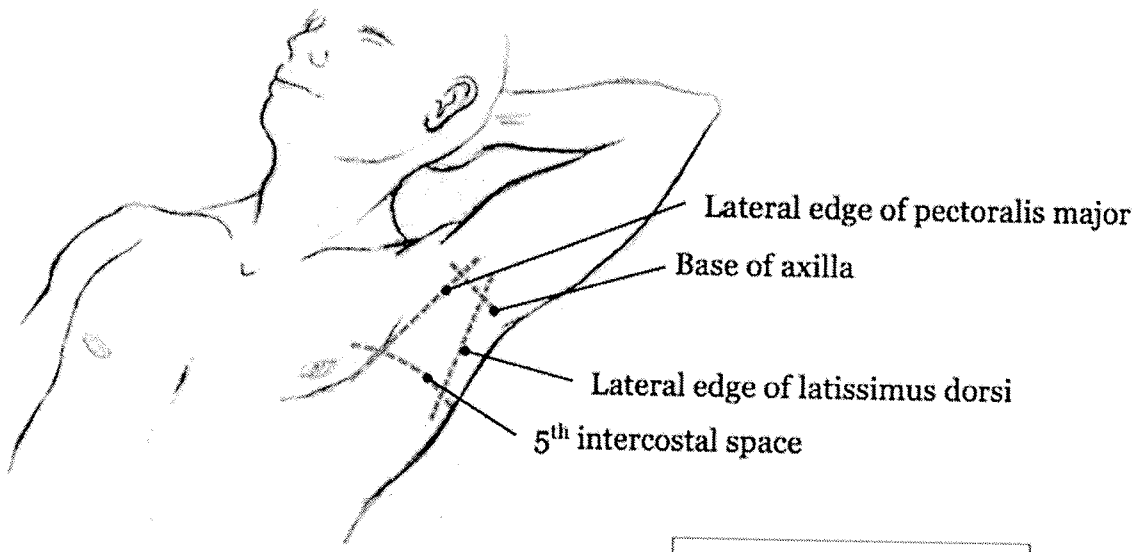
Tube with side openings is pushed into the pleural cavity.

• Other end is connected to under water seal (200 ml of sterile water). Air-water column moving with respiration can be observed. Tube is fixed with skin sutures.

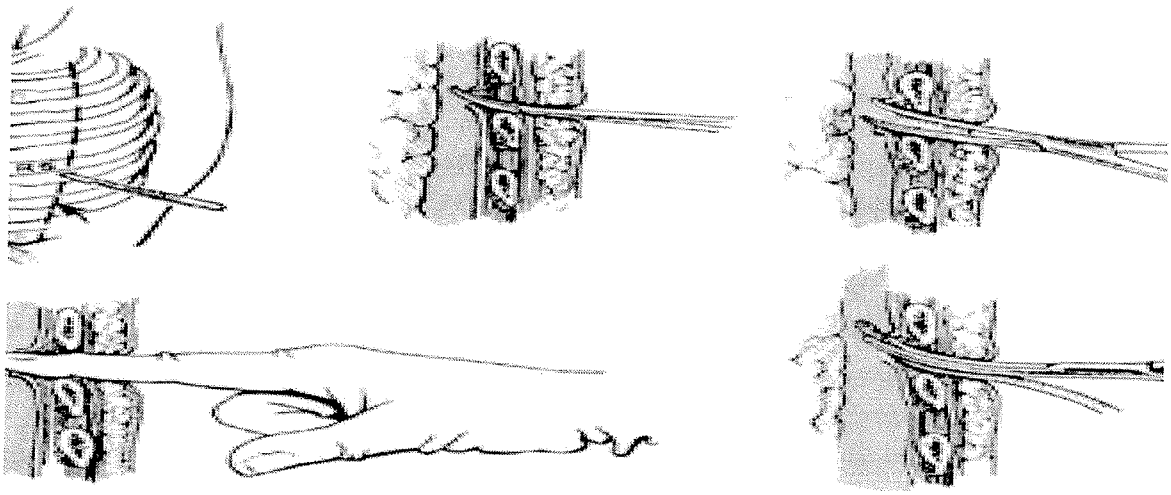
• Usually for pneumothorax ICT is kept for 2-3 days (Till lung expands—Confirmed by check chest X-ray). For haemothorax and pyothorax it is kept for 4-6 days or until it stops draining and lung expansion is confirmed by repeat chest X-ray.

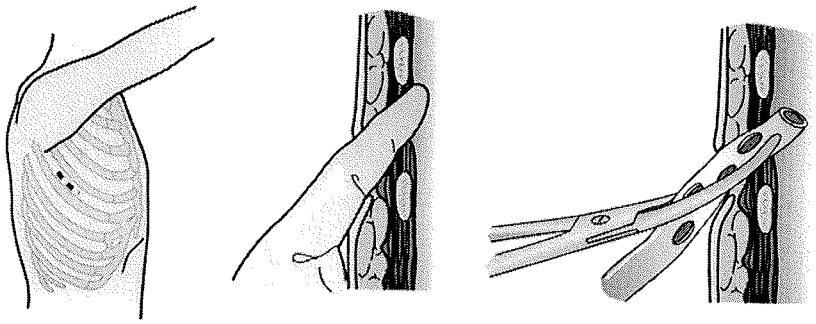
To have a proper expansion of lungs patient is asked to blow foot ball bladder (balloon) (Breathing exercise)

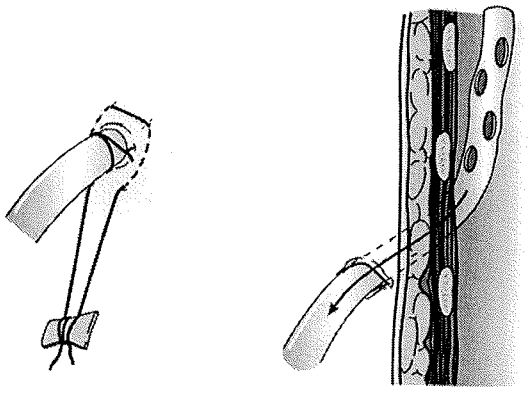
. If there is broncho-pleural fistula, ICT should be placed for longer time until fistula heals.



EBM CONSULT®







Complications

1. Infection.

2. Displacement and inadequate functioning.

3. Injury to intercostal vessels and bleeding.

4. Injury to intercostal nerves, lung and mediastinum.

5. Pain at the site of ICT placement.

Annexure- II

VALUE ADDED COURSE

Surgical procedures in acute emergency & GS09

List of Students Enrolled JULY 2018 –DEC 2018

MBBS Student			
Sl. No	**Name of the Student**	**Roll No**	**Signature**
1	KAVITHA M	U16MB311	
2	KEERTHANA K	U16MB313	
3	KEERTHI K DAS	U16MB314	
4	KUNCHAL BALA VENKATA RAMANA REDDY	U16MB315	
5	LAKSHMIPURAM VEGA SRI VIDYA	U16MB316	
6	LOGESH BABU JS	U16MB317	
7	MADHUMITHA R	U16MB319	
8	MADHUMITHA S	U16MB320	
9	MANIMARANE R	U16MB321	
10	MATHIVANAN J	U16MB323	
11	MD ALTAF KHAN	U16MB324	
12	MEKALA CHARAN CHOWDARY	U16MB325	
13	MERLIN S	U16MB326	
14	MERLINE SHEEBA B	U16MB327	
15	MOHAN B	U16MB328	
16	MOHIT BHARDWAJ	U16MB329	
17	MONISH PALEI PATRA	U16MB330	
18	KAVYA K	U16MB312	
19	LOKESHWARAN	U16MB318	
20	MATHIVAANANE R	U16MB322	

KAVITHA M / 016MB311

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

SURGICAL PROCEDURES IN ACUTE EMERGENCY

MULTIPLE CHOICE QUESTIONS

Course Code: GS09

I. ANSWER ALL THE QUESTIONS

1. making an opening in the anterior wall of trachea and converting it into a stoma on the skin surface is known as

(a) tracheostomy

b. thoracotomy

c. both a and b

d. none

2. high tracheostomy

(a) above second ring

b. through 2nd and 3rd rings

c. Both A & B are Correct

d. None of the above

3. indications for tracheostomy

a. In head, neck and facial injuries

b. Tracheomalacia after thyroidectomy or bilateral recurrent laryngeal nerve palsy.

(c) Both A & B are Correct

d. none

4. complications of tracheostomy

a. Injury to adjacent structures like oesophagus

b. Mediastinal emphysema

(c) Both A & B are Correct

d. None of the above

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

5. indications for thoracocentesis

a. Pleural effusion

b. empyema thoracis

(c) Both A & B are Correct

d. None of the above

6. What is complication of thoracocentesis

a. vagal shock

b. respiratory distress

(c.) Both A & B are Correct

d. None of the above

7. indications of ICD

a. Haemothorax.

b. Pneumothorax.

c.Haemopneumothorax

(d) All the above are correct

8/9

8. site of icd placement in pneumothorax

a. 1st intercoastal space

(b.) 2nd – 3rd intecoastal space

c. 8th ntercoastal space

d. None of the above

ASSESSOR NAME : M. SENTHIL VELAN

SIGNATURE : 21/8/2018

DATE : Dr. M. SENTHILVELAN, MS.,
Reg. No 52175
Professor of Surgery
Sri Lakshmi Narayana Institute of Medical Science

Keerthana k U16MB313

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

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c. 8th ntercoastal space

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7/8

ASSESSOR NAME :

SIGNATURE :

DATE : 21/8/2018

Dr. M. SENTHILVELAN, MS.,
Reg No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Science
Osudu, Kudapakkam, Puducherry-605 502.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that KAVITHA M has actively participated in the Value Added Course on SURGICAL PROCEDURES IN ACUTE EMERGENCY held during JULY 2018 – DEC 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr.Asayas Bosco
Chandra Kumar

RESOURCE PERSON

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dr. K BALAGURUNATHAN

COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that MERLIN S has actively participated in the Value Added Course on SURGICAL PROCEDURES IN ACUTE EMERGENCY held during JULY 2018 – DEC 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr.Asayas Bosco Chandra Kumar

RESOURCE PERSON

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dr. K BALAGURUNATHAN

COORDINATOR

Student Feedback Form

Course Name: **SURGICAL PROCEDURES IN ACUTE EMERGENCY**

Subject Code: **GS09**

Name of Student: Kavitha M Roll No.: V16MB311

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	✓

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 21/8/18

Kavitha
Signature

Student Feedback Form

Course Name: **SURGICAL PROCEDURES IN ACUTE EMERGENCY**

Subject Code: **GS09**

Name of Student: Merlin S Roll No.: U16MB326

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 21/08/2018

Signature

Date 17/12/2018

From
Dr K Balagurunathan,
Professor and Head,
General Surgery,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.
.

Sub: Completion of value-added course: SURGICAL PROCEDURES IN ACUTE EMERGENCY

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **SURGICAL PROCEDURES IN ACUTE EMERGENCY** for 20students on JULY- DEC 2018. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dr. BALAGURUNATHAN

HOD General Surgery

Encl: Certificates

Photographs


MEDICAL EDUCATION UNIT
&
CLINICAL ACADEMIC COUNCIL

Sri Lakshmi Narayana Institute of Medical Sciences

Date: 02.05.2018

From
Dr.Abarna.V
Department of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: WHONET basics in Microbiology Laboratory &Organizational behaviour

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled WHONET basics in Microbiology Laboratory from July2018 to Oct 2018 & Organizational behaviour from Oct 2018 to Dec 2018 for undergraduates on July 2018. We solicit your kind permission for the same.

Kind Regards

Dr.Abarna.V,

Department of Microbiology,

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr.Sukumaran

The HOD: Dr.Abarna.V

The Expert: Mr.Naveenkumar.C

The committee has discussed about the course and is approved.

Dean
(Sign & Seal)

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Subject Expert
(Sign & Seal)

DEPT OF MICROBIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES-PONDICHERRY 605 502

HOD
(Sign & Seal)

DEPT OF MICROBIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES-PONDICHERRY 605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute Of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,

PUDUCHERRY – 605 502

Circular

25.06.2018

Sub: Organising Value-added Course: WHONET basics in Microbiology Laboratory

reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organising "WHONET basics in Microbiology Laboratory". The course content **form** is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before July 2nd 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content .

Course Proposal

Course Title: WHONET basics in Microbiology Laboratory

Course Objective:

1. Introduce the students to different fields of research
2. To learn basic principles of genetics
3. To learn the basic skills involved in karyotyping

Course Outcome: WHONET basics in Microbiology Laboratory

Course Audience: Medical undergraduates

Course Coordinator: Dr. Abarna.V

Course Faculties with Qualification and Designation:

1.Dr.C.Naveenkumar, Msc; PhdAssistant Professor

2.Dr.Jayapradha.S , MD, Assistant Professor

Course Curriculum/Topics with schedule (Min of 34hours)

Sl no	Date	Topic	Time	Hour	Lecture taken by
1.	4.7.2018	Role of Microbiology Department	4-6p.m	2	Mr.Naveenkumar
2.	11.7.2018	What is WHONET	4-6p.m	2	Dr.Abarna.V
3.	18.7.2018	Uses of WHONET	4-6p.m	2	Mr.Naveenkumar
4.	25.7.2018	About WHONET Software 1	4-6p.m	2	Dr.Jayapradha.S
5.	1.8.2018	About WHONET Software 1	4-6p.m	2	Dr.Abarna.V
6.	8.8.2018	Practical hands on training session 1	4-6p.m	2	Mr.Naveenkumar
7.	22.8.2018	Documentation	4-6p.m	2	Mr.Naveenkumar
8.	29.8.2018	Why we should adopt to WHONET ?	4-6p.m	2	Mr.Naveenkumar
9.	5.9.2018	Practical hands on training session 1	4-6p.m	2	Dr.Abarna.V
10.	12.9.2018	Data analysis 1	4-6p.m	2	Dr.Jayapradha.S
11.	19.9.2018	Installing	4-6p.m	2	Dr.Abarna.V
12.	26.9.2018	Data analysis 2	4-6p.m	2	Dr.Jayapradha.S
13.	3.10.2018	Sections in WHONET	4-6p.m	2	Dr.Jayapradha.S
14.	10.10.2018	Conclusion and a practice session	4-6p.m	2	Mr.Naveenkumar
15.	17.10.2018	Practical hands on training session 2	4-6p.m	2	Dr.Abarna.V
16.	24.10.2018	Software installation	4-6p.m	2	Mr.Naveenkumar
17.	31.10.2018	Exercise in data analysis by students	4-6p.m	2	Dr.Jayapradha.S
			Total Hours	34	

- **Journal of clinical and diagnostic research- Reference article**

VALUE ADDED COURSE

1. Name of the programme & Code

WHONET basics in Microbiology Laboratory MIC07

2. Duration & Period

34hrs , Every July 2018– Oct 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Course Feed Back

Enclosed as Annexure- IV

7. No. of times offered during the same year:

34 hrs Every July 2018– Oct 2018

8. Year of discontinuation: 2018

9. Summary report of each program year-wise

Value Added Course					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	MIC07	WHONET basics in Microbiology Laboratory	Dr. C .Naveen kumar Dr.Jayapradha.S	MBBS	25 July 2018– Oct 2018

10. Certificate model Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON **COORDINATOR**

WHONET basics in Microbiology Laboratory

PARTICIPANT HAND BOOK

ANNEXURE I

BIHER SLIMS

COURSE DETAILS

Particulars	Description
Course Title	**WHONET basics in Microbiology Laboratory**
Course Code	MIC07
Objective	1. Role of Microbiology Department 2. What is WHONET? 3. Uses of WHONET 4. About WHONET Software 5. Documentation 6. Why we should adopt to WHONET ? 7. Installing 8. Data analysis 9. Sections 10. Conclusion
Further learning opportunities	**WHONET basics in Microbiology Laboratory**
Key Competencies	On successful completion of the course the students will have skill in handling WHONET
Target Student	MBBS Students
Duration	30hrs Every July 2018– October 2018
Theory Session	20hrs
Practical Session	10hrs
Assessment Procedure	Questionnaire

Date	**Time**	**Topic**	**Resource person**
4.7.2018	4-6pm	Role of Microbiology Department	Mr.Naveenkumar
11.7.2018	4-6pm	What is WHONET	Dr.Abarna.V
18.7.2018	4-6pm	Uses of WHONET	Mr.Naveenkumar
25.7.2018	4-6pm	About WHONET Software 1	Dr.Jayapradha.S

1.8.2018	4-6pm	About WHONET Software 1	Dr.Abarna.V
8.8.2018	4-6pm	Practical hands on training session 1	Mr.Naveenkumar
22.8.2018	4-6pm	Documentation	Mr.Naveenkumar
29.8.2018	4-6pm	Why we should adopt to WHONET ?	Mr.Naveenkumar
5.9.2018	4-6pm	Practical hands on training session 1	Dr.Abarna.V
12.9.2018	4-6pm	Data analysis 1	Dr.Jayapradha.S
19.9.2018	4-6pm	Installing	Dr.Abarna.V
26.9.2018	4-6pm	Data analysis 2	Dr.Jayapradha.S
3.10.2018	4-6pm	Sections in WHONET	Dr.Jayapradha.S
10.10.2018	4-6pm	Conclusion and a practice session	Mr.Naveenkumar
17.10.2018	4-6pm	Practical hands on training session 2	Dr.Abarna.V
24.10.2018	4-6pm	Software installation	Mr.Naveenkumar
31.10.2018	4-6pm	Exercise in data analysis by students	Dr.Jayapradha.S

WHONET Basics

1. **Role of Microbiology Department**

   • Microbiology departments asses trends in development of antimicrobial resistance.

   • The results of sensitivity/resistance patterns should be correlated with Antimicrobial agents currently used in the Hospital.

   • Identify and forecast that nature of relation between antibiotic use and resistance.

2. **What is WHONET?**

• WHONET is an effective computerized microbiology laboratory data management and analysis program that can provide guidance for empiric therapy of infections, alert clinicians of trends of antimicrobial resistance, guide drug-policy decisions and preventive measures. It can handle bacteria, fungus and parasites

• At present, WHONET can handle results from the testing of bacteria, fungi, and parasites. WHONET does not yet have virological tests incorporated, but this is a priority area of programming in the upcoming year.

3. **Uses of WHONET**

- WHONET can be used by individual laboratories or as part of a national and international surveillance network. At present, the software, available in 17 languages, is used in over 90 countries around the world managing data from over 1000 clinical, public health, veterinary, and food laboratories
- WHONET is used to support surveillance activities in the countries indicated in Red. All can share Information The program facilitates sharing of data amongst different hospitals by putting each laboratory data into a common code and file format, which can be merged for national or global collaboration of antimicrobial resistance surveillance
- WHONET contains Complete Laboratory Information System Clinical reporting – return results to clinicians – permanent record Laboratory management system – preliminary and final results – guide technologists through needed laboratory tests – billing and financial accounting Data analysis

4. **About WHONET Software**

It is Multilingual . Languages available at present include: Bulgarian, Chinese (simplified), English, Estonian, French, German, Greek, Indonesian, Italian, Japanese, Norwegian (Bokmål and Nynorsk), Portuguese, Russian, Spanish and Thailand.

5. **Documentation**

WHONET is a Windows-based database software developed for the management of microbiology laboratory data and the analysis of antimicrobial susceptibility test results.

WHONET: is A Microbiology Data Management Tool • Enhance the use of locally-generated data – Antimicrobial policy, infection control – Laboratory quality assurance • Promote collaborations – National and International networks

6. **Why we should adopt to WHONET ?**

The WHONET program puts each laboratory's data into a common code and file format at that laboratory, either by serving as or by translating from its own computer reporting system. It then enables each medical center to analyze its files in ways that help it monitor and manage resistance locally and to merge them with files of other centers for collaborative national or global surveillance of resistance.

7. Components of WHONET ?

WHONET has three main components

• 1 Laboratory configuration

• WHONET permits the customization of the software for use in your institution. You can indicate which antimicrobials you test in the laboratory, patient care areas served, data fields that you want to include in the surveillance program, and microbiological alerts of unusual or important organisms and resistance phenotypes

8. **Installing WHONET**

• You must install WHONET onto your computer before you can begin using it. WHONET • is compatible with all versions of Microsoft Windows from Windows 95 to the most recent, Windows 7 • The installation process is fairly automatic and copies the program files into appropriate locations on your computer, creating menu links and icons which will permit easy access to

9. **Analysis of Data**

Antibiotic Resistance A Changing Phenomena • Susceptibility data obtained from clinical microbiology laboratory helps to formulate antibiotic policy of the hospital. The data is to be analyzed and compared periodically to monitor changes in resistance rates, detecting the emergence of new resistance traits and to measure the impact of any interventions All the Documented results are analyzed in WHONET • The heart of WHONET is a software package designed to collect the results of antibiotic

resistance tests. Researchers / Microbiologists feed the results into a computer and look for trend Growing importance of WHONET • World over antimicrobial resistance is a major public health problem. The WHONET software program puts each laboratory data into a common code and file format, which can be merged for national or global collaboration of antimicrobial resistance surveillan

Our Results Shared With ... • Further, this data can be shared between different centers at the regional, national and global levels to assess the magnitude of the Antibiotic resistance

WHONET is a windows based Database • WHONET is a windows based database software package for the management of microbiology laboratory data and the analysis of antimicrobial susceptibility test results. Current version WHO5.5 can be downloaded from the internet free of charge from URL (www.who.int/drugresistance/whonetsoftware). The software can be installed easily on a personal computers.

We Enter, Share, Modify • This program permits the user to enter and modify laboratory-specific information such as patient- care areas (OPDs or wards), selection of antibiotic panels and interpretive breakpoints for various antibiotics. In addition, one can also indicate what data fields one want included in the data files. This configuration can be modified subsequently. Attractive feature of WHONET • The most attractive feature of WHONET is the ability to analyze stored data. The program has a modular configuration that allows customization of software for clinical, epidemiological, and infection control applications. From a single screen, a WHONET user can select the type of analysis to run,

10. Sections of WHONET

The software consists of three sections.

1) Data Entry. In addition to the routine entry of susceptibility test results (disk diffusion, MIC, and/or E-test), this program permits printing, retrieval, and correction of clinical records as well as immediate feedback on test results.

Data Analysis • Data Analysis. Currently supported analyses include listings and summaries of isolates by user- defined criteria; tabulation of the percentages of resistant, intermediate, and susceptible isolates by species; zone diameter and MIC histograms; scatterplots of zone diameter versus zone diameter or MIC versus MIC;

From a single screen, a WHONET user can select the type of analysis to run. The Analysis Results screen Histograms can be created for Individual Microbe Scatterplot created for two different Antibiotic Amikacin vs. Gentamicin All antibiotic profiles at a click

Down load WHONET through Hyperlink below Click here to download the software and manuals

WHONET A Global networking Programme • WHONET is currently used in over 90 countries, managing data from over 1300 laboratories. – Hospital and public health laboratories – Food and veterinary laboratories – Reference and research laboratories • Data collections – Routine laboratory data – Special surveys and research protocols

Desktop software's Laboratory systems WHONET BacLink Excel Access EpiInfo Laboratory instruments Mysis MEDITECH ADBakt MIC systems Disk diffusion readers Data analysis Data conversion

BacLink can transfer data into WHONET from: • Common commercial database and spread sheet software; commercial susceptibility test instruments for MIC broth micro dilution and disk diffusion readers hospital and laboratory information systems through text files

Principal goals of the software are: • To enhance local use of laboratory data; and to promote national and international collaboration through the exchange of data.

Picks up Antibiograms and analyses • The heart of WHONET is a software package designed to collect the results of antibiotic resistance tests. Researchers feed the results into a computer and look for trends

Trouble shooting • If your computer is part of a hospital network and if you have difficulties installing • WHONET, a frequent explanation is that many computer system administrators disable the ability of typical computer users to install new software's. They do this to help • Protect the computers from viruses or other accidental modifications. In this situation, please ask your computer administrator to install the software for you. If you continue to have difficulties with installation, please write to John Stelling at jstelling@rics.bwh.harvard.edu for additional assistance.

Better services from Microbiology Departments. • Basic infrastructure should be updated for detection of MRSA and ESBL producers. • Documentation of all Opportunistic infections. and Hospital infection outbreak

WHONET Use in the World • African Regional Office of WHO (AFRO) – Algeria, Kenya, Namibia, South Africa, Tanzania, Zambia • Eastern Mediterranean Regional Office of WHO (EMRO) – Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Saudi Arabia, Tunisia • European Regional Office of WHO (EURO) – Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Iceland, Ireland, Israel, Italy, Latvia, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Ukraine, United Kingdom • Pan-American Health Organization (PAHO) – Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, United States, Uruguay, Venezuela • South-East Asian Regional Office of WHO (SEARO) – India, Indonesia, Sri Lanka, Thailand • Western Pacific Regional Office of WHO (WPRO) – China, Hong Kong (China), Japan, Republic of Korea, Malaysia, Philippines, Singapore, Taiwan, Viet Nam

Make your conclusions and contribute to Antibiotic Policy • It is true to say that there is no absolute proof of causative association between antibiotic use and resistance, But many authorities believe the association to be virtually certain. • It is pragmatic and essential approach to control of antibiotic resistance with control of antibiotic use. • Make every one a partner in prevention of Antibiotic resistance, and success will follow.

Computerized Decisions a Emerging Need ….. • Computerized decision support can preserve physician autonomy and has been shown to improve antibiotic use by a number of different measures: fewer susceptibility mismatches, allergic reactions and other adverse events, excess dosages, and overall amount and cost of antibiotic therapy

Implementation of WHONET can help to monitor resistance • Legacy computer systems, quality improvement teams, and strategies for optimizing antibiotic use have the potential to stabilize resistance and reduce costs by encouraging heterogeneous prescribing patterns and use of local susceptibility patterns to inform empiric treatment

World Antibiotic Resistance Network • WHO has also started another program, WARN (the World Antibiotic Resistance Network), to help gather and analyse the data generated by the people who use WHONET. WHO will launch a worldwide campaign to safeguard these medicines for future generations. Antimicrobial resistance - the theme of World Health Day 2011 –

Conclusion:

WHONET is an effective tool which help not only in routine microbiology laboratory data management but also generate valuable information about Antimicrobial susceptibility patterns over a place or time to provide the basis for and assess the effectiveness of prevention programs and policy decisions

Annexure- II

VALUE ADDED COURSE

WHONET basics in Microbiology Laboratory

MIC07

List of Students Enrolled July 2018 – Oct- 2018

MBBS Students			
Sl. No	Name of the Student	Roll No	Signature
1	ANNAPOORANI.L	U17MB251	
2	ANUSUYA.N	U17MB252	
3	APOORVA MALL	U17MB253	
4	ASHISH RANJAN	U17MB254	
5	ASWIN KUMAR.G	U17MB255	
6	ATHUL S PRAMOD	U17MB256	
7	ATHUL SUBHASH	U17MB257	
8	BATCHU JASWANTH BABA	U17MB258	
9	BHAGANAGARAPU BHARGAV SEETA RAM	U17MB259	
10	BHARGAV JYOTI BORAH	U17MB260	
11	BHAVYA GUPTA	U17MB261	
12	BRAHMA PRAKASH MISHRA	U17MB262	
13	CHINMAY DODANI	U17MB263	
14	CHRISTO VINCENT.V	U17MB264	
15	CIBIYASHREE.G	U17MB265	
16	DEBIA JERMIN	U17MB266	
17	DEEPIKAA R.D	U17MB267	
18	DHANUSS BHUVAN SRIDARAN	U17MB268	
19	DHIREN.S	U17MB269	
20	DHWANI SOLANKI	U17MB270	

21	AANNIE SHERLINE RAJAM.L	U17MB271	
22	AARTHISEKAR . D	U17MB272	
23	AARYA R BABU	U17MB273	
24	ABHIJITH.K	U17MB274	
25	ABHISHEIK.J	U17MB275	

RESOURCE PERSON **COORDINATOR**

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EI TON AND RESEARCH

Annexure - III

WHONET basics in Microbiology Laborato

Aayak Babu

Course code: MIC07

I. ANSWER THE QUESTIONS:

1. What is the Role of Microbiology Department in WHONET application?

- loading patient Information
- patient report

2. What is WHONET?

- window based database software

3. What are the uses of WHONET ?

- useful in medical fild
- Laboratory

4. Why we should adopt to WHONET ?

- Easy to use

5. How do you do data analysis in WHONET?

- Common commerical database
- Spreadsheet software

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

WHONET basics in Microbiology Laboratory

Dhiren

Course Code: MIC07

I. ANSWER THE QUESTIONS:

1. What is the Role of Microbiology Department in WHONET application?

- patient report.
- Loading patient Information.
- Organisms.

2. What is WHONET?

- windoo base database software

3. What are the uses of WHONET ?

- lab oriented use
- useful in medical field

4. Why we should adopt to WHONET ?

- Backlink can transfer data into whonet.

5. How do you do data analysis in WHONET?

- Hospital & lab Information System through text files.

Student Feedback Form

Course Name: **Basics Of WHONET in microbiology** Subject Code: **MIC07**

Name of Student: Aaraya R. Babu Roll No.: U17MB273

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date: 31/10/2018

Student Feedback Form

Course Name: **Basics Of WHONET in microbiology** Subject Code: **MIC07**

Name of Student: Dhiren . S Roll No.: U17MB269

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand		✓			
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Dhiren

Signature

Date: 31/10/2018

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that AARYA. BABU. R has actively participated in the Value Added Course on Basics Of WHONET in Microbiology held during July 2017 – Oct 2017 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. C.Naveenkumar
RESOURCE PERSON

Dr.Abarna.V
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that DHIREN has actively participated in the Value Added Course on Basics Of WHONET in Microbiology held during July 2017 – Oct 2017 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. C.Naveenkumar
RESOURCE PERSON

Dr.Abarna.V
COORDINATOR

Date : 31.10.18

From
Dr.Naveenkumar.C,
Department of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course : WHONET basics in Microbiology Laboratory

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: WHONET basics in Microbiology Laboratory on July 2018 for 40 students. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

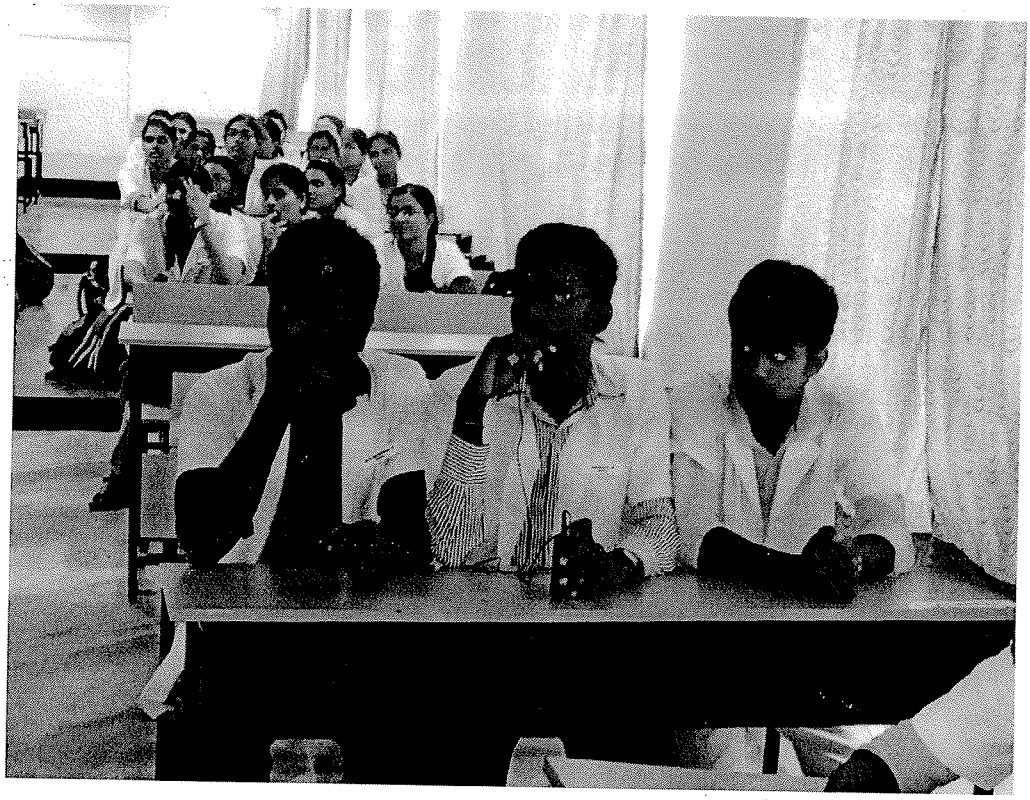
Kind Regards,

Dr.Naveenkumar.C,

Department of Microbiology,

Encl: Certificates

Photographs



SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Annexure 1 **Date:16.04.2018**

From
Dr. Kalarani
Professor and HOD,
Department of Obstetrics and Gynaecology,
Sri Lakshmi narayana Institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institue Of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Laproscopy

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Laproscopy** on April 2019 to Jan 2020. We solicit your kind permission for the same.

Kind Regards

Dr.Kalarani,

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean

The HOD:

The Expert:

The committee has discussed about the course and is approved.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KODAPAKKAM POST,
PUDUCHERRY - 605 502

Subject Expert

ASSISTANT PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

HOD

PROFESSOR
DEPT. OF OBSTETRICS & GYNAE
Sri Lakshmi Narayana Inst
Medical Sciences

ASSISTANT PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

PROFESSOR
DEPT. OF OBSTETRICS & GYNAE
Sri Lakshmi Narayana Inst
Medical Sciences

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

11.06.2018

Sub: Organising Value-added Course: Laproscopy- reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research**, is organizing **"Laproscopy"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30.06.2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content and Registration form.

Course Proposal

Course Title: **Laparoscopy**

Course Objective:

1. **Basic laproscopy instruments**
2. **Practice and acquire competence in basic laparoscopic skills**
3. **Practice fundamental GYN procedures**
4. **Encounter arrange of patient pathology**
5. **Nine basic task**
6. **Two basic task**
7. **Gain experience with various techniques and surgical instruments**
8. **Learn to avoid and control complications**
9. **Handling emergency situation**
10. **DO's and DON'T**

Course Outcome:
Course Audience: Final MBBS Undergraduates
Course Coordinator: Dr.Swetha.S
Course Faculties with Qualification and Designation:

1. **Dr.Kalarani, Prof. and HOD, OG**
2. **Dr.S.Swetha, Assistant Professor, OG**

Course Curriculum/Topics with schedule (Min of 30 hours)

Sl No	Date	Topic	Time	Hrs
1	2.07.2018	Basic instrument of laparoscopy	4.00pm- 7.00pm	3
2	14.07.2018	Practice and acquire competence in basic laparoscopic skill	4.00pm- 7.00pm	3
3	30.07.2018	Practice fundamental GYN procedures	4.00pm- 7.00pm	3
4	12.08.2018	Encounter arrange of patient pathologies	4.00pm- 7.00pm	3
5	16.08.2018	Nine basic task	4.00pm- 7.00pm	3
6	24.08.2018	Two basic task	4.00pm- 7.00pm	3
7	4.09.2018	Gain experience with various techniques and surgical instruments	4.00pm- 7.00pm	3
8	12.09.2018	Learn to avoid and control complications	4.00pm- 7.00pm	3
9	5.10.2018	Handling emergency situation	4.00pm- 7.00pm	3
10	20.10.2018	DO 's and DON'T	4.00pm- 7.00pm	3
			Total Hours	30

Reference : USF CENTRE FOR ADVANCEMENT OF MINIMALLY INVASIVE PELIC SURGERY UNIVERSITY OF SOUTH FALORIDA

VALUE ADDED COURSE

1. Name of the programme& Code

Laproscopy OBGY 9

2. Duration& Period

30 hrs & JULY 2018 - DECEMBER 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7.No. of times offered during the same year:

1- JULY 2018 - DECEMBER 2018

8. Year of discontinuation: 2020

9. Summary report of each program year-wise

Value Added Course					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength& Year**
1	OBGY 9	LAPROSCOPY	Dr. Swetha. S	FINAL YEAR MBBS	JULY 2018 - DECEMBER 2018

10.Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

COORDINATOR

ASSISTANT PROFESS
DEPT. OF OBSTETRICS & GYNAEC
Sri Lakshmi Narayana Instit
Medical Sciences
OSUDU, PUDUCHERR

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

[TYPE THE COMPANY NAME]

LAPROSCOPY1

Participants Hand Book

Juhul
[Pick the date]

[Type the abstract of the document here. The abstract is typically a short summary of the contents of the document. Type the abstract of the document here. The abstract is typically a short summary of the contents of the document.]

Course details

Particulars	**Description**
Course Title	LAPROSCOPY
Course Code	OBGY 09
Objective	1. Introduction **2.** Practice and acquire competence in basic laparoscopic skills **3.** Practice fundamental GYN procedures **4.** Encounterarangeofpatientpathologies **5.** Gainexperiencewithvarioustechniquesand surgicalinstruments **6.** Learn to avoid and control complications **7.** Handling emergency situation **8.** Assessment
Further learning opportunities	Practicing exercises
Key Competencies	On successful completion of the course the students will have skill in handling and observe various techniques in laproscopic surgery
Target Student	Final MBBS Students
Duration	30hrs every April 2019 to August 2019 and September 2019 to January 2020
Theory	10hrs

Session	
Practical Session	20hrs
Assessment Procedure	Multiple choice questions

Basic LaparoscopicGynecology Skills and Procedures Course



Description

Theaimofthiscourseistoallowpracticingsurgeons aswellasresidents/fellowsandmedicalstudentsto acquirebasiclevelskillsinlaparoscopicgynecology including hands-on simulation-based training of essentialOB-GYNprocedures.Thecourseisdesigned in twocomponents:

1. **Proficiency-Based BasicLaparoscopic SkillsTraining**

Trainingwithinaproficiency-basedvirtualreality curriculummayreduceerrorsduringrealsurgical procedures. The basic skills training within this curriculum is based on Development of a Virtual Reality Training Curriculum for Laparoscopic Cholecystectomy (Darzi et al. British Journal of Surgery2009;96:1086–1093).Theaimofthetraining curriculumisforanindividualtoacquireskillsand reachapredeterminedlevelofproficie

ncybefore progressingtomorechallenging cases.
The study, conducted by the Department of BiosurgeryandSurgicalTechnology atSt.Mary's Campus at Imperial College of London, defined, testedandvalidatedawhole-procedurevirtualreality trainingcurriculumforLaparoscopicCholecystectomy on the Simbionix LAP Mentor™ using structured scientificmethodology.Thecurriculumclearlydefines apredeterminedlevelofproficiencyaswellas definingthemodeoftraining onthesimulator.

2. BasicGynecologicalProcedureTraining-PersonalGoalSetting
7 patient cases: Laparoscopic tubal sterilization, salpingostomy, salpingectomy and salpingo-oophorectomy.Traineesencounterarangeofpatient pathologies and gain experience with various techniquesandsurgicalinstruments.Includedarea varietyofcomplicationsandemergencysituations suchasbleedingattheimplantationsite,aruptured fallopiantubeandablood-filledabdominalcavity.

Continued Training - TheTotalLaparoscopicHysterectomyCurriculum The 'Total Laparoscopic Hysterectomy

Training CourseforthesimbionixLAPMentor'isanadvanced GYN procedure curriculum for participants desiring advancedtraining.Thecourseprovidesrepetitive practiceofsurgicalskillsrequiredfortheprocedure, inasafeandreproducibleenvironment,aswellas exposuretocomplicationsencounteredduringthe laparoscopic hysterectomy procedure including ureteralandbowelinjury.

Thiscoursewaswritteninc ollaborationwith:

LarryRGlazermanMD,MBA,FACOG.Associate ProfessorandDirector, MinimallyInvasiveGyn Surgery.Co-Director,USFCenterforthe Advancement of Minimally-Invasive Pelvic Surgery University of SouthFloridaCollegeofMedicine.

StuartHart,MD,FACOG,FACS .AssistantProfessor, DivisionofFemalePelvicMedicineandReconstructive Surgery.DepartmentofObstetricsandGynecology. Co-Director,USFCenterfortheAdvancementof Minimally-InvasivePelvicSurgery.Medical Director, TampaBayResearchandInnovationCenter(TBRIC). UniversityofSouthFloridaCollegeofMedicine.

Objectives

- Practice and acquire competence in basic laparoscopic skills: Camera manipulation 0°; CameraManipulation30°;Eye-handcoordination; Clip application; Clipping and grasping; Two- handed maneuvers; Cutting; Electrocautery; Translocation ofobjects.
- Practice fundamental GYN procedures: Laparoscopic tubal sterilization, salpingostomy, salpingectomyandsalpingo-oophorectomy.
- Encounterarangeofpatientpathologies.
- Gainexperiencewithvariou stechniquesand surgicalinstruments.
- Learn to avoid and control complications and emergency situations such as bleeding at the implantationsite,arupturedfallopiantubeanda blood-filled abdominalcavity.

Specialties

Gynecology

Target Audience

Practicingsurgeons,aswellasresidents/fellowsand medicalstudents,interestedinhands-onsimulation-basedtrainingofessentialGYNprocedures.

Assumptions

Itisrecommendedtoincludeacognitiveskills moduleatthebeginningofthetraining program. Nopreviousproceduralortechnicalknowledgeis required.

Suggested Time Length

Suitablefor2daytrainingcoursesorfordistributed training.

Authors

Thiscoursewaswrittenincollaborationwith:

LarryRGlazermanMD,MBA,FACOG.Associate ProfessorandDirector,MinimallyInvasiveGyn Surgery.Co-

Director,USFCenterfortheAdvancement of Minimally-Invasive Pelvic Surgery University of SouthFloridaCollegeofMedicine.

StuartHart,MD,FACOG,FACS.AssistantProfessor, DivisionofFemalePelvicMedicineandReconstructive Surgery.DepartmentofObstetricsandGynecology.
Co-Director,USFCenterfortheAdvancementof Minimally-InvasivePelvicSurgery.MedicalDirector, TampaBayResearchandInnovationCenter(TBRIC).
UniversityofSouthFloridaCollegeofMedicine.

The Essential Gynecology Module was created in collaboration with:
M.JonathonSolnik,MD,Director,MinimallyInvasive Gynecologic Surgery, Assistant Residency Program Director,DeptOB/Gyn,Cedars-SinaiMedicalCenter, AssistantClinicalProfessor,DeptOB/Gyn,TheDavid GeffenSchoolofMedicineatUCLA.

Prof. Goldenberg Mordechai,

Roy Mashiach, MD,
Minimally Invasive
Gynecologic Surgery,
Sheba Medical Center
at Tel Hashomer.

J.EricJelovsek,M.D.,Ass
istantProfessorofSurgery
,
ClevelandClinicLernerCo
llegeofMedicine,Case
Western
ReserveUniversity.

Dr.AmirSzold,Headof
SurgicalEndoscopyUn
it,
SoraskyMedicalCent
erTel-Aviv.

TaskDescriptionsandCurriculumSteps

Part 1 - Basic Skills

1.1 introductiontoTraining

instructions:
Beforeeachtaskisperformed,provideafulldemonstrationbyanexperie ncedoperator,withanopportunityfor theparticipanttoaskquestions. Suggested time length for the familiarization period is approximately 30 minutes.

1.2 NineBasicTasks-Training

instructions:
Ninetasksareperformedtwiceonthesamedayintwosessions,witha breakofmorethanonehourbetween eachsession.



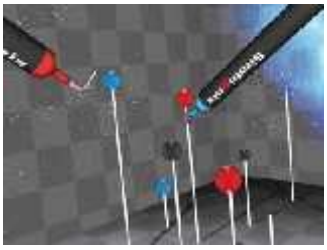
Task 1 - Camera Manipulation 0°

Task Description:
Usinga0°camera,locateandsnapphotographso ftenballs,inanabstract environment.



Task 2 - Camera Manipulation 30°

Task Description:
Usinga30°angledcamera,locateandsnappho tographsoftenballs,inan abstractenvironment.



Task 3 - Eye-Hand Coordination

Task Description:
Locate each flashing ball and touch it with the tool of the appropriate color.



Task 4 - Clip Application

Task Description:
Clip leaking ducts within a specified segment, before the pool fills.



Task 5 - Clipping and Grasping

Task Description:
Safelygraspandclipleakingductswithinaspecifie dsegment,beforethepool fills.



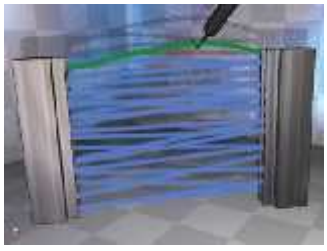
Task 6 - Two-Handed Maneuvers

Task Description:
Usetwograsperstolocatetheballswithinthejell ymassandthenplacethem in theendobag.



Task 7 - Cutting

Task Description:
Safelygraspandclipleakingductswithinaspecifie dsegment,beforethepool fills.



Task 8 – Electrosurgery

Task Description:
Useahooktoburnthehighlightedband,whileret ractingotherbandswithan accessoryinstrument.



Task 9 - Translocation of Objects

Task Description:
Manipulateobjectwithtwograspers,andplaceiti ntotheorientationofthe matchingtransparentobjectwithaminimumn umberoftranslocations.

1.3 TwoBasicTasks–DemonstrationofProficiency

instructions:

Training is completed when all of the following skill levels are reached in two consecutive sessions.



Task 5 - Clipping and Grasping

Task Description:

Safelygraspandclipleakingductswithinaspecifiedsegment,beforethepool fills.

Required Skill Level

Time taken < 100 s



Task 6 - Two-Handed Maneuvers

Task Description:

Usetwograsperstolocatetheballswithinthejellymassandthenplacethem in theendobag.

Required Skill Level

Total time taken < 90 s

Totalnumberofmovements<100

Totalpathlength<440cm

Part 2 – Gynecology Procedures

7patientcases:Laparoscopictubalsterilization,salpingostomy,salpingectomyandsalpingo-oophorectomy. Traineesencounterarangeofpatientpathologiesandgainexperiencewithvarioustechniquesandsurgical instruments.Includedinthismoduleareavarietyofcomplicationsandemergencysituationssuchasbleeding attheimplantationsite,arupturedfallopiantubeandablood-filledabdominalcavity.

Followingperformingeachpatientcase,thetraineeisrequiredtoanalyzehis/herperformancereportandset personalstandardsforimprovement.

2.1 TuballLigation

Objectives:

- Demonstrateknowledgeofnormalpelvicanatomy,specificallythefallopiantube.
- Handlethenormaltissueofthefallopiantubeandovarywhileavoidingunnecessarytraumaandproviding optimalexposure.
- Performatuballigation



Essential GYN Module Case 1: Tubal Ligation

Medical History:

32 year old Gravida 3, Para 3 comes to your office to discuss contraceptiveoptions.Sheishappilymarried,hasthreehealthy childrenanddesirespermanentcontrace

ption.Sheusedbirth controlpillsinthepastthatwouldsometime sexacerbatemigraine headaches.Herhusbanddeclinesvasectom yandshedoesnotfeel comfortableusinganintrauterinedevice.Ala paroscopictuballigation hasbeenscheduledforthepatient.

Pathology:
None.

2.2 EctopicPregnancy–5Cases

Objectives:

- Performproperinspectionofthepelvis.
- Performproperevacuationofhemoperitoneum.
- Determinetheappropriatenessofsalpingostomyversussalpingectomyas theinitialsurgicalstrategy
- Incaseofsalpingostomy:
  - Demonstratepropertechniquetocontrolhemostasisfromtheim plantationsite,whileminimizing thermalspreadtothetube.
  - Demonstrateproperuseofirrigationatthesitewithheavyzoomw iththecameraandlightirrigationand suction.
  - Demonstratetheabilitytoconverttosalpingectomywhenthecas edoesnotseemtobeimprovingwith hemostasisattempts.
- Incaseofsalpingectomy:
  - Performproperremovaloftheectopicpregnancybyperformingsalping ectomy.
  - Performproperremovaloftheectopicusinganendobagremovaldevice .
  - Performproperinspectionafterremovaloftheectopicforhemostasisoft heremainingtube.



EssentialGYNModuleCase2:isthmicEc topic Pregnancy

Medical History:

A36yearoldfemaleGravida1Para0pres entstotheclinictohave anultrasound.Sheisbeingfollowedfori nfertilityandisonher

firstmonthofovulationinduction.Sherepo rtsmildcramping.An ultrasoundshowsa2cmadnexalmassinthe lefttubethatisseparate fromtheovaryandnothingintheuterus.Her BetaHCGis2630.You discussmedicalmanagementofherectopi cbutshedeclinesuseof Methotrexateanddesiresto“justgetthisover with.”Youscheduleher for laparoscopicsalpingostomy.

Pathology:
A right isthmic ectopic pregnancy.



Essential GYN Module Case 3: isthmic Ectopic Pregnancy

Medical History:
A19yearoldGravida2Para0presentstothe emergencydepartment complainingofincreasingpelvicpain,cramping,andbleeding.Her abdomenistenderwithoutreboundorguarding.Shehasahistory of Chlamydia has had one previous ectopic on her right side and underwentalaparoscopicrightsalpingectomy.Hervitalsignsare stable.ABetaHCGreturnsandis2306andhematocritis37.Apelvic ultrasoundshowsaleftadnexalmassapproximately4cmindiameter. Shehasanewpartneranddefinitelywantschildreninthefutureif possible.

Pathology:
Aleftisthmicectopicpregnancy.Therighttubehaspreviouslybeen removed.



EssentialGYNModuleCase4:SmallAmpullaryEctopic Pregnancy

Medical History:
A32-year-oldGravida3Para2presentstotheemergency department complaining of increasing

pelvic pain, cramping and bleeding. A pelvicultrasoundshowsaleftadnexalmass approximately1cm indiameterthatisseparatefromthenormal appearingovary.The patientlacksriskfactorsforanectopicpregnancysuchasahistory ofPID,operativetrauma,ortumors.Because shewishestoretainher fertility,youscheduleherforlaparoscopic salpingostomy.

Pathology:

A small ectopic pregnancy in the right ampullary tube. Active bleedingstartsfromthebedoftheimplantation site.Hemostasiswill notbepossibleandattemptstoachievehemostasismayresultin irreversible tubaldamage.



EssentialGYNModuleCase5:RupturedEctopic Pregnancy Following Sterilization Failure

MedicalHistory:

You are called to the emergency room to evaluate a 36 year old female Gravida4,Para2whocameinforevaluationofseverepelvicpain, cramping,andvaginalspotting.Thepatienthadabilateraltubal ligationabout4yearsprior.Sheappearsstablebutuncomfortable lyinginthebedonherside.Herbloodpressureis110/75andpulse is80.Herabdomenistenderwithmildguarding.Pelvicexamshows aclosedcervicaloswithminimaldarkblodinthevaginalvault and tenderness on moving the cervix. A beta human chorionic gonadotropin(HCG)levelis2810,hematocritis32,andbloodtype isOpositive.Anultrasoundshowsa4-5cmadnexalmassseparate fromtheovaryandnothingintheuterinecavity.Thereisamoderate amountoffluidinthepelvis.Shetellsyoushedoesnotwantanymore childreninthefuture.Alaparoscopicsalpingectomyisscheduledfor thepatient.

1

Pathology:

Arupturedectopicpregnancyfollowingsterilizationfailure.The ectopicpregnancyislocatedinthedistalportionoftheleftfallopian tube.



Essential GYN Module Case 6: Ectopic Pregnancy

Medical History:

A24yearoldfemaleGravida1Para0,presentstotheemergency department with abdominal pain not being controlled by pain medications,novaginalbleeding,andsevere menstrualcramping. Sheisnotsurewhenherlastmenseswas,has ahistoryofChlamydia andmultiplevisitstotheemergencydepartmentforpelvicpainthat isusuallydiagnosedaspelvicinflammatorydisease.Duringphysical examherbloodpressureis100/65,pulseis92.Herabdomenistender andshehasmildguarding.HerserumHCGis4250andhematocrit are33.Apelvicultrasoundshowsnothingintheuterinecavityanda rightadnexalmassapproximately5cmindiameterthatisadjacentto butseparatefromtheovaryandalargeamountofdebrisinthepelvis consistentwithblood.SheisplacedontheO

Rlistforlaparoscopic salpingectomy.

Pathology:

Arupturedampullaryectopicpregnancyin therighttube.Theleft fallopiantubeisinbadconditionwithacl ubbedfimbriatedend.

Adhesionsarepresentintheanatomy.

2.3 ProphylacticSalpingo-Oophrectomy

Prophylactic Oophorectomy - Objectives:

- Toperformproperinspectionofthepelvisandabdomen.
- Toidentifyandavoidtheureterpriortotransectingthe IPligament.
- Toperformproperelectro-surgeryandligationoftheovarianvasculatureandobserveforbleeding.
- Touseelectro-surgeryproperlytotransectthetube,utero-ovarianligamentandvasculaturetoremoveboth thetubeandtheovary.
- Toperformthesameprocedureontheoppositesideandcollectspecimens.



EssentialGYNModuleCase7:ProphylacticSalpingo-Oophrectomy

MedicalHistory:
A 39 year old female Gravid 2 Para 2 comes to your office for counselingregardingherriskofovariancancer.SheisBRCA1positive bygenetictesting(tested,sincemultiplefamilymembershavebeen diagnosedwithbothovarianandbreastcancerataneарlyage).She hasfinishedchildbearingandwishestoreduceherriskofovarian andbreastcancerbygettingherovariesremoved.Shereportsno abnormalsymptoms,ishealthy,andhasneverhadanyabdominal surgery. She is scheduled for laparoscopic prophylacticbilateral salpingo-oophrectomy.

Pathology:
None.

Value Added Courses

LAPAROSCOPIC TECHNIQUES

List of Students Enrolled July 2018 – December 2018

S.No	Register No	Students List	signature
1	U16MB311	KAVITHA .M	
2	U16MB312	KAVIYA .K	
3	U16MB313	KEERTHANA .K	
4	U16MB314	KEERTHI K DAS	
5	U16MB315	KUNCHAL BALA VENKATA RAMANA RED	
6	U16MB316	LAKSHMIPURAM VEDA SREEVIDYA	
7	U16MB317	LOGESH BABU J.S	
8	U16MB318	LOKESHWARAN .M	
9	U16MB319	MADHUMITHA .R	
10	U16MB320	MADHUMITHA .S	
11	U16MB321	MANIMAARANE .R	
12	U16MB322	MATHIVAANANE .R	
13	U16MB323	MATHIVANAN .J	
14	U16MB324	MD ALTAF KHAN	
15	U16MB325	MEKALA CHARAN CHOWDARY	
16	U16MB326	MERLIN.S	
17	U16MB327	MERLINE SHEEBA .B	
18	U16MB328	MOHAN .B	
19	U16MB329	MOHIT BHARDWAJ	
20	U16MB330	MONISH PALEI PATRA	

LAPAROSCOPIC TECHNIQUES
MCQs

5 Matching questions

1. _____ Light cable
2. _____ Light source
3. _____ Knot pusher
4. _____ Endocoupler
5. _____ Insufflation unit

A. A device that connects the endoscope to the camera.

B. The fiberoptic light cable that transmits light from the source to the endoscopic instrument. Sometimes called a light guide.

C. A device that regulates the flow and amount of carbon dioxide gas during insufflation.

D. A device that controls and emits light for endoscopic procedures.

E. A device used to secure suture knots during minimally invasive surgery.

5 True/False questions

1. Endoscopic surgery of a joint. → Stereoscopic viewer

   ○ True

   ○ False

2. A surgical endoscope that has the capability of morcellization, or tissue fragmentation. → Endoscope

   ○ True

   ○ False

3. An element within each silicone chip contained within a device which produces electronic images such as those seen on a surgical monitor used in minimally invasive surgery. → Cannula

   ○ True

   ○ False

4. A term meaning "outside the body." In minimally invasive surgery, it refers to a technique for placing sutures in which the knots are formed outside the body and then tightened after they have been introduced into the surgical wound. → Intracorporeal

- ○ True
- ○ False

5. A spring-loaded needle used to deliver carbon dioxide gas during insufflation. → Video printer

- ○ True
- ○ False

5 Multiple choice questions

1. A channel that extends the full length of a flexible endoscope and is used to retrieve biopsy tissue.

- ◯ Instrument channel
- ◯ Elevator channel
- ◯ Biopsy channel
- ◯ Video printer

2. In robotic surgery, the nonsterile control unit used by the surgeon to manipulate instruments.

- ◯ Diagnostic endoscopy
- ◯ Ligation loop
- ◯ Surgeon's console
- ◯ Stereoscopic viewer

3. A telescopic instrument with serial lenses that is used to view anatomical structures inside the body.

- ◯ Light cable
- ◯ Endoscope
- ◯ Nephroscopy
- ◯ Focus ring

4. In robotic surgery, the nonsterile hand controls that manipulate surgical instruments.

- Master controllers
- Thoracoscopy
- Insertion tube
- Pneumoperitoneum

5. In video technology, the clarity of an image based on the number of signals (pixels) emitted by the camera. A high-definition format displays 1280x721 pixels in a rectangular image.

- Insufflation
- Video cable
- High definition (HD)
- Insufflation unit

REG NO - 016MB321

9/10

LAPAROSCOPIC TECHNIQUES
MCQs

(9)

5 Matching questions

1. B Light cable
2. D Light source
3. E Knot pusher
4. A Endocoupler
5. C Insufflation unit

A. A device that connects the endoscope to the camera.

B. The fiberoptic light cable that transmits light from the source to the endoscopic instrument. Sometimes called a light guide.

C. A device that regulates the flow and ampunt of carbon dioxide gas during insufflation.

D. A device that controls and emits light for endoscopic procedures.

E. A device used to secure suture knots during minimally invasive surgery.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that KEERTHANA has actively participated in the Value Added Course on LAPAROSCOPIC TECHNIQUES held during Jul 2018 – Dec 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

ASSISTANT PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

COORDINATOR

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that KAVITHA has actively participated in the Value Added Course on LAPAROSCOPIC TECHNIQUES held during Jul 2018 – Dec 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

ASSISTANT PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

COORDINATOR

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Annexure 4

Course/Training Feedback Form

Course:
Date:
Name:
Reg NO.
Department: Obstetrics and Gynaecology

Q 1: Please rate your overall satisfaction with the format of the course:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 2: Please rate course notes:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 3: The lecture sequence was well planned

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 4: The lectures were clear and easy to understand

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 5: Please rate the quality of pre-course administration and information:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 6: Any other suggestions:

Comments:

Thank you for taking the time to complete this survey, your comments are much appreciated.

***OPTIONAL Section*:** Name _____
Signature _____ Date _____

Annexure 4

Course/Training Feedback Form

Course: LAPROSCOPIC TECHNIQUES IN OBSTETRICS AND GYNECOLOGY
Date: 31/01/2020
Name: KAVITHA.M
Reg NO. U16MB311
Department: Obstetrics and Gynaecology

Q 1: Please rate your overall satisfaction with the format of the course:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 2: Please rate course notes:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 3: The lecture sequence was well planned

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 4: The lectures were clear and easy to understand

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 5: Please rate the quality of pre-course administration and information:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 6: Any other suggestions: NILL

Comments:

Thank you for taking the time to complete this survey, your comments are much appreciated.

***OPTIONAL Section*:** Name _____
Signature _____ Date _____

Annexure 4

Course/Training Feedback Form

Course: LAPAROSCOPIC TECHNIQUES IN OBSTETRICS AND GYNECOLOGY
Date: 30/08/2019
Name: KAVIYA. K.
Reg NO. U16 NB312
Department: Obstetrics and Gynaecology

Q 1: Please rate your overall satisfaction with the format of the course:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 2: Please rate course notes:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 3: The lecture sequence was well planned

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 4: The lectures were clear and easy to understand

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 5: Please rate the quality of pre-course administration and information:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 6: Any other suggestions: NILL

Comments:

Thank you for taking the time to complete this survey, your comments are much appreciated.

***OPTIONAL Section*:** Name _____
Signature _____ Date _____

Annexure 5

Date: 24.02.2020

From
Dr. S.Swetha
Assistant Professor,
Obstetrics and Gynaecology,
Sri Lakshmi Narayana institute of Medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Laproscopy

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Laproscopy** on April 19 – Jan 20. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr.KALARANI

PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

Encl: Certificates

Photographs

VALUE ADDED COURSES

OBGY 9 LAPAROSCOPIC TECHNIQUES



Sri Lakshmi Narayana Institute of Medical Sciences

Annexure 1

Date 20/06/2018

From
Prof.D.Baba, MS
Professor and Head,
Ophthalmology,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: RETINOBLASTOMA

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **RETINOBLASTOMA** on **JULY-2018 – OCT -2018**. We solicit your kind permission for the same.

Kind Regards

PROF.D.BABA, MS
HOD, OPHTHALMOLOGY

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:
The Dean: Prof.K.Balagurunathan, M.S,
The HOD: Prof.D.Baba M.S,
The Expert: Dr.Muthukrishnan, DNB.M.S,
The committee has discussed about the course and is approved.

DEAN
Prof.K.BALAGURUNATHAN M.S
(General Surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU, PUDUCHERRY

Subject Expert

HOD

PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Ref. No. SLIMS/Dean Off/VAC / OPH10 **Date: 20.06.2018**

From
The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

To
The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

Respected Sir

Sub: Request for permission and approval of Syllabus for certificate course (Value Added course) for the academic year 2018-2019 - Reg
Ref: Requesting letter received from Departments

*****

With reference to the above, herewith forwarding the proposed list of Value-added courses for necessary permission and approval of syllabus to conduct the same.

1. PENETRATING KERATOPLASTY
2. RETINOBLASTOMA

This is for your kind information and needful action.

Thanking you

Yours faithfully

[DEAN]

DEAN
Prof.K.BALAGURUNATHAN M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl's:

1. Requesting letter received from department
2. Syllabus of the course
3. Details of faculty handling course

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

VALUE ADDED COURSE –

1. PENETRATING KERATOPLASTY
2. RETINOBLASTOMA

COURSE CO-ORDINATOR DETAILS

Faculty Name: Prof.D.Baba, MS

Email ID: ophthalmologyprof@gmail.com

Mobile number: 8585485988

Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)

Ref. No. BHIER/ VAC / OPH10 **Date: 21.06.2018**

From

The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

To

The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

Sir / Madam,

Sub: Approval of Syllabus to conduct certificate course (Value Added course) for the academic year 2018-2019 – Reg.

Ref: Ref. No. SLIMS/Dean Off/VAC /OPH10 Dated: 20.06.2018

*****

With reference to the above, it is to inform that the proposal submitted to conduct Value Added Course has been accepted and approved by BIHER, council meeting. List of the VAC are mentioned below for the academic year 2018– 2019. The abstract of the VAC course completion detail should be submitted to the Registrar office.

1. PENETRATING KERATOPLASTY
2. RETINOBLASTOMA

Thanking you

Yours faithfully

REGISTRAR

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

27.06.2018

Sub: Organising Value-added Course: RETINOBLASTOMA

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing "**RETINOBLASTOMA**". The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30TH JUNE 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
Prof.K.BALAGURUNATHAN M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl: Copy of Course content

VALUE ADDED COURSE

1. Name of the programme & Code

Retinoblastoma

2. Duration & Period

30 hrs & July -2018 – Oct -2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

July -2018 – Oct -2018 (1)

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- July -2018 – Oct -2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	**OPH10**	**Retinoblastoma**	**Dr.Muthukrishnan DNB, M.S,**	30	2018

10. Course Feed Back

Enclosed as Annexure

Dr.Muthukrishnan, DNB, M.S,
(Asst.Prof)
RESOURCE PERSON

Prof. D. Baba, M.S, - HOD
COORDINATOR
PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

Annexure 2 – Course Proposal

Course Title: RETONOBLASTOMA

Course Objective:

1. **Definition of Retinoblastoma**
2. **Pathogenesis of Retinoblastoma**
3. **Etiology of Retinoblastoma**
4. **Rees-Ellsworth classification**
5. **International classification of Retinoblastoma**
6. **Management of Retinoblastoma**
7. **Enucleation**
8. **Follow up**

Course Outcome: On successful completion of the course the students will be able to diagnose, understand and classify retinoblastoma; make a detailed representation of the pathological changes in same.

Course Audience: MBBS UNDERGRADUATES

Course Coordinator: PROF.D.BABA, MS,

Course Faculties with Qualification and Designation:

1. **Prof.D.Baba, MS, - HOD Ophthalmology**
2. **Dr.Muthukrishnan, DNB, M.S,**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1.	10/7/2018	**Definition of Retinoblastoma**	4-6PM	2
2.	15/7/2018	**Pathogenesis of Retinoblastoma**	4-7PM	3
3.	22/7/2018	**Pathogenesis of Retinoblastoma**	4-6PM	3
4.	25/7/2018	**Etiology of Retinoblastoma**	4-6PM	2
5.	29/7/2018	**Etiology of Retinoblastom**	4-7PM	3
6.	09/8/2018	**Rees-Ellsworth classification**	4-7PM	3
7.	10/8/2018	**International classification of Retinoblastoma**	4-7PM	3
8.	15/8/2018	**Management of Retinoblastoma**	4-6PM	2
9.	18/8/2018	**Management of Retinoblastoma**	4-6PM	2
10.	20/8/2018	**Enucleation**	4-7PM	3
11.	25/8/2018	**Follow up**	4-6PM	2

12.	29/8/2018	**Follow up**	4-6PM	2
			TOTAL HOURS	30

REFERENCE BOOKS: (Minimum 2)

1. JACK J KANSKI clinical ophthalmology a systemic approach-6th edition.
2. PARSON'S Diseases of the eye – 19th edition

RETINOBLASTOMA

Classification of retinal tumors

A. *Primary tumours*
1. *Neuroblastic tumours.* These arise from sensory retina (retinoblastoma and astrocytoma) and pigment epithelium (benign epithelioma and melanotic malignant tumours).
2. *Mesodermal angiomata* e.g., cavernous haemangioma.
3. *Phakomatoses.* These include: angiomatosis retinae (von Hippel-Lindau disease), tuberous sclerosis (Bourneville's disease), neurofibromatosis (von Recklinghausen's disease and encephalo-trigeminal angiomatosis (Sturge-Weber syndrome).

B. *Secondary tumours*
1. *Direct extension* e.g., from malignant melanoma of the choroid.
2. *Metastatic carcinomas* from the gastrointestinal tract, genitourinary tract, lungs, and pancreas.
3. *Metastatic sarcomas.*
4. Metastatic malignant melanoma from the skin.

RETINOBLASTOMA

It is a common congenital malignant tumour arising from the neurosensory retina in one or both eyes.

Incidence

1. It is the most common intraocular tumour of childhood occurring 1 in 20,000 live births.
2. *Age.* Though congenital, it is not recognised at birth, and is usually seen between 1 and 2 years of age.
3. *Sex.* There is no sex predisposition.
4. *Race.* It is rarer in Negroes than Whites.
5. *Bilaterality.* In 25-30 percent cases, there is bilateral involvement, although one eye is affected more extensively and earlier than the other.

Genetics and heredity

Retinoblastoma (RB) gene has been identified as 14 band on the long-arm of chromosome 13 (13q 14) and is a 'cancer suppressor' or 'antioncogenic' gene. Deletion or inactivation of this protective gene by two mutations (*Knudson's two hit hypothesis*) results in occurrence of retinoblastoma.
Retinoblastoma may arise as hereditary and nonherditary forms.

1. ***Hereditary or familial cases.*** In such cases first hit (mutation) occurs in one of the parental germ cells before fertilization. This means mutation will occur in all somatic cells (predisposing to develop even nonocular tumour). Second hit (mutation) occurs late in postzygote phase and affects the second allele, resulting in development of retinoblastoma.

facts about hereditary retinoblastoma:
_Accounts for 40% of all cases.
_All bilateral cases and about 15% of the unilateral cases are hereditary.
_Most hereditary cases are multifocal.
_Some hereditary cases have trilateral retinoblastoma (i.e., have associated pinealoblastoma).
_Inheritance is autosomal dominant and the risk of transmitting the gene mutation is 50%. Because of high peneterance 40% of offspring of a surviver of heraditary retinoblastoma will develop the tumour.
_There are 40% chances of developing tumour in a sibling of a child with bilateral retinoblastoma (with unaffected parents).

2. ***Non-hereditary or sporadic cases.*** In nonhereditary cases both hits (mutations) occur in the embryo after fertilization and in the same retinal cell. Some *facts about non-hereditary (somatic) retinoblastoma* are:
_Accounts for 60% of all cases.
_All non-hereditary cases are unilateral and unifocal and accounts for 85% of the all unilateral cases of retinoblastoma.
_Patient is not predisposed to get second nonocular cancer.
_Tumour is not transmissible.

Pathology

Origin. It arises as malignant proliferation of the immature retinal neural cells called, *retinoblasts,* which have lost both antioncogenic genes.

Histopathology.
Growth chiefly consists of small round cells with large nuclei, resembling the cells of the nuclear layer of retina. These cells may present as a highly undifferentiated or well-differentiated tumour.
Microscopic features of a well differentiated tumour include Flexner-Wintersteiner rosettes, (highly specific of retinoblastoma), Homer-Wright rosettes, pseudorosettes and fleurettes formation

Clinical picture

It may be divided into four stages:

I. *Quiescent stage.* It lasts for about 6 months to one year. During this stage, child may have any of the following features:
1. *Leukocoria or yellowish-white pupillary reflex* (also called as *amaurotic cat's eye appearance*) is the commonest feature.

2. *Squint,* usually convergent, may develop in some cases.
3. *Nystagmus* is a rare feature, noticed in bilateral cases.

4. *Defective vision.* Very rarely, when the tumour arises late (3-5 years of age), the child may complain of defective vision.
5. *Ophthalmoscopic features of tumour.* In the early stages, before the appearance of leukocoria, fundus examination after full mydriasis may reveal the growth.
Ophthalmoscopic signs in two types of retinoblastoma are as follows:

i. *Endophytic retinoblastoma*:
It grows inwards from the retina into the vitreous cavity.
On ophthalmoscopic examination, the tumour looks like a well circumscribed polypoidal mass of white or pearly pink in colour. Fine blood vessels and sometimes a haemorrhage may be present on its surface. In the presence of calcification, it gives the typical 'cottage cheese' appearance. There may be multiple growths projecting into the vitreous.

ii. *Exophytic retinoblastoma.* It grows outwards and separates the retina from the choroid. On fundus examination it gives appearance of exudative retinal detachment.

II. *Glaucomatous stage*. It develops when retinoblastoma is left untreated during the quiescent stage. This stage is characterised by severe pain, redness, and watering.

Signs. Eyeball is enlarged with apparent proptosis, conjunctiva is congested, cornea become hazy, intraocular pressure is raised.

III. *Stage of extraocular extension*.
Due to progressive enlargement, of tumour the globe bursts through the sclera, usually near the limbus or near the optic disc. It is followed by rapid fungation and

involvement of extraocular tissues resulting in marked proptosis.

IV. ***Stage of distant metastasis***. It is characterised by the involvement of distant structures as follows:
1. *Lymphatic spread* first occurs in the preauricular and neighbouring lymph nodes.
2. *Direct extension* by continuity to the optic nerve and brain is common.
3. *Metastasis by blood stream* involves cranial and other bones. Metastasis in other organs, usually the liver, is relatively rare.

Differential diagnosis

1. ***Differential diagnosis of leukocoria.***
'*pseudoglioma*'. A few common conditions are congenital cataract, inflammatory deposits in vitreous following a plastic cyclitis or choroiditis, coloboma of the choroid, the retrolental fibroplasia (retinopathy of prematurity), persistent hyperplastic primary vitreous, toxocara endophthalmitis and exudative retinopathy of Coats.
2. ***Endophytic retinoblastoma*** discovered on fundus examination should be differentiated from retinal tumours in tuberous sclerosis and neurofibromatosis, astrocytoma and a patch of exudative choroiditis.
3. ***Exophytic retinoblastoma*** should be differentiated from other causes of exudative retinal detachment

Diagnosis

1. *Examination under anaesthesia:* It should be performed in all clinically suspected cases. It should include fundus examination of both eyes after full mydriasis with atropine (direct as well as indirect ophthalmoscopy), measurement of intraocular pressure and corneal diameter.

2. *Plain X-rays of orbit* may show calcification which occurs in 75 percent cases of retinoblastoma.

3. *Lactic dehydrogenase (LDH)* level is raised in aqueous humour.

4. *Ultrasonography and CT scanning* are very useful in the diagnosis. CT also demonstrates extension to optic nerve, orbit and CNS.

Treatment

1. ***Tumour destructive therapy.*** When tumour is diagnosed at an early stage I i.e., when tumour is involving less than half of retina and optic nerve is not involved (usually in the second eye of bilateral

cases), it may be treated conservatively by any one or more of the following tumour destructive methods depending upon the size and location of the tumour:
Present recomendations are for sequential aggressive local therapy (SALT) comprising of multimodality therapy as below:
_*Chemoreduction followed by local therapy* (Cryotherapy, thermochemotherapy or brachytherapy) is recommended for large tumours (>12 mm in diameter)
_*Radiotherapy* (external beam radiotherapy i.e., EBRT or brachytherapy) combined with *chemotherapy* is recommended for medium size tumour <12 mm in diameter and <8mm in thickness).
_*Cryotherapy* is indicated for a small tumour (<4.5 mm indiameter and <2.5 mm in thickness) located anterior to equator.
_*Laser photocoagulation* is used for a small tumour located posterior to equator <3 mm from fovea.
_*Thermotherapy* with diode laser is used for a small tumour located posterior to equator away from macula.

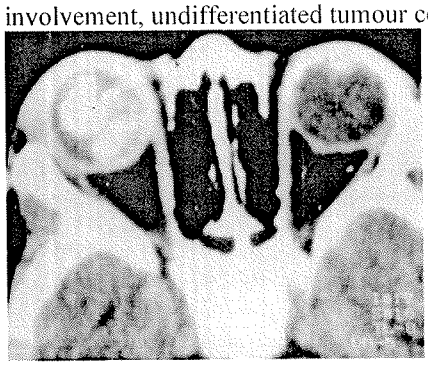
2. *Enucleation.*
_Tumour involves more than half of the retina.
_Optic nerve is involved.
_Glaucoma is present and anterior chamber is involved.
The eyeball should be enucleated along with maximum length of the optic nerve taking special care not to perforate the eyeball.
If optic nerve shows invasion, postoperative treatment should include:
_*Radiotherapy* (5000 rads) should be applied to the orbital apex.
_*Chemotherapy*, consisting of vincristine, carboplatin, and etoposide which may be combined with cyclosporin should be supplemented.

3. *Palliative therapy* is given in following cases where prognosis for life is dismal in spite of aggressive treatment:
_Retinoblastoma with orbital extension,
_Retinoblastoma with intracranial extension, and
_Retinoblastoma with distant metastasis.

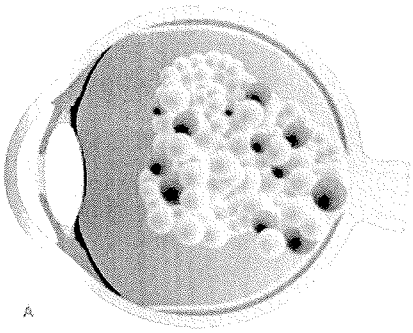
Palliative therapy should include combination of :
_Chemotherapy,
_Surgical debulking of the orbit or orbital exentration, and
_External beam radiotherapy (EBRT)
Note: Exentration of the orbit (a mutilating surgery commonly performed in the past) is now not preferred by many surgeons.

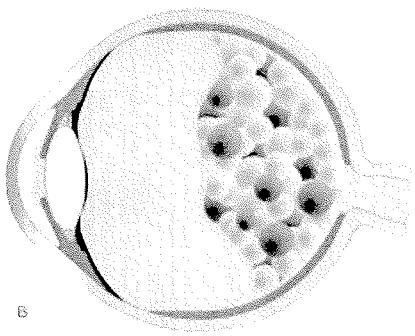
Prognosis

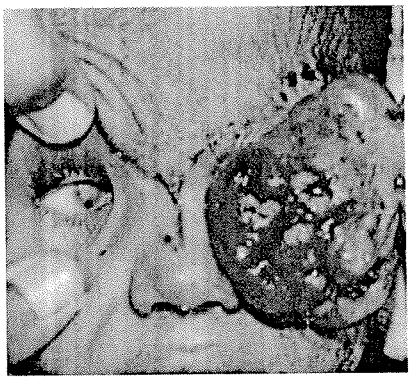
1. If untreated the prognosis is almost always bad and the patient invariably dies. Rarely *spontaneous regression* with resultant cure and shrinkage of the eyeball may occur due to necrosis followed by calcification; suggesting role of some *immunological phenomenon.*
2. Prognosis is fair (survival rate 70-85%) if the eyeball is enucleated before the occurrence of extraocular extension.
3. *Poor prognostic factors are:* Optic nerve involvement, undifferentiated tumour cells.



CT Scan showing retinoblastoma.







Annexure- II

VALUE ADDED COURSE

RETINOBLASTOMA

4. List of Students Enrolled JULY - 2018 – OCT -2018

SL.NO	University Reg.No.	NAME OF THE STUDENTS	SIGNATURE
1	U18MB281	DEVARAPALLI SAI TEJASWINI	
2	U18MB282	DHANUSHA S	
3	U18MB283	DHARANEESHWARAN .S	
4	U18MB284	DHISHVANTH DHEEPAK A.N	
5	U18MB285	DHYAN DAVID S.V	
6	U18MB286	DISHA SHEORAN	
7	U18MB287	DODIYA RAJANSINH KAMALSINH	
8	U18MB288	DONNIE OLIVIA H	
9	U18MB289	EASWAR B	
10	U18MB290	ELDHO BABU	
11	U18MB291	FAUSTINA BAJWIN .S	
12	U18MB292	G SRI SAI NITISH	
13	U18MB293	GAUR DARSHANA PURUSHOTTAM GAUR	
14	U18MB294	GHATKAR SAYALI KRISHNA	
15	U18MB295	GOKUL M S	
16	U18MB296	GOPIKA .P	
17	U18MB297	HARI BALA SIDDHARTH T.R	
18	U18MB298	HARSHINI R C	
19	U18MB299	HIBA MOIDEEN .K	
20	U18MB300	INDHU S	
21	U18MB301	INDU V	

22	U18MB302	INDUKURI SAI AKANKSHA	Indukuri Sai Akanksha
23	U18MB303	IPSITA SETHY	Ipsita Sethy
24	U18MB304	JAGADEESAN S.R	JAGADEESAN S.R
25	U18MB305	JAHNAVI REDDY .M	Jahnavi Reddy
26	U18MB306	JAISHREE .S	Jaishree. S
27	U18MB307	JANANI V	Janani V
28	U18MB308	JASMEET NIRANJAN	Jasmeet Niranjan
29	U18MB309	JAYALAKSHMI S	Jayalakshmi S
30	U18MB310	JAYAREDDYGARI SAI RUCHITHA	Ruchitha

Dr.Muthukrishnan, DNB, M.S,
(Asst.Prof)

RESOURCE PERSON

Prof. D. Baba, M.S,- HOD

COORDINATOR

PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

RETINOBLASTOMA

MULTIPLE CHOICE QUESTIONS

Course Code: OPH10

I. ANSWER ALL THE QUESTIONS

1. Amaurotic Cat's eye reflex is seen in
   a. Retinoblastoma
   b. Retinal detachment
   c. Retinitis pigmentosa
   d. Retrobulbar neuritis
2. Commonest intraocular tumour in children is
   a. Retinoblastoma
   b. Malignant melanoma
   c. Teratoma
   d. Neuroblastoma
   e. Diktyoma
3. About retinoblastoma, all are true except:
   a. Males > Females
   b. Less then 10 years of age
   c. Hereditary transmission
   d. Origin from neuroectoderm
4. Dystrophic calcification is seen in
   a. Retinoblastoma
   b. Rhabdomyosarcoma
   c. Glioma
   d. Malignant melanoma

5. Retinoblastoma is
    a. Benign tumour
    b. Highly malignant tumour
    c. Congenital defect
    d. Inflammation
    e. Degeneration
6. Retinoblastoma metastasises to
    a. Preauricular lymph nodes
    b. Cranial bones
    c. Optic nerve
    d. Brain
    e. All of the above
7. Retinoblastoma
    a. Is most common in early adolescence
    b. Is almost always bilateral
    c. May grow along the optic nerve into the brain
    d. Is treated by local excision with preservation of sclera for cosmetics reasons
    e. All of the above
8. The treatment of choice in a child with a unilateral retinoblastoma of intra ocular stage is
    a. Evisceration
    b. Enucleation
    c. Exenteration
    d. Irradiation
    e. Excision

9. Retinoblastoma presenting features may not include :
    a. Anisocoria
    b. Watering eye
    c. Double vision
    d. Convergent strabismus
10. Microscopically the retinoblastoma
    a. Shows calcium deposits
    b. Shows cell with large hyperchromatic nuclei
    c. Is composed of undifferentiated neuroblastic cells
    d. Contains numerous well-formed rosettes
    e. All of above

8/10

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that DEVARAPALLI SAI TEJASWINI (U18MB281) has actively participated in the Value Added Course on RETINOBLASTOMA held during JUL 2018 TO OCT 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.Muthukrishnan,
DNB, M.S, - Asst Professor
RESOURCE PERSON

Prof.D.Baba, M.S,
Prof & HOD - Ophthal
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

Deemed to be University under Section 3 of the UGC Act, 1956

CERTIFICATE OF MERIT

This is to certify that DHANUSHA S (U18MB282) has actively participated in the Value Added Course on RETINOBLASTOMA held during JUL 2018 TO OCT 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.Muthukrishnan,
DNB, M.S, - Asst Professor
RESOURCE PERSON

Prof.D.Baba, M.S,
Prof & HOD - Ophthal
COORDINATOR

Student Feedback Form

Course Name: **RETINOBLASTOMA**

Subject Code: **OPH10**

Name of Student: Devaa Apalli sai Tejaswini Roll No.: U18MB281

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date:

Annexure 5

Date : 29/4/2018

From
Prof.D.Baba, MS,
Professor and Head,
Ophthalmology,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: RETINOBLASTOMA

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **RETINOBLASTOMA** for 30students in JULY-OCT- 2018. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Prof.D.Baba, MS

HOD ,Ophthalmology

Encl: Certificates

Photographs

Sri Lakshmi Narayana Institute of Medical Sciences

Annexure 1

Date 28/12/2018

From
Prof.D.Baba, MS
Professor and Head,
Ophthalmology,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: RETINOPATHY OF PREMATURITY

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **RETINOPATHY OF PREMATURITY** on **JAN-2019 – APR -2019**. We solicit your kind permission for the same.

Kind Regards

PROF.D.BABA, MS
HOD, OPHTHALMOLOGY

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:
The Dean:Prof.K.Balagurunadhan M.S,
The HOD:Prof.D.Baba M.S,
The Expert:Dr.Shobana - DNB
The committee has discussed about the course and is approved.

DEAN
Prof.K.BALAGURUNATHAN M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU, PUDUCHERRY

Subject Expert

PROFESSOR & HOD
DEPARTM... OPHTHALMOLOGY,
SRI LAKSHMI NAR... HOD ... OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affiliated to Bharath University, Chennai - TN]

Ref. No. SLIMS/Dean Off/VAC / OPH11 **Date: 28.12.2018**

From
The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

To
The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

Respected Sir

Sub: Request for permission and approval of Syllabus for certificate course (Value Added course) for the academic year 2018-2019 - Reg
Ref: Requesting letter received from Departments

*****

With reference to the above, herewith forwarding the proposed list of Value-added courses for necessary permission and approval of syllabus to conduct the same.

1. RETINOPATHY OF PREMATURITY
2. SLIT LAMP BIOMICROSCOPY

This is for your kind information and needful action.

Thanking you

Yours faithfully

[DEAN]

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl's:

1. Requesting letter received from department
2. Syllabus of the course
3. Details of faculty handling course

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

VALUE ADDED COURSE –

3. RETINOPATHY OF PREMATURITY
4. SLIT LAMP BIOMICROSCOPY

COURSE CO-ORDINATOR DETAILS

Faculty Name: Prof.D.Baba, MS

Email ID: ophthalmologyprof@gmail.com

Mobile number: 8585485988

Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)

Ref. No. BHIER/ VAC / OPH07 **Date: 30.12.2018**

From

The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

To

The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

Sir / Madam,

Sub: Approval of Syllabus to conduct certificate course (Value Added course) for the academic year 2018-2019 – Reg.
Ref: Ref. No. SLIMS/Dean Off/VAC /OPH07 Dated: 28.12.2018

*****

With reference to the above, it is to inform that the proposal submitted to conduct Value Added Course has been accepted and approved by BIHER, council meeting. List of the VAC are mentioned below for the academic year 2018– 2019. The abstract of the VAC course completion detail should be submitted to the Registrar office.

1. RETINOPATHY OF PREMATURITY
2. SLIT LAMP BIOMICROSCOPY

Thanking you

Yours faithfully

REGISTRAR

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

31.12.2018

Sub: Organising Value-added Course: RETINOPATHY OF PREMATURITY

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"RETINOPATHY OF PREMATURITY"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 02ND JAN 2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
Prof.K.BALAGURUNATHAN.MS
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl: Copy of Course content

VALUE ADDED COURSE

1. Name of the programme & Code

Retinopathy of prematurity

2. Duration & Period

30 hrs & Jan -2019 – Apr-2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

Jan -2019 – Apr -2019 (1)

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- Jan -2018 – Apr -2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	**OPH11**	Retinopathy Of Prematurity	**Dr.Shobana, DNB,**	30	2019

10. Course Feed Back

Enclosed as Annexure- V

Dr.Shobana, DNB
RESOURCE PERSON

Prof. D. Baba, M.S,
COORDINATOR
PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

Annexure 2 – Course Proposal

Course Title: RETINOPATHY OF PREMATURITY

Course Objective:

1. **Etiopathogenesis**
2. **Clinical features**
3. **Stages of ROP**
4. **Zones of ROP**
5. **Screening protocols**
6. **Management of ROP**

Course Outcome: After undergoing this course students will be able to understand the following.

Course Audience: MBBS UNDERGRADUATES

Course Coordinator: PROF.D.BABA, MS,

Course Faculties with Qualification and Designation:

1. **Prof.D.Baba, MS, - HOD Ophthalmology**
2.

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1.	10/7/2018	**Etiopathogenesis**	4-6PM	2
2.	15/7/2018	**Etiopathogenesis**	4-7PM	3
3.	22/7/2018	**Clinical features**	4-6PM	3
4.	25/7/2018	**Clinical features**	4-6PM	2
5.	29/7/2018	**Stages of ROP**	4-7PM	3
6.	09/8/2018	**Stages of ROP**	4-7PM	3
7.	10/8/2018	**Zones of ROP**	4-7PM	3
8.	15/8/2018	**Zones of ROP**	4-6PM	2
9.	18/8/2018	**Screening protocols**	4-6PM	2
10.	20/8/2018	**Screening protocols**	4-7PM	3
11.	25/8/2018	**Management of ROP**	4-6PM	2
12.	29/8/2018	**Management of ROP**	4-6PM	2
			TOTAL HOURS	30

REFERENCE BOOKS: (Minimum 2)

1. JACK J KANSKI clinical ophthalmology a systemic approach-6th edition.
2. PARSON'S Diseases of the eye – 19th edition

RETINOPATHY OF PREMATURITY

Retinopathy of prematurity (ROP) is a bilateral proliferative retinopathy, occurring in premature infants with low birth weight who often have been exposed to high concentration of oxygen
Earlier this was known as *retrolental fibroplasia.*

Etiopathogenesis
Low birth weight and decreased gestational age are now considered the primary causative factors.

Supplemental oxygen administration which was for a long time considered as the important causative factor is now considered only a risk factor

Based on the above facts, two important hypothesis are postulated to describe pathogenesis of disease:

1. ***Classical theory*** postulates that owing to exposure to high concentration of oxygen, there occurs obliteration of premature retinal vessels. This is followed by neovascularisation and fibrous tissue proliferatiion which ultimately forms a retrolental mass.

2. ***Spindle cell theory*** proposed recently postulates the induction of retinal and vitreal neovascularization by spindle cell insult in a premature retina.

Clinical features
The condition has been divided into active ROP and cicatricial ROP. Clinically the evolution of the active ROP has been divided into five stages

_***Stage* 1.** It is characterised by formation of a *demarcation line* seen at the edge of vessels, dividing the vascular from the avascular retina.

_***Stage* 2.** The line structure of stage 1 acquires a volume to form a *ridge* with height and width.

_***Stage* 3**. It is characterised by a *ridge with extraretinal fibrovascular proliferation* into the vitreous. This stage is further subdivided into mild, moderate and severe, depending on the amount of fibrovascular proliferation.

_***Stage* 4a**. It includes *subtotal retinal detachment not involving the macula.* It occurs as a result of exudation from incompetent blood vessels or traction from the fibrous (cicatricial) tissue.
_***Stage* 4b.** It includes *subtotal retinal detachment involving the macula.*

***Stage* 5**. It is marked by *total retinal detachment which is always funnel-shaped.*

Retinal area (zones) of involvement in ROP

The retina is divided into 3 zones.
The centre of the retinal map for ROP is the optic disc not the macula as in other retinal charts.

***Zone* I.** A circle drawn on the posterior pole, with the optic disc as the centre and twice the disc macula distance as the radius, constitutes zone I.
Any ROP in this zone is usually very severe because of a large peripheral area of avascular retina.
***Zone* II. A** circle is drawn with the optic disc as the centre and disc to nasal ora serrata as the radius. The area between zone I and this boundary constitutes zone II.
***Zone* III**. The temporal arc of retina left beyond the radius of zone II is zone III.

Extent of involvement is denoted by the clock hours of retinal involvement in the particular zone

Plus disease refers to presence of tortuous dilated vessels at posterior pole with any stage of ROP.

Associated with it is the engorgment and dilatation of iris vessels, which result in poor pharmacological dilatation of pupil
Plus diseases signifies a tendency to progression.

Pre threshold disease is defined as ROP in:
Zone I, any stage, or
Zone II, stage 2 with plus component, or
Zone II or III, stage 3 with plus component but not reaching threshold clock hours.

Pre threshold ROP needs very close observation as it can rapidly progress to threshold, which needs prompt treatment.

Threshold disease refers to stage 3 plus disease involving 5 continuous or 8 discontinuous clock hours. This stage needs laser or cryotherapy in less than 72 hours.

Differential diagnosis
Advanced retrolental fibroplasia needs to be differentiated from other causes of leukocoria

Screening and management
Treatment of well-established disease is unsatisfactory.
Prophylaxis is thus very important.

To prevent ROP, the premature newborns should not be placed in incubator with an O_2 concentration of more than 30 percent and efforts should be made to avoid infection and attacks of apnoea

Further, a regular screening is very important.

All premature babies born at less than or equal to 32 weeks of gestational age and those weighing 1500g or less should be screened for ROP.

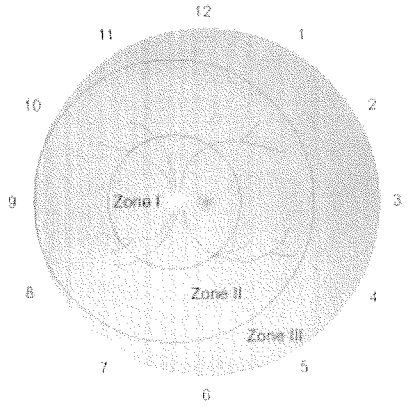
The first examination by indirect ophthalmosocpy should be done between 6 and 7 weeks post-natal age or 34 weeks post-conceptual age (whichever is earlier).

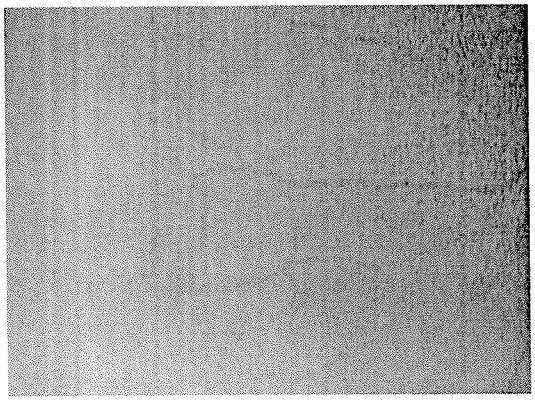
The further line of action will depend upon the overall status of the eye as below:

I. ***Mature retina*** is labelled when the vessels have reached within one disc diameter of both nasal and temporal ora-serrate. Infants with mature retina does not require further follow-up.

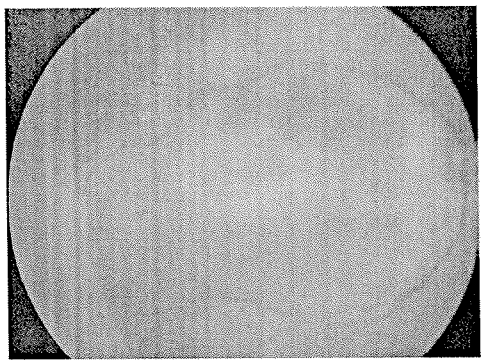
II. ***Immature retina*** is labelled when the vessels are short of one disc diameter of the nasal or temporal ora but ROP is not developed yet. Such infants require further follow-up weekly.

III. ***Retinopathy of prematurity***
When ROP is detected following measures should be taken:
Stage 1 and 2. Since spontaneous regression of disease occurs in 80 to 90% of cases, so only a weekly examination is recommended.
Stage 3, threshold disease should be treated by cryo or laser to prevent progression and to achieve regression.
Stage 4a. Scleral buckling is recommended in addition to cryo or laser therapy.
Stage 4b and 5. Vitrectomy needs to be carried out in this stage.
Prognosis is poor in stage 4b and 5.





(A) *Stage 1 – demarcation line;*



(B) *stage 2 – ridge;*

Annexure- II

VALUE ADDED COURSE

RETINOPATHY OF PREMATURITY

4. List of Students Enrolled JAN - 2019 – APR -2019

SL.NO	University Reg.No.	NAME OF THE STUDENTS	SIGNATURE
1	U18MB251	AASHLESHA DHARKAR	
2	U18MB252	ABINAYAVARTHINI N	
3	U18MB253	ADARSH KUMAR	
4	U18MB254	AISWARYA PREMRAJ	
5	U18MB255	AKSHAYA .R	
6	U18MB256	ALOK PANDA	
7	U18MB257	AMULYA N GOWDA	
8	U18MB258	ANINDA CHAKRABORTY	
9	U18MB259	ANJALI SADHWANI	
10	U18MB260	ANKU KUMAR	
11	U18MB261	ANNIE WELLY	
12	U18MB262	ANTONY ROHAN	
13	U18MB263	ANUPAMA	
14	U18MB264	AQSA QURESHI	
15	U18MB265	ARSHAD AMIN	
16	U18MB266	ASHIQUE RIFANA M	
17	U18MB267	ASHWIN R	
18	U18MB268	ASHWINI.N	
19	U18MB269	ASMIT KESHAV	
20	U18MB270	AVIRAL TYAGI	

21	U18MB271	AYUSH JAISWAL	
22	U18MB272	BANDHAM SANKEERTHANA	
23	U18MB273	BORIS NAMBAM	
24	U18MB274	BUCHHAMMAGARI SOURABH REDDY	
25	U18MB275	CHARAN VARMA C.A	
26	U18MB276	CHARU SAI	
27	U18MB277	CHINKA SARAN SAI	
28	U18MB278	CUTPIECEWALA ALIASGAR MOHAMMED	
29	U18MB279	DATTATREYA BHATTACHARJEE	
30	U18MB280	DEBOPRIYA DEY	

Dr.R.Shobana, DNB,
(SR - OPHTHAL)
RESOURCE PERSON

Prof.D.Baba, M.S,
(PROF & HOD)
COORDINATOR

PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

RETINOPATHY OF PREMATURITY

MULTIPLE CHOICE QUESTIONS

Course Code: OPH11

I. ANSWER ALL THE QUESTIONS

1. Which disease occurs in premature babies?
   a. Retinal detachments
   b. Retinopathy of prematurity
   c. Macular hole
   d. Macular degeneration
2. Which among the following in risk factor ROP except:
   a. Low exposure to corbon dioxide
   b. Overnight
   c. Prematurity
   d. Smoking
3. Which babies are to be screened for ROP
   a. 40wks
   b. Before 31 wks
   c. 33 wks
   d. Birth with > 3kgs
4. Number of bone in grading in ROP
   a. 5
   b. 3
   c. 6
   d. 1

AASALESHA DHARKAR
U18MB281

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

5. Zone I cossesponds to radius _____ distance from disc to macula.
   a. Twice
   b. Thrice
   c. Once
   d. Four times
6. Zone III indicates
   a. Temporal crescent
   b. Nasal crescent
7. Extra retinal fibrovascular tissue everponos to
   a. Stage I
   b. Stage II
   c. Stage III
   d. Stage IV
8. VLBW infants treated for ROP can daily
   a. Myopia
   b. Hypermetropia
   c. Astigmatism
   d. Presbyopia
9. Screening of ROP is done with
   a. +90D
   b. Direct ophthalmoscope
   c. Slit lamp
   d. Indirect ophthalmoscope

10. ROP is treated using

a. Cryo/laser photocopier

b. Antibiotic

c. Analgesics

d. Lubricant

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that AASHLESHA DHARKAR (U18MB251) has actively participated in the Value Added Course on RETINOPATHY OF PREMATURITY held during JAN 2019 TO APR 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.R.Shobana
Senior Resident - Ophthal
RESOURCE PERSON

Prof.D.Baba, M.S,
Prof & HOD - Ophthal
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that ABINAYAVARTHINI N (U18MB252) has actively participated in the Value Added Course on RETINOPATHY OF PREMATURITY held during JUNE 2019 TO OCT 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.R.Shobana
Senior Resident - Ophthal
RESOURCE PERSON

Prof.D.Baba, M.S,
Prof & HOD - Ophthal
COORDINATOR

Student Feedback Form

Course Name: **RETINOPATHY OF PREMATURITY**

Subject Code: **OPH11**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date:

Annexure 5

Date : 30/4/2019

From
Prof.D.Baba, MS,
Professor and Head,
Ophthalmology,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: RETINOPATHY OF PREMATURITY

Dear Sir,

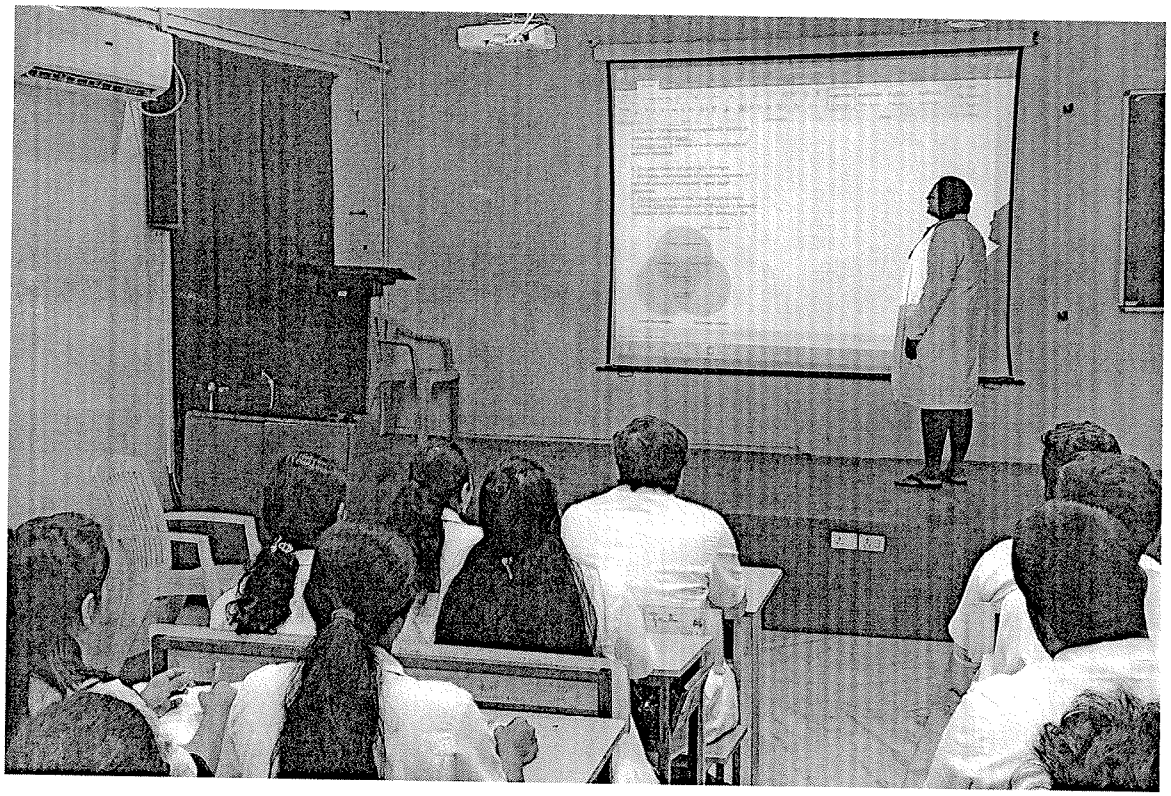
With reference to the subject mentioned above, the department has conducted the value-added course titled: **RETINOPAHY OF PREMATURITY** for 30students in JAN-APR 2019. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Prof.D.Baba, MS
HOD ,Ophthalmology

Encl: Certificates

Photographs



Sri Lakshmi Narayana Institute of Medical Sciences

Date: 05.06.2018

From

Dr. PammySinha
Professor and Head,
Department of Pathology,
Sri Lakshmi Narayana Institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical College,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Polymerase Chain Reaction: Principle, Technique and Applications

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Polymerase Chain Reaction: Principle, Technique and Applicationsfor II year Allied Health Sciences students from JULY-SEPT 2018. We solicit your kind permission for the same.

Kind Regards

Dr.PammySinha

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. Sugumaran. A**

The HOD: **Dr. PammySinha**

The Expert: **Dr. Sivaganesh @ Porko. G**

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign &Seal)	(Sign &Seal)	(Sign &Seal)

DEAN
LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Dr. SIVAGANESH ALIAS PORKO. G
Reg. No:84387
Assistant Professor Department of Pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

12.06.2018

Sub: Organising Value-added Course: Polymerase Chain Reaction: Principle, Technique and Applications**reg**

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing Polymerase Chain Reaction: Principle, Technique and Applicationsfor II year Allied Health Sciences students from JULY-SEPT 2018. The course content and is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30.06.2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content

COURSE PROPOSAL

Course Title: **POLYMERASE CHAIN REACTION – PRINCIPLE, TECHNIQUE & APPLICATION for II year AHS students**

CourseObjective:

At the end of the course, the students should be able to know and describe

1. PRINCIPLE of PCR
2. TECHNIQUE of PCR
3. APPLICATION of PCR

To assess target II year Allied Health Sciences students towards the PCR and getting their feedback.

CourseOutcome: POLYMERASE CHAIN REACTION – PRINCIPLE, TECHNIQUE & APPLICATION

Course Audience: II year Allied Health Sciences

Course Coordinator: Dr.PammySinha

Course Faculties with Qualification and Designation:

1. **Dr. Sivaganesh @ Porko. G, Assistant professor, Pathology**
2. **Dr.J.Priyadharisini, Assistant professor, Pathology**

3 . Dr. A.Manoharan, Assistant professor, Pathology

Course Curriculum/Topics with schedule

SlNo	Date	Topic	Time	Faculty	Hours
1.	7.07.2018	Introduction	1.30-4.pm	**Dr. Sivaganesh @ Porko.G**	2.5 hrs
2.	14.07.2018	Steps of PCR	1.30-4 pm	**Dr.J.Priyadharisini**	2.5 hrs
3.	21.07.2018	Essential Ingredients of PCR	1.30-4 pm	**Dr. A.Manoharan**	2.5 hrs
4.	28.07.2018	Procedure	1.30-4 pm	**Dr.J.Priyadharisini**	2.5 hrs
5.	4.08.2018	Equipment	1.30-4 pm	**Dr. Sivaganesh @ Porko.G**	2.5 hrs
6.	11.08.2018	Thermal Cycling	1.30-4 pm	**Dr. A.Manoharan**	2.5 hrs
7.	18.08.2018	Types of PCR	1.30-4 pm	**Dr.J.Priyadharisini**	2.5 hrs
8.	25.08.2018	Applications of PCR	1.30-4 pm	**Dr. Sivaganesh @ Porko.G**	2.5 hrs
		Practical Class			
9.	1.09.2018	Procedure	1.30-4 pm	**Dr. A.Manoharan**	2.5 hrs

10.	8.09.2018	Equipment&Thermal Cycling	1.30-4 pm	**Dr.J.Priyadharisini**	2.5 hrs
11.	15.09.2018	Troubleshooting	1.30-4 pm	**Dr. A.Manoharan**	2.5 hrs
12	22.09.2018	Assessment and feedback	1.30-4.pm	**Dr. Sivaganesh @ Porko.G**	2.5 hrs
		Total			30hrs

REFERENCES:

1. PranabDey - Basic and Advanced Laboratory Techniques in Histopathology and Cytology-Springer (2018)

2. Molecular Diagnostics in Cytopathology_ A Practical Handbook for the Practicing Pathologist-Springer International Sinchita Roy-Chowdhuri, Paul A. VanderLaan, John M. Stewart, Gilda da Cunha Santos

3. Henry's Clinical Diagnosis and Management by Laboratory Methods, 23e-Elsevier (2016)Richard A. McPherson MD MSc, Matthew R. Pincus MD PhD

VALUE ADDED COURSE

1. Name of the programme& Code

Polymerase Chain Reaction: Principle, Technique and Applications& PA08

2. Duration& Period

30 hrs& JULY - SEPT 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short answer questions- Enclosed as Annexure- III

6. Certificate model

Enclosed as Annexure- IV

7.No. of times offered during the same year:

One

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- JULY - SEPT 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength& Year**
1	PA08	PCR	Dr. Sivaganesh @ Porko. G	II AHS	JULY - SEPT 2018

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

Dr. SIVAGANESH ALIAS PORKO. G
Reg. No. 3455
Assistant. Professor Department of Pathology
Sri Lakshmi Narayan Institute of Medical Sciences
Osudu, Kudapet

COORDINATOR

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

Annexure - I

POLYMERASE CHAIN REACTION – PRINCIPLE, TECHNIQUE & APPLICATION



PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	POLYMERASE CHAIN REACTION – PRINCIPLE, TECHNIQUE & APPLICATION
Course Code	PA08
Objective	1. **Introduction** 2. **Steps of PCR** 3. **Essential Ingredients of PCR** 4. **Procedure** 5. **Equipment** 6. **Thermal Cycling** 7. **Troubleshooting** 8. **Types of PCR** 9. **Applications of PCR**
Further learning opportunities	PCR in research activities
Key Competencies	On successful completion of the course the students will have skill in PCR techniques
Target Student	II AHS students
Duration	30hrs JULY-SEPT 2018
Theory Session	20hrs
Practical Session	10hrs
Assessment Procedure	SHORT ANSWER QUESTIONS

Introduction

Polymerase chain reaction (PCR) is one of the most important techniques in molecular pathology . With the help of PCR, the single or the pieces of target DNA can be amplified many folds. This technique is now an integral part in every modern laboratory for both the diagnosis and research use.

PCR acts like a "molecular photocopying" machine and amplifies the specific target DNA.

The basic principles of PCR are:

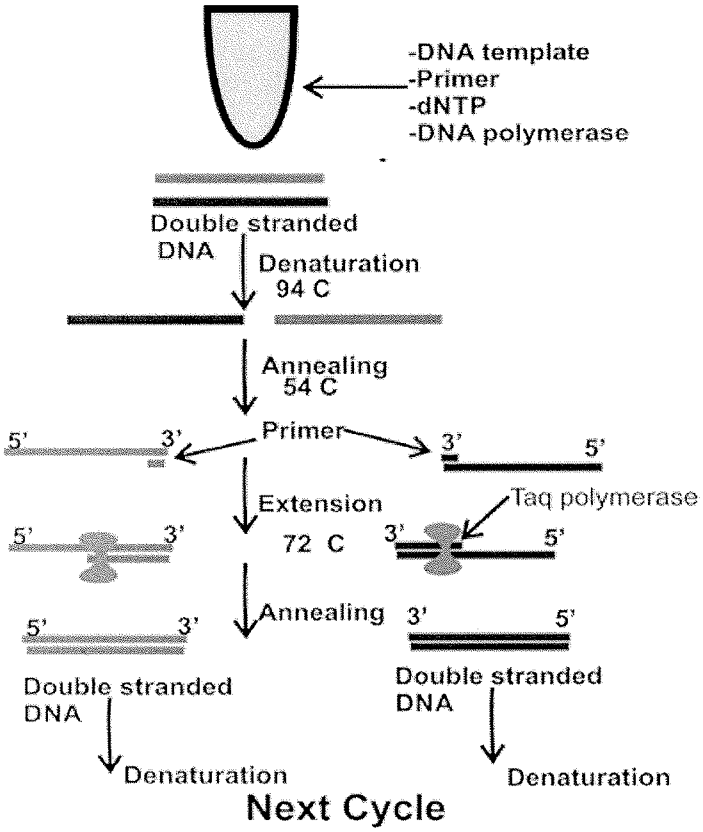
• Double-stranded target DNA is made into single-stranded DNA by applying heat.

• Two oligonucleotide strands or primers are added. The oligonucleotide strand binds with its complimentary DNA strand to the 3′ ends.

• The DNA strand is now extended with the help of DNA polymerase (Taq polymerase). This polymerase enzyme incorporates the nucleotides in the DNA to make it elongated.

• The cycle is repeated

Steps of PCR



• *Denaturation step, 94 °C*: DNA is heated to 94 °C to make it single stranded. Only 1–2 min are given to this heating process in each cycle.

• *Annealing, 54 °C*: The temperature is rapidly cooled. In this lowered temperature, the primer quickly anneals with the respective site of DNA. With the help of Taq polymerase, the reaction starts at the primer-DNA template site.

• *Extension, 72 °C.*

• The complementary nucleotides are attached from the 3′ to 5′ end of DNA.

There is an exponential increment in the number of genes in each cycle. At least 30 cycles of denaturation-annealing- extension is done in each PCR

Essential Ingredients of PCR

• *Primers*: The primers are the small pieces of artificially made DNA strands that are actually
the complementary strands of the 3′ end of each strand of target DNA. Primers usually consist of 20–30 nucleotides.

• *DNA polymerase (Taq polymerase)*: Taq polymerase is a type of DNA polymerase enzyme that extends the new DNA strand. It combines at the end of the primer and then sequentially adds new nucleotides to the DNA strand at 3′ end complementary to the target DNA. High temperature (94 °C) is needed to separate the
double-stranded DNA. Ordinary DNA polymerase breaks down in this temperature. However, the Taq polymerase has the unique characteristic to work efficiently in higher temperature. This Taq DNA polymerase is extracted from the bacteria *Thermusaquaticus*. These bacteria live in hot spring and can survive there.

• *Deoxynucleotide triphosphates (dNTPs)*: Deoxynucleotide triphosphates (dNTPs) are dATP, dCTP, dGTP, and dTTP. These are the raw material or the basic building blocks of the new DNA strands. The Taq polymerase captures these dNTPs from the working solution and attach them to the terminal part of the primers to extend the DNA chain.

• *The target DNA from the sample*: The target DNA is extracted from the sample.

• *Buffer solution*: It provides the optimum chemical environment for the reaction to occur.

• *Magnesium chloride (MgCl2)*: Magnesium chloride works as a cofactor of the Taq polymerase enzyme.

Equipment

• Thermal cycler

• PCR tubes and caps

• Ethanol-resistant marker

• Micropipettes set

Thermal Cycling

• Close the cap of the PCR tubes and then put them in the thermal cycler.

Standard Steps

• **Initial denaturation**: At 94 °C for 1 minute

• **Denaturation**: At 94 °C for 30 seconds

• **Annealing**: 50–60 °C for 30 seconds: The temperature may vary depending on the primer used. The temperature of annealing stage should be 3 to 4 °C lower than the melting point (Tm) of the primers.

• **Extension**: 72 °C for 1 minute per kilobase of the PCR product

• **Final extension**: 72 °C for 10 minute

• *Termination*: The reaction is terminated by chilling the mixture to 4 °C.

Cycling Time The PCR thermal cycle rapidlyheats and cools the PCR reagent mixture. Thecycling time depends on (1) size of the DNA templateand (2) G-C content of DNA. The numberof the thermal cycler is usually set as 25–30 cycles.If the thermal cycle is increased more than 35,then too many unwanted DNA products may be produced.

The product is calculated as $M\,Mf = '2N$

Mf = final number of DNA molecule, M = initial number of DNA molecule, N = number of PCR cycle

Purification of the Amplified Product

The following measures are taken to purify the

PCR products from the reaction solution:

• *Agarose gel electrophoresis of the product*:

Agarose gel electrophoresis is done from the portion of the PCR product to verify the validity of the test.

• *Cloning of products*: In this technique further PCR is done to confirm the PCR product. This is done when the gene is present in very tiny amount.

• *Sequencing of products*: This is done by automated sequencer machine to analyse the sequence of DNA formed as PCR product.

Troubleshooting

The various problems in PCR are described here:

1. *No amplification of DNA*: The possible causes may be:

• *Too small amount of DNA template*: If there is very less amount of DNA template, then there may not be adequate amplification. The amount of DNA template should be increased in such condition.

• *Too stringent reaction condition*: If the reaction condition is kept as very strict, then there may not be any amplification of PCR products.

• *Reagent is not added*: One or more reagents may not be added in the reaction mixture. The whole reaction should be done again by carefully adding the reagents.

• *Reagents are not in optimum concentration or expired*: The reagents should be madefresh, and one new reagent is changed at atime to find out which reagent createdproblem.

• *Denaturation temperature is either too high or too low*: In such condition changethe temperature 1°C low or high at a time.

• *Primer annealing temperature is very high*: In such case, lower the temperature 2 °C at a time.

• *Primer dimer formation*: Two primers may self-anneal or anneal with each other. In this case the gel electrophoresis shows a small product of less than 100 base pair.

Addition of DMSO may solve this problem. Alternatively hot start thermal cycling may resolve this issue.

• *Suboptimal number of thermal cycle*: Suboptimal number of thermal cycle may produce less amount of PCR product. In such condition, increase 5–10 more number of thermal cycle.

• *Faulty primer*: The primer may be faulty and therefore PCR may not function at all. In such case, redesign the primer.

2. *Non-specific product*: Non-specific product may be formed in PCR, and in this case multiple bands with variable lengths are seen in gel electrophoresis. This may be due to:

• *Too less stringency in PCR*: Too less stringent condition generates unwanted DNA products in PCR.

• *Too much DNA template*: Too much DNA template may produce undesired product in PCR.

• *Too many thermal cycles*: In such case, reduce the number of thermal cycle 5–10.

• *Magnesium concentration is very high*: Adjust the concentration and make it low.

• *Faulty primer*: Redesign the primer.

• *Carry over contamination*: Change the place of PCR.

Types of PCR

1. *Direct PCR*: This is the standard PCR technique as has been described in the previous section.

2. *Reverse transcriptase PCR (RT-PCR)*: In case of RT-PCR, at first cDNA is prepared from RNA of the target sample. This cDNA is thenamplified by PCR technique.

3. *Asymmetric PCR*: In this technique unequal concentration of primers is used. The great excess of primers is used for the targeted DNA strand that we need to

amplify. As the reaction proceeds, only the adequate amount of primer in the reaction mixture produces the particular DNA strand in excess. Therefore ultimately single-stranded DNA (ssDNA) is formed as PCR product. As the reaction is slow and goes on arithmetically, so many more cycles are needed in this technique. Asymmetric PCR is used for DNA sequencing and hybridization as only one strand is needed in such conditions.

4. *Hot start PCR* : Normally DNA polymerase acts in the room temperature and even in the ice pack. Thereby there always remains the possibility of spurious products. In hot start PCR technique, the DNA polymerase is unreactive at the lower temperature and works only at higher temperature. This is done by conjugating an inhibitor with the polymerase enzyme, and in the higher temperature, the inhibitor is free from the polymerase enzyme and allows it to work.

5. *In situ PCR*: In case of in situ PCR, the reaction takes place within a cell on the glass slide. The PCR product is accumulated within the cell, so it is possible to locate the origin of the amplified DNA. The specially designed PCR machine is used to put the slide within it.

6. *Inverse PCR*: Inverse PCR (IPCR) amplifies anonymous DNA sequence. It helps to identify the flanking DNA sequence of the genome outside the boundary of the known target sequence .

sequence

7. *Single-strand conformation polymorphism (SSCP)*:

The basic principle of SSCP is that the single-stranded DNA has a specific conformation. Any alteration of the single base change due to mutation may lead to different migration pattern of the single-stranded DNA, and therefore in electrophoresis one can distinguishwild-type DNA from mutant DNA.

8. *Real-time PCR*: Real-time PCR is also known as quantitative PCR (qPCR) as it constantly monitors the quantity of the amplified DNA in the reaction process. In case of qPCR, the amplified DNA is fluorescently

labelled, and the emitted fluorescent is directly proportional to the amount of the amplified fluorescent dye. Therefore in each cycle, the amount of the product can be directly monitored, and it is also possible to quantitate the initial amount of the target DNA in the sample.

9. *Nested PCR* : In case of nested PCR, more than two pairs of primers are used for DNA amplification. The first PCR is a conventional PCR, and the primer is used for the DNA template of the sample. In secondary

PCR the product of the first PCR is used as the target of the second set of primers. The DNA sequence of secondary PCR is different, and therefore there is no chance of undesired PCR product formation.

Applications of PCR

The various applications of PCR in clinical area are described below:

(a) *DNA sequencing*: PCR is often used in case of DNA sequencing.

(b) *Diagnosis of infection*: PCR is widely used for the diagnosis of viral, bacterial and parasiticinfection. As mentioned before Q-PCRcan quantitate the viral load in the body .

PCR rapidly detects the tuberculosis within a few hours, whereas the culture of mycobacteria takes few weeks to develop. As a sensitive technique PCR is able to detect tuberculosis in the early latent phase.

(c) *Diagnosis and prognostic information on cancer*: PCR technique is extensively used inthe field of cancer:

• *Mutation detection*: PCR is applied to detect mutation of the oncogenes and tumor suppressor gene such as mutation in p53, c-myc, ras gene, etc..

• *Chromosomal changes*: PCR helps to identify the specific chromosomal changes such as chromosomal translocation, gene rearrangement, loss of heterozygosity, etc.

• *Monoclonality detection*: PCR can detect B and T cell gene rearrangement and thereby can prove the monoclonality in doubtful case of lymphoma.

• *Minimal residual disease*: In case of follow- up of a cancer case, PCR particularly Q-PCR can detect and quantitate certain genetic change to detect any minimal residual disease of a patient .

(d) *Genetic diseases*: PCR technique is very helpful to detect various genetic diseases such as Down's syndrome, cystic fibrosis, Gaucherec disease, etc. The main advantage of PCR technique is that it can bypass the aggressive placental bed biopsy to detect these inherited diseases. The minute amount of foetal cells collected from the mother's blood or cervical mucosa are enough to reach at a diagnosis (e) *Forensic pathology*: PCR technique is helpfulin forensic pathology in different ways:

• To detect paternity of the child

• To identity of the corpse or mutilated body

• To identify the criminal from the crime site and biological materials of the criminal.

(f) *Gene therapy*: PCR helps to engineer the specific gene to introduce in the diseased person to cure various diseases

Annexure- II

VALUE ADDED COURSE

Polymerase Chain Reaction: Principle, Technique and Applications & PA08

List of Students Enrolled: JULY - SEPT 2018

II PAMS Student			
No	**Name of the Student**	**Roll No**	**Signature**
1	**LAZIM AMEEN.P**	PM17 CPT 193	
2	**MOHANA. A**	PM17 CPT 194	
3	**NEVETHA.R**	PM17 CPT 195	
4	**NOYA ANN OOMMEN**	PM17 CPT 196	
5	**PADMAVATHI. T**	PM17 CPT 197	
6	**PRABHUL CHANDRAN.V**	PM17 CPT 198	
7	**RASIGA. M**	PM17 CPT 199	
8	**RESHMI**	PM17 CPT 200	
9	**SRAVAN .S .RAJ**	PM17 CPT 201	
10	**SREERAJ.R**	PM17 CPT 202	
11	**SRI RAMYA.S**	PM17 CPT 203	
12	**SRUTHY SUDHEER**	PM17 CPT 204	
13	**SURIYAMOORTHI. V**	PM17 CPT 205	
14	**VISMAYA. P K**	PM17 CPT 206	
15	**ANAND.M**	PM17 OTAT 207	
16	**DIVYA.P**	PM17 OTAT 208	
17	**FIDA.C.P**	PM17 OTAT 209	
18	**JAYASRI. E**	PM17 OTAT 210	
19	**KAMINI. M**	PM17 OTAT 211	
20	**KESAVEL.V**	PM17 OTAT 212	

RESOURCE PERSON

Dr. SIVAGANESH ALIAS PORKO. G
Reg. No:84387
Assistant. Professor Department. of Pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

COORDINATOR

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

Polymerase Chain Reaction: Principle, Technique and Applications

Short answer questions

Course Code: PA08

I. ANSWER ALL THE QUESTIONS **(5X2=10 marks)**

1. What are the steps in PCR?
2. What are the types in PCR?
3. What is the principle of PCR?
4. List 5 trouble shooting steps in PCR
5. Name some applications of PCR

----------XXXXXXXXXXXXXXXXX----------XXXXXXXXXXXXX----------

POLYMERASE CHAIN REACTION: PRINCIPLE, TECHNIQUE AND APPLICATION.

SREERAJ. R
PM17CP202

8/10

1. What are the steps in PCR?

* PCR is a biochemical process capable of amplifying a single DNA molecule into millions of copies in a short time.

*(1) Denaturation, in which double stranded DNA template are heated to separate the strands. (2) Annealing, in which short DNA molecules called primers bind to flanking regions of the target DNA.

(3) Extension regions of the target DNA, and polymerase extends the 3' end of each primer along the template strand.

2. What are types of PCR?

* Real-time PCR,
* Reverse-Transcriptase (RT-PCR)
* Multiplex PCR
* Nested PCR
* Hot Start PCR
* Long range PCR
* Assembly PCR
* Asymmetric PCR
* In situ PCR.

3. What is the principle of PCR?

* In vitro application, multiple copies of a DNA fragment from an extract,
* Matrix DNA can be genomic DNA as well as complementary DNA obtained by RT-PCR from a messenger RNA extract.

8/10

1, Step of PCR:

(i) Denaturation step. 94°C: DNA is heated to 94°C to make it singh stranded. only 1-2 min are given to this heating process during cycle.

(ii) Annealing 54°C: the temperature is rapidly cooled. in this lowered temperature. the Primer quickly anneals with the respective site of DNA with the help of Taq Polymerase, the reaction starts at the Primer - DNA template site

(iii) Extension. 72°C

2, Type of PCR:

(i) Direct PCR. This is the standard PCR techniques as has been described in the previous section

(ii) Reverse transcriptase PCR (RT-PCR): in case of RT-PCR First cDNA is prepared from RNA of the target sample this DNA is then amplified by PCR technique.

3. Principle of PCR:

Sri Lakshmi Narayana Institute of Medical Sciences

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(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that PADMAVATHI. T has actively participated in the Value Added Course on Polymerase Chain Reaction: Principle, Technique and Applications held during JULY-SEPT2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Sivaganesh @ Porko. G

RESOURCE PERSON

Dr. SIVAGANESH ALIAS PORKO. G
Reg. No:84387
Assistant. Professor Department. of Pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. Pammy Sinha

COORDINATOR

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that ANAND. M has actively participated in the Value Added Course on Polymerase Chain Reaction: Principle, Technique and Applications held during JULY-SEPT2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Sivaganesh @ Porko. G
RESOURCE PERSON

Dr. SIVAGANESH ALIAS PORKO. G
Reg. No. 84787
Assistant Professor Department of Pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. Pammy Sinha
COORDINATOR

PROFESSOR & HEAD, DEPT OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

Annexure - V

Student Feedback Form

Course Name: **POLYMERASE CHAIN REACTION – PRINCIPLE, TECHNIQUE & APPLICATION**

Subject Code: **PA08**

Name of Student: MOHANA. D Roll No.: PM17CPT194

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	(4)	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Mohan

Signature

Date: 22/9/18

Annexure - V

Student Feedback Form

Course Name: **POLYMERASE CHAIN REACTION – PRINCIPLE, TECHNIQUE & APPLICATION**

Subject Code: **PA08**

Name of Student: KESAVEL . V Roll No.: PM17 OTAT 212

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations			✓	✓	
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	(4)	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Good learning experience

Signature

Date: 22-09-18

Date: 22.09.2018

From

Dr.Sivaganesh @ Porko. G
Assistant Professor
Department of pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course:POLYMERASE CHAIN REACTION – PRINCIPLE, TECHNIQUE & APPLICATION

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: "Polymerase Chain Reaction: Principle, Technique and Applicationsfor II year Allied Health Sciences students from JULY-SEPT 2018. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr.Sivaganesh @ Porko. G

DR. SIVAGANESH ALIAS PORKO. G
Reg. No:84387
Assistant Professor Department of Pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Encl: **Certificates**

Photographs



Sri Lakshmi Narayana Institute of Medical Sciences

Date: 02.06.2018

From
DR. John Dinesh
Professor and Head,
Department of Psychiatry,
Sri Lakshmi narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Awareness and Assessment of Suicide and Suicide Prevention

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Awareness and Assessment of Suicide and Suicide Prevention** on 2/07/2018. We solicit your kind permission for the same. Kind Regards

Dr. John Dinesh

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. A.Sugumaran**

The HOD: **Dr. John Dinesh**

The Expert: **Dr. Arun Seetharaman.** The committee has discussed about the course and is approved.

Dean (Sign & Seal)

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Subject Expert (Sign & Seal)

Dr. ARUN SEETHARAMAN, MD.,
Reg. No: 91440
Associate Professor, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

HOD (Sign & Seal)

DR. A.JOHN DINESH
REG. NO. 71691

Professor & HOD, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu Kudapakkam, Puducherry-605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

15.06.2018

Sub: Organising Value-added Course: Awareness and Assessment of Suicide and Suicide Prevention

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Awareness and Assessment of Suicide and Suicide Prevention"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30/06/2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Course Proposal

Course Title: **Suicide prevention and Management**

Course Objective:

Awareness on the importance of suicide prevention
Awareness On The Contributing Factors to suicide prevention Biopsychosocial Model Of Approach
Review of suicide helpline

Course Outcome:

Course Audience: FINAL YEAR STUDENTS of 2018 Batch
Course Coordinator: Dr. John Dinesh
Course Faculties with Qualification and Designation:
1.Dr. John Dinesh, Professor & HOD
2.Dr. Arun, Assistant Professor
Course Curriculum/Topics with schedule (Min of 30 hours)

Sl.No	Date	Topic	Resource persons	Time	Hours
1.	2.07.2018	Introduction	Dr.John Dinesh	4-5p.m	1
2.	3.07.2018	Biopsychosocial approach for suicide	Dr.Arun	2-3p.m	1
3.	4.07.2018	Genetics of suicide	Dr.Vignesh	4-6p.m	2
4.	5.07.2018	Gender preponderance	Dr.Avin	4-6p.m	2
5.	6.07.2018	Co-morbidities in suicide	Dr.John Dinesh	4-6p.m	2
6.	9. 7.2018	**Module 1** – Introduction to suicide and depression	Dr.Arun	4-5p.m	2
7.	11.07.2018	**Module 2** – Prevalence of suicide in India	Dr.Vignesh	4-5P.M	1
8.	13.07.2018	**Module 3** – Aetiology	Dr.Avin	4-5p.m	1
9.	23.07.2018	**Module 4** – Co-morbidities	Dr.John Dinesh	4-5p.m	1
10.	27.07.2018	**Module 5** – Types of suicides	Dr.Arun	4-6p.m	2
11.	1.08.2018	**Module 6** – Assessment of	Dr.Vignesh	4-	1

		suicide		6p.m	
12.	3.08.2018	**Module 7 –** Treatment and rehabilitation	Dr.Avin	4-6p.m	2
13.	6.08.2018	Pre course and Post Course evaluation, Feedback analysis from Likert scale	Dr.John Dinesh	2-5p.m	3
		Practical Class I	Dr.Arun		
13.	8.08.2018	Prevention	Dr.Vignesh	2-3 PM	1
14.	10.08.2018	Emergency in suicide	Dr.Avin	2-3 PM	1
15.	13.08.2018	ECT in suicide	Dr.John Dinesh	2-4 PM	2
16.	15.08.2018	HELPLINE	Dr.Arun	2-4 PM	2
17.	20.08.2018	National strategy for prevention of suicide	Dr.Vignesh	2-4p.m	2
		Total			30 hrs

REFERENCE BOOKS:

1.Comprehensive textbook of PSYCHIATRY by Kaplan and Saddocks.

2. OXFORD TEXTBOOK OF PSYCHIATRY

3.SYNOPSIS OF PSYCHIATRY

VALUE ADDED COURSE

1. Name of the programme & Code

Awareness And Assessment of Suicide and Suicide Prevention

2. Duration & Period

30hrs- July -December 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Awareness And Assessment of Suicide and Suicide Prevention - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 Time July -December 2018

8. Year of discontinuation: 2018

9. Summary report of each program year-wise

Value Added Course- July -December 2018, January - March 2019, April – June 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PSYC07	Awareness And Assessment Of Suicide And Suicide Prevention	Dr. JOHN DINESH Dr. Arun	FINAL YEAR	15 students JULY - DECEMBER 2018

10. Course Feed Back -*Enclosed as Annexure- V*

Dean (Sign & Seal)

Subject Expert (Sign & Seal)

HOD (Sign & Seal)

(Sign & Seal) **RESOURCE PERSON**

Dr. ARUN SEETHARAMAN, MD., Reg. No: 91440

DR. A.JOHN DINESH

COORDINATOR

1. **Dr. John Dinesh**
2. **Dr.Arun**

Dr. John Dinesh

Suicide prevention



PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	SUICIDE PREVENTION
Course Code	MIC01
Objective	1. Introduction 2. Prevalence 3. Aetiology 4. Co-morbidities 5. Types of suicides 6. Suicide 7. National strategy for prevention of suicide 8. Prevention 9. Emergency 10. Treatment and rehabilitation 11. HELPLINE
Further learning opportunities	SUICIDE PREVENTION
Key Competencies	On successful completion of the course the students will have skill in handling suicide prevention
Target Student	3RD year MBBS Students
Duration	30hrs Every July – December 2018
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Multiple choice questions

Suicide is derived from the Latin word for "self-murder." It is a fatal act that represents the person's wish to die. There is a range, however, between thinking about suicide and acting it out. Some plan for days, weeks, or even years before acting, while others take their lives seemingly on impulse without premeditation. Lost in the de□nition are intentional misclassi□cations of the cause of death, accidents of undetermined cause, and so-called chronic suicide (e.g., deaths through alcohol and substance abuse and consciously poor adherence to medical regimens for addiction, obesity, and hypertension).

Table 23.1-1

Terms Comprising Suicidal Ideation and Behavior

In psychiatry, suicide is the primary emergency, with homicide and failure to diagnose an underlying potentially fatal illness representing other, less common psychiatric emergencies. Suicide is to the psychiatrist as cancer is to the internist—the psychiatrist may provide optimal care, yet the patient may die by suicide nonetheless. Thus, suicide is impossible to predict, but numerous clues can be seen. There are also some generally accepted standards of care that facilitate risk reduction, as well as lessen the likelihood of successful litigation, should a patient death occur and a lawsuit be □led. Suicide also needs to be considered in terms of the devastating legacy that it leaves for those who have survived a loved one's suicide, the impact it has on the treating physician, and the rami□cation for the clinicians who cared for the decedents. Perhaps the most important concept regarding suicide is that it is almost always the result of mental illness, usually depression, and is amenable to psychological and pharmacological treatment.

EPIDEMIOLOGY

There are over 35,000 deaths per year (approximately 100 per day) in the United States attributed to suicide. This is in contrast to approximately 20,000 deaths annually from homicide. It is estimated that there is a 25 to 1 ratio between suicide attempts and completed suicides. Although signi□cant shifts were seen in the suicide death rates for certain subpopulations during the past century (e.g., increase

adolescent and decreased elderly rates), the rate remains fairly constant, averaging about 12 per 100,000 through the 20th century and into the first decade of the 21st century. Suicide is currently ranked the tenth overall cause of death in the United States, after heart disease, cancer, chronic lower respiratory diseases, cerebrovascular diseases, accidents, Alzheimer's disease, diabetes, influenza and pneumonia, and kidney disease.

Suicide rates in the United States are the midpoint of the rates for industrialized countries. Internationally, suicide rates range from highs of more than 25 per 100,000 persons in Lithuania, South Korea, Sri Lanka, Russia, Belarus, and Guyana to fewer than 10 per 100,000 in Portugal, the Netherlands, Australia, Spain, South Africa, Italy, Egypt, and others. A state-by-state analysis of suicides in the past decade revealed that New Jersey had the nation's lowest suicide rate for both sexes and Montana had the nation's highest rate. Montana and Wyoming had the highest rates for men, and Alaska and Idaho had the highest rates for women. The prime suicide site in the world is the Golden Gate Bridge in San Francisco, with 1,600 suicides committed there since the bridge opened in 1937.

Risk Factors

Gender Differences. Men commit suicide more than four times as often as women, regardless of age or race, in the United States—despite the fact that women attempt suicide or have suicidal thoughts three times as often as men. Although this disparity remains unclear, it may be related to the methods used. Men are more likely than women to commit suicide using firearms, hanging, or jumping from high places. Women, on the other hand, more commonly take an overdose of psychoactive substances or poison. The use of firearms among women, however, is increasing. In states with gun control laws, the use of firearms has decreased as a method of suicide. Globally, the most common method of suicide is hanging.

Age. For all groups, suicide is rare before puberty. Suicide rates increase with age and underscore the significance of the midlife crisis. Among men, suicides peak after age 45; among women, the greatest number of completed suicides occurs after age 55. Rates of 29 per 100,000 population occur in men age 65 or older. Older persons attempt suicide less often than younger persons, but are more often successful. Although they represent only 13 percent of the total population, older persons account for 16 percent of suicides.

The suicide rate, however, is rising among young persons. Suicide is the third leading cause of death in those aged 15 to 24 years, after accidents and homicides. Attempted suicides in this age group number between 1 million and 2 million annually. Most suicides now are among those aged 35 to 64.

Race. Suicide rates among white men and women are approximately two to three times as high as for African American men and women across the life cycle. Among young persons who live in inner cities and certain Native American and Alaskan Native groups, suicide rates have greatly exceeded the national rate. Suicide rates among immigrants are higher than those in the native-born population.

Religion. Historically, Protestants and Jews in the United States have had higher suicide rates than Catholics. Muslims have much lower rates. The degree of orthodoxy and integration may be a more accurate measure of risk in this category than simple institutional religious affiliation.

Marital Status. Marriage lessens the risk of suicide significantly, especially if there are children in the home. Single, never-married persons register an overall rate nearly double that of married persons. Divorce increases suicide risk, with divorced men three times more likely to kill themselves as divorced women. Widows and widowers also have high rates. Suicide occurs more frequently than usual in persons who are socially isolated and have a family history of suicide (attempted or real). Persons who commit so-called anniversary suicides take their lives on the day a member of their family did. Homosexual men and women appear to have higher rates of suicide than heterosexuals.

Occupation. The higher the person's social status, the greater the risk of suicide, but a drop in social status also increases the risk.

Work, in general, protects against suicide. Among occupational rankings, professionals, particularly physicians, have traditionally been considered to be at greatest risk. Other high-risk occupations include law enforcement, dentists, artists, mechanics, lawyers, and insurance agents. Suicide is higher among the unemployed than among employed persons. The suicide rates increase during economic recessions and depressions and decrease during times of high employment and during wars.

PHYSICIAN SUICIDES. The weight of current evidence supports the conclusion that both male and female physicians in the United States have elevated rates of suicide. It is estimated that approximately 400 physicians commit suicide each year in the United States. United Kingdom

and Scandinavian data show that the suicide rate for male physicians is two to three times that found in the general male population of the same age. Female physicians have a higher risk of suicide than other women. In the United States, the annual suicide rate for female physicians is about 41 per 100,000, compared with 12 per 100,000 among all white women over 25 years of age. Studies show that physicians who commit suicide have a mental disorder, most often depressive disorder, substance dependence, or both. Both male and female physicians commit suicide significantly more often by substance overdoses and less often by firearms than persons in the general population; drug availability and knowledge about toxicity are important factors in physician suicides. Among physicians, psychiatrists are considered to be at greatest risk, followed by ophthalmologists and anesthesiologists, but all specialties are vulnerable.

Climate. No significant seasonal correlation with suicide has been found. Suicides increase slightly in spring and fall but, contrary to popular belief, not during December and holiday periods.

Physical Health. The relation of physical health and illness to suicide is significant. Previous medical care appears to be a positively correlated risk indicator of suicide: About one third of all persons who commit suicide have had medical attention within 6 months of death, and a physical illness is estimated to be an important contributing factor in about half of all suicides.

Factors associated with illness that contribute to both suicides and suicide attempts are loss of mobility, especially when physical activity is important to occupation or recreation; dis□gurement, particularly among women; and chronic, intractable pain. Patients on hemodialysis are at high risk. In addition to the direct e□ects of illness, the secondary e□ects—for example, disruption of relationships and loss of occupational status—are prognostic factors.

Certain drugs can produce depression, which may lead to suicide in some cases. Among these drugs are reserpine (Serpasil), corticosteroids, antihypertensives, and some anticancer agents. Alcohol-related illnesses, such as cirrhosis, are associated with higher suicide rates.

Mental Illness. Almost 95 percent of all persons who commit or attempt suicide have a diagnosed mental disorder. Depressive disorders account for 80 percent of this figure, schizophrenia accounts for 10 percent, and dementia or delirium for 5 percent. Among all

persons with mental disorders, 25 percent are also alcohol dependent and have dual diagnoses. Persons with delusional depression are at highest risk of suicide. A history of impulsive behavior or violent acts increases the risk of suicide as does previous psychiatric hospitalization for any reason. Among adults who commit suicide, significant differences between young and old exist for both psychiatric diagnoses and antecedent stressors. Diagnoses of substance abuse and antisocial personality disorder occurred most often among suicides in persons less than 30 years of age and diagnoses of mood disorders and cognitive disorders most often among suicides in those age 30 and above. Stressors associated with suicide in those under 30 were separation, rejection, unemployment, and legal troubles; illness stressors most often occurred among suicide victims over age 30.

Psychiatric Patients. Psychiatric patients' risk for suicide is 3 to 12 times that of nonpatients. The degree of risk varies, depending on age, sex, diagnosis, and inpatient or outpatient status. Male and female psychiatric patients who have at some time been inpatients have five and ten times higher suicide risks, respectively, than their counterparts in the general population. For male and female outpatients who have never been admitted to a hospital for psychiatric treatment, the suicide risks are three and four times greater, respectively, than those of their counterparts in the general population. The higher suicide risk for psychiatric patients who have been inpatients reflects that patients with severe mental disorders tend to be hospitalized—for example, patients with depressive disorder who require electroconvulsive therapy (ECT). The psychiatric diagnosis with greatest risk of suicide in both sexes is a mood disorder.

Those in the general population who commit suicide tend to be middle aged or older, but studies increasingly report that psychiatric patients who commit suicide tend to be relatively young. In one study, the mean age of male suicides was 29.5 years and that of women 38.4 years. The relative youthfulness in these suicide cases was partly attributed to two early-onset, chronic mental disorders—schizophrenia and recurrent major depressive disorder—which account for just over half of these suicides, and so re□ects an age and diagnostic pattern found in most studies of psychiatric patient suicides.

A small, but signi□cant, percentage of psychiatric patients who commit suicide do so while they are inpatients. Most of these do not kill themselves in the psychiatric ward itself,

but on the hospital grounds, while on a pass or weekend leave, or when absent without leave. For both sexes, the suicide risk is highest in the first week of the psychiatric admission;
after 3 to 5 weeks, inpatients have the same risk as the general population. Times of sta rotation, particularly of the psychiatric residents, are periods associated with inpatient
suicides. Epidemics of inpatient suicides tend to be associated with periods of ideological change on the ward, staff disorganization, and staff demoralization.
The period after discharge from the hospital is also a time of increased suicide risk. A follow-up study of 5,000 patients discharged from an Iowa psychiatric hospital showed that
in the rst 3 months after discharge, the rate of suicide for female patients was 275 times that of all Iowa women; the rate of suicide for male patients was 70 times that of all Iowa
men. Studies show that one third or more of depressed patients who commit suicide do so within 6 months of leaving a hospital; presumably they have relapsed.
The main risk groups are patients with depressive disorders, schizophrenia, and substance abuse and patients who make repeated visits to the emergency room. Patients, especially
those with panic disorder, who frequent emergency services, also have an increased suicide risk. Thus, mental health professionals working in emergency services must be well
trained in assessing suicidal risk and making appropriate dispositions. They must also be aware of the need to contact patients at risk who fail to keep follow-up appointments.

DEPRESSIVE DISORDERS. Mood disorders are the ones most closely linked to suicide. Approximately 60 to 70 percent of suicide victims
suffered a significant depression at the time of their deaths. The lifetime risk of death by suicide among individuals with bipolar disorder is
approximately 15 to 20 percent, and suicide is more likely during depressed states rather than manic states.
More patients with depressive disorders commit suicide early in the illness rather than later; more depressed men than women commit suicide; and the chance of depressed
persons' killing themselves increases if they are single, separated, divorced, widowed, or recently bereaved. Patients with depressive disorder in the community who commit suicide
tend to be middle aged or older.

Social isolation enhances suicidal tendencies among depressed patients. This □nding is in accord with the data from epidemiological studies showing that persons who commit
suicide may be poorly integrated into society. Suicide among depressed patients is likely at the onset or the end of a depressive episode. As with other psychiatric patients, the
months after discharge from a hospital are a time of high risk.
Regarding outpatient treatment, most depressed suicidal patients had a history of therapy; however, less than half were receiving psychiatric treatment at the time of suicide. Of
those who were in treatment, studies have shown that treatment was less than adequate. For example, most patients who received antidepressants were prescribed subtherapeutic
doses of the medication.
SCHIZOPHRENIA. The suicide risk is high among patients with schizophrenia: Up to 10 percent die by committing suicide. In the United
States, an estimated 4,000 patients with schizophrenia commit suicide each year. The onset of schizophrenia is typically in adolescence or
early adulthood, and most of these patients who commit suicide do so during the first few years of their illness; therefore, those patients
with schizophrenia who commit suicide are young.
Thus, the risk factors for suicide among patients with schizophrenia are young age, male gender, single marital status, a previous suicide attempt, a vulnerability to depressive
symptoms, and a recent discharge from a hospital. Having three or four hospitalizations during their 20s probably undermines the social, occupational, and sexual adjustment of
possibly suicidal patients with schizophrenia. Consequently, potential suicide victims are likely to be male, unmarried, unemployed, socially isolated, and living alone—perhaps in a
single room. After discharge from their last hospitalization, they may experience a new adversity or return to ongoing di□culties. As a result, they become dejected, experience
feelings of helplessness and hopelessness, reach a depressed state, and have, and eventually act on, suicidal ideas. Only a small percentage committed suicide because of hallucinated
instructions or a need to escape persecutory delusions. Up to 50 percent of suicides among patients with schizophrenia occur during the □rst few weeks and months after discharge
from a hospital; only a minority commit suicide while inpatients.

ALCOHOL DEPENDENCE. Up to 15 percent of all alcohol-dependent persons commit suicide. The suicide rate for those who are alcoholic is estimated to be about 270 per 100,000 annually; in the United States, between 7,000 and 13,000 alcohol-dependent persons commit suicide each year.

About 80 percent of all alcohol-dependent suicide victims are male, a percentage that largely reflects the sex ratio for alcohol dependence. Alcohol-dependent suicide victims tend to be white, middle aged, unmarried, friendless, socially isolated, and currently drinking. Up to 40 percent have made a previous suicide attempt. Up to 40 percent of all suicides by persons who are alcohol dependent occur within a year of the patient's last hospitalization; older alcohol-dependent patients are at particular risk during the postdischarge period.

Studies show that many alcohol-dependent patients who eventually commit suicide are rated depressed during hospitalization and up to two thirds are assessed as having mood disorder symptoms during the period in which they commit suicide. As many as 50 percent of all alcohol-dependent suicide victims have experienced the loss of a close, affectionate relationship during the previous year. Such interpersonal losses and other types of undesirable life events are probably brought about by the alcohol dependence and contribute to the development of the mood disorder symptoms, which are often present in the weeks and months before the suicide.

The largest group of male alcohol-dependent patients is composed of those with an associated antisocial personality disorder. Studies show that such patients are particularly likely to attempt suicide; to abuse other substances; to exhibit impulsive, aggressive, and criminal behaviors; and to be found among alcohol-dependent suicide victims.

OTHER SUBSTANCE DEPENDENCE. Studies in various countries have found an increased suicide risk among those who abuse substances. The suicide rate for persons who are heroin dependent is about 20 times the rate for the general population. Adolescent girls who use intravenous substances also have a high suicide rate. The availability of a lethal amount of substances, intravenous use, associated antisocial personality disorder, a chaotic lifestyle, and impulsivity are some of the factors that predispose substance-dependent persons to suicidal behavior, particularly when they are dysphoric, depressed, or intoxicated.

PERSONALITY DISORDERS. A high proportion of those who commit suicide have various associated personality difficulties or disorders. Having a personality disorder may be a determinant of suicidal behavior in several ways: by predisposing to major mental disorders such as depressive disorders or alcohol dependence; by leading to difficulties in relationships and social adjustment; by precipitating undesirable life events; by impairing the ability to cope with a mental or physical disorder; and by drawing persons into conflicts with those around them, including family members, physicians, and hospital staff members.

An estimated 5 percent of patients with antisocial personality disorder commit suicide. Suicide is three times more common among prisoners than among the general population.

More than one third of prisoner suicides have had past psychiatric treatment, and half have made a previous suicide threat or attempt, often in the previous 6 months.

ANXIETY DISORDER. Uncompleted suicide attempts are made by almost 20 percent of patients with a panic disorder and social phobia. If depression is an associated feature, however, the risk of completed suicide rises.

Previous Suicidal Behavior. A past suicide attempt is perhaps the best indicator that a patient is at increased risk of suicide. Studies show that about 40 percent of depressed patients who commit suicide have made a previous attempt. The risk of a second suicide attempt is highest within 3 months of the first attempt. The relation between a mood disorder, completed suicide, and attempts at suicide is shown in

Depression is associated with both completed suicide and serious attempts at suicide. The clinical feature most often associated with the seriousness of the intent to die is a diagnosis of a depressive disorder. This is shown by studies that relate the clinical characteristics of suicidal patients with various measures of the medical seriousness of the attempt or of the intent to die. Also, intent-to-die scores correlate signi□cantly with both suicide risk scores and the number and severity of depressive symptoms. Patients having high suicide intent are more often male, older, single or separated, and living alone than those with low intent. In other words, depressed patients who seriously attempt suicide more closely resemble suicide victims than they do suicide attempters.

ETIOLOGY

Sociological Factors

Durkheim's Theory. The first major contribution to the study of the social and cultural influences on suicide was made at the end of the 19th century by the French sociologist Emile Durkheim. In an attempt to explain statistical patterns, Durkheim divided suicides into three social categories: egoistic, altruistic, and anomic. Egoistic suicide applies to those who are not strongly integrated into any social group. The lack of family integration explains why unmarried persons are more vulnerable to suicide than married ones and why couples with children are the best protected group. Rural communities have more social integration than urban areas and, thus, fewer suicides. Protestantism is a less cohesive religion than Roman Catholicism, and so Protestants have a higher suicide rate than Catholics.

Altruistic suicide applies to those susceptible to suicide stemming from their excessive integration into a group, with suicide being the outgrowth of the integration—for example, a Japanese soldier who sacri□ces his life in battle. Anomic suicide applies to persons whose integration into society is disturbed so that they cannot follow customary norms of behavior. Anomie explains why a drastic change in economic situation makes persons more vulnerable than they were before their change in fortune. In Durkheim's theory, anomie also refers to social instability and a general breakdown of society's standards and values.

Psychological Factors

Freud's Theory. Sigmund Freud offered the first important psychological insight into suicide. He described only one patient who made a suicide attempt, but he saw many depressed patients. In his paper "Mourning and Melancholia," Freud stated his belief that suicide represents aggression turned inward against an introjected, ambivalently cathected love object. Freud doubted that there would be a suicide without an earlier repressed desire to kill someone else.

Menninger's Theory. Building on Freud's ideas, Karl Menninger, in *Man against Himself,* conceived of suicide as inverted homicide because of a patient's anger toward another person. This retroflexed murder is either turned inward or used as an excuse for punishment. He also described a self-directed death instinct (Freud's concept of Thanatos) plus three components of hostility in suicide: the wish to kill, the wish to be killed, and the wish to die.

Recent Theories. Contemporary suicidologists are not persuaded that a specific psychodynamic or personality structure is associated with suicide. They believe that much can be learned about the psychodynamics of suicidal patients from their fantasies about what would

happen and what the consequences would be if they commit suicide. Such fantasies often include wishes for revenge, power, control, or punishment; atonement, sacrifice, or restitution; escape or sleep; rescue, rebirth, reunion with the dead; or a new life. The suicidal patients most likely to act out suicidal fantasies may have lost a love object or received a narcissistic injury, may experience overwhelming affects like rage and guilt, or may identify with a suicide victim. Group dynamics underlie mass suicides such as those at Masada, at Jonestown, and by the Heaven's Gate cult.

Depressed persons may attempt suicide just as they appear to be recovering from their depression. A suicide attempt can cause a longstanding depression to disappear, especially if it ful□lls a patient's need for punishment. Of equal relevance, many suicidal patients use a preoccupation with suicide as a way of □ghting o□ intolerable depression and a sense of hopelessness. A study by Aaron Beck showed that hopelessness was one of the most accurate indicators of long-term suicidal risk.

Biological Factors. Diminished central serotonin plays a role in suicidal behavior. A group at the Karolinska Institute in Sweden first noted that low concentrations of the serotonin metabolite 5-hydroxyindoleacetic acid (5-HIAA) in the lumbar cerebrospinal fluid (CSF) were associated with suicidal behavior. This finding has been replicated many times and in different diagnostic groups. Postmortem neurochemical studies have reported modest decreases in serotonin itself or 5-HIAA in either the brainstem or the frontal cortex of suicide victims. Postmortem receptor studies have reported significant changes in presynaptic and postsynaptic serotonin binding sites in suicide victims. Together, these CSF, neurochemical, and receptor studies support the hypothesis that reduced central serotonin is associated with suicide. Recent studies also report some changes in the noradrenergic system of suicide victims.

Low concentrations of 5-HIAA in CSF also predict future suicidal behavior. For example, the Karolinska group examined completed suicide in a sample of 92 depressed patients who had attempted suicide. They found that 8 of the 11 patients who committed suicide within 1 year belonged to the subgroup with below-median concentrations of 5-HIAA in CSF. The suicide risk in that subgroup was 17 percent, compared with 7 percent among those with above-median concentrations of 5-HIAA in CSF (Fig. 23.1-2). Also, the cumulative

number of patient-months survived during the first year after attempted suicide was significantly lower in the subgroup with low 5-HIAA concentrations. The Karolinska group
concluded that low 5-HIAA concentrations in CSF predict short-range suicide risk in the high-risk group of depressed patients who have attempted suicide. Low 5-HIAA
concentrations in CSF have also been demonstrated in adolescents who kill themselves.

Cumulative suicide risk during first year after attempted suicide in patients with low versus high cerebrospinal fluid (CSF) concentrations of 5-hydroxyindoleacetic acid (5-HIAA). Filled circles indicate CSF 5-HIAA concentrations below the sample median and filled squares indicate concentrations above the sample median (87 nM). (From Nördstrom P, Samuelsson M, Asberg M, Träskman-Bendz L, Aberg-Wistedt A, Nordin C, Bertilsson L. CSF concentrations 5-HIAA predicts suicide risk after attempted suicide. *Suicide Life Threat Behav.* 1994;24:1, with permission.)

Genetic Factors. Suicidal behavior, as with other psychiatric disorders, tends to run in families. In psychiatric patients, a family history
of suicide increases the risk of attempted suicide and that of completed suicide in most diagnostic groups. In medicine, the strongest
evidence for involvement of genetic factors comes from twin and adoption studies and from molecular genetics. Such studies in suicide are
reviewed below.

Twin Studies. A landmark study in 1991 investigated 176 twin pairs in which one twin had committed suicide. In nine of these twin
pairs, both twins had committed suicide. Seven of these nine pairs concordant for suicide were found among the 62 monozygotic pairs,
whereas two pairs concordant for suicide were found among the 114 dizygotic twin pairs. This twin group difference for concordance for
suicide (11.3 vs. 1.8 percent) is statistically significant ($P < .01$).
Another study collected a group of 35 twin pairs in which one twin had committed suicide and the living co-twin was interviewed. Ten of
the 26 living monozygotic cotwins had themselves attempted suicide, compared with 0 of the 9 living dizygotic cotwins ($P < .04$). Although
monozygotic and dizygotic twins may have some differing developmental experiences, these results show that monozygotic twin pairs have
significantly higher concordance for both suicide and attempted suicide, which suggests that genetic factors may play a role in suicidal

behavior.

Danish-American Adoption Studies. The strongest evidence suggesting the presence of genetic factors in suicide comes from adoption studies carried out in Denmark. A screening of the registers of causes of death revealed that 57 of 5,483 adoptees in Copenhagen eventually committed suicide. They were matched with adopted controls. Searches of the causes of death revealed that 12 of the 269 biological relatives of these 57 adopted suicide victims had themselves committed suicide, compared with only 2 of the 269 biological relatives of the 57 adopted controls. This is a highly significant difference for suicide between the two groups of relatives. None of the adopting relatives of either the suicide or control group had committed suicide. In a further study of 71 adoptees with mood disorder, adoptee suicide victims with a situational crisis or impulsive suicide attempt or both (particularly) had more biological relatives who had committed suicide than controls had. This led to the suggestion that a genetic factor lowering the threshold for suicidal behavior may lead to an inability to control impulsive behavior. Psychiatric disorders or environmental stress may serve "as potentiating mechanisms which foster or trigger the impulsive behavior, directing it toward a suicidal outcome."

Molecular Genetic Studies. Tryptophan hydroxylase (TPH) is an enzyme involved in the biosynthesis of serotonin. A polymorphism in the human *TPH* gene has been identified, with two alleles—U and L. Because low concentrations of 5-HIAA in CSF are associated with suicidal behavior, it was hypothesized that such individuals may have alterations in genes controlling serotonin synthesis and metabolism. It was found that impulsive alcoholics, who had low CSF 5-HIAA concentrations, had more LL and UL genotypes. Furthermore, a history of suicide attempts was significantly associated with TPH genotype in all the violent alcoholics; 34 of the 36 violent subjects who attempted suicide had either the UL or LL genotype. Thus, it was concluded that the presence of the L allele was associated with an increased risk of suicide attempts.

Also, a history of multiple suicide attempts was found most often in subjects with the LL genotype and to a lesser extent among those with the UL genotype (Fig. 23.1-3). This led to the suggestion that the L allele was associated with repetitive suicidal behavior. The presence of one TPH*L allele may indicate a reduced capacity to hydroxylate tryptophan to 5-hydroxytryptophan in the synthesis of

serotonin, producing low central serotonin turnover and, thus, a low concentration of 5-HIAA in CSF.

PREDICTION

Clinicians must assess an individual patient's risk for suicide on the basis of a clinical examination. The predictive items associated with suicide risk are listed in Table 23.1-2. Suicide is grouped into high-risk–related and low-risk–related factors (Table 23.1-3). High-risk characteristics include more than 45 years of age, male gender, alcohol dependence (the suicide rate is 50 times higher in alcohol-dependent persons than in those who are not alcohol dependent), violent behavior, previous suicidal behavior, and previous psychiatric hospitalization.

Evaluation of Suicide Risk

It is important that questions about suicidal feelings and behaviors be asked, often directly. Asking depressed patients whether or not they have had thoughts of wanting to kill themselves does not plant the seed of suicide. To the contrary, it may be the □rst opportunity a patient has had to talk about suicidal ideation that may have been present for some time.

Questions about Suicidal Feelings and Behaviors

Treatment

Most suicides among psychiatric patients are preventable, because evidence indicates that inadequate assessment or treatment is often associated with suicide. Some patients experience su□ering so great and intense, or so chronic and unresponsive to treatment, that their eventual suicides may be perceived as inevitable. Such patients are relatively uncommon, however (see discussion of inevitable suicide below). Other patients have severe personality disorders, are highly impulsive, and commit suicide spontaneously, often when dysphoric, intoxicated, or both.

The evaluation for suicide potential involves a complete psychiatric history; a thorough examination of the patient's mental state; and an inquiry about depressive symptoms, suicidal thoughts, intents, plans, and attempts. A lack of future plans, giving away personal property, making a will, and having recently experienced a loss all imply increased risk of suicide. The decision to hospitalize a patient depends on diagnosis, depression severity and suicidal ideation, the patient's and the family's coping abilities, the patient's living situation, availability

of social support, and the absence or presence of risk factors for suicide.

Inpatient versus Outpatient Treatment

Whether to hospitalize patients with suicidal ideation is the most important clinical decision to be made. Not all such patients require hospitalization; some can be treated on an outpatient basis. But the absence of a strong social support system, a history of impulsive behavior, and a suicidal plan of action are indications for hospitalization. To decide whether outpatient treatment is feasible, clinicians should use a straightforward clinical approach: Ask patients who are considered suicidal to agree to call when they become uncertain about their ability to control their suicidal impulses. Patients who can make such an agreement with a doctor with whom they have a relationship reaffirm the belief that they have sufficient strength to control such impulses and to seek help.

In return for a patient's commitment, clinicians should be available to the patient 24 hours a day. If a patient who is considered seriously suicidal cannot make the commitment, immediate emergency hospitalization is indicated; both the patient and the patient's family should be so advised. If, however, the patient is to be treated on an outpatient basis, the therapist should note the patient's home and work telephone numbers for emergency reference; occasionally, a patient hangs up unexpectedly during a late night call or gives only a name to the answering service. If the patient refuses hospitalization, the family must take the responsibility to be with the patient 24 hours a day.

According to Edwin S. Shneidman, a clinician has several practical preventive measures for dealing with a suicidal person: reducing the psychological pain by modifying the patient's stressful environment, enlisting the aid of the spouse, the employer, or a friend; building realistic support by recognizing that the patient may have a legitimate complaint; and offering alternatives to suicide.

Many psychiatrists believe that any patient who has attempted suicide, despite its lethality, should be hospitalized. Although most of these patients voluntarily enter a hospital, the danger to self is one of the few clear-cut indications currently acceptable in all states for involuntary hospitalization. In a hospital, patients can receive antidepressant or antipsychotic medications as indicated; individual therapy, group therapy, and family therapy are available, and patients receive the hospital's social support and sense of security. Other therapeutic measures depend on patients' underlying diagnoses. For example, if alcohol dependence is an associated problem, treatment must be

directed toward alleviating that condition.
Although patients classi□ed as acutely suicidal may have favorable prognoses, chronically suicidal patients are di□cult to treat, and they exhaust the caretakers. Constant observation by special nurses, seclusion, and restraints cannot prevent suicide when a patient is resolute.
ECT may be necessary for some severely depressed patients, who may require several treatment courses.
Useful measures for the treatment of depressed suicidal inpatients include searching patients and their belongings on arrival in the ward for objects that could be used for suicide and repeating the search at times of exacerbation of the suicidal ideation. Ideally, suicidally depressed inpatients should be treated on a locked ward where the windows are shatterproof, and the patient's room should be located near the nursing station to maximize observation by the nursing sta□. The treatment team must assess how much to restrict the patient and whether to make regular checks or use continuous direct observation.
Vigorous treatment with antidepressant or antipsychotic medication should be initiated, depending on the underlying disorder. Some medications (e.g., risperidone [Risperdal]) have both antipsychotic and antidepressant e□ects and are useful when the patient has signs and symptoms of both psychosis and depression.
Supportive psychotherapy by a psychiatrist shows concern and may alleviate some of a patient's intense su□ering. Some patients may be able to accept the idea that they are su□ering from a recognized illness and that they will probably make a complete recovery. Patients should be dissuaded from making major life decisions while they are suicidally depressed, because such decisions are often morbidly determined and may be irrevocable. The consequences of such bad decisions can cause further anguish and misery when the patient has recovered.
Patients recovering from a suicidal depression are at particular risk. As the depression lifts, patients become energized and, thus, are able to put their suicidal plans into action (paradoxical suicide). A further complication is the activating e□ect of serotonergic drugs, such as fluoxetine (Prozac), which are effective antidepressants, especially with suicidally depressed patients. Such agents may improve psychomotor withdrawal, thus permitting the patient to act on preexisting suicidal impulses because they have more energy. Sometimes, depressed patients, with or without treatment, suddenly appear to be at peace with themselves because they have reached a secret decision to commit

suicide. Clinicians should be especially suspicious of such a dramatic clinical change, which may portend a suicide attempt. Although rare, some patients lie to the psychiatrist about their suicidal intent, thus subverting the most careful clinical assessment.

A patient may commit suicide even when in the hospital. According to one survey, about 1 percent of all suicides were committed by patients who were being treated in general medical-surgical or psychiatric hospitals, but the annual suicide rate in psychiatric hospitals is only 0.003 percent.

Legal and Ethical Factors

Liability issues stemming from suicides in psychiatric hospitals frequently involve questions about a patient's rate of deterioration, the presence during hospitalization of clinical signs indicating risk, and psychiatrists' and sta members' awareness of, and response to, these clinical signs.

In about half of the cases in which suicides occur while patients are on a psychiatric unit, a lawsuit results. Courts expect suicides to occur; do not require zero suicide rates, but do require periodic patient evaluation for suicidal risk, formulation of a treatment plan with a high level of security, and having staff members follow the treatment plan.

Currently, suicide and attempted suicide are variously viewed as a felony and a misdemeanor, respectively; in some states, the acts are not considered crimes but unlawful under common law and statutes. Aiding and abetting a suicide adds another dimension to the legal morass; some court decisions have held that although neither suicide nor attempted suicide is punishable, anyone who assists in the act may be punished.

National Strategy for Suicide Prevention

In 2001, Surgeon General David Satcher organized the National Strategy for Suicide Prevention, under the auspices of the National Institutes of Health (NIH). The National Strategy for Suicide Prevention has set specific goals and objectives to reduce suicide

Table 23.1-6

Goals to Reduce Suicide

The National Strategy for Suicide Prevention creates a framework for suicide prevention for the nation. It is designed to encourage and empower groups and individuals to work together. The stronger and broader the support and collaboration on suicide prevention, the

greater the chance of success for this public health initiative. Suicide and suicidal behaviors can be reduced as the general public gains more understanding about (1) the extent to which suicide is a problem, (2) the ways in which it can be prevented, and (3) the roles individuals and groups can play in prevention efforts.

SUICIDES INVOLVING OTHER DEATHS

Victim-Precipitated Homicide

The phenomenon of using others, usually police, to kill oneself is well known to law enforcement personnel. Described by Marvin Wolfgang, the classic situation is exemplified by a person holding up a gas station or all-night store and brandishing a gun, which he threatens to use on the police when they arrive. They then shoot him, thinking that it is in self-defense. The psychology of such victims is not clear, except that they apparently believe this is the only way they can die.

A 25-year-old white divorced father of twin 3-year-old boys had been threatening to his wife, and, consequently, she had an order of restraint placed on him. Nonetheless, one evening, he went to her home, carrying a realistic-looking toy pistol in his pocket "to give her a scare." She refused to admit him, and, when he began to create a scene, she called the police. When three police officers arrived, he refused to leave, pointed the toy pistol at them and taunted them to shoot him. They drew their revolvers, ordered him to drop his "weapon" (which he did), and restrained him. They took him to a local emergency department, where the nurse's admission note read: "divorced and angry man threatened others with a toy pistol." The on-call psychiatrist saw him briefly; the patient denied suicidal or homicidal intent; and the psychiatrist concluded that it was safe to discharge him (as a "situational problem–marital issues"). The following day, he killed himself by using carbon monoxide. Although this was not a case of "completed" victim-precipitated homicide, hospital staff failed to perceive that this represented "attempted" victim-precipitated homicide and was an act of high risk. Noting that he "threatened others with a toy pistol" trivialized the gravity of pointing what appears to be a genuine gun at armed police and telling them to shoot. In effect, he had given up control over this life-threatening situation to the police, and only their self-restraint protected him from being killed that evening.

Murder-Suicides

Murder-suicides receive a disproportionate amount of attention because they are dramatic and tragic. Unless it is a pact between two truly

consenting adults, such events testify to the enormous amount of aggression inherent in many suicides—in addition to the depression.
Furthermore, what appears to be a pact is often, in fact, more of a coercion (or □at-out murder) than a true pact among equals. Pacts tend to be made more often by females or elderly couples.
Terrorist Suicides. Terrorist-bomber suicides represent a special category of murder-suicides, one in which there is no question of willingness of the victim's part and in which the victims are unknown to the perpetrators except in some generic, group sense (e.g., Jews, Westerners). Some suicide experts do not classify these as "true" suicides because they differ in so many domains from typical suicides

Differences between Terrorist-Bomber Suicides and Typical Suicides
Although many terrorists are recruited from poorer and less-educated classes, it is surprising that a very large proportion of terrorist bombers are instead from middle-class, welleducated, and possibly less-fundamentalist populations. Because suicide means to take one's life, it is hard to exclude these terrorist deaths from such a classification.
INEVITABLE SUICIDE
Not all suicides are preventable; some may be inevitable. In fact, over one third of all completed suicides occur in persons who are receiving treatment for a psychiatric disorder, most commonly depression, bipolar disorder, or schizophrenia. It is not unreasonable to assume that some of those patients received the best care available, but that their suicides could not be prevented.
Some clinicians believe that viewing certain suicides as being inevitable may lead to therapeutic nihilism, others feel it may cause both clinicians and patients to lose hope. But inevitable suicide can only be determined a posteriori, after all known facts of a particular suicide have been analyzed and synthesized. And if it cannot be predicted there is no reason for therapeutic nihilism or for treatment e□orts to be in□uenced negatively; indeed viewing some suicides as possibly inevitable may encourage clinicians to increase their therapeutic zeal to prevent or postpone the inevitable from happening.
Certain criteria must be met for a particular suicide to be considered inevitable. Most important is a strong genetic history of suicide in one or more family members as well as heavy genetic loading for mental illness. Although a strong genetic diathesis for suicide is associated with completed suicide, it is not, in and of itself, su□cient. Other risk factors must also be present, numerous, and at the extreme end of

profound pathology. Among the many risk factors (as described above) are a history of physical, emotional, or sexual abuse, especially during childhood; divorce; unemployment; male gender; recent discharge from a psychiatric hospital; prior suicide attempts; alcoholism or other substance abuse; a history of panic attacks; and the presence of a medical illness. Persistent suicidal thoughts, especially coupled with a plan, are particularly dangerous. As mentioned above, inevitability presumes that these risk factors are numerous, severe, and present in severe degrees.

Finally, to consider suicide inevitable the patient must have received the highest standard of treatment and that treatment must have failed. Inevitability assumes, among many other factors, that everything that could have been done was done—and done correctly—yet the patient died.

The case of Ernest Hemingway may be an example of inevitable suicide. Including Ernest, □ve people committed suicide in the Hemingway family. His father, brother, sister, and granddaughter all killed themselves. In addition, one of his sons su□ered from major depression and underwent several courses of ECT during his lifetime.

Toward the end of his life, Hemingway had several hospitalizations for depression accompanied by suicide attempts. His last hospitalization was in 1961 at the Mayo Clinic, where he had been admitted in a severely depressed state after yet another suicide attempt. He was delusional (thinking that people were following him with deadly intent), had cognitive di□culties that prevented him from writing creatively, was physically ill with cardiovascular disease, and had been drinking heavily. He was hospitalized for 7 weeks, during which time he was treated with antidepressants, ECT, and psychotherapy. On June 26, 1961, he was discharged from the hospital.

As Hemingway was leaving the hospital, in a last conversation, he was purported to have said, "You and I both know what I am going to do to myself one day."

On July 2, 1961, at 7:30 in the morning, 6 days after discharge, Hemingway put a shotgun to his head and pulled the trigger.

Hemingway had all of the biopsychosocial determinants of an inevitable suicide. There was heavy genetic loading for suicide, severe psychiatric disorder characterized by persecutory delusions, substance abuse, and other risk factors such as profound suicidal ideation and prior suicide attempts. In addition, Hemingway was the victim of severe childhood trauma, which increased his vulnerability to suicide.

As yet, there are insu□cient data to predict the inevitability of a particular suicide. The paradigm of inevitability, however, may serve as a stimulus to increase root cause analysis into this phenomenon. The history of medicine is replete with disorders that inexorably led to death but which are now curable and suicide may one day join those ranks.

SURVIVING SUICIDE

To be a *suicide survivor* refers to those who have lost a loved one to suicide, not to someone who has attempted suicide but lived. The toll on suicide survivors appears greater than that by other deaths, mainly because the opportunities for guilt are so great. Survivors feel that the loved one intentionally and willfully took his or her life and that if only the survivor had done something di□erently, the decedent would still be here. Because the decedent cannot tell them otherwise, survivors are at the mercy of their often merciless consciences.

What is generally more accurate is that the decedents were not entirely willful but were themselves victims of their own genetic or lifetime experience predispositions to depression and suicide. For children, in particular, the loss of a parent to suicide feels like a shameful abandonment for which the child may blame himself or herself. For parents of children who have killed themselves, their grief is compounded not only by having lost a part of themselves, but also by having failed in what they perceive as their responsibility for the total feelings of their child. To provide mutual support, survivors of suicide groups have appeared throughout the United States, generally led by nonprofessional survivors themselves. Therapists who have lost patients to suicide comprise another survivor group—one too often ignored and unsupported, despite their own considerable su□ering and sense of guilt and compounded by the specter of litigation potentially beingbrought to bear.

Best practice elements of various suicideprevention strategies

Strategy Key best practice elements

- Awareness
- programs
- Dissemination of educational information through
- multiple methods such as media, short talks, leaflets,
- and placards.
- Sharing of survivor experiences

- Combining awareness with screening programs
- Educating primary care providers to recognize and
- respond to psychological distress
- Screening Consider using screening tools with good sensitivity,
- specificity, and nature of target population
- Incorporate screening approaches in emergency
- department and primary care evaluations
- Gatekeeper
- training
- Training period may extend to 3-6 months
- Should involve early warning signs of suicide risk,
- how to approach and broach the topic of suicide,
- psychological first aid, and basic postvention
- activities
- Should be provided periodically
- Knowledge of at-risk populations and referral
- strategies
- Access to means
- restriction
- Legislative restrictions on availability and sale of
- firearms/pesticides
- Constructing physical barriers at jumping hotspots
- Use drugs safer in overdose
- Be aware of unusual phenomena such as means
- substitution
- Follow-up care Facilitate after-care process, particularly for high-risk
- individuals
- Provide telephonic and other forms of ongoing
- support
- Community outreach programs
- Increased vigilance for the first 3 months after
- discharge when risk is highest
- Hotlines/
- helplines
- Basic symptoms and signs of common mental
- disorders
- Eliciting suicidal ideas/thoughts/plans in a

- nonthreatening manner
- Identification of at-risk populations/referral for
- bonafide treatment needs
- Handling acute suicidal crisis
- Providing relevant health-related information
- Media practices Avoid sensationalizing/deifying the act or person
- Avoid explicit description of suicide methods
- Emphasize preventability of suicide and treatability
- of predisposing mental health conditions
- Provide contact details for suicide support service
- Collaboration between media and medical
- professionals and training of journalists on
- responsible reporting
- Pharmacotherapy Treat the underlying psychiatric morbidity, if any
- Lithium, clozapine, and electroconvulsive therapy
- have proven antisuicidal properties
- Combination strategies (pharmacotherapy and
- psychotherapy), particularly for adolescents
- Psychotherapy CBT
- DBT
- IPT
- Problem-solving therapy
- CBT=Cognitive behavior therapy, DBT=Dialectical behavioral therapy,
- IPT=Interpersonal therapy

Suicide awareness programs

The ideal conditions for an effective awareness program include delivery in a relevant setting, having a multifaceted and comprehensive nature inclusive of community-based strategies, and adopting a universal approach while simultaneously ensuring identification of at-risk groups.[6,7]

For the lay public

Focused suicide awareness programs such as short talks for a 90-min period have been shown to enhance the identification of warning signs of suicide.[8] Concurrent dissemination of educational material coupled with reaching out through media and training of gatekeepers appear more effective than the distribution of educational material alone. Sharing of patient

and suicide survivor experiences is useful in enhancing awareness.[9] Awareness programs for gatekeepers should involve education about risk factors, information on suicide support initiatives as well as legislations and initiatives to reduce stigma.[10,11]

Programs which are multipronged in approach such as the SEYLE awareness (empower pupils by increasing the awareness on general mental health and healthy and unhealthy behaviors) and Question, Persuade, and Refer (QPR) appear promising for suicide prevention, especially in adolescents.[12] An interactive approach using focus group discussions and role plays was adopted in the "Surviving the Teens" method to provide awareness on suicidal burden, risk factors, helplines, and warning signs to students. Positive effects were noted on self-efficacy and help-seeking behaviors at 3 months postintervention.[13]

While the above evidence generally supports the use of awareness strategies for suicide prevention, evidence for a favorable impact on subsequent health-seeking behaviors, a crucial outcome in suicide awareness activities, is mixed.[9,11,14]

For medical and nursing professionals

Educating the primary care physicians in recognizing and responding to psychological distress and suicidal thoughts improves detection and enhances the treatment of depression,[11] though mixed evidence also exists.[15,16] Nevertheless, this seems an important strategy for suicide prevention as most people who die by suicide have contacted the primary care provider in the preceding month.[17,18] Similarly, programs targeting mental health professionals and nursing professionals that highlighted postsuicide attempt counseling and restriction of means increased their knowledge, comfort, and counseling skills on suicide.[19]

Screening programs for suicide prevention

Modest evidence shows that the screening tools employed can pick up high-risk adults and older adults at risk of suicide among the community.[20] Notably, the sensitivity and specificity of the instrument play a key role in risk assessment.[20,21] Contemporary suicide screening programs utilize specialized measures to identify at-risk youth for early referral and intervention.[22] One of the most commonly

used instruments is the Columbia-Suicide Severity Rating Scale - Screening version with a high degree of sensitivity and specificity, followed by Suicide Risk Screen and Diagnostic Interview Schedule for Children-IV.[23]

The primary care setting and the emergency department (ED) are key areas where suicide screening must be implemented. The ED assessment should cover a wide range of screening measures for common medical conditions and should ideally incorporate suicide behavior assessment.[23,24] The youth presenting to the ED and their parents/caregivers tend to support such comprehensive screening methods employed in the ED.[24] Because depression is closely associated with suicidal risk, the same needs to be screened in any setting.[23] Recent studies show positive effects due to screening measures, which are web-based and anonymous.[25,26]

Gatekeeper training

- Gatekeepers refer to individuals who regularly interact with
- potentially suicidal persons and are available to recognize
- the key behavioral clues indicating elevated suicide risk.[8,11]
- Potential gatekeepers include teachers, peers, schoolsupport
- staff, and specifically appointed counselors.
- All of them havethe common advantage of significant face-to-face contact time
- with large number of people in the community.[27]
- Gatekeepertraining for students includes elements of informing the
- suicidal burden, risk factors, warning signs, support system
- available, signs of depression, communication, and counseling
- skills to address at-risk population.[28]
- Group-based approaches to gatekeeper training with suicide
- awareness, referral sources, referral skills and QPR as
- components[29-33] along with behavioral rehearsal have been
- described[29,34-37] for diverse populations such as schoolchildren,
- college students, and veterans.
- The QPR model is widelyused for gatekeeper training and shows consistent effects inimprovement of suicide awareness and enhancing skills to dealwith adolescents at-risk.[38]
- Most studies reveal that trainingperiod of gatekeepers can be kept at 3 months,[37,39-41] with somestudies following up the gatekeepers up to 6–9 months.[42,43]

- Some of the challenges involved in assessing the effectiveness
- of gatekeeper training include determining the required levels of
- institutional support, paucity of randomized controlled trials in
- this area and measuring acquired learning. Moreover, questions
- remain on the durability of skills acquired from dedicated
- programs over the long term. For better results, gatekeeper
- programs must include a wide range of individuals such as the
- clergy, legal functionaries, and the police personnel.[44,45]
-

Restriction of access to means

Means restriction is an effective strategy to curb suicidal behaviors as it addresses the population at large including those in whom suicidal risk remains undetected. There can be various modes of restriction of means to suicide such as elimination of the potentially lethal agent, impediments or

interferences to access, or sociocultural educational activities promoting suicide awareness.[46]

Restriction of access to pesticides, substituting lethal pesticides with less lethal compounds, double-lock boxes, and nonpesticide agricultural movement preventing ready access to dangerous pesticides[46-48] have been found to be effective. Community locker programs for pesticides where the pesticides are stored in lockers along with community involvement have led to reduced usage of pesticides and decreased suicidal deaths among rural farmers of India,[49] though contrasting evidence is available from other countries.[50]

With regard to firearms, evidence suggests that appealing to individuals against storing dangerous items such as firearms, avoiding giving them to at-risk individuals and enrolling the gun owner groups in programs to reduce the risk of suicide may be more effective than implementing punitive laws and stringent actions.[51,52]

Other methods tried include analgesic withdrawal from dispensaries, restricting sales of barbiturates and caffeine tablets to reduce overdose suicidal attempts, restricting measures on hanging, erection of barriers at jumping hotspots, and restricting access to charcoal.[47,52] An unusual phenomenon arising out of means restriction is “means substitution” wherein

the individual may simply substitute one suicide method with another. This could possibly be due to locoregional restrictions in the availability of specific means or overdiagnosis of suicidal risk in those who are in severe psychological distress and yet without contemplations on suicide.[46]

It is also important to note that limitations exist for many of the above strategies to restrict means,[47,52-54] perhaps implying that no single strategy may work best.

Follow-up care

The risk of suicide in the postdischarge period is quite high and has been observed in diverse populations (youth and adults) and periods.[55] The suicide re-attempt rates are the highest in the 1st week, followed by the first 3 months postdischarge and may last up to 1–3 years from the present attempt.[56,57] Evidence suggests that suicide patients who are discharged from the hospital can be provided various support and follow-up measures such as caring letters, postcards, frequent phone calls, text messaging, brief and regular sessions of supportive counseling, follow-up by mental health worker, and outreach programs.[56,58] To target the survivors of suicide (peers/family), school administrators, teaching and nonteaching support staff, students, families, and the community need to participate in postvention or follow-up care services.[59,60]

Suicide hotlines/helplines

Before embarking on a discussion about the state of evidence of suicide hotlines, it is necessary to understand what constitutes a hotline for suicide. A report by the California Department of Mental Health states that suicide prevention hotlines "provide phone-based services for individuals who are at risk of suicide or concerned about someone at risk of suicide."[61]

Overall, there is a dearth of evidence for the empirical effectiveness of telephonic and Internet-based suicide hotlines. Most available studies have either assessed hotlines among a group of other interventions for suicide prevention, which makes it difficult to isolate the effect of the hotline, or focused on diverse outcome measures such as acceptability, identification, and referral of people at risk as well as service barriers.[47]

Studies comparing synchronous telephonic hotlines against asynchronous online support groups have found that suicide

threats were significantly lesser in the hotline group.[62] A randomized controlled trial conducted among callers, both young and elderly, to a suicide hotline that evaluated the efficacy of two types of brief telephonic psychotherapy concluded that telephonic psychotherapy was superior to waitlisted controls and that hotlines, when they employ professionals with focused training, are a viable option to deliver effective brief psychotherapy for distressed and suicidal callers.[63]

Gould *et al*.[64] carried out a research aimed at delineating the suicidal severity of adult suicide hotline users, end point severity following the call, as well as the nature and predictors of suicidality on follow-up. Contrary to popular perception, the service attracted seriously suicidal clients and mitigation of the suicidal desire as well as reduction in hopelessness was observed on follow-up.

A few studies have examined the prospective impact of suicide hotlines on suicide rates in the community. In one such study,[65] the impact of a 24 × 7 suicide telephone hotline on suicide rates in the community of select towns where the program was started was examined. Each town was compared against a control town that was matched for socioeconomic parameters. The authors found a statistically significant decline in suicide rates in the towns where the intervention was carried out but not in the control towns, thus pointing to a positive impact of the program. Of note, the hotline was manned by lay workers who underwent specific training mainly aimed at determining if the service user required specialist referral.

In a study on the effectiveness of hotline services on linking callers to specialist mental health care units among adolescents and the elderly,[66] it was found that the post call service utilization rate was nearly 50%. Additionally, the authors also concluded that hotline services may facilitate surmounting attitudinal and structural barriers to utilizing mental health-care services.

The helper behaviors and intervention styles that were found to be associated with better short-term outcomes among young and elderly users of crisis hotlines include an attitude of empathy, support, respect, and collaborative problem-solving rather than active listening.[67] These findings have important implications for recruitment and training of helpline volunteers.

Media strategies for suicide prevention

Given the influence of media reporting on public perceptions and attitudes toward suicide, media-based approaches such as responsible reporting represent a population-level strategy for suicide prevention.

Evidence suggests that glorifying and graphic reporting of suicide, especially related to the suicide method used, can trigger imitative attempts by vulnerable people.[68,69] Studies on depressed adults have also pointed to the characteristics of people who may be most vulnerable and impressionable in this regard; the young, currently depressed; and those who have attempted recently.[70] Interestingly, studies, while showing a positive association between media reporting and emergent suicidal behavior, also showed a bidirectional relationship with protective effects in the general population (possibly related to an emphasis on healthy coping) and negative effects in vulnerable people.[47] Two systematic reviews[71,72] confirmed an association between media reporting and ensuing suicide. Further, one of the reviews found that adherence to guidelines reduces the phenomenon of imitative or "copycat" suicides. Wide variability in the impact of guidelines on suicide reporting quality has been observed.[71] The authors concluded that collaborative, media-driven training approaches may have the best chances of success in reducing suicide. Collaboration with both national and regional media may be required for optimal results.[73]

Based on the above evidence, the World Health Organization (WHO) and International Association of Suicide Prevention have framed guidelines for media reporting of suicide,[74] mainly for use in countries that do not have national guidelines themselves. The Indian Psychiatric Society (IPS) has brought out a position statement[75] on media coverage of suicides, which emphasizes collaboration between media professionals and medical professionals for better dissemination and impact. The major recommendations of the IPS position statement are as follows:

- Matter of fact, neutral reporting rather than sensationalism
- Discreet reporting (avoiding front page, small headline and without photographs) devoid of detailed description

of the method used
• Sensitive to possible psychological harm on survivors and respecting their privacy
• Exercising restraint when reporting celebrity suicides.

In a rather negative indictment of media reporting practices in India, Jain and Kumar[76] concluded that suicide reporting in India is inadequately adherent to the WHO guidelines and tends to veer toward sensationalism. These findings were subsequently endorsed in a larger study which noted several harmful suicide-reporting practices, such as explicit descriptions of methods used.[77]

Pharmacotherapeutic strategies

Psychotropics play a major role in reducing suicidal risk among psychiatric patients. They may be working primarily by controlling the symptoms of the underlying psychiatric disorder. Depressive disorder is currently the most common cause of suicidal attempt among those with an underlying psychiatric disorder.[78] Antidepressants are proven to be effective in reducing the suicidal risk among depressed patients.

Lithium, a mood stabilizer, has shown efficacy in reducing suicidal risk in both bipolar and depressive disorders.[79] Though the exact mechanism of action is unknown, possible explanations include a secondary effect of relapse-rate reductions. The other possible mechanism is that it could increase serotonin levels in brain and confer ongoing protection.[80]

The atypical antipsychotic clozapine is used primarily in the management of treatment-resistant schizophrenia. Its antisuicidal effects have been shown in adults with chronic schizophrenia and schizoaffective disorders.[81] Here too, as for lithium, the putative mechanisms of action involve modulation of central serotonin levels, thereby favorably impacting suicidal risk. Preliminary evidence from adult studies exists for the antisuicidal properties of other antipsychotics such as olanzapine, quetiapine, ziprasidone, aripiprazole, and asenapine; nutraceutical agents such as omega 3 fatty acids; and anesthetic agents such as ketamine.[82,83]

Electroconvulsive therapy has proven rapid antisuicidal effects.[84] Finally, positive evidence for combination strategies such as medications and psychotherapy for reducing depressive

symptoms and suicide risk among adolescents is available from prospective trials such as the Treatment of Adolescent Suicide Attempters study.[85] Ketamine, a noncompetitive N-methyl D-Aspartate antagonist, has been shown to have antisuicidal properties with a rapid onset of action.[86] Based on this, a possible role for ketamine in suicide prevention, particularly in emergency settings, has been postulated. Key caveats here include short duration of the benefits observed with ketamine and the finding that its antisuicidal properties are linked to its antidepressant effects.[87]

Psychotherapeutic approaches

Psychotherapy is an important and evidence-based treatment modality in the management of suicidality. It has been particularly effective in the adult age group, those with borderline personality disorder (BPD), and those receiving outpatient treatment. The absolute risk reduction for suicidal events at follow-up with psychotherapeutic strategies was 6.59% when compared to treatment as usual.[88]

Among the different types of psychotherapy, cognitive behavior therapy (CBT) has robust evidence in reducing the suicidal risk.[89] In this technique, one aims at collaboratively exploring the reasons for a suicide attempt, applying techniques such as cognitive restructuring to alter dysfunctional cognitions, and enabling healthy coping.[90] Maladaptive coping has previously been shown to be increased among impulsive adult suicide attempters.[91] Common cognitive themes targeted among youths and adults include ideas of hopelessness, considering suicide as a solution for problems, a need to escape, and feelings of loneliness.[92] In the recent past, third-wave CBT techniques such as mindfulness-based CBT techniques have In suicidality associated with BPD, dialectical behavioral therapy (DBT), a form of CBT based on the principles of emotional regulation and interpersonal effectiveness, has been shown to be effective. A modified version of DBT to suit adolescents was found to be effective in rapidly resolving suicidal ideations in BPD and also had a long-term effect on reducing self-harm attempts.[94]

Encouraging evidence also exists for interpersonal therapy, predicated upon links between stressful life events and mood, in the elderly[95,96] as well as problem-solving therapy[97] in

reducing suicidal ideations in adolescent people at risk for suicide.

Other novel intervention models with promising evidence for impact on suicide attempts include the following:

- Safe Alternatives for Teen and Youth – This approach employs principles from both CBT and DBT to promote safety among those attempting suicide in the adolescent age groups[98]
- Attempted Suicide Short Intervention Program – This incorporates elements of therapeutic alliance, narrative style of interviewing, education about mental illness, safety measures, and regular letters for 2 years[99]
- Collaborative Assessment and Management of Suicidality – This is an intervention to address suicidal ideations, for the older adolescents, adults, and elderly, in the inpatient setting, and has short-term effects in reducing further attempts[100]
- Systems Training for Emotional Predictability and Problem Solving – This is a program which results in improvement in emotional regulation and thereby reduction of suicidal attempts in adults.[101]

Combining the above strategies, we propose a multitier approach to suicide prevention [Figure 1]. This framework combines population-level (Tier 1), subpopulation-level (Tier 2), and individual-level (Tier 3) strategies. As one progresses from left to right of the schema, the strategies become more proximal and individually focused. This framework may help in designing a comprehensive approach to suicide prevention with adequate focus at the population as well as individual levels.

The strengths and limitations of the various suicide prevention approaches discussed here merit attention. While population- and subpopulation-level strategies such as public awareness and information programs as well as gatekeeper training may have broader cascading effects on the knowledge of risk factors, stigma, and help-seeking behaviors, evidence has shown limited effects on major outcomes of suicidal behavior or on intermediate outcomes such as help-seeking behaviors.[102] As these are highly resource intensive approaches, there is a need to evaluate their long-term cost-effectiveness in a systematic manner. For screening programs, the major limitation is the

lack of universally accepted and valid screening tools to assess suicide risk. Due to their significant potential to shape public opinion, media strategies such as responsible media reporting appear promising. However, the obvious limitation is that merely reporting suicide as per media reporting guidelines, without an educational component and collaboration of journalists with training and support groups, may not have the desired effect. Restriction of access to means is an attractive method that can be implemented with legislation and public policy initiatives, but is limited by its suitability to contexts where the method is lethal, popular, and easily accessible as well as by the possibility of substitution of means. Moreover, in all likelihood, this is only a time-buying strategy and is likely to have an impact only when combined with other interventions. Helplines or hotlines can be used for the general population or vulnerable subgroups but, perhaps, the biggest constraints, especially in low-resource settings, are the availability of trained volunteers and peer support groups to optimize benefits.

Individual strategies such as pharmacotherapy and psychotherapy may not have population-level effects, and one must also keep in mind the potential risks such as aggravation of suicidal behavior in select populations such as children and adolescents.[103] Interventions focusing on enhancing follow-up care for suicide offer the advantage of reducing burden on the patients and their caregivers as well as the larger health-care system. However, these approaches are limited by their emphasis on the involvement of family in after care and need for social connectedness.

Conclusion

Although several approaches have shown evidence for suicide prevention, it is likely that a combination of strategies may work better than isolated approaches. Given the low base rate of suicide in the population, challenges exist in evaluating and defining effective outcomes for interventions in suicide prevention. Many of the interventions described are multifaceted, and isolating the effective components in order to delineate the best practice elements in each strategy remains an arduous task. Clearly, more well-designed randomized controlled trials involving at-risk individuals may answer some of these questions. Cross-cultural translation of findings

remain sketchy and more local evidence is needed to inform

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCE

VALUE ADDED COURSE STUDENT DETAILS

SUICIDE PREVENTIONAND MANGAMENT for 3RD year students

S.No	Register No	Students List	Department	Signature
1	U15MB360	SELVASRINIVASAN. B	Pyschiatry	
2	U15MB361	SENTHILKUMARAN. A	Pyschiatry	
3	U15MB362	SHAHARA ZAD .S	Pyschiatry	
4	U15MB363	SHAKTHI. K	Pyschiatry	
5	U15MB364	SHALINI. A	Pyschiatry	
6	U15MB365	SHANMUGA PRIYANGA. A	Pyschiatry	
7	U15MB366	SHARUMATHI.E	Pyschiatry	
8	U15MB367	SHIYAM. M	Pyschiatry	
9	U15MB368	SHRIRAAM .K	Pyschiatry	
10	U15MB369	SIVA SAKTHI VELAN .A.V	Pyschiatry	
11	U15MB370	SIVAKUMAR. S	Pyschiatry	
12	U15MB371	SIVANAMBI .S	Pyschiatry	
13	U15MB372	SOPHIYA .L	Pyschiatry	
14	U15MB373	SOUNDARIYA.M	Pyschiatry	
15	U15MB374	SOWMYA LAKSHMI .I	Pyschiatry	

SRI LAKSHMI NARAYANA INSTITUE OF MEDICAL SCIENCES

Awareness And Assessment Of Suicide And Suicide Prevention

Candidate Name		Assessor Name	
Date of Assessment		Assessor Position	

MULTIPLE CHOICE QUESTIONS

Course code: PSYC07

There is a typical profile for a person who attempts suicide

- True
- False

More men than women complete suicide

- True
- False

Many suicides are completed under the influence of alcohol and drugs

- True
- False

All suicidal people have a mental illness

- True
- False

Which of the following statements is true?

- All suicidal ex-service men and women are mentally ill
- Many suicides can be prevented in our community
- People who are suicidal always want to die
- People who talk about suicide are unlikely to go through with it

Suicides always occur without warning

True False

Which of the following is a warning sign of suicidal behaviour?

- Angry outbursts

- Reckless behaviour
- Mood changes
- Withdrawal from family and friends
- Increased use of alcohol or other drugs
- Giving away possessions
- Threatening to hurt or kill themselves
- Talking about death or suicide
- Expressing feelings of hopelessness, being trapped with no way out and no reason for living
- Abnormal anxiety or agitation
- Sleeplessness
- Feeling isolated and that no one understands you
- Crying
- All of the above

Grieving after suicide is different than after other kinds of death.

True False

Being angry with someone after he or she dies by suicide is a normal reaction.

- True
- False

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Awareness And Assessment Of Suicide And Suicide Prevention

Candidate Name	SHAKTHI	**Assessor Name**	DR. ARUN
Date of Assessment	12.11.2018	**Assessor Position**	ASSOCIATE PROFESSOR.

UNIVERSITY. RG'NO :- U15MB363

10/10

MULTIPLE CHOICE QUESTIONS

Course code: PSYC07

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- True
- False

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Awareness And Assessment Of Suicide And Suicide Prevention

Candidate Name	SHAHARAZAD.S	Assessor Name	Dr. ARUN
Date of Assessment	12-11-2018	Assessor Position	ASSOCIATE PROFESSOR

UNIVERSITY REG NO:- U15MB362

MULTIPLE CHOICE QUESTIONS

Course code: PSYC07

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Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SHARUMATHI.E has actively participated in the Value Added Course on Awareness And Assessment of Suicide and Suicide Prevention held during July-December 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. ARUN SEETHARAMAN
RESOURCE PERSON

Dr. ARUN SEETHARAMAN, MD.,
Reg. No: 91440
Associate Professor, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Ossudu, Kudapakkam, Puducherry-605 502.

DR. A.JOHN DINESH
REG. NO. 71691

Dr. John Dinesh
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SIVAKUMAR. S has actively participated in the Value Added Course on Awareness And Assessment of Suicide and Suicide Prevention held during July-December 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

DR. A JOHN DINESH
REG. NO. 71691

Dr. ARUN SEETHARAMAN
RESOURCE PERSON

Dr. JOHN DINESH
COORDINATOR

Student Feedback Form

Course Name: **SUICIDE PREVENTION**
Subject Code: **PSYC07**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Signature
Date:

Student Feedback Form

Course Name: **SUICIDE PREVENTION**

Subject Code: **PSYC07**

Name of Student: SHALINI. A Roll No.: U15MB364

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	✓

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 31.12.2018

A. Shalini
Signature

Student Feedback Form

Course Name: **SUICIDE PREVENTION**

Subject Code: **PSYC07**

Name of Student: SHANMUGIA PRIYANGIA · A Roll No.: U15MB365

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Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear		✓			
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	3 ✓	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date: 31.12.2018

Date: 31-12-2018

From

Dr.V.R.Sridhar
Professor and Head,
Department of Psychiatry,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

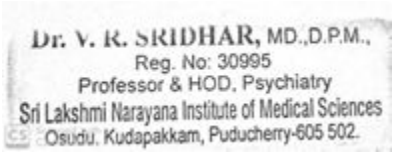
Sub: Completion of value-added course: Suicide prevention and Management

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Suicide prevention and Management**. We solicit your kind action to send certificates for the participants that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. V.R.SHRIDHAR



Photographs


PSYC07
Suicide prevention and Management
JULY TO DEC 2018



Sri Lakshmi Narayana Institute of Medical Sciences

Date 05/06/2018

From
Dr.D.Raghavendran
Professor and Head,
Department of Paediatrics,
Sri Lakshmi narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Newer diagnostic modalities in TB

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Newer diagnostic modalities in TB** from 03/08/2018. We solicit your kind permission for the same.

Kind Regards

Dr.D.Raghavendran

PROFESSOR & HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr A Sugumaran

The HOD: Dr Raghavendran

The Expert: Dr Satya Manasa Gayatri Vinay

The committee has discussed about the course and is approved.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Subject Expert

ASSISTANT PROFESSOR
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

HOD

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

10.07.2018

Sub: Organising Value-added Course: Newer Diagnostic Modalities in TB., reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi narayana institute of medical sciences, **Bharath Institute of Higher Education and Research**, is organising **"Newer Diagnostic Modalities in TB"**. The course content and registration form is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 20 JULY 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content

Course Proposal

Course Title: Newer diagnostic modalities in TB

Course Objective: To enumerate and discuss the newer modalities available in the diagnosis of TB

Course Outcome: On successful completion of the course the students will have a comprehensive understanding on the newer diagnostic modalities in the diagnosis of Tuberculosis

Course Audience: Final year MBBS Students

Course Coordinator: Dr. Raghavendran

Course Faculties with Qualification and Designation:

1. **Dr. Raghavendran – MD Paediatrics – Head of Department**
2. **Dr. Satyamanasa Gayathri Vinay –DNB paediatrics– Assistant professor**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	hours	Resource person
1.	3.08.2018	Introduction and Epidemiology of TB	2-4 pm	2	Dr. Raghavendran
2.	6.08.2018	TB guidelines in children	2-4 pm	2	Dr. Raghavendran
3.	10.08.2018	Sputum collection and microscopy	2-4 pm	2	Dr. Satyamanasa Gayathri Vinay
4.	13.08.2018	Culture based diagnostics	2-4 pm	2	Dr. Raghavendran
5.	17.08.2018	Cellular response- to detect latent to active progression	2-4 pm	2	Dr. Satyamanasa Gayathri Vinay
6.	20.08.2018	Breath biomarker detection	2-4 pm	2	
7.	23.08.2018	High/moderate/low complexity assays	2-4 pm	2	Dr. Satyamanasa Gayathri Vinay
8.	27.08.2018	Molecular biology advances with nucleic acid based tests	2-4 pm	2	Dr. Raghavendran
9.	31.08.2018	Drug resistance	2-4 pm	2	Dr. Satyamanasa Gayathri Vinay
10.	3.09.2018	Line probe assays	2-4 pm	2	Dr. Raghavendran
11.	7.09.2018	Anti TB Drugs	2-4 pm	2	Dr. Satyamanasa Gayathri Vinay

12.	10.09.2018	TB and HIV in children	2-4 pm	2	Dr. Raghavendran
13.	14.09.2018	End TB strategy	2-4 pm	2	Dr. Satyamanasa Gayathri Vinay
14.	17.09.2018	Summary and discussion	2-4 pm	2	Dr. Satyamanasa Gayathri Vinay
15.	21.09.2018	Assessment	2-4 pm	2	Dr. Raghavendran
			Total Hours	30	

REFERENCE BOOKS: (Minimum 2)

1.Nelson Textbook of Paediatrics, 20 E

2.IAP textbook on paediatric infectious diseases

VALUE ADDED COURSE ON LEARNING DISABILITY IN CHILDREN

1. Name of the programme & Code

Newer Diagnostic Modalities in TB and PECO 8

2. Duration & Period

30 hrs (August 2018- September 2018)

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

Once (August 2018- September 2018)

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PECO 8	Newer Diagnostic Modalities in TB	Dr. Satyamanasa Gayatri Vinay	Final year MBBS	20 (August 2018- Sept 2018)

10. Course Feed Back

Enclosed as Annexure- V

Dr. Satyamanasa Gayathri Vinay

RESOURCE PERSON

ASSISTANT PROFESSOR
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

Dr.D.Raghavendran

COORDINATOR

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

Annexure- I

NEWER DIAGNOSTIC MODALITIES IN TUBERCULOSIS

PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	Newer Diagnostic Modalities in TB
Course Code	PECO 8
Objective	To enumerate and discuss the newer modalities available in the diagnosis of TB
Further learning opportunities	Advanced TB screening
Key Competencies	On successful completion of the course the students will have a comprehensive understanding on the newer diagnostic modalities in the diagnosis of Tuberculosis
Target Student	Final MBBS Students
Duration	30hrs July 2018- August 2018
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Multiple Choice questions

Introduction

Research in new diagnostics, drugs and vaccines for tuberculosis (TB) is happening at an unprecedented rate. The Global Plan to Stop TB 2006-2015 anticipated the development of numerous technologies and provided a framework to make them accessible to high TB burden settings. The Stop TB Partnership established a Task Force on Retooling to stimulate the adoption, introduction and implementation of these tools.

Thanks to the work of the Foundation for Innovative New Diagnostics (FIND) and other organizations, several new diagnostics tools are already available and more will become available in the coming years. These tools are desperately needed. The World Health Organization (WHO) reports that although treatment success rates are improving every year, case detection rates are increasing more slowly. In Africa, less than 50% of estimated cases are being detected in DOTS programmes. Compounded by new challenges, such as drug resistance and TB/HIV co-infection, the lack of effective, quality controlled diagnostic tools and laboratory systems endangers the gains that have been made in TB control.

This document describes nineteen (19) new or improved diagnostic tools of the many that have been or are being developed. WHO has a process for evaluating and endorsing new tools for TB control programmes. Three (3) of the tools described in this document have already been endorsed by WHO and are being implemented by countries, while the others are still under development or in piloting phase and are expected to be ready for review for appropriateness for scaled-up use in the coming years. The purpose of this document is not to recommend specific tools, but rather to provide summary information about them so that all who play a part in TB control, especially in National TB Programmes, can understand the tools better and make well-informed decisions when retooling.

Challenges faced in TB diagnosis

Sputum smear microscopy remains the cornerstone of TB diagnosis in developing countries. The method depends upon the quality and bacterial load of the sputum specimen and the training and motivation of laboratory technicians. Although highly specific in most countries, smear microscopy is insensitive – it detects roughly 50% of all the active cases of TB. Sensitivity can be as low as 20% in children and HIV-infected people. Furthermore, smear microscopy cannot detect resistance to drugs.

Smear microscopy also places a burden on the patient. A person with suspected TB typically has to visit the clinic at least twice before a diagnosis can be made, and then has to return again for the results. This process can be expensive in terms of transportation costs and lost

New TB drugs and vaccines

In 2000, there were virtually no prospective new drugs for TB. Today, members of the Working Group on New TB Drugs have built a pipeline of drug development projects, with several in advanced stages. Moxifloxacin [Bayer, TB Alliance, UCL, British MRC] and gatifloxacin [OFLOTUB Consortium] may help shorten TB therapy to 3 to 4 months and if successful, could be registered within the next 5 years. Other anti-TB drug candidates (PA-824 [TB Alliance], OPC 67683 [Otsuka Pharmaceuticals], TMC 207 [Tibotec], LL-3853 [Lupin Limited] and SQ-109 [Sequella, Inc.]) are also active against multidrug- resistant strains of TB. All of the new drugs should be suitable for areas where HIV/AIDS is common.

A new vaccine for TB is also needed. Today's TB vaccine, Bacille Calmette-Guérin (BCG), provides some protection against severe forms of TB in children but is unreliable against pulmonary TB, which accounts for most of the worldwide disease burden. In recent years, members of the Working Group on New TB Vaccines, including non-profit organizations such as Aeras Global TB Vaccine Foundation (www.aeras.org) and the Tuberculosis Vaccine Initiative (www.tbvi.eu), and other researchers from the public, private and academic sectors have developed multiple new TB vaccine candidates. Some of these candidates would replace BCG, while

Who is suffering from the lack of effective TB diagnostic tools?

TB is an airborne infectious disease that is preventable and curable. Left untreated, each person with active TB will infect on average between 10 and 15 people every year. The WHO estimated that 1.7 million people died from TB in 2006. Although one in three people in the world is infected with TB bacteria, not everyone who is TB-infected becomes ill with tuberculosis.

HIV/AIDS and TB are so closely connected that they are often referred to as co-epidemics or dual epidemics. HIV affects the immune system and increases the likelihood of people becoming infected with TB and developing TB disease. HIV promotes both the progression of latent TB infection to active disease and relapse of the disease in previously treated patients. TB is the leading cause of death in people infected with HIV, particularly in low-income countries. Of the 1.7 million deaths from TB in 2006, 200,000 were among people infected with HIV, the virus that causes AIDS. Many HIV-infected TB patients suffer from extrapulmonary TB. Extrapulmonary TB is particularly hard to diagnose. Even when there are clinical symptoms or x-ray findings suggestive of TB, they can be hard to distinguish from other conditions.

Drug resistance is a major public health problem that threatens TB control. Drug resistance is caused by improper use of TB drugs in chemotherapy. Drug-resistant TB can be passed from person to person. Multidrug- resistant TB (MDR-

Diagnosis of childhood tuberculosis is challenging. The disease frequently bears little resemblance to the pulmonary presentation usually seen in adults. Furthermore, children often have difficulty producing sputum and conventional tests like sputum smear microscopy are therefore not useful to diagnose TB in children.

Even where capacity exists, diagnosing TB with culture can take weeks because of the slow growth rate of TB bacilli. In most countries TB culture is reserved for retreatment cases. Specimens are often sent to distant laboratories. This can delay processing of specimens and lead to inaccurate results. Furthermore, test results must travel long distances back to reach the clinic and the patient.

Selecting and adopting new diagnostic tools

The Stop TB Partnership's Retooling Task Force has published valuable materials for countries seeking to implement new tools, including a "Framework for their Adoption, Introduction and Implementation," guidance on "Engaging Stakeholders for Retooling TB Control" and a checklist for the introduction of liquid culture. The information in these publications will be helpful as you prepare to select and adopt new tools for your programme. You can find the publications on the Retooling Task Force website (http://www.stoptb.org/retooling) or ask for them by email (stoptbretooling@who.int).

What should you consider when assessing technologies?

The above publications describe many factors to keep in mind when reviewing potential new tools for your programme, including:

- The evidence base. This includes evidence not only of the accuracy of a new tool under the conditions of controlled clinical trials but also its effectiveness under actual field conditions. Some tools becoming available look promising but their value in TB control activities is yet to be demonstrated on a wide scale in developing countries, or among the TB population they target (such as tools for DST in countries with a high prevalence of MDR-TB). Define the diagnostic needs and priorities of your programme (higher general case-detection, enhanced case-detection in HIV positive people, detection of MDR-TB, and so on) and ensure there is evidence that a tool meets those needs. Note that the actual impact of new diagnostic tools on TB control is unknown at present.
- Your programmatic readiness. Implementation of tools often requires changes in national policy and treatment guidelines, meaning that decision-makers must be well informed about the prospective advantages of the tools and be ready to adopt and set policy that supports their use. Furthermore, none of the new tools will – alone – address all of your needs. Programme managers and the heads of laboratory networks must think through the potential roles of different tools and how they can be used (or combined) in different country settings for best effect, and develop a plan for the required laboratory capacity strengthening. Piloting new tools under programme conditions, with assistance from donors and partners if necessary, can help build the programme capacity and evidence you need before scaling up nationwide.
- Turnaround time for results. Although several new tools provide results faster than existing diagnostic methods, their practical role within your larger diagnostic network must be carefully considered to ensure they achieve the aims you expect. A fast tool that cannot deliver reliable, timely results to the point of care because of transport and other issues has limited additional value.
- Costs of the products required and their maintenance. Many tools bring with them high initial costs for equipment and ongoing costs for maintenance and for consumable products. The costs-versus-benefits of each tool should be carefully considered. Slightly reduced (but acceptable) benefits may be achievable at highly reduced costs. Forecasted needs and secure finances are essential to finalizing tool selection. Procurement systems and teams must be in place and properly informed to ensure continuity of the supply needed for sustainable, high-quality TB diagnostic services.
- Regulatory and quality control measures. Evidence review is a fundamental step required by many countries before a new product is authorized to enter countries and be integrated into the health care system. In many countries, the product registration process includes submission of a dossier containing information on efficacy, safety and other properties. Furthermore, tools bring with them ongoing quality assurance, logistical requirements and costs, which place demands on national quality control programmes. Both internal quality controls and external quality assurance are critical, as a good test done badly may be worse than no test at all. These factors should be considered and arrangements made with national regulatory systems and quality control programmes before beginning implementation. It is recognized that in many countries, national regulatory mechanisms for diagnostics do not exist or are weak.
- Safety considerations. Many of the tools becoming available require sophisticated, expensive laboratory biosafety infrastructure that must be established before you can use the tool. Proper infrastructure must be established and staff trained in necessary safety procedures before you can begin using the tool.
- Staff capacity and training capacity. Staff must understand the advantages of a new tool and how to use it properly. For some tools, sensitization and training of staff in one or two laboratories will be relatively simple. For other tools (even very simple ones), training activities will need to be carefully coordinated with

Important new WHO policies

Given current evidence and consensus, WHO has established the following new policies:

1. The definition of a new sputum smear positive pulmonary TB case has been revised, and is now based on the presence of at least one acid fast bacillus (AFB) in at least one sputum sample in countries with a well functioning quality assurance system.
2. The minimum number of sputum specimens to be examined in the investigation of suspected TB by smear microscopy has been reduced from three to two in settings with a well- functioning external quality assurance scheme, and where workload is high and human resources limited.
3. The use of liquid culture and rapid species identification to address the needs for culture and DST is recommended, based on a country- specific plan for laboratory capacity strengthening. The use of liquid culture and rapid species identification should be implemented in a phased approach.
4. The use of line probe assays for rapid detection of MDR-TB is recommended within the context of country plans for appropriate management of MDR-TB patients, including the development of country-specific screening algorithms and timely access to quality-assured second-line anti-tuberculosis drugs.

Find out more

supply management, essential infrastructure changes and the development of laboratory-specific operating procedures, particularly where tools are being introduced in phases in the country.

Who can help?

The ultimate responsibility for how you retool your diagnostic services lies with your programme and Ministry of Health, however, several resources exist to advise you during planning and to provide finances or technical assistance to help you realize those plans. You may already have contacts with partners that can assist you. The Stop TB Partnership Retooling Task Force may also be a help to you. If you require additional support, however, you can begin by contacting:

- Stop TB DOTS Expansion Working Group (dotsexpansion@who.int)
- Stop TB Working Group on New Diagnostics (http://www.stoptb.org/wg/new_diagnostics)
- Stop TB Global Laboratory Initiative (http://www.who.int/tb/dots/laboratory/gli)
- Stop TB TEchnical Assistance Mechanism (tbteam@who.int)

Summary of new diagnostic technologies (2008-2009)

Many new diagnostic tools are under development/evaluation (i.e. in the diagnostics pipeline). It is expected that the evidence for several of these will be sufficient to merit review by the WHO research-into-policy process within the next few years. Some of these diagnostic tools are likely to be endorsed by WHO. This document does not aim at being exhaustive but at illustrating the pipeline by describing a selection of some of the most promising and/or well-known tools. There are published reviews in scientific literature that provide a more extensive listing of all available diagnostic tests for TB (see page 16).

Tools for screening for latent TB

The Tuberculin Skin Test (TST) is one of the most common tests to determine if someone has been exposed to and become infected with the TB bacteria. A positive skin test is indicated by a skin reaction at the point of the injection. However, vaccination with the BCG vaccine can also lead to a reaction at the TST site (as can repeated TST testing), which limits the test's usefulness in vaccinated children or people repeatedly tested because of high risks of exposure (such as healthcare workers). One new tool developed to supplement or replace the TST are described in this document: Interferon gamma release assays (page 12).

Tools for improving smear microscopy

Smear microscopy is not a very sensitive technique and requires that the patient comes at least twice to the clinic – but it is also relatively fast, inexpensive, and specific for TB in high incidence areas. Thus, in the absence of better alternatives, it is a useful tool in the basic laboratories common in developing countries. Many researchers have focused on new tools and methods to improve the sensitivity and/or efficiency of microscopy, three of which are described in this document: Front-loaded smear microscopy (page 12), LED fluorescence microscopy (page 13) and bleach microscopy (page 15).

Tools for improving culture and DST services

WHO has recommended liquid culture and rapid species identification to address the needs for culture and DST. Liquid culture systems reduce the delays in obtaining positive cultures. The rapid growth in liquid culture results in reduced delays for DSTs also, compared with conventional solid media. Liquid systems are more sensitive for detection of mycobacteria and may increase the case yield by 10% over solid media. With increased sensitivity and reduced delays, liquid systems may contribute significantly to improved patient management. It should be noted, however, that just because a tool relies on a liquid culture medium, does not necessarily mean it is endorsed by WHO. The Expert Meeting on liquid culture convened by WHO only reviewed evidence on the use of commercial broth-based culture systems, and recommendations only pertain to these systems. This document describes four new tools for improving culture diagnosis and DST: Liquid culture: Manual liquid culture technique and commercial broth-based culture systems (page 9), Solid culture: Nitrate reduction assay and Thin layer agar culture (page 14), and Colorimetric redox indicators (page 11).

Tools for rapidly identifying the species of culture isolates

Speciation is necessary to discriminate between *Mycobacterium tuberculosis* complex and other species of mycobacteria which may grow in cultures. Traditional biochemical methods of speciation can take weeks. With commercially-available broth culture systems, the organisms need to be removed from the culture tubes and tested. Researchers are working to develop and/or scale up tools for rapidly speciating the results of culture, one of which is described in this document: Strip speciation (page 10).

Tools for molecular testing

Molecular techniques that could reduce turnaround times in the laboratory for diagnosing TB and detection of drug resistance are being developed and evaluated in many countries. WHO has already approved tools for detection of drug resistance-associated genetic mutations directly from the sputum of smear-positive patients or from isolates grown in culture. An automated technology, as well as two molecular line probe assays focused on rapid detection of rifampicin resistance alone or in combination with isoniazid resistance, are described in this document: Automated detection and MDR screening (page 11) and Molecular line probe assay (page 9).

Case study: Lesotho

Since late 2006, global and national partners had already been working to improve Lesotho's TB diagnostic capabilities, including strengthening of the National Reference Laboratory (NRL). WHO recommends implementing the new technologies first in the country's national reference laboratory, so that it can provide experience during scale-up to the rest of the laboratory system.

Thanks to the close collaboration among multiple stakeholders, Lesotho established a state-of-the-art mycobacteriology laboratory and rapidly introduced new TB diagnostic technologies needed to address the challenges posed by MDR- and XDR-TB.

Partners in Health (PIH), with funding from the Open Society Institute, had established a partnership with the Ministry of Health and Social Welfare (MOH&SW) to launch a treatment programme for MDR-TB.

In addition, the Foundation for Innovative New Diagnostics (FIND) had signed a memorandum of understanding with the government in April 2007 to help prepare the laboratory system in Lesotho to introduce new diagnostic technologies. The MOH&SW coordinated several levels of global and national support to rehabilitate the NRL and institute laboratory staff training programmes. It installed new equipment bought through the Global Fund, developed standard operating procedures, streamlined workflow, and recruited additional technicians to tackle the new workload.

WHO provided technical guidance and appointed a country-based WHO medical officer to support laboratory strengthening. PIH provided logistics and financial assistance. FIND provided an on-site technical expert for renovation and provided a liquid culture system and rapid strip test to detect TB in cultures. In October 2008, a new molecular laboratory was finished and Lesotho started doing line probe assays as well.

Summary of technologies			Estimated costs			
Technology	Description	Produc	Training	Infrastructure[2]	Equip.[3]	Consumables
WHO-endorsed tools (2006-2008)						
Liquid	Commercial broth-based culture systems detect TB bacteria (manual and automated systems are available); can be configured for DST.	BacT/ALERT 3D;	Extensive (3	■■■	Hig	Hig
Molecular line probe	Strip test simultaneously detects TB bacteria and genetic mutations that indicate isoniazid and/or rifampicin	GenoType® MTBDR MTBDRplus; INNO-LiPA Rif.TB	Moderate (3 days)	■■ to ■■■	High	High
Strip	Strip speciation test detects a TB-specific antigen from positive liquid or solid cultures to confirm the presence of TB bacteria in culture samples.	Capilia TB Rapid Diagnostic Test	Minimal (1	■■■	Lo	Mediu
Tools in late-stage development/evaluation						
Automated detection and MDR screening	Device allows automated sample processing, DNA amplification and detection of *M. tuberculosis* and screening for rifampicin resistance.	Cepheid GeneXpert device and Xpert MTB	Minim	■	Hig	Hig
Colorimetric redox indicators	Technique detects isoniazid and rifampicin resistance in culture samples after incubation with redox dyes.	Non-commercial method (Resazurin)	Extensive	■■■	Low	Medium
Front-loaded smear	Based on 2 or 3 specimens but aims to examine specimens on the day that patient presents to the health service (thus identifying 95% of TB cases).	n/	Minim	■	Lo	Lo
Interferon gamma release assay	Blood test detects specific cellular immune responses indicating TB infection.	QuantiFERON®-TB Gold In Tube; T-SPOT.TB®	Moderate	■	Low	High
LED fluorescence microscopy	Robust fluorescence microscopy (FM) systems based on light-emitting diodes (LEDs) that could allow the advantages of FM at levels of the health system where conventional FM would be impractical.	Fraen LW Scientific Zeiss	Moderate Moderate Moderate	■ ■ ■	Medium Medium Medium	Low Low Low
Microscopic Observation Drug Susceptibility (MODS)	Manual liquid culture technique uses basic laboratory equipment (incl. an inverted light microscope) and microscopy skills to detect TB bacteria.	Non-commercial method	Extensive	■■ to ■■■	Mediu	Medium
New solid culture methods	Solid culture technique measures nitrate reduction to indicate isoniazid and rifampicin resistance. Solid culture technique simultaneously detects TB bacteria and indicate isoniazid and rifampicin resistance	Non-commercial method (Nitrate reductase assay) Non-commercial method	Moderat Extensiv	■■ t ■■■ ■■ t ■■■	Lo Lo	Mediu Mediu

Tools in early phase of development

To	Level of health
Breathalyser screening test	Community or point-of-care
First-generation loop-mediated isothermal amplification technology platform (LAMP)	Peripheral laboratory
Lipoarabinomannan (LAM) detection in urine	Peripheral laboratory
Phage-based tests	Reference laboratory

To	Level of health
Sodium hypochlorite (bleach) microscopy	Peripheral laboratory
Sputum filtration	Peripheral laboratory
TB Patch Test	Health post
Vital fluorescent staining of sputum smears	Peripheral laboratory

[2]Key	Description
■	Basic laboratory[4]; no specialized biosafety equipment.
■■	Biosafety level 2. Specialized biosafety equipment required, such as biosafety cabinet.
■■■	Biosafety level 3. Biosafety cabinet and other primary safety equipment required. Controlled ventilation system that maintains a directional airflow into the laboratory required.

[1]Estimates assume that technicians are already trained in existing TB diagnostic techniques (such as smear microscopy and culturing) and the necessary laboratory safety precautions. [3]Product prices may vary depending on geographical location and terms of supply. Ranges are indicative only: Low (minimum-2000 US$); Medium (2001-7000 US$); high (7001+ US$). [4]Detailed information available in the WHO Laboratory Biosafety Manual: http://www.who.int/csr/delibepidemics/WHO_CDS_CSR_LYO_2004_11/en/.

WHO-endorsed tools (2006-2008)

Liquid culture: Commercial broth-based culture systems



New tools can detect fluorescence in a liquid culture medium, enriched with oxygen, to indicate the presence of bacteria. As bacteria grows in the culture, the oxygen is utilized, causing it to be fluorescent when placed under UV light. Methods for testing for drug susceptibility follow the same principle but use two culture samples: one with a drug added and one without the drug (a growth control). If the test drug is active against the TB bacteria, it will inhibit growth and suppress fluorescence. In the manual system, a technician visually identifies fluorescence using a hand-held UV lamp. Automated systems have the capacity for up to 960 cultures at a time.

Potential advantages: Such systems have been thoroughly evaluated in clinical settings and approved for use in industrialised countries for years. Liquid culture systems provide results significantly faster than solid culture techniques: on average diagnosis can be performed in 7-14 days (up to 42 days for a negative result). DST takes on average 7-14 days (range 4-14 days) after the initial culture. Automated systems can benefit laboratories with a high workload and provide standardized reading of samples. Such systems have a sensitivity and specificity of nearly 100% (slightly less for manual systems). Studies have shown that both automated and manual systems perform well in detection of isoniazid and rifampicin susceptibility, but are not as effective for ethambutol and streptomycin.

Considerations: The machine (required for the automated system) and the growth indicator tubes (required for both manual and automated systems) are costly, although a "Developing country" price has been negotiated for MGIT by FIND. Manual systems typically require additional manipulation and use of a hand-held UV lamp. Liquid media are more prone to contamination than solid media, leading to invalid tests unless carefully controlled. Automated machines must be maintained, requiring on-site technical support from manufacturers or their agents.

Requirements: As with all TB culture systems, BSL-2 facilities are required for processing specimens and innoculating cultures. BSL-3 is required if tubes need to be opened and the cultured organisms manipulated (for speciation or further testing). Since speciation of organisms grown in commercial broth-based culture systems requires tubes to be opened and cultures to be manipulated, BSL-3 facilities are required. Laboratory technicians require training in BSL-3 safety precautions and training in the use of these methods and tools. A stable source of electricity is required for automated systems. Laboratories performing rapid culture in liquid medium require sophisticated technology (such as the BACTEC™ MGIT™ 960 System for the automated Mycobacterium Growth Indicator Tube test) or a hand-held UV lamp (for manual systems) as well as several consumable products for which a supply chain must be established, such as BBL MGIT Indicator Tubes, centrifuge tubes, sodium hydroxide, sodium citrate solution, N-acetyl-L-cysteine powder, phosphate buffer, vortex mixer, incubator, pipettes and pipette tips, sodium sulfite solution, mycobacterial agar or egg-based medium, tissue homogenizer or sterile swab, Normal saline, ATCC reference strains, microscope and materials for staining slides, and blood agar plates. Some methods of rapid culture in liquid medium require proprietary products and countries may find it difficult to find local/national suppliers, so establishing long-term support agreements with international suppliers is critical.

Product information: BacT/ALERT 3D (industry.biomerieux.com); BACTEC™ MGIT™ 960 System, BBL MGIT Indicator Tubes (www.bd.com/ds); hand-held UV lamp (www.ambion.com)

Current known developers: Becton, Dickinson and Company (BD, www.bd.com) in collaboration with FIND (www.finddiagnostics.org); BioMerieux (www.biomerieux.com)

Molecular line probe assay



Strip test detects TB DNA and genetic mutations associated with drug resistance from smear-positive sputum specimens or culture isolates after DNA extraction and PCR amplification.

Potential advantages: Studies have shown such assays perform well when used directly on smear-positive sputum specimens (with sensitivity exceeding 97% and specificity exceeding 98%), confirming their value in rapid screening of patients suspected of MDR-TB. While molecular methods are not yet sufficiently developed to fully replace conventional methods for culture and DST, implementation of such assays may reduce the demand for sophisticated and expensive conventional laboratory infrastructure, especially in high MDR-TB burden settings. There is the potential for savings in overall TB diagnostic cost if such assays are judiciously introduced in screening algorithms for detection of MDR-TB.

Considerations: While specificity is excellent for isoniazid resistance, sensitivity estimates are modest and highly variable. Geographical variation in prevalence of mutations associated with rifampicin - and in particular with isoniazid resistance - may result in varying performance of line probe assays in different epidemiological settings. Introduction of line probe assays should preferably be preceded by an assessment of sensitivity and specificity of these assays in a representative collection of MDR- and non-MDR isolates at country or at regional level. Line probe assays are as complex to perform as conventional culture and DST methods and require skilled and well-trained laboratory personnel, as well as adequate laboratory space and design to reduce the risk of false-positive results. Line

probe assays do not eliminate the need for conventional culture and DST capability, as culture remains necessary for definitive diagnosis of TB in smear-negative patients, while conventional DST is required to diagnose XDR-TB. Problems with contamination may be experienced, especially when newly-trained staff perform the assay.

Requirements: Processing of smear-positive specimens for direct testing should be performed in a BSL-2 level laboratory, whereas performing line probe assays on positive cultures requires BSL-3 laboratory infrastructure and equipment, including a class I or class II microbiological safety cabinet equipped with uninterrupted power supply (UPS), autoclave, screw-topped tubes and bottles, pipetting aids, disposable transfer loops and personal protective equipment such as gloves, gown/lab coat, respirator and eye protection. Laboratory technicians require training in either BSL-2 or BSL-3 safety precautions (depending on the procedure) and in how to perform the line probe assay. Reagents used in line probe assays must be refrigerated or frozen, while amplification and hybridization procedures must be conducted under closely monitored temperature conditions. Line probe assays require specific equipment for molecular procedures, such as a thermal cycler, shaking platform and water bath, heating block, sonicator, micro centrifuge and tubes, fridge, freezer, micropipettes and pipette tips, and PCR tubes. UPS is required during PCR amplification and use of the automated hybridization systems to avoid interruption of the procedure and subsequent loss of results. The laboratory must be designed to address the risk of amplicon contamination. Certain equipment such as incubators and automated hybridization systems are product-specific. Technical support from test distributors is required to address hardware problems and to assist with troubleshooting related to unusual results and contamination. Establishing a long-term support agreement with an international supplier is critical.

Product information: GenoType® MTBDR and MTBDRplus (www.hain-lifescience.com); INNO-LiPA Rif.TB (www.innogenetics.com)

Current known developers: GenoType® MTBDR and MTBDRplus (Hain Lifescience GmbH in collaboration with FIND); INNO-LiPA Rif.TB (Innogenetics NV)

Strip speciation



Strip speciation test can detect a TB-specific antigen (MPB64) from positive liquid or solid cultures to confirm the presence of organisms belonging to *M. tuberculosis* complex. Speciation is necessary to differentiate *M. tuberculosis* complex and other mycobacteria grown in cultures.

Potential advantages: Studies have demonstrated that the rapid speciation tests compare favourably with other established phenotypic or genotypic methods. This test provides results within 15 minutes and is highly sensitive and specific (98.6% and 97.9%, respectively). Other than the equipment needed to culture TB, no additional equipment or consumables are needed to perform the test and can detect TB even when mixed with nontuberculous mycobacteria.

Considerations: The results of *M. bovis* and *M. bovis* BCG cultures may vary since some BCG strains are known to lack MPB64 antigen production. Although limited data exists on the product's performance and cost-effectiveness further studies are required to validate its readiness for large-scale implementation in countries.

Requirements: Rapid speciation tests require BSL-3 laboratory infrastructure and equipment, including a class I or class II microbiological safety cabinet. Laboratory technicians require training in BSL-3 safety precautions and training in the use of such tests. Establishing a long-term support agreement with an international supplier is critical to enable uninterrupted supply. In addition, a well-established laboratory and consumables required to perform liquid or solid culture (see above).

Product information: Capilia TB Rapid Diagnostic Test (www.capilia.com/en/TBInsert.html)

Current known developers: Tauns Laboratories, Inc. (http://www.tauns.co.jp) in collaboration with FIND

Case study: United Republic of Tanzania

The Tanzanian National TB and Leprosy Programme (NTLP) has made progress in recent years, successfully treating 81% of its cases and expanding its TB/HIV coordinated activities. Nonetheless, it faces challenges. Two of its greatest ambitions are to improve detection of new, smear-positive TB cases and detection of drug-resistance. New diagnostics were identified by Tanzania as one way to help achieve these goals. For years, the NTLP worked closely with national diagnostics experts to evaluate the new diagnostic tools becoming available. With careful consideration and considerable political will, retooling is expected to meet the challenges of the NTLP.

In 2007, the NTLP began evaluating LED fluorescence microcopy as a more appropriate tool for improving case detection at the periphery. Standard light microscopes were converted to LED using an adaptor. Conventional fluorescence microscopy, not LED-based, is on average 10% more sensitive than traditional Ziehl-Neelsen microscopy but also more prone to false positive results. Because it builds upon existing techniques, it does not require costly infrastructure or extensive training. The positive response to the LED trials has prompted the NTLP to begin rapidly scaling-up its availability at all district hospitals and high-volume sites. The adoption and implementation of such new tools requires large programmatic changes, unfortunately making it impossible to implement immediately at peripheral laboratories, where the need (and potential impact in high-volume laboratories) is likely to be greatest.

Tanzania has also begun introducing faster, more sensitive liquid culture and DST at national and regional reference laboratories. The availability of these tests is expected to improve the diagnosis and management of TB patients. Increasing detection of drug resistant cases poses different challenges at the periphery. As in most countries, samples from patients failing treatment are sent to a central reference laboratory. Transporting these samples can be a challenge – and specimens may be delayed for long periods or even lost. Long delays and other adverse conditions of transport can result in the specimens being unculturable (because of contamination) or falsely considered negative. Delayed detection of resistance can have tragic results.

In 2009, the NTLP will assess the feasibility of the Hain GenoType® MTBDRplus rapid test for detecting drug resistance. The assessment will be conducted in the same limited number of laboratories conducting culture and DST but specimens may not be so sensitive to adverse transport conditions. Results should be available quicker. Studies have shown that line probe assays (endorsed by WHO in 2008) adequately detect rifampicin resistance when used directly on smear-positive patients, thus confirming their potential value for screening suspected MDR-TB patients.

Tools in late-stage development/evaluation

Automated detection and MDR screening



Amplification and detection of *M. tuberculosis* DNA is one of the fastest and most sensitive ways to detect tuberculosis, and also may allow the detection of genetic mutations associated with drug resistance. Unfortunately, conventional DNA amplification methods are cumbersome, require specialized training, and can only be performed on material that has been subjected to processing and DNA extraction. This has limited their use to reference laboratories. The Xpert MTB device is a fully automated system that allows a relatively untrained operator to perform sample processing, DNA amplification, and detection of *M. tuberculosis* and screening for rifampin resistance in less than 2 hours and only minutes of hands-on time.

Potential advantages: Results can be available while patient waits in clinic. The only manual step, adding sample treatment reagent to the specimen cup before loading the cartridge, kills over 99.9% of TB bacilli in the specimen. The test detects TB in essentially all smear-positive samples and the majority of smear-negative samples. The presence of non-tuberculous mycobacteria does not confound testing. The cartridges are stable at room temperature. The same device may in the future be used for HIV viral load detection.

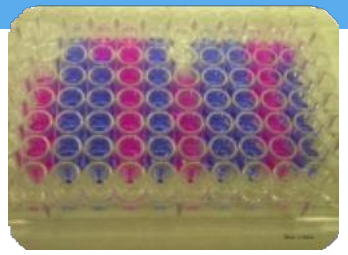
Considerations: The device that automates the procedure is a computer-driven, sophisticated piece of equipment that will require reliable energy supply, security and maintenance. Test costs will be much higher than the cost of tests routinely done at lower level laboratories, where high performance detection and drug resistance screening are not currently performed.

Requirements: Laboratories performing the Xpert MTB assay will require BSL-1 laboratory infrastructure and equipment. Technicians require training in BSL-1 safety precautions and the use of the GeneXpert device. A reliable source of electricity is needed as well as a room that can be secured outside working hours. All buffers and reagents are included in the cartridge. A plastic Pasteur pipette is used to transfer sputum to the Xpert MTB cartridge. Cepheid, Inc., and its distributors will be the only source of consumables and maintenance, so a long term supply and service agreement will be necessary.

Product information: Cepheid GeneXpert device and Xpert MTB cartridge (www.cepheid.com)

Current known developers: Cepheid, Inc. (www.cepheid.com) in collaboration with FIND

Colorimetric redox indicators



Colorimetric methods are based on the reduction of an indicator solution added to a liquid culture medium after TB organisms have been exposed to different antibiotics. Isoniazid and rifampicin resistance is detected by a change in colour of the indicator.

Potential advantages: There is limited evidence that colorimetric methods are highly sensitive (about 95%) and specific for the detection of MDR-TB and faster than conventional solid or liquid culture DST methods (first results between 7 and 14 days after culturing). Colorimetric methods do not require sophisticated equipment and are therefore less expensive to perform than some other liquid culture techniques for DST.

Requirements: As with all TB culture systems, BSL-2 facilities are required for processing specimens and innoculating cultures. BLS-3 facilities are required if tubes need to be opened and the cultured organisms manipulated (for speciation or further testing). Since the colorometric test requires that the microtitre plates be opened and indicator solution pipetted into the wells, BLS-3 facilities are required. Laboratory technicians require training in BSL-3 safety procedures and in the colorimetric DST methodology. Laboratories performing colorimetric DST require the equipment (centrifuge, balance, Bunsen burner, freezer, incubator, refrigerator, vortex mixer and water distillator) and consumables (antiseptics and dispensing syringes) required to perform liquid culture (see

above). Furthermore, the test requires equipment (microtitre plates) and consumable products for which a supply chain must be established, including Middlebrook 7H9 broth and a redox indicator (MTT solution or resazurin).

Product information: Middlebrook 7H9 broth (www.bd.com); MTT reagent (www.millipore.com); resazurin powder (uk.vwr.com); microtitre plates (www.bdbiosciences.com)

Current known developers: Academic laboratories

Front-loaded smear microscopy



Microscopy services currently require patients to make repeat visits to the healthcare facility. This is associated with considerable patient costs and patient drop-out during diagnosis. The new WHO definition of a smear positive case does not require confirmatory smears. This allows patients to be diagnosed on a single smear.

Two smears have been shown to diagnose 95-98% of patients. In front-loaded microscopy the first two specimens are collected and examined on the same day a patient presents. Patients with negative smears can be asked to return with a morning specimen the next day, depending on whether routine services are based on two or three specimens being examined.

Potential advantages: The costs for visits incurred by patients, particularly by poor patients, are often prohibitive. This new method intends to reduce these costs and the considerable proportion of patients dropping out of the diagnostic process. TB patients can be offered treatment on the day they present.

Considerations: In addition to this method, programmes can seek ways to provide better follow-up in order to reduce patient drop-out. Data on the impact and effectiveness of this method is limited; studies to validate the method are currently in progress. To make best use of this method, clinics may have to reorganize their clinical and laboratory services so that people have both their smears examined on the same day – making it possible to put them onto treatment rapidly.

Requirements: Does not require any equipment or biosafety measures beyond that already required for direct smear microscopy. Some supervised training of existing smear microscopy laboratory technicians is required to change from a two-day to one-day sampling. Laboratories performing front-loaded microscopy require the equipment and consumables needed for traditional smear microscopy. National guidelines for TB control, forms and registers may need revision to account for changed protocols.

Current known developers: UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR, www.who.int/tdr)

Interferon gamma release assay



Interferon gamma release assays detect cellular immune responses to proteins that are specific for latent TB infection. If a patient is infected with TB, their immune cells will release IFN-gamma in response to stimulation by TB antigens. The results of interferon gamma release assays are based on the amount of IFN-gamma that is released in response to these antigens.

Potential advantages: Very high specificity and much less likely than the tuberculin skin tests (TST) to be confounded by exposure to environmental mycobacteria or by prior BCG vaccination. Does not boost responses that will be measured by subsequent tests, as happens with TST. Interferon gamma release

Considerations: Although studies suggest assays are more closely associated with recent exposure risks than TST, they may have lower sensitivity than the TST for past infection. Assays do not discriminate between active and latent TB infection. Perfomance in immunosuppressed populations and children has not been extensively evaluated but studies suggest assays may be more sensitive than the TST. The test is moderately complex and requires standard ELISA equipment that may only be appropriate for use at district hospitals in many developing countries. Blood samples have to be incubated within 16 hours of being collected, which may require the use of portable incubators or establishment of systems enabling tranportation to properly equipped laboratories for testing. Requires that blood be drawn from the patient with a needle, which can lead to other infections. The application of such tests in disease-endemic, developing countries where half the population is likely to be infected with *M. tuberculosis* is the subject of extensive investigation.

Requirements: Laboratory technicians require supervised training in the use of these tests. Depending on the kits chosen, laboratories using these tests may require some or all of the following: PBMC separation equipment and PBMC counting equipment (such as an inverted light microscope or an automated cell counter), an ELISPOT plate reader, a centrifuge, an incubator, water bath, microplate shaker, microplate washer and a microplate reader fitted with reference filters. Furthermore, the test requires several consumable products for which a supply chain must be established,

including needles, centrifuge- and microcentrifuge tubes, PBS, cell culture media (RPMI 1640 or GIBCO AIM-VTM is recommended), Trypan Blue stain, variable volume and multichannel pipettes and pipette tips and 24-well culture plates. Interferon gamma release assay kits are typically proprietary products and countries may find it difficult to find local/national suppliers, so establishing a long-term support agreement with an international supplier is critical.

Product information: QuantiFERON®-TB Gold In Tube (QFT™) (www.cellestis.com); T-SPOT.TB® (www.oxfordimmunotec.com)

Current known developers: Cellestis, Inc. (www.cellestis.com); Oxford Immunotec Ltd. (www.oxfordimmunotec.com)

LED fluorescence microscopy



The use of fluorescence microscopy (FM) could potentially increase the sensitivity of smear microscopy and improve the efficiency of facilities. These microscopes allow a much larger area of the smear to be seen, resulting in more rapid examination of the specimen (up to four times faster) and making it easier to count bacilli.

Potential advantages: Light-emitting diodes (LEDs) are more sustainable and user-friendly than the quartz-halogen lamps or high-pressure mercury vapour lamps typically used in FM; powered correctly, they have an extremely long life expectancy (10 000 hours versus 200 for a conventional mercury lamp). Unlike the light

Considerations: In some countries, it may be difficult to find the LED lamps required. Also, the Royal Blue colour LED lamp which works best for FM was only very recently developed and may not be widely available. Some issues with the stability of reagents under field conditions, and the stability of stained smears for blinded rechecking, have been reported. These need further investiation. Proper training is critical; it must be carefully considered and carried out properly. The sensitivity, specificity, cost-effectiveness and cost-benefit of this approach have not yet been adequately established. International guidance on quality assurance for FM does not currently exist.

Requirements: Apart from an LED microscope (or an adaptor to convert an existing microscope to LED FM) and stains for FM, this technology does not require equipment or biosafety measures beyond that already required for smear microscopy. Training of existing smear microscopy laboratory technicians is required to perform FM. LED FM may be powered by electricity or batteries. There are various manufacturers of LED fluorescence microscopes or adaptors converting standard light microscopes to LED fluorescence microscopes. These are proprietary products and countries may find it difficult to find local/national suppliers, so establishing a long-term support agreement with an international supplier is critical. Some LED equipment (the Fraen and the Lumin) can be used as add-ons to existing microscopes, while others (the iLED) are complete microscope kits.

Product information: Fraen AFTER® LED add-on kit or ready-to-use instrument (www.fraensrl.com/flmicro.html); LWS Lumin™ and QBC Paralens™ fluorescence microscopy system; Primo Star iLED microscope (www.zeiss.com); auramine stain (www.sigmaaldrich.com)

Current known developers: Carl Zeiss, Inc. (www.zeiss.com) in collaboration with FIND; Fraen Corporation (www.fraensrl.com); LW Scientific (lwscientific.com) and QBC Diagnostics (www.qbcdiagnostics.com); multi-centre evaluations being conducted by TDR.

Microscopic observation drug susceptibility (MODS)

Microscopic observation drug susceptibility (MODS) is a manual liquid culture technique that uses basic laboratory equipment (including an inverted light microscope) and microscopy skills to detect TB bacteria. Microscopic colonies (micro-colonies) of *M. tuberculosis* are observed in the culture media using an inverted microscope, through the bottom of a sealed plastic container. The characteristic pattern of growth of *M. tuberculosis* complex allows ready identification. Concurrent culture of sputum in drug-free and drug-containing media facilitates direct rifampicin and isoniazid DST.

Potential advantages: For detection of TB in sputum, MODS has been demonstrated in multi-center studies to be more sensitive and faster than conventional solid culture and automated liquid culture (median time to culture-positivity of the same samples cultured in MODS, automated MBBacT and LJ were 7, 13 and 26 days respectively). Because MODS utilizes direct DST, median MDR detection time is also 7 days. MODS is relatively inexpensive compared to commercial broth-based liquid culturing systems.

Considerations: Like all liquid and solid culture techniques, MODS is more challenging than smear microscopy. Laboratory technicians may have difficulty distinguishing between the micro-colonies of TB and some nontuberculous mycobacteria (NTM). This could potentially have impact where NTM prevalence is high. MODS is delicate and requires experienced personnel. As with all TB culture systems, biosafety of laboratory workers must be taken into consideration. Further studies are required to adequately validate this technique.

Requirements: As with all TB culture systems, BSL-2 facilities are required for processing specimens and inoculating cultures. BSL-3 facilities are required if tubes need to be opened and the cultured organisms manipulated, such as for speciation or further testing. Laboratory technicians require training in BSL-2 or BSL-3 safety precautions as appropriate and in the use of MODS.

Laboratories using MODS require functioning biosafety cabinets, a fridge/freezer for storing media, a vortex and centrifuge for sputum decontamination, an incubator and an inverted light microscope (such as the Radical RTC-6). Furthermore, MODS relies on a proprietary liquid medium called Middlebrook 7H9. A cold supply chain for OADC and PANTA and agreement with suppliers for proper support for equipment must be established.

Product information: Middlebrook 7H9, OADC and PANTA (www.bd.com) and Radical RTC-6 (www.radicalindia.com/)

Current known developers: Academic laboratories; PATH (www.path.org); Tulip Diagnostics (www.tulipgroup.com). Detailed technical information available at www.modsperu.org.

New solid culture methods: Nitrate reduction assay (NRA), e.g. Griess method



Solid culture technique measures nitrate reduction to indicate resistance to isoniazid and rifampicin. This technique is based on the property of TB to reduce nitrate to nitrite, which is revealed as a color change of the culture media.

Potential advantages: The nitrate reductase assay (NRA) is less expensive to perform than liquid culture techniques for DST. Furthermore, since the NRA method makes use of the recognition of nitrate reduction as a sign of growth, results are acquired earlier than by eye examination of colonies in solid culture. Studies have shown that the specificity and sensitivity of NRA were comparable to traditional solid culture methods for DST of isoniazid and rifampicin. It uses solid media, which may be safer than liquid media. NRA does not need sophisticated equipment, is not complex to perform and could therefore be appropriate for laboratories with limited resources.

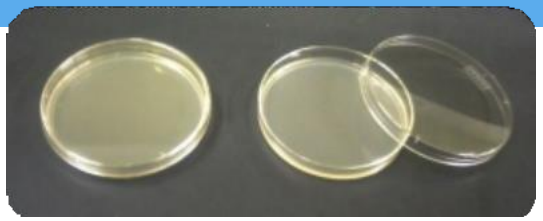
Considerations: The culture is killed by the mix reagent used to develop the assay, requiring that multiple cultures be prepared if comparative testing will be performed. Only fresh cultures must be used (<14 days). Additional studies and cost-effectiveness analyses are required to validate this technique and determine if it is appropriate for large-scale implementation in countries with a high prevalence of MDR-TB.

Requirements: As with all TB culture systems, BSL-2 facilities are required for processing specimens and innoculating cultures. BSL-3 facilities are required if tubes need to be opened and the cultured organisms manipulated, such as for speciation or further testing. Since speciation of *M. tuberculosis* growing in NRA cultures is done by visualization of a colour change in the tube (without opening them) BSL-2 facilities may be sufficient. Laboratory technicians require training in appropriate safety precautions and in how to perform NRAs. Laboratories performing NRA require the equipment and consumables required to perform solid culture (see above). Furthermore, the test itself requires several consumable products for which a supply chain must be established, including sodium nitrate and either hydrochloric acid, sulfanilamide and N-naphthylethylene-diamine (if the test will be performed with liquid reagents) or sulfanilic acid, N-(1-naphthyl)-ethylenediamine dihydrochloride and tartaric acid (if the test will be performed with a crystalline reagent).

Product information: sulfanilamide (www.merck.com); N-(1-naphthyl)-ethylenediamine dihydrochloride (www.sigmaaldrich.com); hypocholoric acid (www.sigmaaldrich.com)

Current known developers: Academic laboratories

New solid culture methods: Thin layer agar culture (TLA)



The technique uses a standard microscope to simultaneously detect TB bacteria and indicate isoniazid and rifampicin resistance. Plates with a thin layer of agar medium are incubated and examined microscopically on alternate days for the first two weeks and less frequently thereafter.

Potential advantages: Inexpensive compared to other culture techniques. Test can be done with a standard light microscope. At least one study has demonstrated that this technique provides results faster (in about 11 days) than traditional solid culture using Löwenstein–Jensen medium (26.5 days). Sensitivity obtained with thin layer agar is slightly better than with Löwenstein–Jensen. TB bacteria can be detected in as little as 7 days, with results for DST between 10-15 days. Uses solid media, which may be safer than liquid media. Simpler to manage large numbers of samples than for manual liquid culture.

Considerations: The contamination rate is slightly higher than when using Löwenstein–Jensen medium. Although reportedly faster than traditional solid culture techniques, it is not as fast or as sensitive as liquid culture. Further studies are required to adequately validate this technique.

Requirements: As with all TB culture systems, BSL-2 facilities are required for processing specimens and inoculating cultures. BSL-3 facilities are required if tubes need to be opened and the cultured organisms manipulated, such as for speciation or further testing. Since speciation of *M. tuberculosis* growing in TLA cultures is done without opening the Petri dishes, BSL-2 facilities may be sufficient. If Petri dishes cannot be adequately sealed, however, then BSL-3 facilities are required. Laboratory technicians require training in the appropriate safety precautions and in the use of thin layer agar cultures. Laboratories performing the thin layer agar technique require the equipment and consumables to perform solid culture (see above), as well as additional consumable products for which a supply chain must be established: OADC, PANTA, Middlebrook agar-based medium and Petri dishes.

Product information: OADC, PANTA, Middlebrook 7H10 or 7H11 agar (www.bd.com)

Current known developers: Academic laboratories

Case study: Peru

According to the most recent WHO Global Tuberculosis Control Report, in 2006 there were 34,311 TB cases and 893 confirmed MDR-TB cases in Peru. One of the strategies of the Peruvian National TB Control Programme to control MDR-TB includes decentralization of first-line DST to district laboratories to screen patients at risk of MDR-TB. As part of this strategy the National Reference Laboratory first validated the direct Griess method, a colorimetric method using nitrate reductase reaction to indicate the growth of TB on solid medium. From 2005 this method was then progressively decentralized to district laboratories. Two district laboratories served 228 health establishments with a population of more than 5 million people. From January 2005 to July 2008 these district laboratories performed a total of 14,907 DSTs. With adequate quality assurance and training, this method performed well as a rapid test to screen for MDR-TB at district level. The method proved to be inexpensive, simple and robust. The median time from sputum collection to DST result was 31 days as compared to 99 days for conventional DST in a pilot district laboratory. Decentralization of first- line DST to district laboratories decreased the bottleneck of the central level and improved access to early diagnosis and treatment.

Tools in an early phase of development

Researchers continue to develop and evaluate diagnostic tools beyond those described in this document. There is a wide array of products in the pipeline with different expected dates of availability – and a new tool may be superceded quickly by a newer tool, where appropriate evidence exists to support it. It is important that programmes continue to monitor the progress of research and carefully consider the potential of future tools when planning to invest in existing tools. Below is a short summary of several other promising new diagnostic tools that still require further development and/or evaluation, but evidence for some could be ready for review by WHO in the next few years.

Breathalyser screening test

A test for respiratory forms of the disease that could be used in the community to screen high risk groups. Patients cough into a disposable device which is placed in the instrument for detection of volatile organic compounds. The instrument is fully portable and runs off rechargeable AA batteries. The test is performed and readout obtained in under 10 minutes. Limited performance data is available and further evaluation studies are required. Developers: Rapid Biosensor Systems Ltd (www.rapidbiosensor.com). Level of health system: community or point-of-care.

First-generation loop-mediated isothermal amplification (LAMP) assay

Molecular amplification methods are proven technologies for the detection of TB but have not been widely used in remote settings because of the cost and complexity. LAMP is a simple DNA amplification method that does not require a thermocycler or detection system and reportedly allows visual detection of amplification, possibly allowing it to be used at lower levels of the health system. Developers: Eiken Chemical Co. Ltd. (www.eiken.co.jp) and FIND. Level of health system: Peripheral laboratory.

Lipoarabinomannan (LAM) detection in urine

M. tuberculosis LAM has been shown to be excreted in the urine of TB patients. Urine is an easier specimen to collect than sputum, and may be less variable in quality and safer to handle. There are several versions of this assay in development, including in-tube ELISA and dipstick methods. Urinary antigen detection may be of particular value in diagnosing TB in HIV-coinfected patients. It may prove valuable for rapid and simple diagnosis of TB in particular in developing countries at peripheral levels. Developers: Inverness Medical Innovations, inc. (www.invernessmedical.com). Level of health system: Peripheral laboratory.

Phage-based tests

A method for detecting rifampicin resistance directly from sputum smear positive samples or indirectly from culture. The test has a manual format and results are read by eye. Results are reportedly available within 2 days and utilize basic microbiological equipment and skills available in most laboratories. The performance of the FASTPlaque-Response has been evaluated in a TDR sponsored Phase III clinical trial in Peru. Phase IV demonstration evaluations are necessary to assess use of the diagnostic in the public sector of low-income countries. Developers: Fast-Plaque™ Response Test, by BIOTEC Laboratories, Ltd. (www.biotec.com); academic laboratories. Level of health system: Reference laboratory.

Sodium hypochlorite (bleach) microscopy

The digestion of sputum with household bleach prior to sputum smear preparation and microscopy has been reported to be an effective, simple method to improve the yield of smear microscopy even in high HIV-prevalence settings. Progress on the development of a bleach microscopy method has been complicated by the wide heterogeneity, and lack of standardization, in methods described. A standardized bleach method, the Mathare Sodium Hypochlorite (MaSH) method, has recently been developed and evaluated in MSF-sponsored studies in Mathare, Nairobi. The addition of a standardized sodium hypochlorite solution to sputum followed by overnight sedimentation resulted in a 15% increase in TB cases detected. The MaSH Method is now being evaluated by TDR under operational conditions in large multi-country studies. Developers: TDR. Level of health system: Peripheral laboratory.

Sputum filtration

In this method, sputum is liquefied and passed through a filter, which is then stained or cultured by standard techniques. Filtration considerably concentrates mycobacteria, increasing sensitivity. Another advantage of using concentrating sputum is the reduction in time spent on sputum examination. Some studies have been published on this method, but further validations studies are required. Developers: Academic laboratories. Level of health system: Peripheral laboratory.

TB Patch Test

The TB Patch Test is a point-of-care diagnostic used to diagnose active TB. The Patch delivers MPT64, a protein specific to the organisms that cause TB. In those with active, infectious TB, a localized immune response consisting of erythema and/or vesiculation appears 3-4 days after application to the skin. The patch reportedly avoids responding to BCG vaccination, to other mycobacteria or to a previous TB infection that has been cured with drugs. Enrollment in a Peru clinical trial complete; data analysis ongoing. Additional trials in the Philippines began in 2007. Developers: Sequella (www.sequella.com). Level of health system: Health post.

Vital fluorescent staining of sputum smears

Unlike most fluorescent stains, fluorescent vital dye only stains living, culturable organisms. While a positive finding provides a basis for initiating antibiotic treatment, the sensitivity of the direct smear is highly variable. Note that use of this dye requires a fluorescent microscope. This technique might be most appropriate for used with patients not responding to therapy. Developers: Academic laboratories. Level of health system: Peripheral laboratory.

Select documents and resources for further reading

The following are a selection of documents that may be valuable to you as you prepare to retool your diagnostics programme and consider new diagnostic tools.

- Evidence-based tuberculosis diagnosis. M Pai, A Ramsay, R O`Brien. PLoS Med. 2008 Jul 22;5(7):e156.
- Using a bus service for transporting sputum specimens to the Central Reference Laboratory: effect on the routine TB culture service in Malawi. AD Harries, J Michongwe, TE Nyirenda, JR Kemp, SB Squire, AR Ramsay, P Godfrey-Faussett, FM Salaniponi. International Journal of Tuberculosis and Lung Diseases. 2004. 8(2): 204-210
- Timely diagnosis of MDR-TB under program conditions: is rapid drug susceptibility testing sufficient? M Yagui, MT Perales, L Asencios, L Vergara, C Suarez, G Yale, C Salazar, M Saavedra, S Shin, O Ferrousier, P Cegielski. Int J Tuberc Lung Dis. 2006 Aug;10(8):838-43.
- Optimizing sputum smear microscopy for the diagnosis of pulmonary tuberculosis. KR Steingart, A Ramsay, M Pai. Expert Reviews in Anti-infective Therapy, 2007. Jun;5(3):327-31).
- Reducing the number of sputa examined, and thresholds for positivity: an opportunity to optimize smear microscopy. M Bonnet, A Ramsay, F Varaine, W Githui, L Gagnidze, P Guerin. Accepted by International Journal of TB and Lung Diseases. 2007. Sep;11(9):953-8.
- The bleach microscopy method and case detection for tuberculosis control. A Ramsay, SB Squire, K Siddiqi, J Cunningham, MD Perkins. Int J Tuberc Lung Dis. 2006 Mar;10(3):256-8.
- Bleach Sedimentation: An opportunity to optimize smear microscopy for tuberculosis in settings of high prevalence of HIV. M Bonnet, A Ramsay, W Githui, L Gagnidze, F Varaine, PJ Guerin. Clinical Infectious Diseases, 2008. June. 46(11): 710-6)
- Commercial serological tests for tuberculosis - do they work? K Steingart, A Ramsay, M Pai. Future Microbiology. July 2007. Aug;2:355-9.
- Laboratory-based evaluation of 19 commercially-available rapid diagnostic tests for tuberculosis. WHO/TDR. 2008. World Health Organization, Geneva.
- New Diagnostics for Latent and Active Tuberculosis: State of the Art and Future Prospects. M Pai, R O'Brien. Semin Respir Crit Care Med. 2008. 29: 560-568.
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- Diagnostics for Tuberculosis: Global Demand and Market Potential. 2007. WHO/TDR.
- Operational feasibility of using loop-mediated isothermal amplification (LAMP) for diagnosis of pulmonary tuberculosis in microscopy centers of developing countries. CC Boehme, P Nabeta, G Henostroza, R Raqib, Z Rahim, M Gerhardt, E Sanga, M Hoelscher, T Notomi, T Hase, MD Perkins. J Clin Microbiol. 2007 Jun;45(6):1936-40. Epub 2007 Mar 28.
- Stop TB Partnership Retooling Task Force. New Technologies for TB Control: A Framework for their Adoption, Introduction and Implementation. Geneva, World Health Organization, 2007 (WHO/HTM/STB/2007.40).
- Stop TB Partnership Retooling Task Force. Engaging Stakeholders For Retooling TB Control. Geneva, World Health Organization, 2008.
- Stop TB Partnership Retooling Task Force. Liquid Culture Checklist. Geneva, World Health Organization. 2008.

Abbreviations/acronyms used in this document

Abbreviation	Means
BCG	Bacille Calmette-Guérin – current vaccine for TB
BSL	Biosafety level
CDC	United States Center for Disease Control and Prevention
DST	Drug susceptibility testing
FIND	Foundation for Innovative New Diagnostics
FM	Fluorescence microscopy
LED	Light-emitting diode
MDR-TB	Multidrug-resistant TB
MGIT	Mycobacterium Growth Indicator Tube
MODS	Microscopic Observation Drug Susceptibility
NTLP	National TB and Leprosy Programme
NTM	Nontuberculosis mycobacteria
NRA	Nitrate reductase assay
NTP	National TB Programme
TB	Tuberculosis
TDR	UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases
TST	Tuberculin skin test
UPS	Uninterrupted power supply
UV	Ultra-violet
WHO	World Health Organization
XDR-TB	Extensively drug-resistant TB

Acknowledgements

The following individuals were involved in the development of this framework, and their contribution is gratefully acknowledged.

Stop TB Partnership Task Force on Retooling

Mohamed Aziz, Rachel Bauquerez (Secretariat), Delia Boccia, Jean-Francois de Lavison, Saidi Egwaga, Ulrich Joseph Fruth, Michel Gasana, Christy Hanson (Co-chair), Barbara Laughon, David Lee, Davide Manissero, Robert Matiru, Vinand Nantulya (Co-chair), PR Narayanan, Ikushi Onozaki, Philip Onyebujoh, Andrew Ramsay, Guy Stallworthy, Javid Syed, Francis Varaine, Rosalind Vianzon, Karin Weyer, Jennifer Woolley.

Working Group on New TB Diagnostics

Giorgio Roscigno (Chair), Andrew Ramsay (Secretariat), core group members and sub-group chairs.

Other reviewers and contributors

Michael Brennan (Aeras), Leopold Joseph Blanc (WHO), Marcos Espinal (Stop TB Partnership), Ruth McNerney (London School of Hygiene & Tropical Medicine), David Moore (Imperial College), Madhukar Pai (McGill University), Mark Perkins (FIND), Mario Raviglione (WHO), Véronique Vincent (WHO), Diana Weil (WHO).

Additional support

The development of this document was made possible thanks to the generous contribution of the Stop TB Partnership.

Photos courteousy of

Becton, Dickinson and Company, Carl Zeiss, Inc., Cellestis, Inc., Hain Lifescience, Inc., Hangzhou Genesis Biodetection and Biocontrol, Ltd., Dr. Anandi Martin of the Institute of Tropical Medicine Antwerp, and TDR.

About the Stop TB Partnership's Retooling Task Force

Previous experience with the introduction of new tools for the control of other communicable diseases has shown that there can be a significant delay between the availability of new tools at global level and their eventual adoption and implementation at country level. Recognizing this important delay between formulation and implementation of policy, the Stop TB Partnership (http://www.stoptb.org) has established a Task Force on Retooling. Its task is to develop a framework for catalyzing policy-makers and practitioners at global and national levels towards accelerated introduction of new tools into national TB programmes and national immunization programmes. One of its aims is to stimulate discussion and planning for optimal, timely and appropriate introduction, adoption and implementation of new tools as they become available.

The main activities of the Retooling Task Force are to:

- Consolidate and share information from the working groups on drugs, diagnostics and vaccines on current product pipelines and timelines/milestones.
- Create opportunities for consultative dialogue with stakeholders from high TB burden countries, including ministries of health, NGOs, affected communities, etc.
- Facilitate the mobilization of financial and human resources for country-level introduction and deployment.
- Consolidate relevant lessons learnt form other disease areas to inform TB-specific processes for adoption, introduction and implementation.
- Facilitate operational research on introduction of new tools.
- Generate evidence to support the adoption of new tools.
- Fast-track the incorporation of new tools into WHO and national policies and guidelines.
- Enhance communication among all working groups around the theme of retooling.

More information about the Retooling Task Force is available at http://www.stoptb.org/retooling/ or by email to stoptbretooling@who.int.

Partne	Contac

Aeras Global TB Vaccine Foundation Mérieux-Alliance

Foundation for Innovative New Diagnostics (FIND) Global Alliance for TB Drug

Development Médecins Sans Frontières (MSF)

National Institute of Allergy and Infectious Diseases (NIAID) Research Institute of Tuberculosis

(RIT)

South African Medical Research Council Stop TB Partnership

Stop TB Partnership Global Drug Facility

Stop TB Partnership Global Laboratory Initiative Treatment Action Group (TAG)

United States Agency for International Development (USAID)

WHO Department of Technical Cooperation for Essential Drugs and Traditional Medicine WHO Special Programme for

Research and Training in Tropical Diseases (TDR)

WHO Stop TB Department

http://www.aeras.org/

http://www.biomerieux.com/

http://www.finddiagnostics.org/

http://new.tballiance.org/

http://www.msf.org/

http://www3.niaid.nih.gov/

http://www.jata.or.jp/eindex.htm

http://www.mrc.ac.za/

http://www.stoptb.org/

http://www.stoptb.org/gdf

http://www.who.int/tb/dots/laboratory/gli

http://www.aidsinfonyc.org/tag/

http://www.usaid.gov/

http://www.who.int/medicines/about/tcm/en/

http://www.who.int/tdr/

http://www.who.int/tb/en/

Annexure- II

VALUE ADDED COURSE

Newer Diagnostic modalities in TB and PECO 8

List of Students Enrolled (July 2018- August 2018)

Final Year MBBS Student			
Sl. No	**Name of the Student**	**Roll No**	**Signature**
1	AARTHI .H	U15MB250	Aaarthi. H.
2	ABARNA. M	U15MB251	Abarna
3	ABINAYA.J	U15MB252	Abinaya
4	ADARSH .S	U15MB253	Adarsh. S
5	AGILAN .A	U15MB254	Agilan
6	AKSHAYA .S	U15MB255	Akshaya
7	AKSSHAYA .M.R	U15MB256	Aksshya. M.R.
8	AMARNATH. S	U15MB257	Amarnath
9	AMUDHESAR .K.M	U15MB258	Amudesh K.M
10	ANANDH.S	U15MB259	Anandh
11	ARCHITH VIGNESH .B	U15MB260	Archithvignesh. B.
12	ARJUNBALAJI .A	U15MB261	Archith vignesh
13	ARUL NIVETHINI V.A	U15MB262	Arulnivethini. V.A
14	ARUL PRINCE. E	U15MB263	Arul prince
15	ARUN PRASAD. K	U15MB265	Arunprasad. K.
16	ARUNA .S	U15MB266	Arun Prasad
17	ARUNKUMAR .S	U15MB264	Arunkumar. S
18	ASAN THASTHAGIR. M	U15MB267	Asan Thasthagir
19	ASWIN. B	U15MB268	Aswin. B.
20	BALAMANI KANDAN. S	U15MB269	Balamani kandan

Dr Karuppaiah Pandi

RESOURCE PERSON

ASSISTANT PROFESSOR
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

Dr Sivaprakasam

CO-ORDINATOR

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

AARTHI . H
U15MB250

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Newer Diagnostic Modalities in TB

MCQs

Course Code: PECO 8

1. Tuberculosis is suspected when fever and cough lasts for more than how many weeks?

a. 1 week

b. 2 weeks

c. 3 weeks

d. 4 weeks

2. Which is the most preferred sample for detecting AFB in young children?

a. early morning gastric aspirate

b. early morning sputum sample

c. nasopharyngeal aspirate

d. urine sample

3. Induction of sputum is done using?

a. normal saline

b. hypertonic saline

c. distilled water

d. 5% dextrose

4. The most common form of extra pulmonary TB is?

a. TB spine

b. Lymph node TB

c. pleural TB

d. TB pericarditis

5. A ring enhancing lesion is pathognomonic of tuberculoma. T or F?

a. True

b. False

6.A new Case is a patient who has had no previous ATT or for less than how many weeks?

a.3 weeks

b.4 weeks

c.5 weeks

c.6 weeks

6. Which of the following is not a risk factor for TBM?

a. age more than 5 years

b. contact with an adult suffering from tuberculosis

c. PEM grade III and IV

d. HIV infection.

7. A positive mantoux test is defined as?

a. redness measuring more than 5 mm

b. redness measuring more than 10mm

c. induration measuring more than 5 mm

d. induration measuring more than 10mm

8. MR spectroscopy helps in differentiating Tuberculoma and Neurocysticercosis. Tor F?

a. True

b. False

9. BCG vaccination plays an important role in the diagnosis of childhood TB?

a. True

b. False

10. Nucleic acid amplification tests using polymerase chain reaction continues to be positive even after successful treatment.

a. True

b. False

1.

ABARNA.M
U15MB251

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

pNewer Diagnostic Modalities in TB

MCQs

Course Code: PECO 8

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b. False

1.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _____AKSHAYA .S __U15MB255___ has actively participated in the Value Added Course on *Newer Diagnostic Modalities in TB* during July 2018- August 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Satyamanasa
Gayathri Vinay
RESOURCE PERSON

Dr. Raghavendran
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _____ANANDH.S__U15MB259___ has actively participated in the Value Added Course on *Newer Diagnostic Modalities in TB* during July 2018- August 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Satyamanasa
Gayathri Vinay
RESOURCE PERSON

Dr. Raghavendran
COORDINATOR

Student Feedback Form

Course Name: **Newer Diagnostic Modalities in TB**
Subject Code: **PECO8**

Name of Student: Abarna - M Roll No.: U15MB217.

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

nil.

Date: 21.08.2018.

Signature

Date: 02.10.2019

From

Dr. Raghavendran V
Professor and Head,
Department of Pediatrics,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Newer Diagnostic Modalities in TB

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Newer Diagnostic Modalities in TB** from August 2018 to Septemner 2018 for 20 final year MBBS students. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,



Dr. Raghavendran V



Encl: Certificates

Photographs

PECO8 – Newer Diagnostic Modalities in TB, September 2018



Sri Lakshmi Narayana Institute of Medical Sciences

From

Dr. Vijay Kumar
Assistant Professor and Head,
Department of TB & Chest,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Date: 02.07.2018

To

The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS .

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Diagnosis and treatment of Drug sensitive Tuberculosis** for interns August to September 2018. We solicit your kind permission for the same.

Kind Regards

Dr. Vijay Kumar

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. Jaya lakshmi**

The HOD: **Dr. Vijay Kumar**

The Expert: **Dr. Prakash Rao Balan**

The committee has discussed about the course and is approved.

Dean

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Subject Expert

Dr. Prakash Rao Balan

HOD

Dr. Vijay Kumar

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

10.07.2018

Sub: Organising Value-added Course : DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS"**. The course content is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30.7.2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean
Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Course Proposal

Course Title: **DIAGNOSIS AND MANAGEMENT OF DRUG SENSITIVE TUBERCULOSIS**

Course Objective:

1. DIAGNOSIS OF DRUG SENSITIVE TUBERCULOSIS
2. MANAGEMENT OF DRUG SENSITIVE TUBERCULOSIS

Course Outcome: Improvement in management of Drug sensitive Tuberculosis

Course Audience: Medical Interns of 2018 Batch

Course Coordinator: Dr.Vijay Kumar
Course Faculties with Qualification and Designation:

1.Dr Vijay Kumar ,assistant professor
2.Dr.Prakash Rao Balan, Senior Resident

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Resource faculty	Time	Hours
1.	2/8/2018	Introduction	Dr.vijay kumar	2-6p..m	4
2.	4/8/2018	History , Epidemiology	Dr.prakash rao balan	2-6pm	4
3.	6/8/2018	Epidemiology-global perspective	Dr.vijay kumar	2-6p.m	4
4.	9/8/2018	Pathology	Dr.prakash rao balan	2-6p.m	4
5.	11/8/2018	The mycobacteria	Dr.vijay kumar	2-6p.m	4
6.	13/8/2018	Immunology of tuberculosis	Dr.prakash rao balan	2-6p m	4
7.	16/8/2018	Genetic susceptibility parameters in tuberculosis	Dr.vijay kumar	2-6P.M	4
8.	18/8/2018	Genetic of susceptibility of tuberculosis	Dr.prakash rao balan	2-6p.m	4

9.	20/8/2018	Laboratory diagnosis	Dr.vijay kumar	4-6p.m	2
		Total			34hr

REFERENCE BOOKS:

1. Miller GE(1990), The assessment of clinical skills/competence/performance. Academic medicine, 65(9), 63-67.

2. Syndneysmee ABC of skill learning BMJ 2003; 326.703-706.

3. Biomedical Waste Management & Handling Rules (2016) with Amendment, updated on 2018.

4. BangBangal V. Training and assessment of medical interns using “direct observation of procedural skills (DOPS)” tool in obstetrics and gynecology.*MOJ Womens Health.* 2018;7(4):120–123. DOI: 10.15406/mojwh.2018.07.00181al V. Training and assessment of medical interns using “direct observation of procedural skills (DOPS)” tool in obstetrics and gynecology. *MOJ Womens Health.* 2018;7(4):120–123. DOI: 10.15406/mojwh.2018

VALUE ADDED COURSE

1. Name of the programme & Code

DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS & CT01

2. Duration & Period

34 hrs & August – September 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time

8. Year of discontinuation: 2018

9. Summary report of each program year-wise

Value Added Course- August – September 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	CT 01	DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS	Dr. Vijay Kumar	CRRI Interns	8 students Aug – Sept 2018

10. Course Feed Back

Enclosed as Annexure- V

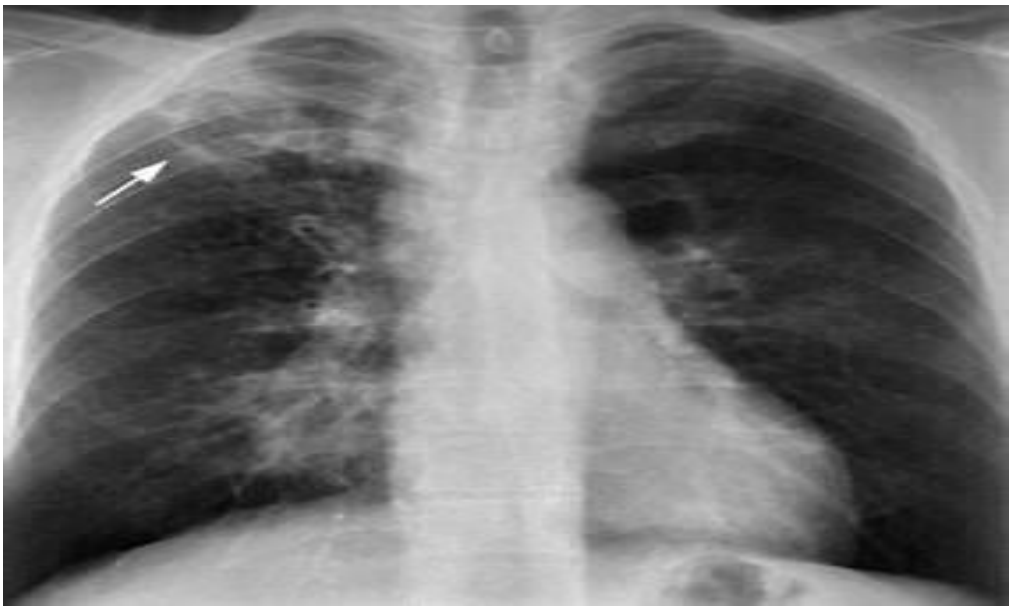


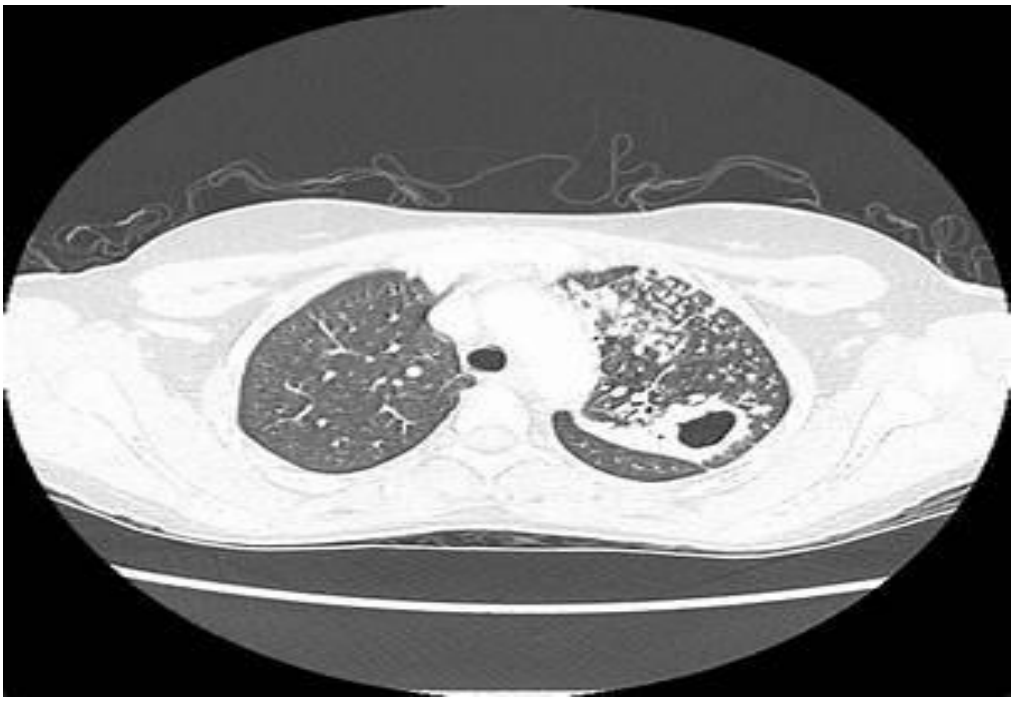
RESOURCE PERSON



COORDINATOR

TUBERCULOSIS





PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	Tuberculosis
Course Code	CT01
Objective	1.INTRODUCTION 2.HISTORY OF TUBERCULOSIS 3.TRANSMISSION OF TUBERCULOSIS: 3.CLASSIFICATION: 4.PATHOGENESIS AND PROGRESSION OF TUBERCULOSIS: PROGRESSION OF TUBERCULOSIS: 5.DIAGNOSIS OF TUBERCULOSIS: 6.TREATMENT OF DRUG SENSITIVE TUBERCULOSIS
Further learning opportunities	Diagnosis and treatment of Tuberculosis
Key Competencies	On successful completion of the course the students will have skill in diagnosing and treating Tuberculosis.
Target Student	CRRI Interns
Duration	34hrs August – September 2016
Theory Session	32 hours + 2 hours(MCQ)
Assessment Procedure	Multiple choice questions

1.INTRODUCTION:

Tuberculosis [TB] continues to intimidate the human race since time immemorial not only due to its effects as a medical malady, but also by its impact as a social and economic tragedy.

At the dawn of the new millennium, we are still mute witnesses to the silent yet efficient march of this sagacious disease, its myriad manifestations and above all its unequalled, vicious killing power.

Through the millennia, TB never ever disappeared from the developing world. In the developed world, it only went into hibernation for a while in the mid and late 1970s, to explode once again with the advent of human immunodeficiency virus [HIV] infection and acquired immunodeficiency syndrome [AIDS] pandemic in the 1980s.

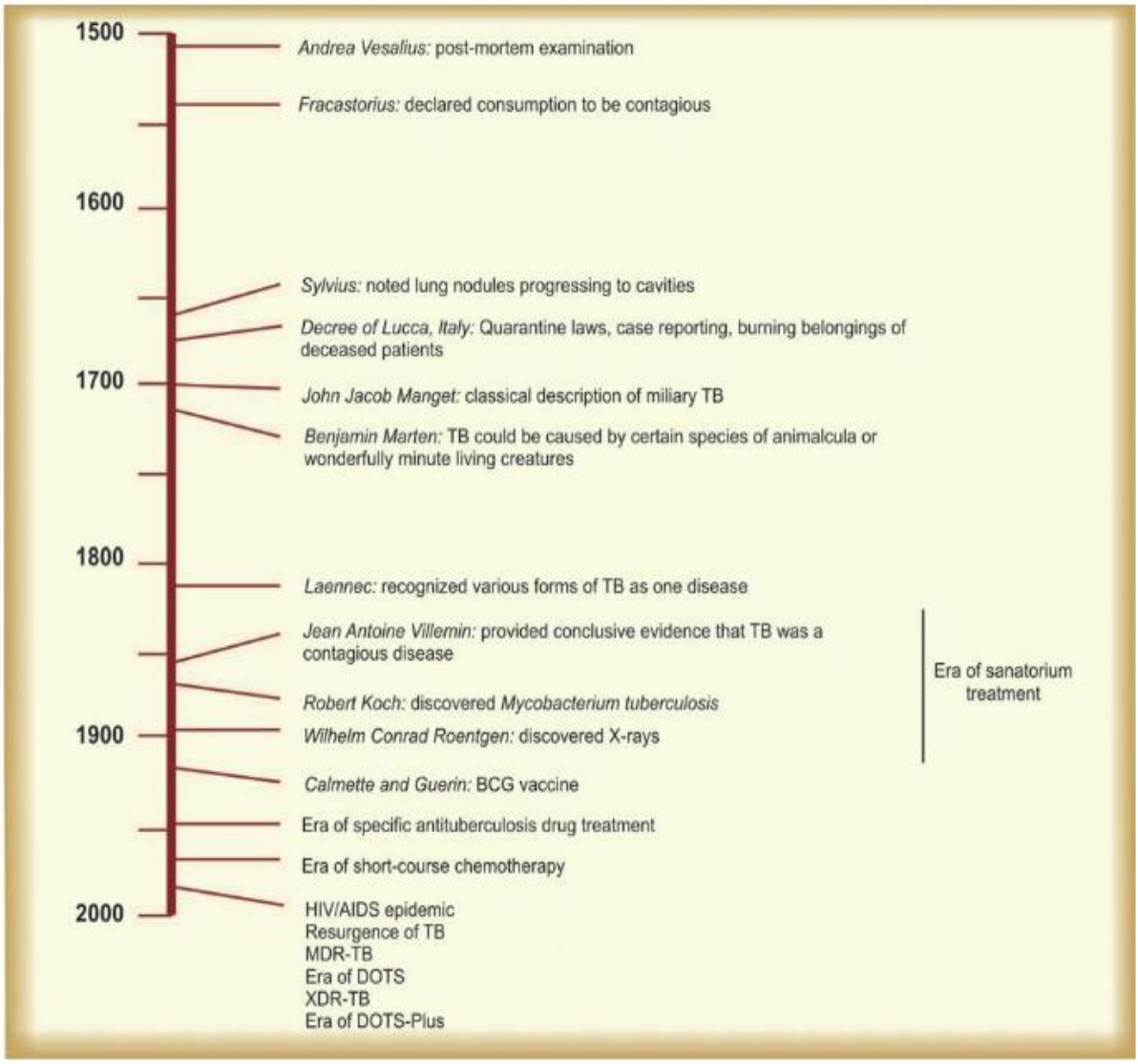
There have been references to this ancient scourge in the Vedas [vide infra] and it was called “rajayakshma” [meaning “wasting disease”].

Hippocrates [460-377 B.C.] called the disease “pthisis”, a Greek word which meant “to consume”, “to spit” and “to waste away“ (2,3).

The word “consumption” [derived from the Latin word “consumere”] has also been used to describe TB in English literature.

The Hebrew word “schachepheth” [meaning “waste away”] has been used in the Bible. J.L. Schonlein, Professor of Medicine at Zurich, is credited to have named the disease “tuberculosis”.

2.HISTORY OF TUBERCULOSIS:



3.TRANSMISSION OF TUBERCULOSIS:

M. tuberculosis is carried in airborne particles, called droplet nuclei, of 1– 5 microns in diameter.

Infectious droplet nuclei are generated when persons who have pulmonary or laryngeal TB disease cough, sneeze, shout, or sing**.**

3.CLASSIFICATION:

Based on sequence of events following the first exposure

Primary TB

- Disease caused by *Mycobacterium tuberculosis* in a person with no previous exposure

Progressive primary TB

- Primary disease which is generally self-limiting may progress to give rise to larger lesions

Post-primary TB

- Disease which is the result of endogenous reactivation [in a person previously exposed to *Mycobacterium tuberculosis*] or exogenous reinfection

Based on location

Localized disease

- Pulmonary TB
- Extra-pulmonary TB
- Disseminated TB
  - Tuberculosis disease process involving more than 2 non-contiguous sites. Disseminated TB can occur in primary [early generalized TB] and post-primary [late generalized TB] forms of the disease. When the lesions are uniform and are of the size of a millet seed [< 2 mm], the term miliary TB is used

TB = tuberculosis

4.PATHOGENESIS AND PROGRESSION OF TUBERCULOSIS:

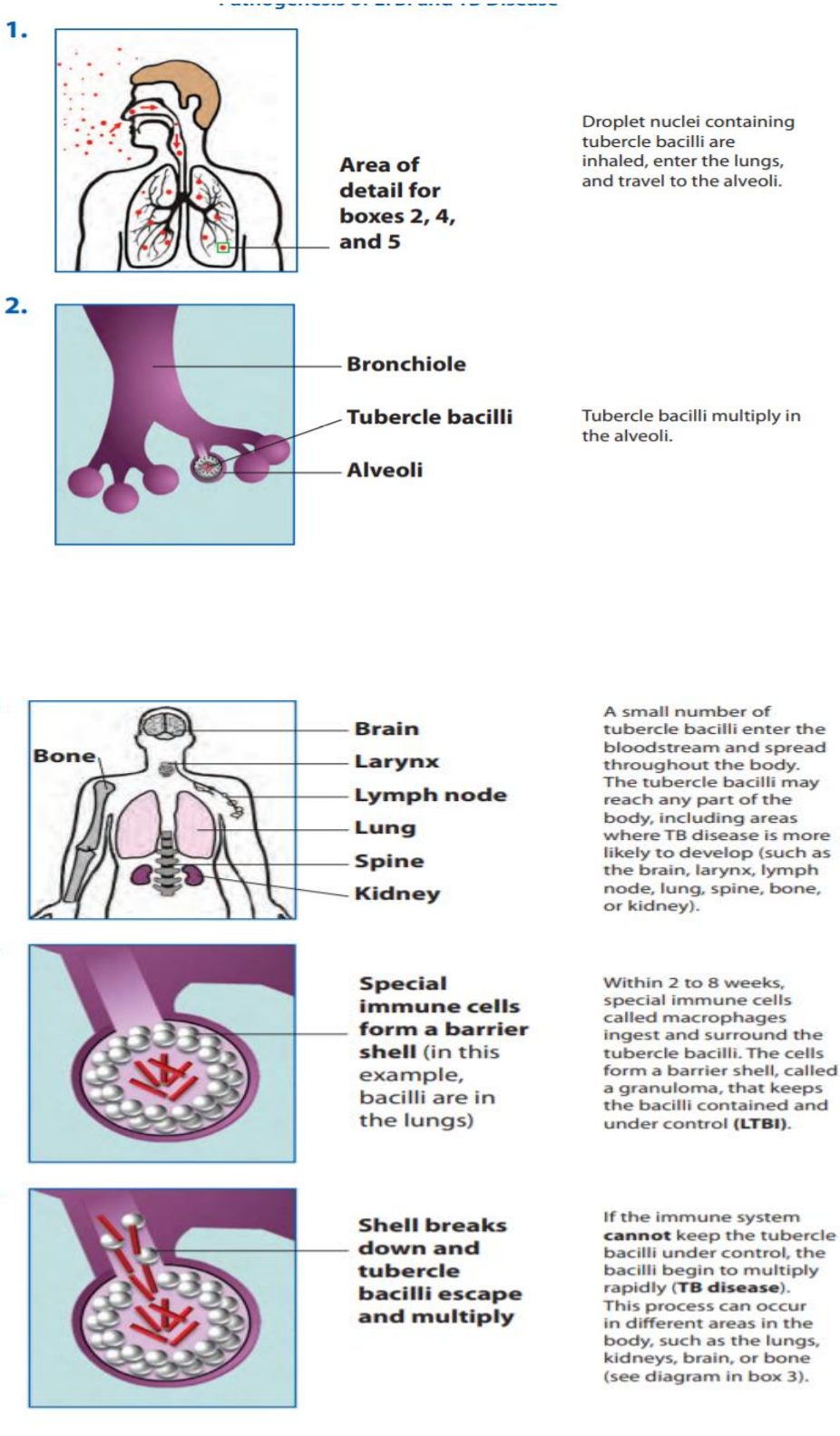
The lung is the predominant primary site of TB infection in postnatal life.

CONDITIONS PREDISPOSING TO TUBERCULOSIS:

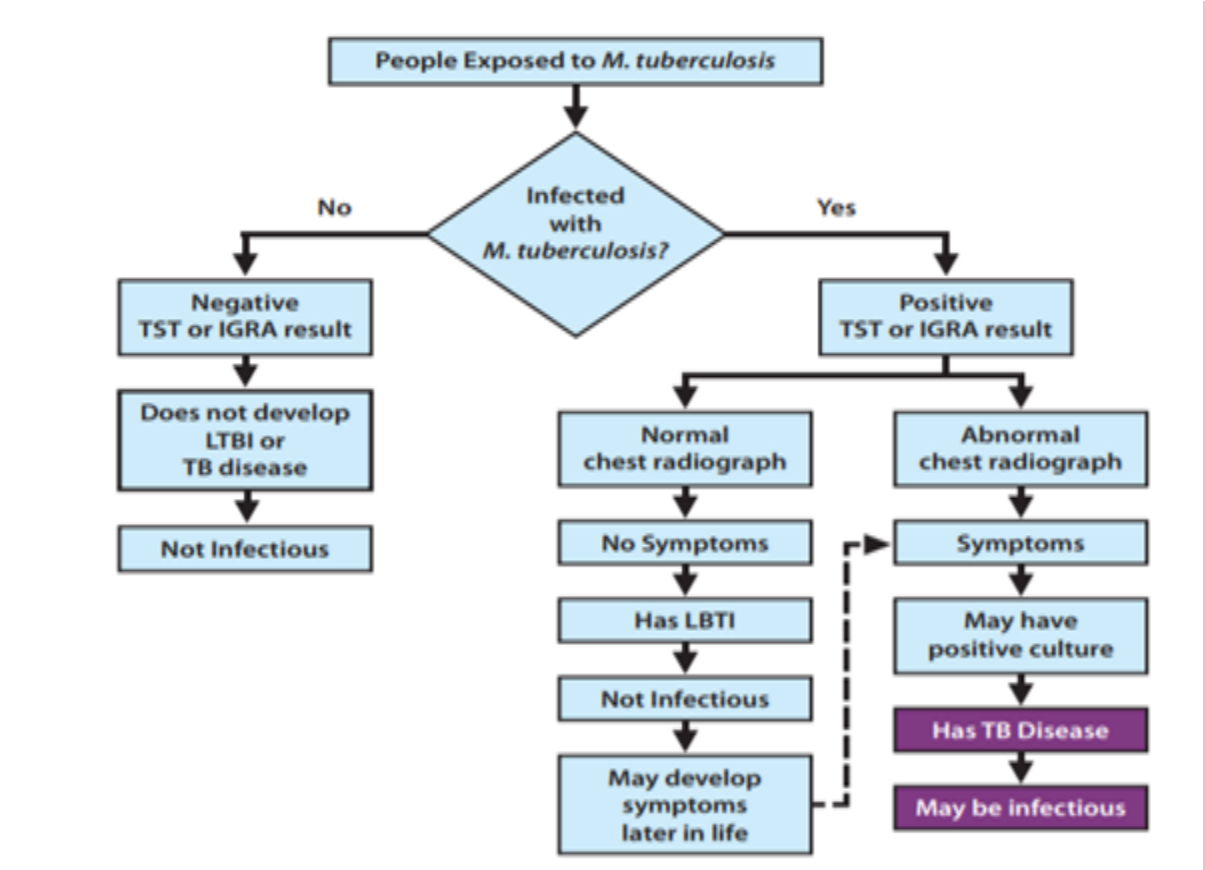
Immunodeficiency disorders affecting CMI including HIV infection and AIDS
Immunosuppressive therapy
Immunomodulator drugs [e.g. infliximab, etanercept]
Malignant neoplasm [carcinomas of the head and neck, stomach, intestines and lungs; Hodgkin's disease, non-Hodgkin's lymphoma, acute lymphocytic and myelogenous leukaemia]
Silicosis
High dose, long-term corticosteroid treatment
Poorly controlled diabetes mellitus
Chronic renal failure, haemodialysis
Connective tissue disorders
Organ transplantation
Intravenous drug abuse, heroin addiction
Tobacco smoking

CMI = cell-mediated immunity; HIV = human immunodeficiency virus; AIDS = acquired immunodeficiency syndrome

PATHOGENESIS OF TUBERCULOSIS**:**



PROGRESSION OF TUBERCULOSIS:



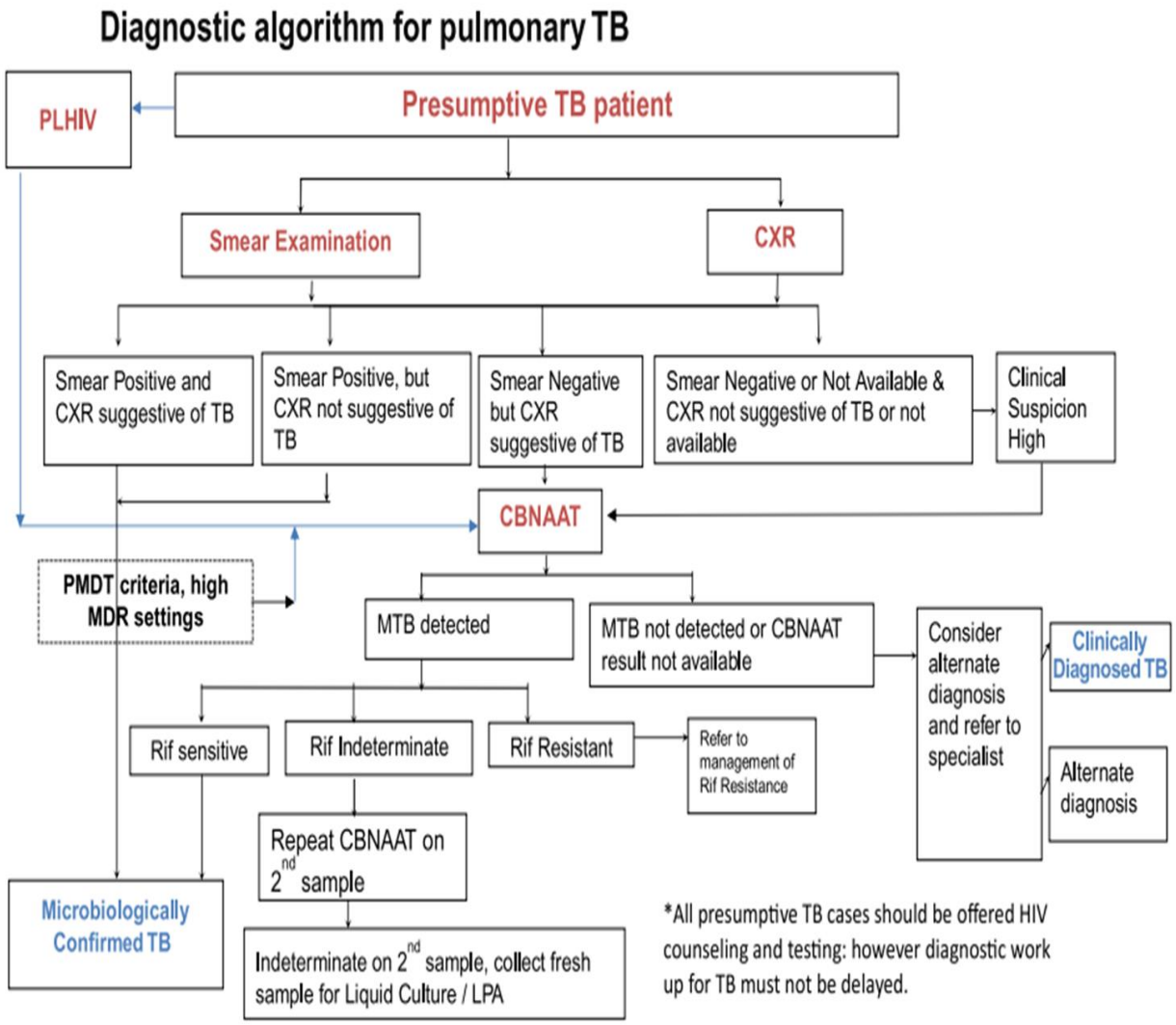
5.DIAGNOSIS OF TUBERCULOSIS:

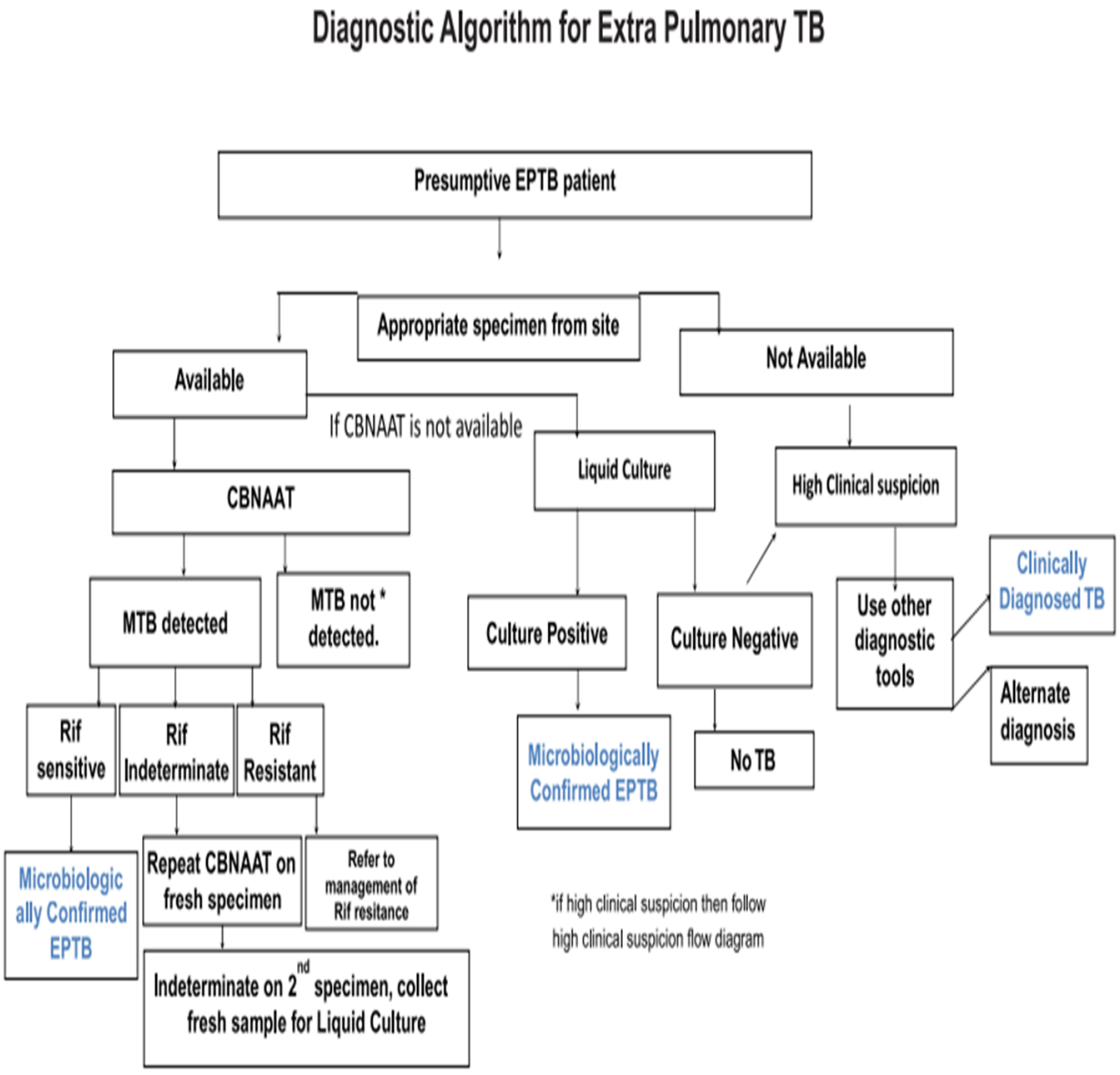
The primary screening method for tuberculosis (TB) infection (active or latent) is the Mantoux tuberculin skin test with purified protein derivative (PPD). An in vitro blood test based on interferon-gamma release assay (IGRA) with antigens specific for *Mycobacterium tuberculosis* can also be used to screen for latent TB infection. IGRA assays offer certain advantages over tuberculin skin testing

- **Molecular diagnosis** : PCR- Gene Xpert , LPA
- **Bacterialogical test :** Sputum smear for AFB ,Sputum for AFB culture
- **Histopathological diagnosis:** FNAC/Biopsy

- **Radiological diagnosis:** X-Ray, USG, CT scan, MRI

Clinical diagnosis





6.TREATMENT OF DRUG SENSITIVE TUBERCULOSIS:

Administration of daily fixed dose combination of first-line AKT as per appropriate weight bands

Weight Category (2019)	Number of Tablets (FDCs)	
	Intensive Phase - 4FDC (HRZE) 75/150/400/275	Continuation Phase -3FDC (HRE) 75/150/275
25-34	2	2
35-49	3	3
50-64	4	4
65-75	5	5
>75Kg*	6	6

*patients >75 kg may receive 5 tablets/day if they do not tolerate this dose

Annexure- II

VALUE ADDED COURSE

DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS & CT01

4. List of Students Enrolled AUG 2018 – SEPT 2018

1st Year MBBS Student			SIGNATURE
Sl. No	Name of the Student	Roll No	
1	NILA.R	U14MB281	
2	NIMINESH.B.S	U14MB282	
3	NIVETHA. B	U14MB283	
4	NONG LEGO	U14MB284	
5	OBED NEWMAI	U14MB285	
6	PAVITHRA. S	U14MB286	
7	PRADEEPA. A	U14MB287	
8	PRASANNA.S	U14MB288	

RESOURCE PERSON

COORDINATOR

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS

MULTIPLE CHOICE QUESTIONS.

10/10

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

CANDIDATE AND ASSESSOR INFORMATION

Course code: CT 01

Candidate Name	PAVITHRA. S	**Assessor Name**	DR. VIJAY KUMAR
Date of Assessment	20.8.2018	**Assessor Position**	ASSISTANT PROFESSOR + HOD

1. Which of the following family members exposed to TB would be at highest risk for contracting the disease?

A 45-year-old mother

B 17-year-old daughter

C 8-year-old son

~~D~~ 76-year-old grandmother

2. Which of the following symptoms is common in patients with TB?

~~A~~ Weight loss

B Increased appetite

C Dyspnea on exertion

D Mental status changes

3.The Causative agent of Tuberculosis is said to be:

A Mycobacterium Tuberculosis

B Hansen's Bacilli

C Bacillus Anthracis

D Group A Beta Hemolytic Streptococcus

4. A patient with primary TB infection can expect to develop which of the following conditions?

A Active TB within 2 weeks

B Active TB within 1 month

C A fever that requires hospitalization

D A positive skin test

5. Which of the following antituberculous drugs can cause damage to the eighth cranial nerve?

A Streptomycin

B Isoniazid

C Para-aminosalicylic acid

D Ethambutol hydrochloride

6. Community health nurse is conducting an educational session with community members regarding TB. The nurse tells the group that one of the first symptoms associated with TB is:

A A bloody, productive cough

B A cough with the expectoration of mucoid sputum

C Chest pain

D Dyspnea

7. INH treatment is associated with the development of peripheral neuropathies. Which of the following interventions would the doctor teach the patient to help prevent this complication?

A Adhere to a low cholesterol diet

B Supplement the diet with pyridoxine (vitamin B6)

C Get extra rest

D Avoid excessive sun exposure

8. A client with a positive Mantoux test result will be sent for a chest x-ray.

For which of the following reasons is this done?

A To confirm the diagnosis

B To determine if a repeat skin test is needed

C To determine the extent of the lesions

D To determine if this is a primary or secondary infection

9. A patient has active TB. Which of the following symptoms will he exhibit?

A Chest and lower back pain

B Chills, fever, night sweats, and hemoptysis

C Fever of more than 104*F and nausea

D Headache and photophobia

10. A chest x-ray should a patient's lungs to be clear. His Mantoux test is positive, with a 10mm if induration. His previous test was negative. These test results are possible because:

A He had TB in the past and no longer has it.

B He was successfully treated for TB, but skin tests always stay positive

C He's a "seroconverter", meaning the TB has gotten to his bloodstream

D He's a "tuberculin converter," which means he has been

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS

10/10

MULTIPLE CHOICE QUESTIONS.

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

CANDIDATE AND ASSESSOR INFORMATION

Course code: CT 01

Candidate Name	NIVETHA. B	Assessor Name	DR. VIJAY KUMAR
Date of Assessment	20. 8. 2018	Assessor Position	ASSISTANT PROFESSOR & HOD

1. Which of the following family members exposed to TB would be at highest risk for contracting the disease?

A 45-year-old mother

B 17-year-old daughter

C 8-year-old son

D 76-year-old grandmother

2. Which of the following symptoms is common in patients with TB?

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D He's a "tuberculin converter," which means he has been

Sri Lakshmi Narayana Institute of Medical Sciences

CERTIFICATE OF MERIT

This is to certify that __Nivetha.B(U14MB283)_____ has actively participated in the Value Added Course on DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS held during August - September 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Prakash Rao Balan
RESOURCE PERSON

Dr. Vijay Kumar
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

This is to certify that __Pavithra.S(U14MB286)_____ has actively participated in the Value Added Course on DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS held during August - September 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Prakash Rao Balan
RESOURCE PERSON

Dr. Vijay Kumar
COORDINATOR

Student Feedback Form

Course Name: **DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS**

Subject Code: **CT 01**

Name of Student: NIVETHA . B Roll No.: U14HB283

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

GOOD

Signature

Date: 20 . 8 . 2018

Student Feedback Form

Course Name: **DIAGNOSIS AND TREATMENT OF DRUG SENSITIVE TUBERCULOSIS**

Subject Code: **CT 01**

Name of Student: PAVITHRA . S Roll No.: 114MB236

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date: 20.8.2018

Date: 20.8.2018

From

Dr. Vijay Kumar
Assistant Professor and Head,
Department of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: DIAGNOSIS AND MANAGEMENT OF DRUG SENSITIVE TUBERCULOSIS

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: : **DIAGNOSIS AND MANAGEMENT OF DRUG SENSITIVE TUBERCLOSIS , AUG-SEP 2018** for 8 interns . We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. Vijay Kumar

Encl: Certificates

Photographs



SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Osudu, Agaram Village, Villianur commune, Kuduppakkam Post, Pudhucherry-605 502

Date: 16/07/2018

From

Dr. Somashekar I Tolanur
Professor and Head,
Department of Anatomy,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry-2.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry-2.

Sub: Permission to conduct value-added course: 3D printing in Anatomy Education & its applications – reg.

Dear Madam,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: 3D **printing in Anatomy Education & its Applications** for 1st MBBS students of 2018-2019 batch. We solicit your kind permission for the same.

Kind Regards,

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village,Pondicherry-605 502

FOR THE USE OF DEAN'S OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. Jayalakshmi. G**
The HOD: **Dr. Somashekar I Tolanur**
The Expert: **Dr. S Shanthini**

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign & Seal)	(Sign & Seal)	(Sign & Seal)

Dr. G. JAYALAKSHMI, BSc., MBBS., DICD., PhD
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kuduppakkam Post
Villianur Commune, Puducherry-605502

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village,Pondicherry-605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

23.07.2018

Sub: Organizing Value-added Course on "3D printing in Anatomy Education & its applications" – Reg.

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry affiliated to Bharath Institute of Higher Education and Research University is organizing a value added course on "**3D printing in Anatomy Education & its applications**" during September 2018 for Ist year M.B.B.S students (2018 – 2019 Batch). The course content for the same is enclosed below."

Dean
(Dr.G Jayalakshmi)

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502

Encl: Copy of Course content

COURSE CONTENT

Particulars	Description
Course Title	3D printing in Anatomy Education & its applications
Course Code	AN100
Topics	1. Introduction to 3D printing 2. Terminology in 3D printing 3. History of 3D printing 4. General principles in 3D printing 5. Modeling 6.Printing 7.Finishing 8. Materials used for 3D printing 9. Multimaterial 3D printing 10. Processes and Printers 11. Applications in Anatomy 12. Video demonstration of 3D printing 13. Health & safety 14.Hazard control 15. Legal aspects – Intellectual property
Further learning opportunities	4D printing
Key Competencies	On successful completion of the course the students will have better understanding of complex human anatomical structures which helps in better learning & understanding of anatomy
Target Student	1st MBBS Students
Duration	30hrs, September 2018
Theory Session	28 hrs
Practical Session	2hrs
Assessment Procedure	Short answer questions

Course Proposal

Course Title:

3D printing in Anatomy Education & its applications

Course Objective:

1. Introduce the students to 3d anatomical models
2. To learn complex anatomical structures with better understanding and orientation

Course Outcome:

Gain knowledge on 3d oriented anatomical structures for better understanding and easy learning

Course Audience: 1st year MBBS

Course Coordinator: Dr.Somashekar I Tolanur

Course Faculties with Qualification and Designation:

1. Dr. B Rajesh, M.Sc., Ph.D, Professor/Anatomy
2. Dr. S Shanthini, M.B.B.S, M.D, Assistant Professor/Anatomy
2. Dr. B Anitha, M.B.B.S, M.D, Assistant Professor/Anatomy

Course Curriculum/subtopics with schedule (30 hours)

Sl.No	Date	Topic	Time	Hours	Faculty Name
1.	01.09.2018	Introduction to 3D printing	2-4p.m	2	Dr S Shanthini
2.	03.09.2018	Terminology used in 3D printing	4-6p.m	2	Dr. B Rajesh
3.	04.09.2018	History of 3d printing	4-6p.m	2	Dr. B Anitha
4.	05.09.2018	General principles in 3d printing	4-6p.m	2	Dr.S Shanthini
5.	06..09.2018	Modeling	4-6p.m	2	Dr. B Rajesh
6.	07.09.2018	Printing	4-6p.m	2	Dr. B Anitha
7.	08.09.2018	Finishing	2-4p.m	2	Dr. S Shanthini
8.	10.09.2018	Materials used for 3D printing	4-6p.m	2	Dr. B Rajesh
9.	11.09.2018	Multimaterial 3D printing	4-6p.m	2	Dr. B Anitha
10.	12.09.2018	Processes & Printers	4-6p.m	2	Dr. B Rajesh
11.	13.09.2018	Applications in Anatomy	4-6p.m	2	Dr. B Anitha
12.	15.09.2018	Video Demonstration of 3D printing	2-4p.m	2	Dr. S Shanthini
13.	19.09.2018	Health & safety	4-6p.m	2	Dr. B Anitha
14.	21.09.2018	Hazard control	4-6p.m	2	Dr. B Rajesh
15.	29.09.2018	Legal aspects – Intellectual property	4-6p.m	2	Dr. S Shanthini
			Total Hours	30	

REFERENCE BOOKS/ARTICLES:

1. Ye, Z., Dun, A., Jiang, H. *et al.* The role of 3D printed models in the teaching of human anatomy: a systematic review and meta-analysis. *BMC Med Educ* 20, 335 (2020). https://doi.org/10.1186/s12909-020-02242-x.
2. Sharma SGS. 3D printing and its future in medical world. J Med Res Innov. 2019;3(1):e000141.
3. Garas M, M V, G N, K M-D, J H. 3D-Printed specimens as a valuable tool in anatomy education: A pilot study. Ann Anat. 2018;219:57–64.
4. Mogali SR, WY Y, HKJ T, GJS T, PH A, N Z, N L-B, MA F. Evaluation by medical students of the educational value of multi-material and multicolored three-dimensional printed models of the upper limb for anatomical education. Anat Sci Educ. 2018;11(1):54–64.
5. M V, V P. 3D printing: a valuable resource in human anatomy education. Anat Sci Int. 2015;90(1):64–5.
6. AbouHashem Y, Dayal M, Savanah S, Strkalj G. The application of 3D printing in anatomy education. Med Educ Online. 2015;20.
7. McMenamin PG, MR Q, CR M, JW A. The production of anatomical teaching resources using three-dimensional (3D) printing technology. Anat Sci Educ. 2014;7(6):479–86.

VALUE ADDED COURSE

1. Name of the programme & Code

3D printing in Anatomy Education & its applications (Code - AN100)

2. Duration & Period

30 hrs & September 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short Answer Questions - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time - September 2018

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course - September 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	Code - AN100	3D printing in Anatomy Education & its applications	Dr. S Shanthini Dr. B Rajesh Dr. B Anitha	Ist M.B.B.S (2018 – 2019 batch)	20 / September 2018

10. Course Feed Back

Enclosed as Annexure- V

COORDINATOR
(Dr. Somasekar I Tolanur)

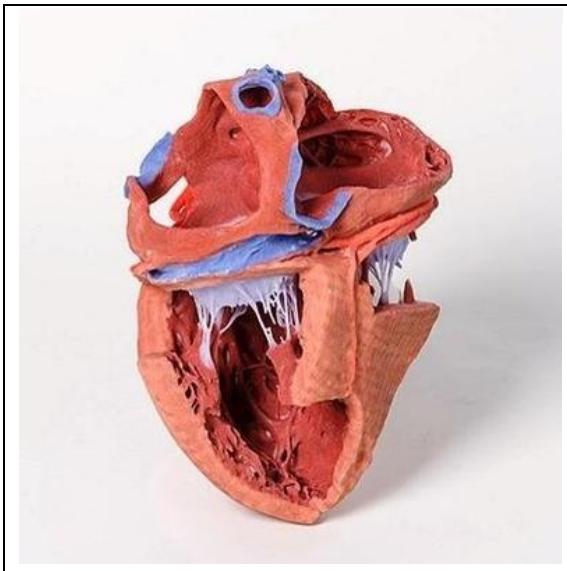
PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village, Pondicherry-605 502

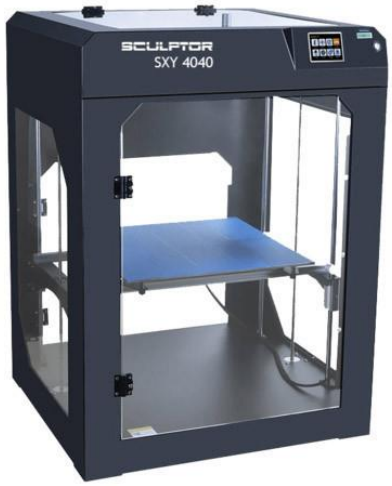
RESOURCE PERSONS

1. **(Dr. S Shanthini)**
2. **(Dr. B Rajesh)**
3. **(Dr. B Anitha)**

Annexure 1

3D Printing in Anatomy Education & its Applications





PARTICIPANT HAND BOOK

BIHER SLIMS

COURSE DETAILS

Particulars	Description
Course Title	3D printing in Anatomy Education & its applications
Course Code	AN100
Topics	1. Introduction to 3D printing 2. Terminology in 3D printing 3. History of 3D printing 4. General principles in 3D printing 5. Modeling 6.Printing 7.Finishing 8. Materials used for 3D printing 9. Multimaterial 3D printing 10. Processes and Printers 11. Applications in Anatomy 12. Video demonstration of 3D printing 13. Health & safety 14.Hazard control 15. Legal aspects – Intellectual property
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Target Student	1st MBBS Students
Duration	30hrs September 2018
Theory Session	28 hrs
Practical Session	2hrs
Assessment Procedure	Multiple choice questions

Introduction:

3D printing or additive manufacturing is a process of making three dimensional solid objects from a digital file. The creation of a 3D printed object is achieved using additive processes. In an additive process an object is created by laying down successive layers of **material** until the object is created.

The umbrella term *additive manufacturing (AM)* gained popularity in the 2000s, inspired by the theme of material being added together (in any of various ways). In contrast, the term *subtractive manufacturing* appeared as a retronym for the large family of machining processes with material *removal* as their common process. The term *3D printing* still referred only to the polymer technologies in most minds, and the term *AM* was more likely to be used in metalworking and end-use part production contexts than among polymer, inkjet, or stereolithography enthusiasts. Inkjet was the least familiar technology even though it was invented in 1950 and poorly understood because of its complex nature. The earliest inkjets were used as recorders and not printers. As late as the 1970s the term recorder was associated with inkjet. Continuous Inkjet later evolved to On-Demand or Drop-On-Demand Inkjet. Inkjets were single nozzle at the start and now have thousands of nozzles for printing in each pass over a surface.

By the early 2010s, the terms *3D printing* and *additive manufacturing* evolved senses in which they were alternate umbrella terms for additive technologies, one being used in popular language by consumer-maker communities and the media and the other used more formally by industrial end-use part producers, machine manufacturers, and global technical standards organizations. Until recently, the term *3D printing* has been associated with machines low in price or in capability. *3D printing* and *additive manufacturing* reflect that the technologies share the theme of material addition or joining throughout a 3D work envelope under automated control. Peter Zelinski, the editor-in-chief of *Additive Manufacturing* magazine, pointed out in 2017 that the terms are still often synonymous in casual usage, but some manufacturing industry experts are trying to make a distinction whereby additive manufacturing comprises 3D printing plus other technologies or other aspects of a manufacturing process.

Terminology:

Terms that have been used as synonyms or hypernyms have included *desktop manufacturing*, *rapid manufacturing* (as the logical production-level successor to rapid prototyping), and *on-demand manufacturing* (which echoes on-demand printing in the 2D sense of *printing*). Such application of the adjectives *rapid* and *on-demand* to the noun *manufacturing* was novel in the 2000s reveals the prevailing mental model of the long industrial era in which almost all production manufacturing involved long lead times for laborious tooling development. Today, the term *subtractive* has not replaced the term *machining*, instead complementing it when a term that covers any removal method is needed. Agile tooling is the use of modular means to design tooling that is produced by additive manufacturing or 3D printing methods to enable quick prototyping and responses to

tooling and fixture needs. Agile tooling uses a cost-effective and high-quality method to quickly respond to customer and market needs, and it can be used in hydro-forming, stamping, injection molding and other manufacturing processes.

History:

1950s

The general concept of and procedure to be used in 3D-printing was first described by Raymond F. Jones in his story, "Tools of the Trade," published in the November 1950 issue of Astounding Science Fiction magazine. He referred to it as a "molecular spray" in that story.

1970s

In 1971, Johannes F Gottwald patented the Liquid Metal Recorder, US3596285A, a continuous Inkjet metal material device to form a removable metal fabrication on a reusable surface for immediate use or salvaged for printing again by remelting. This appears to be the first patent describing 3D printing with rapid prototyping and controlled on-demand manufacturing of patterns.

The patent states " As used herein the term printing" is not intended in a limited sense but includes writing or other symbols, character or pattern formation with an ink. The term ink as used in is intended to include not only dye or pigment-containing materials, but any flowable substance or composition suited for application to the surface for forming symbols, characters, or patterns of intelligence by marking". The preferred ink is of a Hot melt" type. The range of commercially available ink compositions which could meet the requirements of the invention are not known at the present time. However, satisfactory printing according to the invention has been achieved with the conductive metal alloy as ink."

"But in terms of material requirements for such large and continuous displays, if consumed at theretofore known rates, but increased in proportion to increase in size, the high cost would severely limit any widespread enjoyment of a process or apparatus satisfying the foregoing objects." "It is therefore an additional object of the invention to minimize use to materials in a process of the indicated class." "It is a further object of the invention that materials employed in such a process be salvaged for reuse."

"According to another aspect of the invention, a combination for writing and the like comprises a carrier for displaying an intelligence pattern and an arrangement for removing the pattern from the carrier." In 1974, David E. H. Jones laid out the concept of 3D printing in his regular column Ariadne in the journal New Scientist.

1980s

Early additive manufacturing equipment and materials were developed in the 1980.

In April 1980, Hideo Kodama of Nagoya Municipal Industrial Research Institute invented two additive methods for fabricating three-dimensional plastic models with photo-hardening thermoset polymer, where the UV exposure area is controlled by a mask pattern or a scanning fiber transmitter. He filed a patent for this XYZ plotter, which was published on 10 November 1981. (JP S56-144478). His research results as journal papers were published in April and November in 1981. However, there was no reaction to the series of his publications. His device was not highly evaluated in the laboratory and his boss did not show any interest. His research budget was just 60,000 yen or $545 a year. Acquiring the patent rights for the XYZ plotter was abandoned, and the project was terminated. A Patent US

4323756, Method of Fabricating Articles by Sequential Deposition, Raytheon Technologies Corp granted 6 April 1982 using hundreds or thousands of 'layers' of powdered metal and a laser energy source is an early reference to forming "layers" and the fabrication of articles on a substrate.

In 2 July 1984, American entrepreneur Bill Masters filed a patent for his Computer Automated Manufacturing Process and System (US 4665492). This filing is on record at the USPTO as the first 3D printing patent in history; it was the first of three patents belonging to Masters that laid the foundation for the 3D printing systems used today.

On 16 July 1984, Alain Le Méhauté, Olivier de Witte, and Jean Claude André filed their patent for the stereolithography process.[18] The application of the French inventors was abandoned by the French General Electric Company (now Alcatel-Alsthom) and CILAS (The Laser Consortium). The claimed reason was "for lack of business perspective"

In 1983, Robert Howard started R.H. Research, later named Howtek, Inc. in Feb 1984 to develop a color inkjet 2D printer, Pixelmaster, commercialized in 1986, using Thermoplastic (hot-melt) plastic ink. A team was put together, 6 members from Exxon Office Systems, Danbury Systems Division, an inkjet printer startup and some members of Howtek, Inc group who became popular figures in 3D Printing Industry. One Howtek member, Richard Helinski patent US5136515A, Method and Means for constructing three-dimensional articles by particle deposition, application 11/07/1989 granted 8/04/1992 formed a New Hampshire company C.A.D-Cast, Inc, name later changed to Visual Impact Corporation (VIC) on 8/22/1991. A prototype of the VIC 3D printer for this company is available with a video presentation showing a 3D model printed with a single nozzle inkjet. Another employee Herbert Menhennett formed a New Hampshire company HM Research in 1991 and introduced the Howtek, Inc, inkjet technology and thermoplastic materials to Royden Sanders of SDI and Bill Masters of Ballistic Particle Manufacturing (BPM) where he worked for a number of years. Both BPM 3D printers and SPI 3D printers use Howtek, Inc style Inkjets and Howtek, Inc style materials. Royden Sanders licensed the Helinksi patent prior to manufacturing the Modelmaker 6 Pro at Sanders prototype, Inc (SPI) in 1993. James K. McMahon who was hired by Howtek, Inc to help develop the inkjet, later worked at Sanders Prototype and now operates Layer Grown Model Technology, a 3D service provider specializing in Howtek single nozzle inkjet and SDI printer support. James K. McMahon worked with Steven Zoltan, 1972 drop-on-demand inkjet inventor, at Exxon and has a patent in 1978 that expanded the understanding of the single nozzle design inkjets(Alpha jets) and help perfect the Howtek, Inc hot-melt inkjets. This Howtek hot-melt thermoplastic technology is popular with metal investment casting, especially in the 3D printing jewelry industry. Sanders (SDI) first Modelmaker 6Pro customer was Hitchner Corporations, Metal Casting Technology, Inc in Milford, NH a mile from the SDI facility in late 1993-1995 casting golf clubs and auto engine parts.

On 8 August 1984 a patent, US4575330, assigned to UVP, Inc., later assigned to Chuck Hull of 3D Systems Corporation was filed, his own patent for a stereolithography fabrication system, in which individual laminae or layers are added by curing photopolymers with impinging radiation, particle bombardment, chemical reaction or just ultraviolet light lasers. Hull defined the process as a "system for generating three-dimensional objects by creating a cross-sectional pattern of the object to be formed,". Hull's contribution was the STL (Stereolithography) file format and the digital slicing and infill strategies common to many processes today. In 1986, Charles "Chuck" Hull was granted a patent for this system, and his company, 3D Systems Corporation was formed and it released the first commercial 3D printer, the SLA-1. later in 1987 or 1988. The technology used by most 3D printers to date—

especially hobbyist and consumer-oriented models—is fused deposition modeling, a special application of plastic extrusion, developed in 1988 by S. Scott Crump and commercialized by his company Stratasys, which marketed its first FDM machine in 1992.

1990s

AM processes for metal sintering or melting (such as selective laser sintering, direct metal laser sintering, and selective laser melting) usually went by their own individual names in the 1980s and 1990s. At the time, all metalworking was done by processes that are now called non-additive (casting, fabrication, stamping, and machining); although plenty of automation was applied to those technologies (such as by robot welding and CNC), the idea of a tool or head moving through a 3D work envelope transforming a mass of raw material into a desired shape with a toolpath was associated in metalworking only with processes that removed metal (rather than adding it), such as CNC milling, CNC EDM, and many others. But the automated techniques that *added* metal, which would later be called additive manufacturing, were beginning to challenge that assumption. By the mid-1990s, new techniques for material deposition were developed at Stanford and Carnegie Mellon University, including microcasting and sprayed materials. Sacrificial and support materials had also become more common, enabling new object geometries.

The term *3D printing* originally referred to a powder bed process employing standard and custom inkjet print heads, developed at MIT by Emanuel Sachs in 1993 and commercialized by Soligen Technologies, Extrude Hone Corporation, and Z Corporation. The year 1993 also saw the start of an inkjet 3D printer company initially named Sanders Prototype,Inc and later named Solidscape, introducing a high-precision polymer jet fabrication system with soluble support structures, (categorized as a "dot-on-dot" technique). In 1995 the Fraunhofer Society developed the selective laser melting process.

2000 - 2020

Fused Deposition Modeling (FDM) printing process patents expired in 2009

As the various additive processes matured, it became clear that soon metal removal would no longer be the only metalworking process done through a tool or head moving through a 3D work envelope, transforming a mass of raw material into a desired shape layer by layer. The 2010s were the first decade in which metal end use parts such as engine brackets and large nuts would be grown (either before or instead of machining) in job production rather than obligately being machined from bar stock or plate. It is still the case that casting, fabrication, stamping, and machining are more prevalent than additive manufacturing in metalworking, but AM is now beginning to make significant inroads, and with the advantages of design for additive manufacturing, it is clear to engineers that much more is to come.

One place that AM is making a significant inroad is in the aviation industry. With nearly 3.8 billion air travellers in 2016, the demand for fuel efficient and easily produced jet engines has never been higher. For large OEMs (original equipment manufacturers) like Pratt and Whitney (PW) and General Electric (GE) this means looking towards AM as a way to reduce cost, reduce the number of nonconforming parts, reduce weight in the engines to increase fuel efficiency and find new, highly complex shapes that would not be feasible with the antiquated manufacturing methods. One example of AM integration with aerospace was in 2016 when Airbus was delivered the first of GE's LEAP engine. This engine has integrated 3D printed fuel nozzles giving them a reduction in parts from 20 to 1, a 25% weight reduction and reduced assembly times. A fuel nozzle is the perfect in road for additive manufacturing in a jet engine since it allows for optimized design of the complex internals and it is a low

stress, non-rotating part. Similarly, in 2015, PW delivered their first AM parts in the Pure Power PW1500G to Bombardier. Sticking to low stress, non-rotating parts, PW selected the compressor stators and synch ring brackets to roll out this new manufacturing technology for the first time. While AM is still playing a small role in the total number of parts in the jet engine manufacturing process, the return on investment can already be seen by the reduction in parts, the rapid production capabilities and the "optimized design in terms of performance and cost". As technology matured, several authors had begun to speculate that 3D printing could aid in sustainable development in the developing world.

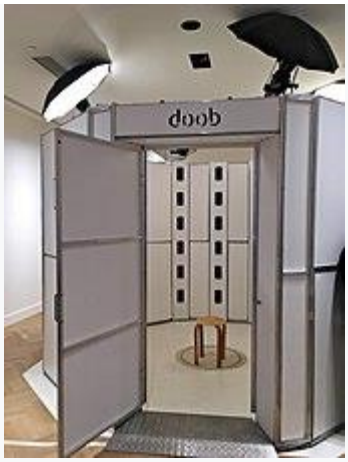
In 2012, Filabot developed a system for closing the loop with plastic and allows for any FDM or FFF 3D printer to be able to print with a wider range of plastics. In 2014, Benjamin S. Cook and Manos M. Tentzeris demonstrate the first multi-material, vertically integrated printed electronics additive manufacturing platform (VIPRE) which enabled 3D printing of functional electronics operating up to 40 GHz. The term "3D printing" originally referred to a process that deposits a binder material onto a powder bed with inkjet printer heads layer by layer. More recently, the popular vernacular has started using the term to encompass a wider variety of additive-manufacturing techniques such as electron-beam additive manufacturing and selective laser melting. The United States and global technical standards use the official term additive manufacturing for this broader sense. The most-commonly used 3D printing process (46% as of 2018) is a material extrusion technique called fused deposition modeling, or FDM.[4] While FDM technology was invented after the other two most popular technologies, stereolithography (SLA) and selective laser sintering (SLS), FDM is typically the most inexpensive of the three by a large margin, which lends to the popularity of the process.

General Principles:

Modeling:



3D printable knee joint implant



3D photo booth

3D printable models may be created with a computer-aided design (CAD) package, via a 3D scanner, or by a plain digital camera and photogrammetry software. 3D printed models created with CAD result in relatively fewer errors than other methods. Errors in 3D printable models can be identified and corrected before printing. The manual modeling process of preparing geometric data for 3D computer graphics is similar to plastic arts such as sculpting. 3D scanning is a process of collecting digital data on the shape and appearance of a real object, creating a digital model based on it.

CAD models can be saved in the stereolithography file format (STL), a de facto CAD file format for additive manufacturing that stores data based on triangulations of the surface of CAD models. STL is not tailored for additive manufacturing because it generates large file sizes of topology optimized parts and lattice structures due to the large number of surfaces involved. A newer CAD file format, the Additive Manufacturing File format (AMF) was introduced in 2011 to solve this problem. It stores information using curved triangulations.

Printing:

Before printing a 3D model from an STL file, it must first be examined for errors.
Most CAD applications produce errors in output STL files, of the following types:

1. holes;
2. faces normals;
3. self-intersections;
4. noise shells;
5. manifold errors.

A step in the STL generation known as "repair" fixes such problems in the original model. Generally STLs that have been produced from a model obtained through 3D scanning often have more of these errors]as 3D scanning is often achieved by point to point acquisition/mapping. 3D reconstruction often includes errors.

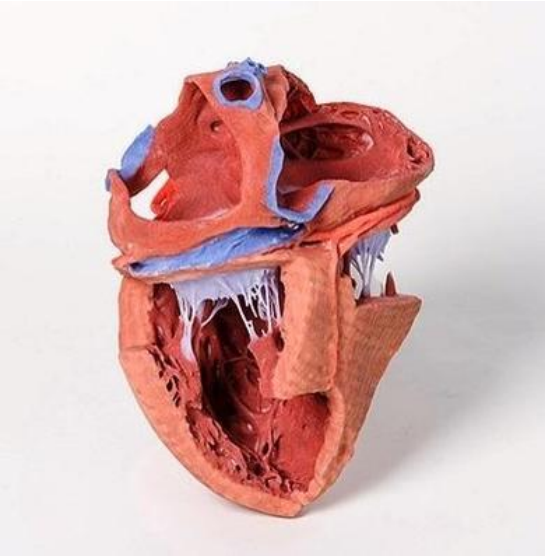
Once completed, the STL file needs to be processed by a piece of software called a "slicer," which converts the model into a series of thin layers and produces a G-code file containing instructions tailored to a specific type of 3D printer (FDM printers). This G-code file can then be printed with 3D printing client software (which loads the G-code, and uses it to instruct the 3D printer during the 3D printing process).

Printer resolution describes layer thickness and X–Y resolution in dots per inch (dpi) or micrometers (μm). Typical layer thickness is around 100 μm (250 DPI), although some machines can print layers as thin as 16 μm (1,600 DPI). X–Y resolution is comparable to that of laser printers. The particles (3D dots) are around 50 to 100 μm (510 to 250 DPI) in diameter. For that printer resolution, specifying a mesh resolution of 0.01–0.03 mm and a chord length ≤ 0.016 mm generate an optimal STL output file for a given model input file. Specifying higher resolution results in larger files without increase in print quality.

Construction of a model with contemporary methods can take anywhere from several hours to several days, depending on the method used and the size and complexity of the model. Additive systems can typically reduce this time to a few hours, although it varies widely depending on the type of machine used and the size and number of models being produced simultaneously.

Finishing:

Though the printer-produced resolution is sufficient for many applications, greater accuracy can be achieved by printing a slightly oversized version of the desired object in standard resolution and then removing material using a higher-resolution subtractive process. The layered structure of all Additive Manufacturing processes leads inevitably to a stair-stepping effect on part surfaces which are curved or tilted in respect to the building platform. The effects strongly depend on the orientation of a part surface inside the building process. Some printable polymers such as ABS, allow the surface finish to be smoothed and improved using chemical vapour processes based on acetone or similar solvents.



3D printed Heart Model

Some additive manufacturing techniques are capable of using multiple materials in the course of constructing parts. These techniques are able to print in multiple colors and color combinations simultaneously, and would not necessarily require painting. Some printing techniques require internal supports to be built for overhanging features during construction. These supports must be mechanically removed or dissolved upon completion of the print. All of the commercialized metal 3D printers involve cutting the metal component off the metal substrate after deposition. A new process for the GMAW 3D printing allows for substrate surface modifications to remove aluminium or steel.

Materials used for 3D printing:

Traditionally, 3D printing focused on polymers for printing, due to the ease of manufacturing and handling polymeric materials. However, the method has rapidly evolved to not only print various polymers but also metals and ceramics, making 3D printing a versatile option for manufacturing. Layer-by-layer fabrication of three-dimensional physical models is a modern concept that "stems from the ever-growing CAD industry, more specifically the solid modeling side of CAD. Before solid modeling was introduced in the late 1980s, three-dimensional models were created with wire frames and surfaces." but in all cases the layers of materials are controlled by the printer and the material properties. The three-dimensional material layer is controlled by deposition rate as set by the printer operator and stored in a computer file. The earliest printed patented material was a Hot melt type ink for printing patterns using a heated metal alloy.

A drawback of many existing 3D printing technologies is that they only allow one material to be printed at a time, limiting many potential applications which require the integration of different materials in the same object. Multi-material 3D printing solves this problem by allowing objects of complex and heterogeneous arrangements of materials to be manufactured using a single printer. Here, a material must be specified for each voxel (or 3D printing pixel element) inside the final object volume.

Type	Material
Composites	ABS, nylon (polyamide), polycarbonate, PP, epoxies, glass-filled polyamide, windform, polystyrene, polyester, and polyphenylesulfone
Metallic Materials	Plain carbon steel, tool steel, stainless steel, aluminum, copper, titanium, bronze, and nickel alumides
Bio-Compatible Materials	Polycaprolactone (PCL), polypropylene-tricalcium phosphate, (PP-TCP), PCL-hydroxyapatite (HA), polyetheretherketone-hydroxyapatite, (PEEK-HA), tetra calcium phosphate (TTCP), beta-tricalcium phosphate (TCP), and polymethyl methacrylate (PMMA)
Others	Sand, ceramics, elastomers, tungsten, wax, starch, and plaster

The process can be fraught with complications, however, due to the isolated and monolithic algorithms. Some commercial devices have sought to solve these issues, such as building a Spec2Fab translator, but the progress is still very limited. Nonetheless, in the medical industry, a concept of 3D printed pills and vaccines has been presented. With this new concept, multiple medications can be combined, which will decrease many risks. With more and more applications of multi-material 3D printing, the costs of daily life and high technology development will become inevitably lower. Metallographic materials of 3D printing is also being researched. By classifying each material, CIMP-3D can systematically perform 3D printing with multiple materials.

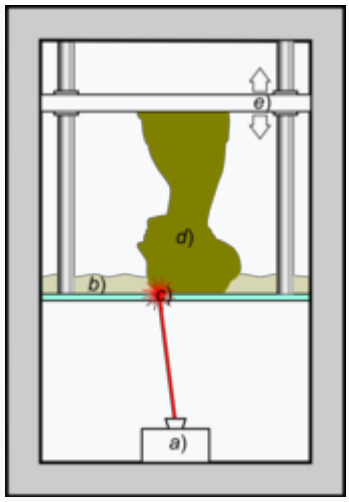
Processes & Printers:

There are many different branded additive manufacturing processes,that can be grouped into seven categories:

- Vat photopolymerization
- Material jetting
- Binder jetting
- Powder bed fusion
- Material extrusion
- Directed energy deposition
- Sheet lamination

- The main differences between processes are in the way layers are deposited to create parts and in the materials that are used. Each method has its own advantages and drawbacks, which is why some companies offer a choice of powder and polymer for the material used to build the object. Others sometimes use standard, off-the-shelf business paper as the build material to produce a durable prototype. The main considerations in choosing a machine are generally speed, costs of the 3D printer, of the printed prototype, choice and cost of the materials, and color capabilities. Printers that work directly with metals are generally expensive. However less expensive printers can be used to make a mold, which is then used to make metal parts.
- ISO/ASTM52900-15 defines seven categories of Additive Manufacturing (AM) processes within its meaning: binder jetting, directed energy deposition, material extrusion, material jetting, powder bed fusion, sheet lamination, and vat photopolymerization.
- The first process where three-dimensional material is deposited to form an object was done with Material Jetting or as it was originally called particle deposition. Particle deposition by inkjet first started with Continuous Inkjet technology (CIT) (1950's) and later with drop-On-Demand Inkjet technology.(1970's) using Hot-melt inks. Wax inks were the first three-dimensional materials jetted and later low temperature alloy metal was jetted with CIT. Wax and thermoplastic hot-melts were jetted next by DOD. Objects were very small and started with text characters and numerals for signage. An object must have form and can be handled. Wax characters tumbled off paper documents and inspired a Liquid Metal Recorder patent to make metal characters for signage in 1971. Thermoplastic color inks (CMYK) printed with layers of each color to form the first digitally formed layered objects in 1984. The idea of investment casting with Solid-Ink jetted images or patterns in 1984 led to the first patent to form articles from particle deposition in 1989, issued in 1992.
- Some methods melt or soften the material to produce the layers. In Fused filament fabrication, also known as Fused deposition modeling (FDM), the model or part is produced by extruding small beads or streams of material which harden immediately to form layers. A filament of thermoplastic, metal wire, or other material is fed into an extrusion nozzle head (3D printer extruder), which heats the material and turns the flow on and off. FDM is somewhat restricted in the variation of shapes that may be fabricated. Another technique fuses parts of the layer and then moves upward in the working area, adding another layer of granules and repeating the process until the piece has built up. This process uses the unfused media to support overhangs and thin walls in the part being produced, which reduces the need for temporary auxiliary supports for the piece. Recently, FFF/FDM has expanded to 3-D print directly from pellets to avoid the conversion to filament. This process is called fused particle fabrication (FPF) (or fused granular fabrication (FGF) and has the potential to use more recycled materials.
- Powder Bed Fusion techniques, or PBF, include several processes such as DMLS, SLS, SLM, MJF and EBM. Powder Bed Fusion processes can be used with an array of materials and their flexibility allows for geometrically complex structures, making it a go to choice for many 3D printing projects. These techniques include selective laser sintering, with both metals and polymers, and direct metal laser sintering. Selective laser melting does not use sintering for the fusion of powder granules but will completely melt the powder using a high-energy laser to create fully dense materials in a layer-wise method that has mechanical properties similar to those

of conventional manufactured metals. Electron beam melting is a similar type of additive manufacturing technology for metal parts (e.g. titanium alloys). EBM manufactures parts by melting metal powder layer by layer with an electron beam in a high vacuum. Another method consists of an inkjet 3D printing system, which creates the model one layer at a time by spreading a layer of powder (plaster, or resins) and printing a binder in the cross-section of the part using an inkjet-like process.
With laminated object manufacturing, thin layers are cut to shape and joined together.
In addition to the previously mentioned methods, HP has developed the Multi Jet Fusion (MJF) which is a powder base technique, though no laser are involved. An inkjet array applies fusing and detailing agents which are then combined by heating to create a solid layer.

- 

- Schematic representation of Stereolithography; a light-emitting device *a)* (laser or DLP) selectively illuminate the transparent bottom *c)* of a tank *b)* filled with a liquid photo-polymerizing resin; the solidified resin *d)* is progressively dragged up by a lifting platform

- Other methods cure liquid materials using different sophisticated technologies, such as stereolithography. Photopolymerization is primarily used in stereolithography to produce a solid part from a liquid. Inkjet printer systems like the *Objet PolyJet* system spray photopolymer materials onto a build tray in ultra-thin layers (between 16 and 30 µm) until the part is completed. Each photopolymer layer is cured with UV light after it is jetted, producing fully cured models that can be handled and used immediately, without post-curing. Ultra-small features can be made with the 3D micro-fabrication technique used in multiphoton photopolymerisation. Due to the nonlinear nature of photo excitation, the gel is cured to a solid only in the places where the laser was focused while the remaining gel is then washed away. Feature sizes of under 100 nm are easily produced, as well as complex structures with moving and interlocked parts. Yet another approach uses a synthetic resin that is solidified using LEDs.
- In Mask-image-projection-based stereolithography, a 3D digital model is sliced by a set of horizontal planes. Each slice is converted into a two-dimensional mask image. The mask image is then projected onto a photocurable liquid resin surface and light is projected onto the resin to cure it in the shape of the layer. Continuous liquid interface production begins with a pool of liquid photopolymer resin. Part of the pool bottom is transparent to ultraviolet light (the "window"), which causes the resin to solidify. The

object rises slowly enough to allow resin to flow under and maintain contact with the bottom of the object. In powder-fed directed-energy deposition, a high-power laser is used to melt metal powder supplied to the focus of the laser beam. The powder fed directed energy process is similar to Selective Laser Sintering, but the metal powder is applied only where material is being added to the part at that moment.

- As of December 2017, additive manufacturing systems were on the market that ranged from $99 to $500,000 in price and were employed in industries including aerospace, architecture, automotive, defense, and medical replacements, among many others. For example, General Electric uses high-end 3D Printers to build parts for turbines. Many of these systems are used for rapid prototyping, before mass production methods are employed. Higher education has proven to be a major buyer of desktop and professional 3D printers which industry experts generally view as a positive indicator. Libraries around the world have also become locations to house smaller 3D printers for educational and community access. Several projects and companies are making efforts to develop affordable 3D printers for home desktop use. Much of this work has been driven by and targeted at DIY/Maker/enthusiast/early adopter communities, with additional ties to the academic and hacker communities.
- Computed axial lithography is a method for 3D printing based on computerised tomography scans to create prints in photo-curable resin. It was developed by a collaboration between the University of California, Berkeley with Lawrence Livermore National Laboratory. Unlike other methods of 3D printing it does not build models through depositing layers of material like fused deposition modelling and stereolithography, instead it creates objects using a series of 2D images projected onto a cylinder of resin. It is notable for its ability to build an object much more quickly than other methods using resins and the ability to embed objects within the prints.
- Liquid additive manufacturing (LAM) is a 3D printing technique which deposits a liquid or high viscose material (e.g. Liquid Silicone Rubber) onto a build surface to create an object which then is vulcanised using heat to harden the object. The process was originally created by Adrian Bowyer and was then built upon by German RepRap

Medical Applications for 3D printing:

3D printing has been applied in medicine since the early 2000s, when the technology was first used to make dental implants and custom prosthetics. Since then, the medical applications for 3D printing have evolved considerably. Recently published reviews describe the use of 3D printing to produce bones, ears, exoskeletons, windpipes, a jaw bone, eyeglasses, cell cultures, stem cells, blood vessels, vascular networks, tissues, and organs, as well as novel dosage forms and drug delivery devices. The current medical uses of 3D printing can be organized into several broad categories: tissue and organ fabrication; creating prosthetics, implants, and anatomical models; and pharmaceutical research concerning drug discovery, delivery, and dosage forms. A discussion of these medical applications follows:

Bio printing Tissues and Organs:

Tissue or organ failure due to aging, diseases, accidents, and birth defects is a critical medical problem. Current treatment for organ failure relies mostly on organ transplants from living or deceased donors. However, there is a chronic shortage of human organs available for transplant. In 2009, 154,324 patients in the U.S. were waiting for an organ. Only 27,996 of them (18%) received an organ transplant, and 8,863 (25 per day) died while on the waiting list.As of early 2014, approximately 120,000 people in the U.S. were awaiting an organ transplant. Organ transplant surgery and follow-up is also expensive, costing more than $300 billion in 2012. An additional problem is that organ transplantation involves the often difficult task of finding a donor who is a tissue match.[1] This problem could likely be eliminated by using cells taken from the organ transplant patient's own body to build a replacement organ. This would minimize the risk of tissue rejection, as well as the need to take lifelong immunosuppressants.

Therapies based on tissue engineering and regenerative medicine are being pursued as a potential solution for the organ donor shortage. The traditional tissue engineering strategy is to isolate stem cells from small tissue samples, mix them with growth factors, multiply them in the laboratory, and seed the cells onto scaffolds that direct cell proliferation and differentiation into functioning tissues. Although still in its infancy, 3D bioprinting offers additional important advantages beyond this traditional regenerative method (which essentially provides scaffold support alone), such as: highly precise cell placement and high digital control of speed, resolution, cell concentration, drop volume, and diameter of printed cells. Organ printing takes advantage of 3D printing technology to produce cells, biomaterials, and cell-laden biomaterials individually or in tandem, layer by layer, directly creating 3D tissue-like structures. Various materials are available to build the scaffolds, depending on the desired strength, porosity, and type of tissue, with hydrogels usually considered to be most suitable for producing soft tissues.

Although 3D bioprinting systems can be laser-based, inkjet-based, or extrusion-based, inkjet-based bioprinting is most common. This method deposits "bioink," droplets of living cells or biomaterials, onto a substrate according to digital instructions to reproduce human tissues or organs. Multiple printheads can be used to deposit different cell types (organ-specific, blood vessel, muscle cells), a necessary feature for fabricating whole heterocellular tissues and organs. A process for bioprinting organs has emerged: 1) create a blueprint of an organ with its vascular architecture; 2) generate a bioprinting process plan; 3) isolate stem cells; 4) differentiate the stem cells into organ-specific cells; 5) prepare bioink reservoirs with organ-specific cells, blood vessel cells, and support medium and load them into the printer; 6) bioprint; and 7) place the bioprinted organ in a bioreactor prior to transplantation. Laser printers have also been employed in the cell printing process, in which laser energy is used to excite the cells in a particular pattern, providing spatial control of the cellular environment.

Although tissue and organ bioprinting is still in its infancy, many studies have provided proof of concept. Researchers have used 3D printers to create a knee meniscus, heart valve, spinal disk, other types of cartilage and bone, and an artificial ear. Cui and colleagues applied inkjet 3D printing technology to repair human articular cartilage. Wang et al used 3D bioprinting technology to deposit different cells within various biocompatible hydrogels to produce an artificial liver. Doctors at the University of Michigan published a case study in the *New England Journal of Medicine* reporting that use of a 3D printer and CT images of a patient's airway enabled them to fabricate a precisely modeled, bioresorbable tracheal splint that was surgically implanted in a baby with tracheobronchomalacia. The baby recovered, and full resorption of the splint is expected to occur within three years.

A number of biotech companies have focused on creating tissues and organs for medical research. It may be possible to rapidly screen new potential therapeutic drugs on patient tissue, greatly cutting research costs and time. Scientists at Organovo are developing strips of printed liver tissue for this purpose; soon, they expect the material will be advanced enough to use in screening new drug treatments. Other researchers are working on techniques to grow complete human organs that can be used for screening purposes during drug discovery. An organ created from a patient's own stem cells could also be used to screen treatments to determine if a drug will be effective for that individual.

Challenges in Building 3D Vascularised Organs:

Proof-of-concept studies regarding bioprinting have been performed successfully, but the organs that have been produced are miniature and relatively simple. They are also often avascular, aneural, alymphatic, thin, or hollow, and are nourished by the diffusion from host vasculature. However, when the thickness of the engineered tissue exceeds 150–200 micro meters, it surpasses the limitation for oxygen diffusion between host and transplanted tissue. As a result, bioprinting complex 3D organs will require building precise multicellular structures with vascular network integration, which has not yet been done.

Most organs needed for transplantation are thick and complex, such as the kidney, liver, and heart.[11] Cells in these large organ structures cannot maintain their metabolic functions without vascularization, which is normally provided by blood vessels. Therefore, functional vasculature must be bioprinted into fabricated organs to supply the cells with oxygen/gas exchange, nutrients, growth factors, and waste-product removal—all of which are needed for maturation during perfusion. Although the conventional tissue engineering approach is not now capable of creating complex vascularized organs, bioprinting shows promise in resolving this critical limitation. The precise placement of multiple cell types is required to fabricate thick and complex organs, and for the simultaneous construction of the integrated vascular or microvascular system that is critical for these organs to function.

TIJ printers are considered to be the most promising for this use. However, various 3D printing techniques and materials have been applied successfully to create vasculature as simple as a single channel, as well as more complex geometries, such as bifurcated or branched channels. Recently, collaborators from a network of academic institutions, including the University of Sydney, Harvard University, Stanford University, and the Massachusetts Institute of Technology, announced that they had bioprinted a functional and perfusable network of capillaries, an achievement that represents a significant stride toward overcoming this problem.

Customized Implants and Prostheses:

Implants and prostheses can be made in nearly any imaginable geometry through the translation of x-ray, MRI, or CT scans into digital .stl 3D print files. In this way, 3D printing has been used successfully in the health care sector to make both standard and complex customized prosthetic limbs and surgical implants, sometimes within 24 hours. This approach has been used to fabricate dental, spinal, and hip implants. Previously, before implants could be used clinically, they had to be validated, which is very time-consuming.

The ability to quickly produce custom implants and prostheses solves a clear and persistent problem in orthopedics, where standard implants are often not sufficient for some patients, particularly in complex cases. Previously, surgeons had to perform bone graft surgeries or use scalpels and drills to modify implants by shaving pieces of metal and plastic to a desired

shape, size, and fit. This is also true in neurosurgery: Skulls have irregular shapes, so it is hard to standardize a cranial implant. In victims of head injury, where bone is removed to give the brain room to swell, the cranial plate that is later fitted must be perfect. Although some plates are milled, more and more are created using 3D printers, which makes it much easier to customize the fit and design.

There have been many other commercial and clinical successes regarding the 3D printing of prostheses and implants. A research team at the BIOMED Research Institute in Belgium successfully implanted the first 3D-printed titanium mandibular prosthesis. The implant was made by using a laser to successively melt thin layers of titanium powders. In 2013, Oxford Performance Materials received FDA approval for a 3D-printed polyetherketoneketone (PEKK) skull implant, which was first successfully implanted that year. Another company, LayerWise, manufactures 3D-printed titanium orthopedic, maxillofacial, spinal, and dental implants. An anatomically correct 3D-printed prosthetic ear capable of detecting electromagnetic frequencies has been fabricated using silicon, chondrocytes, and silver nanoparticles. There is a growing trend toward making 3D-printed implants out of a variety of metals and polymers, and more recently implants have even been printed with live cells.

3D printing has already had a transformative effect on hearing aid manufacturing. Today, 99% of hearing aids that fit into the ear are custom-made using 3D printing. Everyone's ear canal is shaped differently, and the use of 3D printing allows custom-shaped devices to be produced efficiently and cost-effectively. The introduction of customized 3D-printed hearing aids to the market was facilitated by the fact that class I medical devices for external use are subject to fewer regulatory restrictions. Invisalign braces are another successful commercial use of 3D printing, with 50,000 printed every day. These clear, removable, 3D-printed orthodontic braces are custom-made and unique to each user. This product provides a good example of how 3D printing can be used efficiently and profitably to make single, customized, complex items.

Anatomical Models for Surgical Preparation:

The individual variances and complexities of the human body make the use of 3D-printed models ideal for surgical preparation. Having a tangible model of a patient's anatomy available for a physician to study or use to simulate surgery is preferable to relying solely on MRI or CT scans, which aren't as instructive since they are viewed in 2D on a flat screen. The use of 3D-printed models for surgical training is also preferable to training on cadavers, which present problems with respect to availability and cost. Cadavers also often lack the appropriate pathology, so they provide more of a lesson in anatomy than a representation of a surgical patient.



Figure 4 Researchers at the National Library of Medicine generate digital files from clinical data, such as CT scans, that are used to make custom 3D-printed surgical and medical models.[12]

3D-printed neuroanatomical models can be particularly helpful to neurosurgeons by providing a representation of some of the most complicated structures in the human body .The intricate, sometimes obscured relationships between cranial nerves, vessels, cerebral structures, and skull architecture can be difficult to interpret based solely on radiographic 2D images. Even a small error in navigating this complex anatomy can have potentially devastating consequences. A realistic 3D model reflecting the relationship between a lesion and normal brain structures can be helpful in determining the safest surgical corridor and can also be useful for the neurosurgeon to rehearse challenging cases. Complex spinal deformities can also be studied better through the use of a 3D model. High-quality 3D anatomical models with the right pathology for training doctors in performing colonoscopies are also vital, since colorectal cancer is the second leading cause of cancer-related deaths in the U.S.

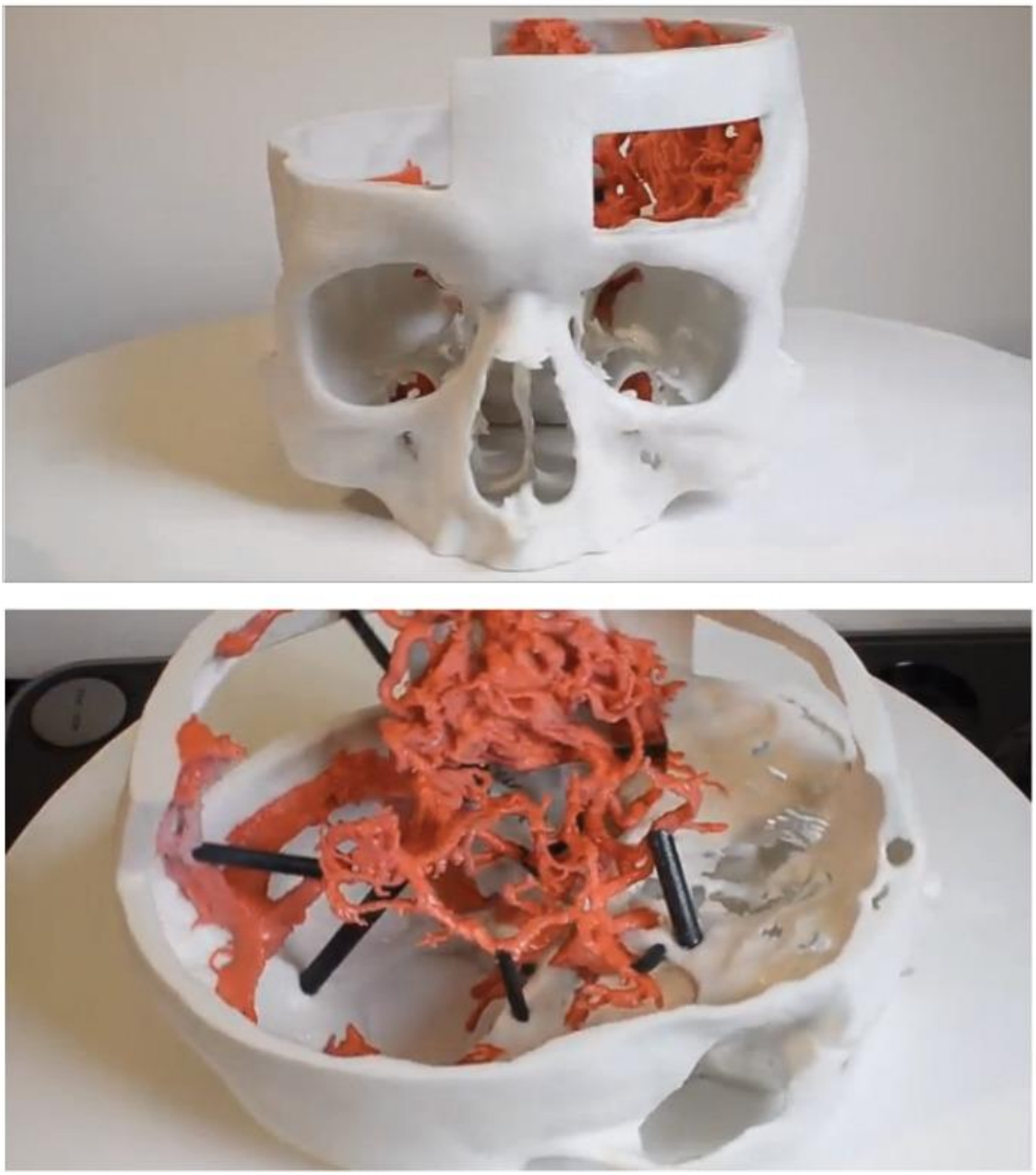


Figure 5 A 3D model used for surgical planning by neurosurgeons at the Walter Reed National Military Medical Center.[12]

3D-printed models can be useful beyond surgical planning. Recently, a polypeptide chain model was 3D printed in such a way that it could fold into secondary structures because of the inclusion of bond rotational barriers and degrees of freedom considerations. Similar models could be utilized to aid the understanding of other types of biological or biochemical structures. Pre- and post-comprehension study results have shown that students are better able to conceptualize molecular structures when such 3D models are used.

Health & Safety:

Emissions from fused filament printers can include a large number of ultrafine particles and volatile organic compounds (VOCs). The toxicity from emissions varies by source material due to differences in size, chemical properties, and quantity of emitted particles. Excessive exposure to VOCs can lead to irritation of the eyes, nose, and throat, headache, loss of coordination, and nausea and some of the chemical emissions of fused filament printers have also been linked to asthma. Based on animal studies, carbon nanotubes and carbon nanofibers sometimes used in fused filament printing can cause pulmonary effects including inflammation, granulomas, and pulmonary fibrosis when at the nanoparticle size. A National Institute for Occupational Safety and Health (NIOSH) study noted particle emissions from a fused filament peaked a few minutes after printing started and returned to baseline levels 100 minutes after printing ended. Workers may also inadvertently transport materials outside the workplace on their shoes, garments, and body, which may pose hazards for other members of the public.

Laser sintering and laser beam melting systems for additive manufacturing have become more important recently. The Institute for Occupational Safety and Health (IFA) together with German social accident insurance institutions conducted a measurement programme on inhalation exposure to hazardous substances during laser deposition welding and laser beam melting with alloyed steels and nickel-, aluminium- and titanium-based alloys.
No chromium(VI) compounds were detected in the workplace air during the process when materials containing chromium were processed, and the assessment criteria were complied with during processes with the other metal powders. One reason for this is that the machines are usually operated with encapsulation or dust extraction in order to achieve the required product quality. Since many work steps before and after the process including the handling of powder or powdered parts are performed manually or semi-automatically, there are huge effects on the degree of inhalation exposure and the measured values vary broadly. It is therefore difficult to derive tailored measures for these processes.
Carbon nanoparticle emissions and processes using powder metals are highly combustible and raise the risk of dust explosions. At least one case of severe injury was noted from an explosion involved in metal powders used for fused filament printing.

Hazard controls include using manufacturer-supplied covers and full enclosures, using proper ventilation, keeping workers away from the printer, using respirators, turning off the printer if it jammed, and using lower emission printers and filaments. Personal protective

equipment has been found to be the least desirable control method with a recommendation that it only be used to add further protection in combination with approved emissions protection.

Future of 3D Printing:

4D printing:

4D printing has the potential to find new applications and uses for materials (plastics, composites, metals, etc.) and will create new alloys and composites that were not viable before. The versatility of this technology and materials can lead to advances in multiple fields of industry, including space, commercial and the medical field. The repeatability, precision, and material range for 4D printing must increase to allow the process to become more practical throughout these industries.

To become a viable industrial production option, there are a couple of challenges that 4D printing must overcome. The challenges of 4D printing include the fact that the microstructures of these printed smart materials must be close to or better than the parts obtained through traditional machining processes. New and customizable materials need to be developed that have the ability to consistently respond to varying external stimuli and change to their desired shape. There is also a need to design new software for the various technique types of 4D printing. The 4D printing software will need to take into consideration the base smart material, printing technique, and structural and geometric requirements of the design.

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Annexure II

VALUE ADDED COURSE

3D printing in Anatomy Education & its applications (code - AN100)

List of students Enrolled – September 2018

Sl. No.	Registration Number	Name of the Student	Signature
1	U18MB251	AASHLESHA DHARKAR	
2	U18MB252	ABINAYAVARTHINI N	
3	U18MB253	ADARSH KUMAR	
4	U18MB254	AISWARYA PREMRAJ	
5	U18MB255	AKSHAYA .R	
6	U18MB256	ALOK PANDA	
7	U18MB257	AMULYA N GOWDA	
8	U18MB258	ANINDA CHAKRABORTY	
9	U18MB259	ANJALI SADHWANI	
10	U18MB260	ANKU KUMAR	
11	U18MB261	ANNIE WELLY	
12	U18MB262	ANTONY ROHAN	
13	U18MB263	ANUPAMA	
14	U18MB264	AQSA QURESHI	
15	U18MB265	ARSHAD AMIN	
16	U18MB266	ASHIQUE RIFANA	
17	U18MB267	ASHWIN R	
18	U18MB268	ASHWINI.N	
19	U18MB269	ASMIT KESHAV	
20	U18MB270	AVIRAL TYAGI	

RESOURCE PERSONS

1.
2.
3.

COORDINATOR

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Usudu Agaram Village, Pondicherry-605 502

Annexure III

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

VALUE ADDED COURSES

3D PRINTING IN ANATOMY EDUCATION & ITS APPLICATIONS

Course Code: AN100

I. ANSWER ALL THE QUESTIONS (2 x 5 = 10 marks) **Duration – 30 minutes**

1. What is 3D printing
2. Mention the basic principles in 3d printing
3. List any 4 common material used in 3d printing
4. Name the types of 3d printers with is uses
5. Lists the applications of 3d anatomical models in medicine

1.10.2018. Value added Course – 3D Printing Aashlesha
U18MB251

8½/10

2/10/2018

1. What is 3D Printing?

Also called as additive Manufacturing. It is a process of making 3 dimensional solid objects from a digital file. Here an object is created by laying down successive layers of materials until the entire object is created.

2

2. Mention the basic Principles in 3d Printings?

The basic principles in 3d Printings are:

a) Modeling – 3D Printable models may be created with CAD package. (or) other computer softwares.

b) Printing – 3D model is printed from an STL file. Errors like holes, noise shells, should be rectified before doing printing. This G-Code file can be printed with 3D printing client software.

c) finishing – a slightly oversized version of object is achieved & then removing material using a higher resolution subtractive process.

1½

3. List any 4 common materials used in 3D printing?

Nylon, polymethylmetha-acrylate, ABS, polyester

2

1.10.2018 VALUE ADDED COURSE – 3D PRINTING. Asmit Keshav. U18MB269.

9/10

1. WHAT IS 3D PRINTING?

It is a process of making three dimensional objects (solid) from a digital file. This process is achieved by using additive processes. Here an object is created by laying down successive layers of materials until the whole object is created.

2

2. Mention the basic principles in 3d printing?

Basic Principles involved in 3d Printing are:

a) modeling b) printing c) Finishing.

1

3. List any 4 common materials used in 3D printing?

ABS, ceramics, polycarbonate, Aluminium.

2

4. Name the type of 3D printers & its uses?

a) Stereolithography (SLA) – models produced are with high levels of details, smooth surface & tight tolerances.

b) poly Jet – Here models are produced with multiple properties like colors & materials.

2

c) Selective Laser Sintering (SLS) – models are made from real thermoplastic material, they are durable, suitable for functional testing, and can support living hinges & snap-fits.

Annexure 5

Student Feedback Form

Course Name: 3D printing in Anatomy Education & its applications

Subject Code: AN100

Name of Student: Adarsh kumar **Roll No.:** U18MB253

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance:

Sl. No.	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5 ✓

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Very informative session. Looking forward for new such courses.

Signature of Student
Date: 29.9.2018

Annexure 5

Student Feedback Form

Course Name: 3D printing in Anatomy Education & its applications

Subject Code: AN100

Name of Student: Anupama **Roll No.:** U18MB263

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance:

Sl. No.	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5 ✓

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

–

Anupama

Signature of Student

Date: 29.9.2018

Date: 03-10-2018

From

Dr. Somasekar I Tolanur
Professor and Head,
Department of Anatomy,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry - 2.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry - 2.

Sub: Completion of value-added course: 3D Printing in Anatomy Education & its Applications – Reg.

Dear Sir,

With reference to the subject mentioned above, the Department of Anatomy has conducted the value-added course on **3D printing in Anatomy Education & its Applications** during September 2018 for 1st year MBBS Students (2018-2019 Batch). We solicit your kind action to send certificates for the participants whose list is attached with this letter. Also I am attaching the photographs captured during the conduct of the course.

Kind Regards,

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
Osudu Agaram Village, Pondicherry-605 502

Encl: Participants List

Photograph

LIST OF PARTICIPANTS

Sl. No.	Registration Number	Name of the Student
1	U18MB251	AASHLESHA DHARKAR
2	U18MB252	ABINAYAVARTHINI N
3	U18MB253	ADARSH KUMAR
4	U18MB254	AISWARYA PREMRAJ
5	U18MB255	AKSHAYA .R
6	U18MB256	ALOK PANDA
7	U18MB257	AMULYA N GOWDA
8	U18MB258	ANINDA CHAKRABORTY
9	U18MB259	ANJALI SADHWANI
10	U18MB260	ANKU KUMAR
11	U18MB261	ANNIE WELLY
12	U18MB262	ANTONY ROHAN
13	U18MB263	ANUPAMA
14	U18MB264	AQSA QURESHI
15	U18MB265	ARSHAD AMIN
16	U18MB266	ASHIQUE RIFANA
17	U18MB267	ASHWIN R
18	U18MB268	ASHWINI.N
19	U18MB269	ASMIT KESHAV
20	U18MB270	AVIRAL TYAGI


Value Added Course
on
3D Printing in Anatomy Education
& its Application

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that **ABINAYAVARTHINI N** has actively participated in the Value Added Course on **3D Printing in Anatomy Education & its Applications** held during September 2018 Organized by Department of Anatomy, Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. S Shanthini
Resource person

Dr. B Anitha
Resource person

Dr. B Rajesh
Resource person

Dr. Somasekar I Tolanur
Co-ordinator

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village,Pondicherry-605 502

Dr. G Jayalakshmi
Dean

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that **ANTONY ROHAN** has actively participated in the Value Added Course on **3D Printing in Anatomy Education & its Applications** held during September 2018 Organized by Department of Anatomy, Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. S Shanthini
Resource person

Dr. B Anitha
Resource person

Dr. B Rajesh
Resource person

Dr. Somasekar I Tolanur
Co-ordinator

Dr. G Jayalakshmi
Dean

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village, Pondicherry-605 502

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Sri Lakshmi Narayana Institute of Medical Sciences

Date 02/09/2018

From
Dr.R.Venkataramanan,
Professor and Head,
otorhinolaryngology,
SLIMS
Bharath Institute of Higher Education and Research,
Puducherry.

To
The Dean,
SLIMS
Bharath Institute of Higher Education and Research,
Puducherry.

Sub: Permission to conduct value-added course: : Hands on training and an Extensive Discussion on BERA reg.

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Simulation Based Training In Audiology on Sep 2018 to Dec 2018. We solicit your kind permission for the same.

Kind Regards

Dr.R.Venkataramanan

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:
The Dean:
The HOD:
The Expert:

The committee has discussed about the course and is approved.

Dean

(Sign&Seal)

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Dr. R. VENKATARAMANAN, MS.,
Reg. No: 72549
Professor ENT
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Subject expert
(Sign &Seal)

Seal & Signature of the HOD
PROFESSOR & HOD
DEPARTMENT OF E.N.T
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Ref. No. SLIMS/Dean Off/VAC/024 **Date:03/09/18**

From
The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

To
The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

Respected Sir

Sub: Request for permission and approval of Syllabus for certificate course (Value Added course) for the academic year 2018-19 - Reg
Ref: Requesting letter received from Departments

*****

With reference to the above, herewith forwarding the proposed list of Value-added courses for necessary permission and approval of syllabus to conduct the same.

This is for your kind information and needful action.

Thankingyou

Yours faithfully

[DEAN]

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl's:

1. Requesting letter received from department
2. Syllabus of thecourse
3. Details of faculty handlingcourse

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

VALUE ADDED COURSE : Hands on training and an Extensive Discussion on BERA

COURSE CO-ORDINATOR DETAILS

Faculty Name: Dr. K.Venkataramanan

Email ID:e n t s l i m s @ g m a i l . c o m

Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)

Ref. No. BHIER/ VAC/B-02 **Date:05.09.2018**

From

The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

To

The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

Sir / Madam,

Sub: Approval of Syllabus to conduct certificate course (Value Added course) for the academic year 2018-2019 – Reg.

Ref: Ref. No. SLIMS/Dean Off/VAC /024 Dated: 03.09.2018

*****

With reference to the above, it is to inform that the proposal submitted to conduct Value Added Course has been accepted and approved by BIHER, council meeting. List of the VAC are mentioned below for the academic year 2018– 2019. The abstract of the VAC course completion detail should be submitted to the Registrar office.

Thanking you

Yours faithfully

REGISTRAR

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

.

07/09/2018

Sub: Organising Value-added Course: Hands on training and an Extensive Discussion on BERA **reg.**

With reference to the above mentioned subject, it is to bring to your notice that SLIMS,**Bharath Institute of Higher Education and Research**, is organising **"Hands on training and an Extensive Discussion on BERA"**. The course content and registration form is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 15/09/2018. Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl: Copy of Course content

VALUE ADDED COURSE

1. Name of the programme &Code

Hands on training and an Extensive Discussion on BERA – A value added course for the medical students.
& **ENT 08**

2. Duration &Period

30 hrs & Sep 2018-Dec 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Pre test and post test which includes 10 mcqs - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time Sep 2018- Dec 2018

8. Year of discontinuation:2019

9. Summary report of each program year-wise

Value Added Course- Sep 2018- Dec 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	ENT 08	Hands on training and an Extensive Discussion on BERA	1.Dr.Venkataramanm 2. Dr. Sreedhar.B	3rd year MBBS students	14 students & 2018

10. Course FeedBack

Enclosed as Annexure- V





RESOURCEPERSON
1. **Dr.K.R.Jothikumar**
2. **Dr. Sreedhar.B**

COORDINATOR
Dr.R.Venkataramanan

COURSE PROPOSAL

1. NAME OF THE PROGRAMME

Hands on training and an ExtensiveDiscussion on BERA– A value added course for the medical students.

2. AIM

Training the students with hands on experience in BERA as an objective audiological test

3. OBJECTIVES

a) To teach the students to connect the electrodes of BERA
b) To teach the students to interpret the BERA waves

4. METHODOLOGY

Students who are interested in participating in value added course are enrolled and the course is conducted for them during the non college hours for a period of 30 hours from Sep 2018 – Dec 2018 . This course is conducted every 6 months.

Course Audience: 3rd year MBBS students

Course Coordinator: Dr.R.Venkataramanan

Course Faculties with Qualification and Designation:

1.Dr.K.R. jothikumar

2.Dr. Sreedhar.B

Schedule followed during the course

No	Topic	Title	Duration	Date and time
1	Hands on training and an Extensive Discussion on BERA	Introduction of Brain Stem Evoked Response Audiometry (BERA)	4 hrs	4pm-6pm(19/9/18),4pm-6pm(25/9/18)
		Principle and method of recording BERA	4 hrs	4pm-6pm(29/9/18),4pm-6pm(4/10/18)
		Latency and amplitude studies of BERA	4 hrs	4pm-6pm(10/10/18),4pm-6pm(15/10/18)
		Clinical uses of BERA	4 hrs	4pm-6pm(19/10/18),4pm-6pm(23/10/18)
		Neurophysiologic basis of BERA	4 hrs	4pm-6pm(29/10/18),4pm-6pm(4/11/18)
		Demonstration of BERA and interpretation of results	5 hrs	4pm-6pm(10/11/18),4pm-7pm(15/11/18)
		Hands on training on BERA lead connection and interpretation of results and DOPS	5 hrs	4pm-6pm(23/11/18),4pm-6pm(3/12/18),4pm-5pm(8/12/18)
		TOTAL	30HRS	

REFERENCE BOOKS: 1) SCOTT BROWN 7th edition

2) ANIRBAN BISWAS 3rd edition

Brainstem Auditory Evoked Potentials

History

Sohmer and Feinmesser

- Signal-averaged ECochG studies

Jewett and co-workers

- Identified the short-latency scalp-recorded AEPs as far- field potentials volume-conducted from the brainstem, described the components and their properties
- Established the Roman numeral labeling of the peaks

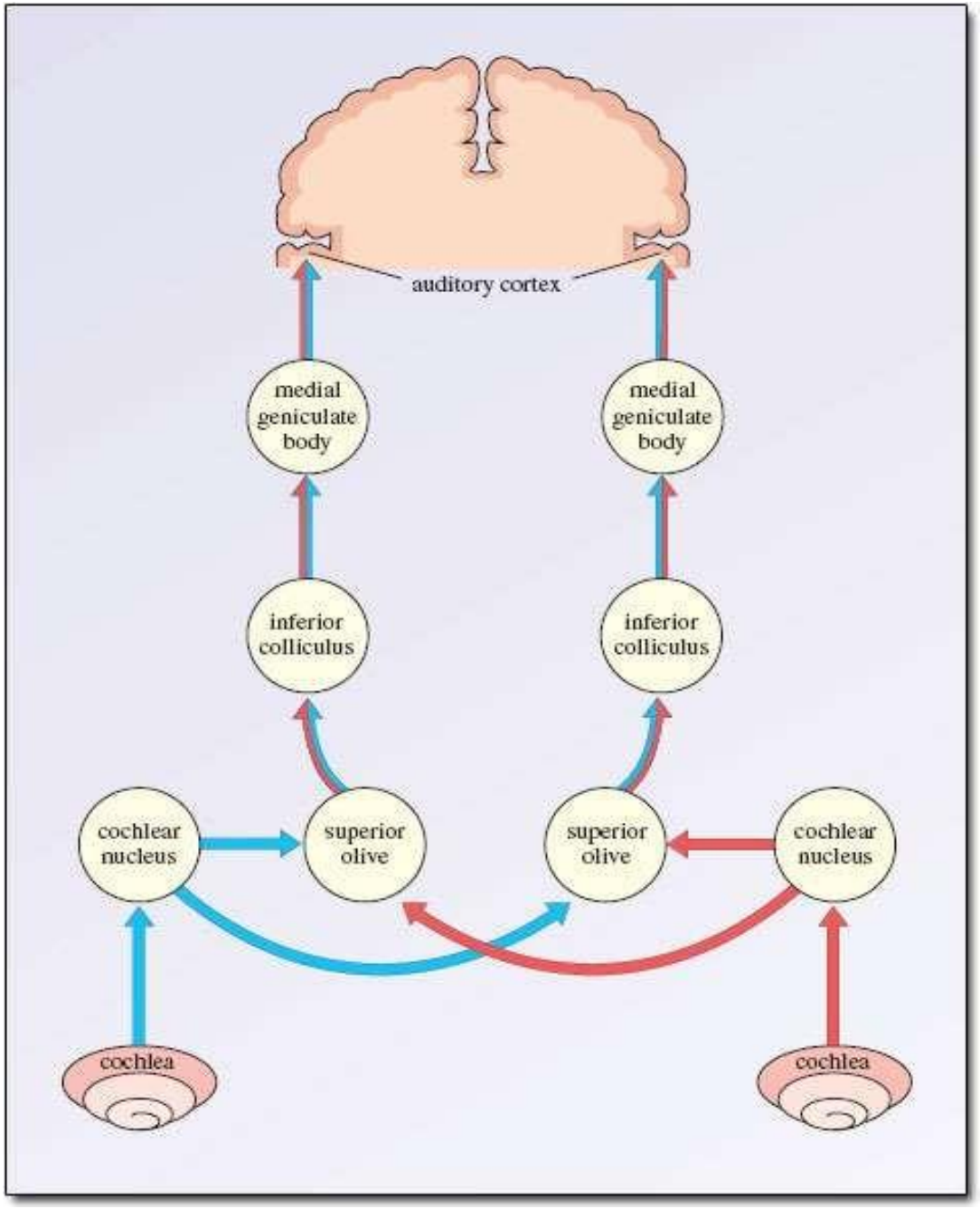
Brainstem Auditory Evoked Potentials

- Following a transient acoustic stimulus, ear and parts of the nervous system generate a series of electrical signals with latencies ranging from milliseconds to hundreds of milliseconds
- Recorded from electrodes placed on the skin
- To evaluate noninvasively the function of the ear and portions of the nervous system activated by the acoustic stimulation

BAEPs

- Generated by an anatomically distinguishable neuronal subsystem for sound localization within the brainstem
- BAEPs can be used only to assess the status of the ear, auditory nerve, and brainstem auditory pathways up through the level of the mesencephalon

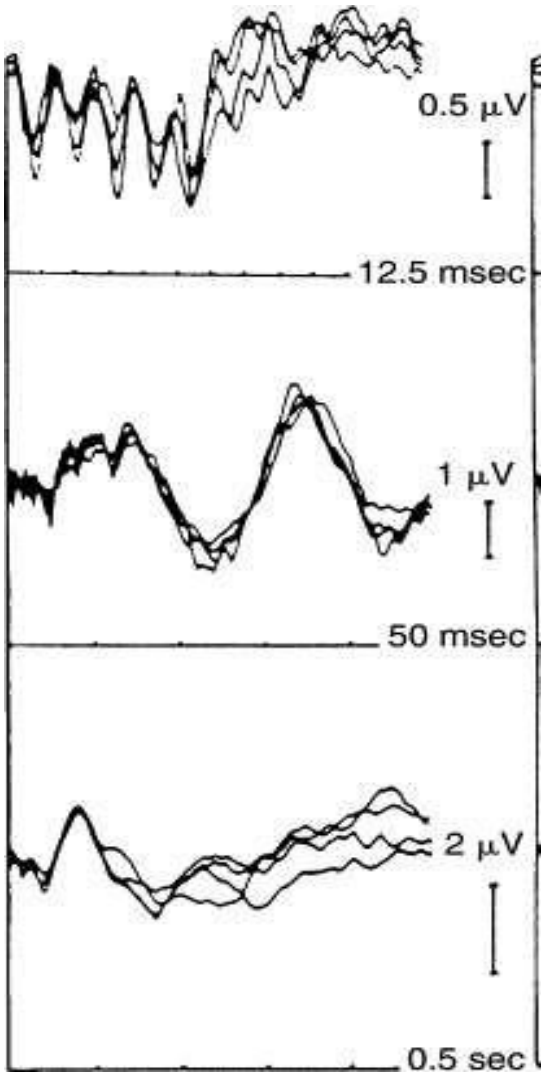
Auditory pathway



BAEPs

- Ascending projections from the cochlear nucleus are bilateral but are more extensive contralaterally than ipsilaterally
- Despite this anatomic asymmetry, the BAEPs appear to reflect predominantly activity in the ipsilateral ascending pathways

- Short-latency components, with latencies of under 10 msec in adults
- Long-latency AEPs, with latencies exceeding 50 msec
- Middle-latency AEPs, with intermediate latencies



- Affected profoundly by the degree to which the subject is

  attending to the stimuli and analyzing stimulus features

  - Used as probes of cognitive processes
  - Their variability, as well as uncertainty about the precise identity of their cortical generators, limits their utility for neurologic diagnosis

Middle-latency AEPs

- Small
- Subject to contamination by myogenic signals
- Variable from subject to subject

Middle- and Long-latency AEP

- generated predominantly by postsynaptic potentials

  within areas of cerebral cortex that are activated by the acoustic stimulus

- affected increasingly by the state of the subject and by anesthesia as their latency increases

Greatest clinical utility because

- Relatively easy to record
- Waveforms and latencies are highly consistent across normal subjects
- Unaffected by the subject's degree of attention to the stimuli and are almost identical in the waking and sleeping states
- Minor differences related to changes in body temperature

Although short-latency AEPs commonly are called brainstem auditory evoked potentials, this term is not completely accurate because the roster of generators

clearly includes the distal (with respect to the brainstem) cochlear nerve and may also include the thalamocortical auditory radiations, neither of which is within the brainstem

Stimulation

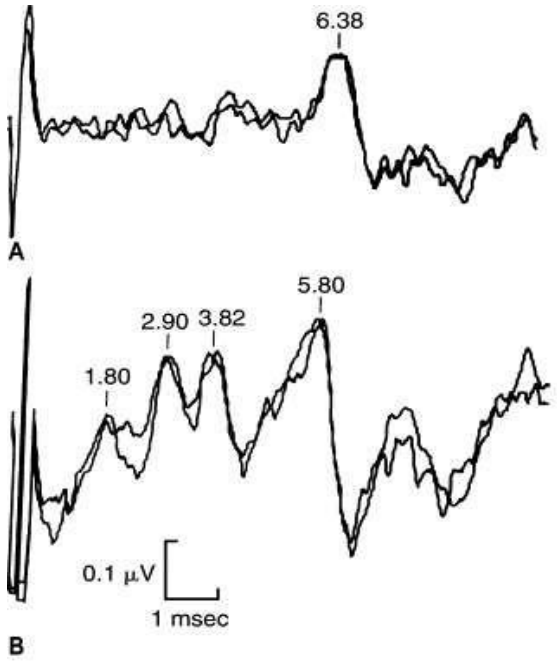
- Brief acoustic click stimuli that are produced by delivering monophasic square pulses of 100-μsec duration to headphones or other electromechanical transducers at a rate of about 10 hz
- A rate of exactly 10 hz or another submultiple of the power line frequency should be avoided because of line frequency artifact
- Stimulus intensity of 60 to 65 db HL is a typical level
- If hearing loss is present, stimulus intensity may be

Stimulation

- Stimuli are delivered monaurally
- To prevent contralateral ear stimulation it is masked with continuous white noise at an intensity 30 to 40 dB below that of the BAEP stimulus
- Activate region of the cochlea (base) responding to2,000- to 4,000-Hz sounds

Stimulation at Several Intensities

Differentiate peripheral from neural abnormalities, especially when wave I is not clear



- In Conductive hearing loss,if the stimulus intensity is increased and no coexisting sensorineural hearing loss is present, a normal BAEP will be recorded
- In contrast, BAEPs that are delayed as a result of abnormally slowed neural conduction do not normalize

Rapid Stimulation

- Approximately 10 Hz is used for routine clinical testing
- As the stimulus rate is increased above approximately 10 per sec, component amplitudes decrease and the peaks tend to become less well defined
- Wave V is most resistant to these effects
- More rapid rates may be used to facilitate recordings to measure the wave V threshold

Stimulus clicks according to polarity

Compression click (condensation click)

- If the electrical square pulse causes the diaphragm of the acoustic transducer to move toward the patient's ear

Rarefaction click

- Reversing the polarity of the electrical square pulse
- Generally preferable because BAEP peaks tend to be clearer

Stimulation with brief tone pips

- To probe specific parts of the cochlea

Acoustic masking

- Used to obtain frequency-specific information from BAEPs
- Relatively poor signal-to-noise ratios

BAEPs by bone-conducted stimuli

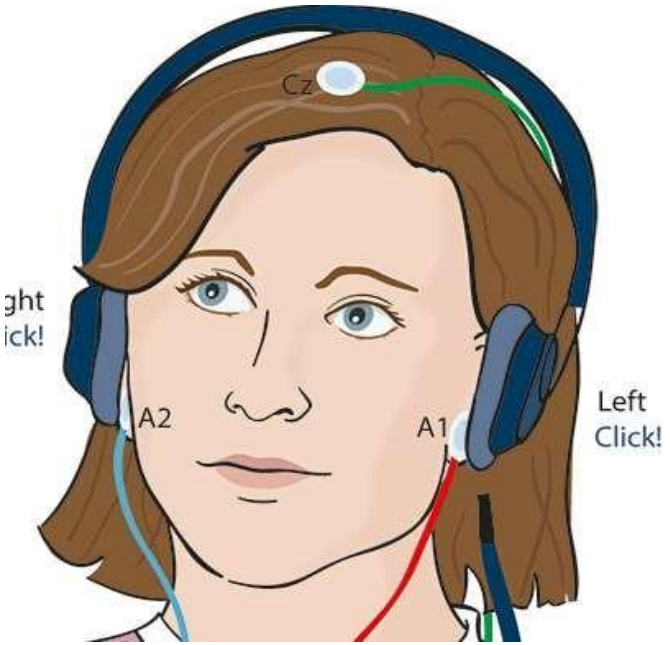
- Most useful in assessing patients who may have conductive hearing losses, such as neonates in whom BAEPs performed with air-conducted stimuli are suggestive of a hearing loss

BAEPs to Electrical Stimuli

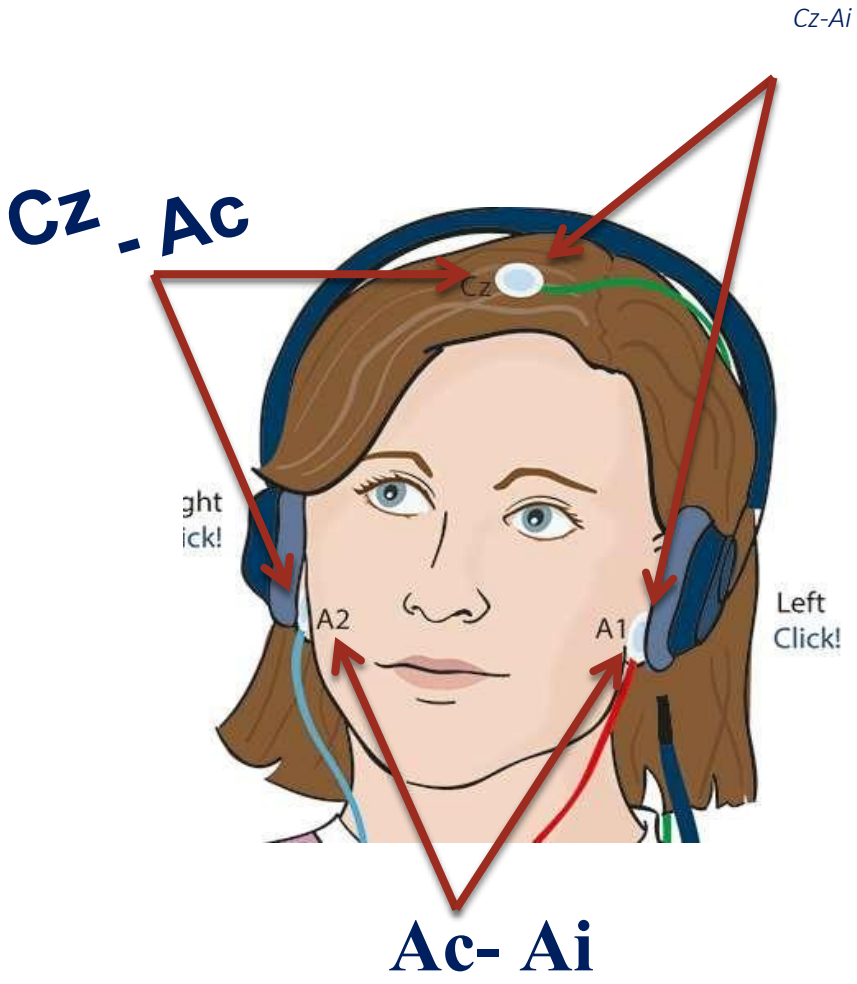
- Electrical stimulation of eighth nerve fibers through the electrodes of a cochlear prosthesis
- Used to assess the proximity of these electrodes to the spiral ganglion during implantation and the adequacy of eighth nerve stimulation during programming of the processor
- Correlate well with auditory outcomes, and may prove to be useful in guiding therapy in young children with questionable auditory nerve integrity

Recording electrodes

- Typically are placed at the vertex (location Cz of the International 10–20 System) and at both ear lobes (Ai and Ac)
- Electrodes at the mastoids (Mi and Mc) may be substituted, although wave I tends to be smaller because of muscle noise



Montages



May assist in the identification of wav

Patient relaxation

- Patients usually are tested while lying comfortably so that their neck musculature is relaxed
- Patients should be requested to let their mouth hang open if the muscles of mastication are tensed
- encouraged to sleep during testing
- If the patient cannot relax sufficiently, sedation can be induced with agents such as chloral hydrate (little or no effect on BAEPs in the usual sedative doses)

Data analysis

- Amplifier filters out all of the delta, theta, alpha, and beta bands of the EEG
- Biologically derived noise in the recordings is derived predominantly from muscle activity
- Therefore, patient relaxation during the recording session is essential to obtain “clean” waveforms with a good signal-to-noise ratio

Data analysis

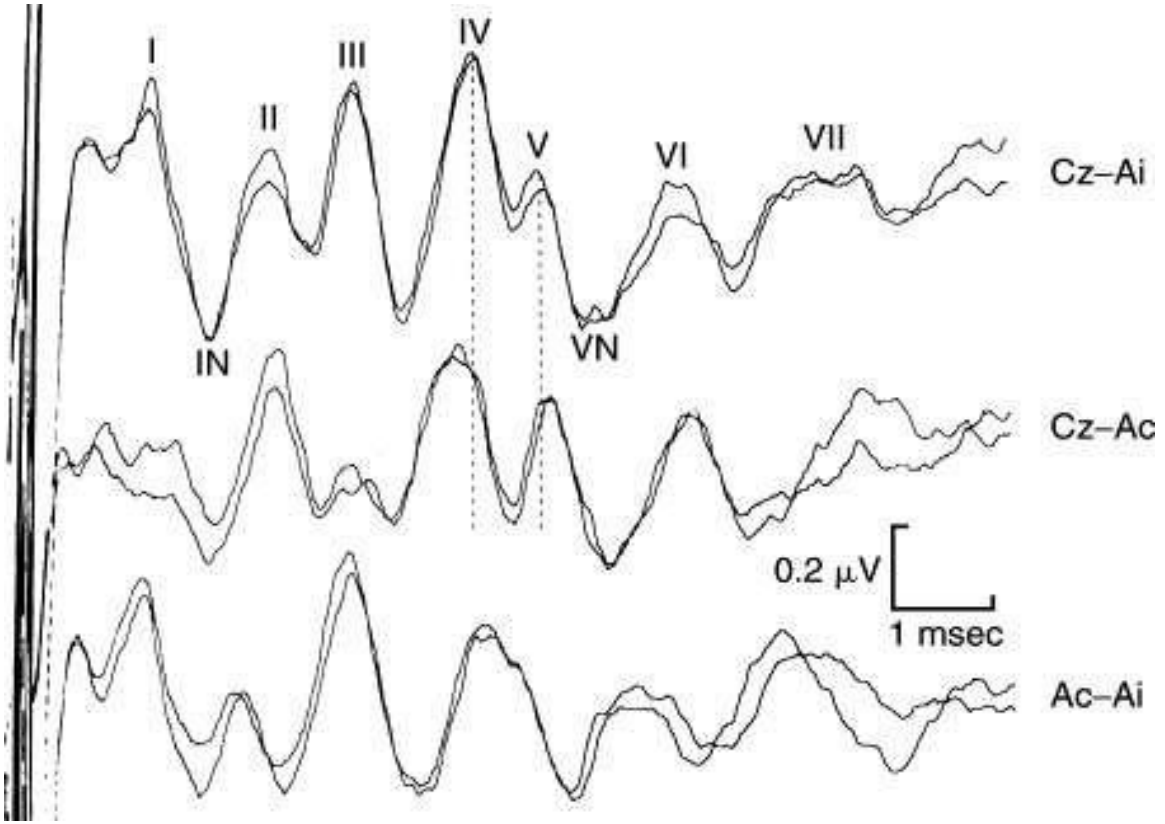
- Data typically are digitized over an epoch duration or analysis time of approximately 10 msec
- Longer analysis time of 15 msec may be required for recording pathologically delayed BAEPs, BAEPs to lowered stimulus intensities (as when recording a latency–intensity study), BAEPs in children, and BAEPs during intraoperative monitoring
- Signal averaging is required for improvement in the signal-to-noise ratio

Waveform Identification

- Cz–Ai BAEP typically is displayed so that positivity at the vertex relative to the stimulated ear is displayed as an upward deflection
- Upward-pointing peaks are labeled with Roman numerals
- Downward-pointing peaks are labeled with the suffix N according to the peak that they follow

- Typically begins with an electrical stimulus artifact that is

synchronous with stimulus production at the transducer



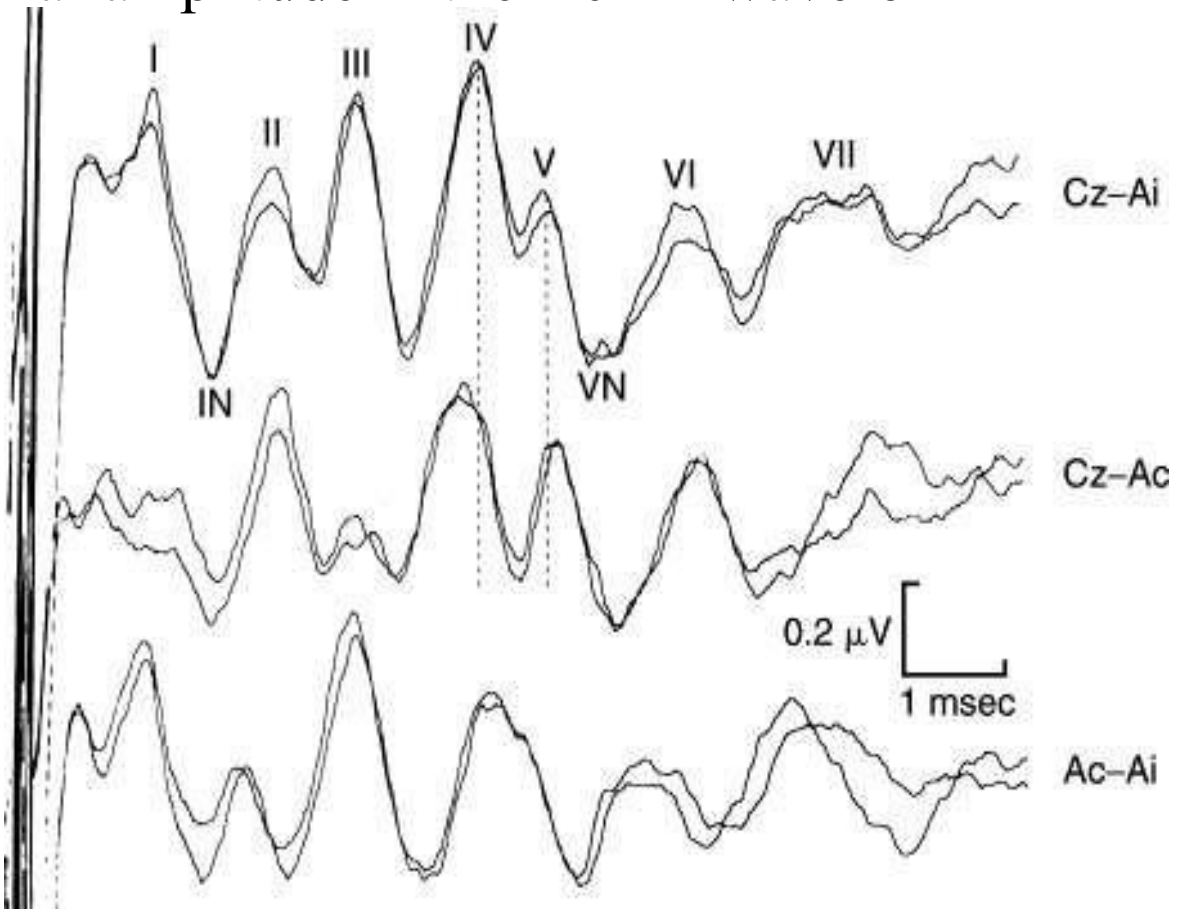
Reducing the Stimulus Artifact

May overlap with wave I and impair the identification and measurement

- Using shielded headphones and headphones with piezoelectric transducers instead of voice coil transducers
- Transducers that are connected to an ear insert by flexible plastic tubing several centimeters in length

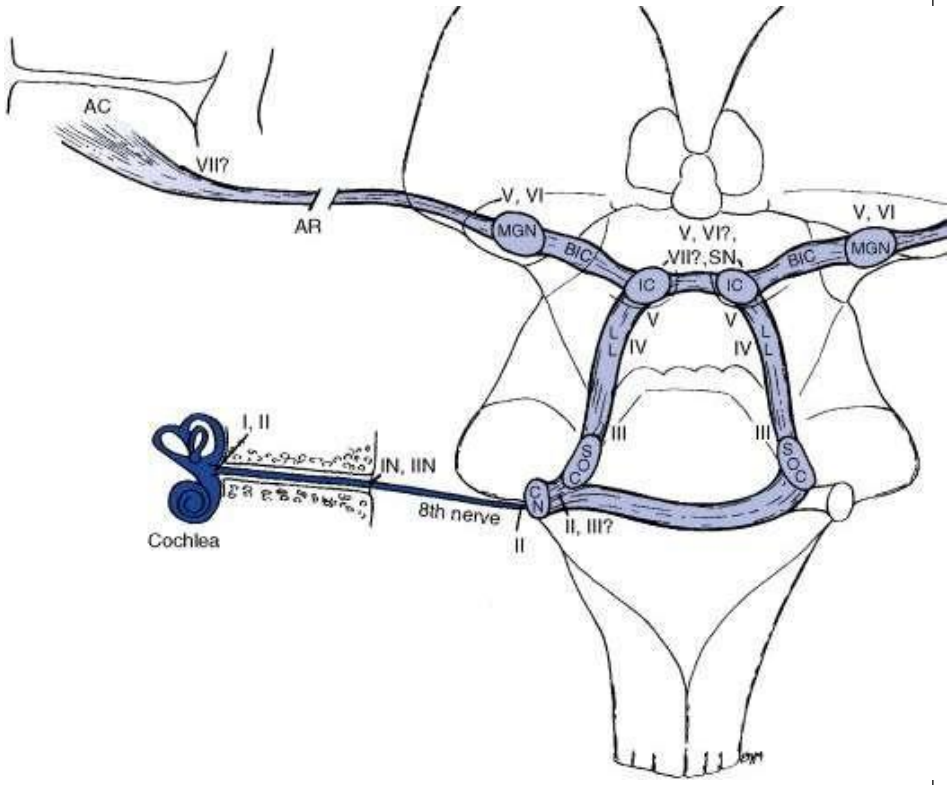
Wave I

- first major upgoing peak of the Cz–Ai BAEP
- upgoing peak of similar amplitude in the Ac–Ai waveform
- markedly attenuated or absent in the Cz–Ac waveform



Wave I

- Arises from at the most distal (i.E., Closest to the cochlea) portion of auditory nerve
- Circumscribed negativity around the stimulated ear
- Appears in Cz–Ai and Ac– Ai recordings but is minimal or absent in Cz–Ac



Cochlear microphonic Vs Wave I

- Visible as a separate peak preceding wave I, especially if the stimulus artifact is small
- Distinguished by reversing the stimulus polarity, which will reverse the polarity of the cochlear microphonic; Wave I may show a latency shift, but will not reverse polarity

Bifid wave I

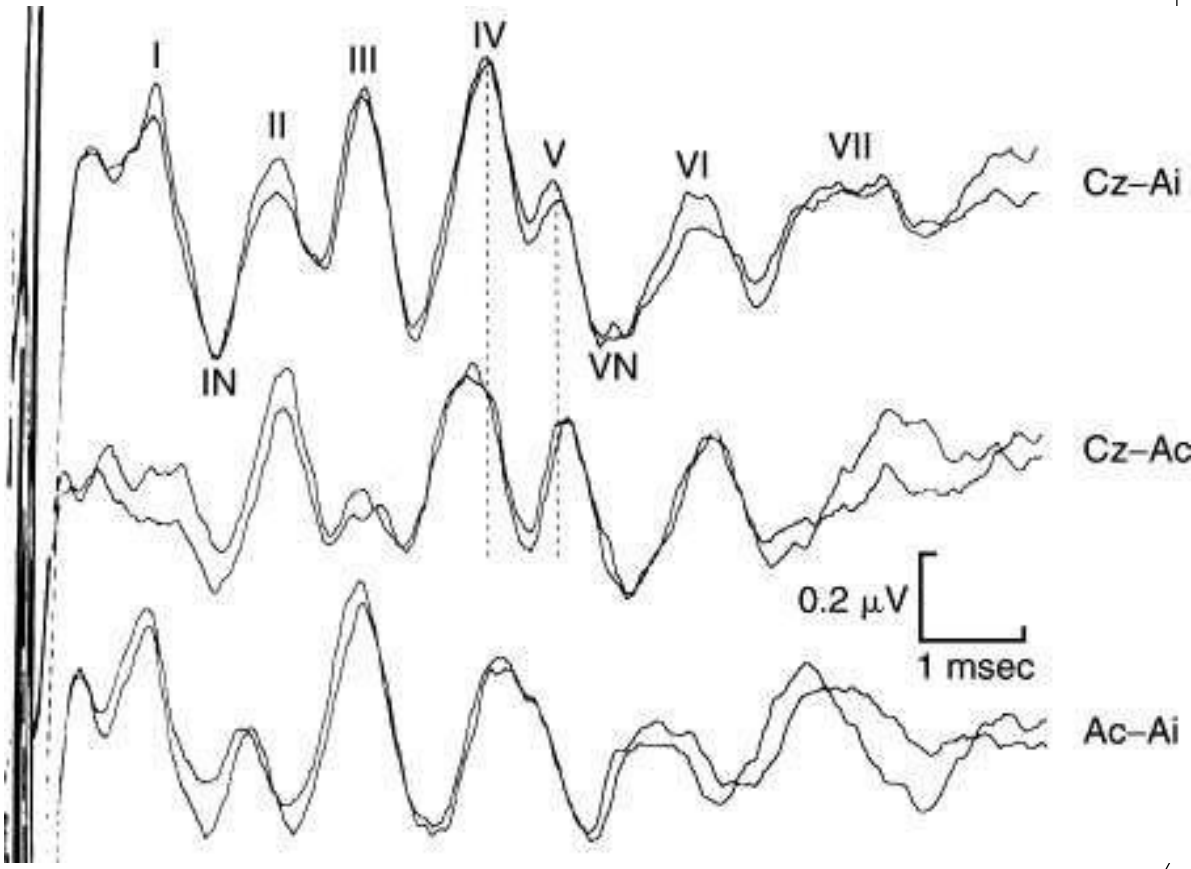
- Represents contributions to wave I from different portions of the cochlea
- Earlier of the two peaks, which reflects activation of the base of the cochlea, corresponds to the single wave I that is typically present in the Cz–Ai waveform
- Reversal of stimulus polarity can be used to distinguish a bifid wave I from a cochlear microphonic followed by (a single) wave I

Techniques to obtain a clearer wave I

- Electrode within the external auditory canal
- Ac–Ai recording channel can yield a somewhat larger and clearer wave I than that in the standard Cz–Ai recording
- Reduction in the stimulus repetition rate
- Increasing the stimulus intensity

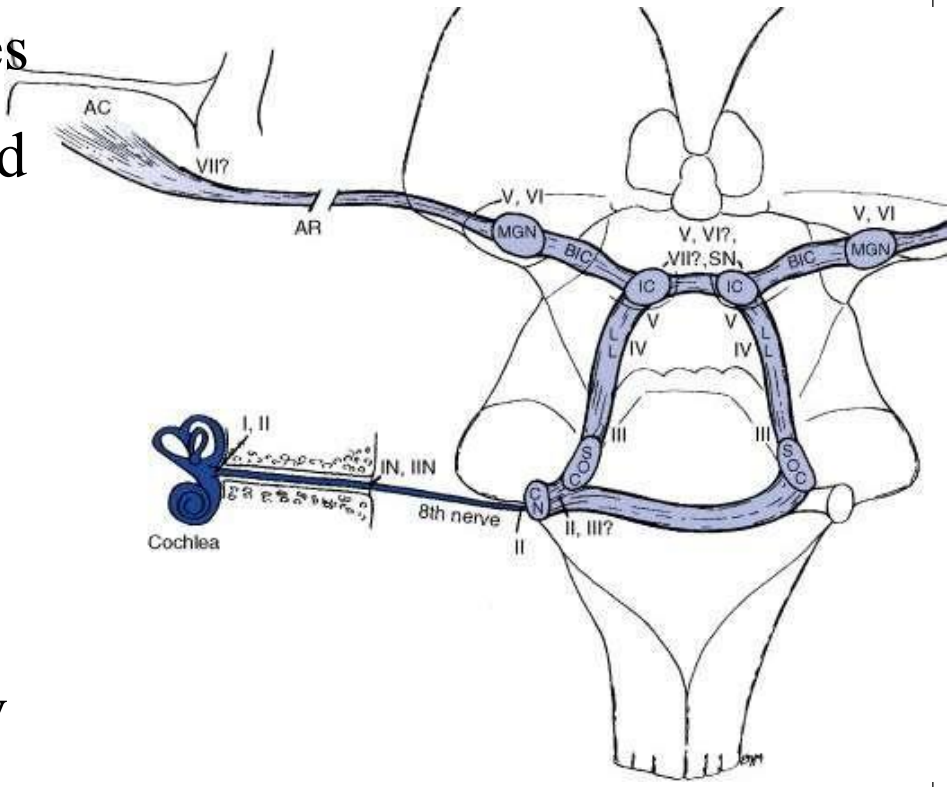
Wave IN

- Present at substantial amplitude in the Cz–Ac channel
- Usually the earliest BAEP component in that waveform



Wave IN

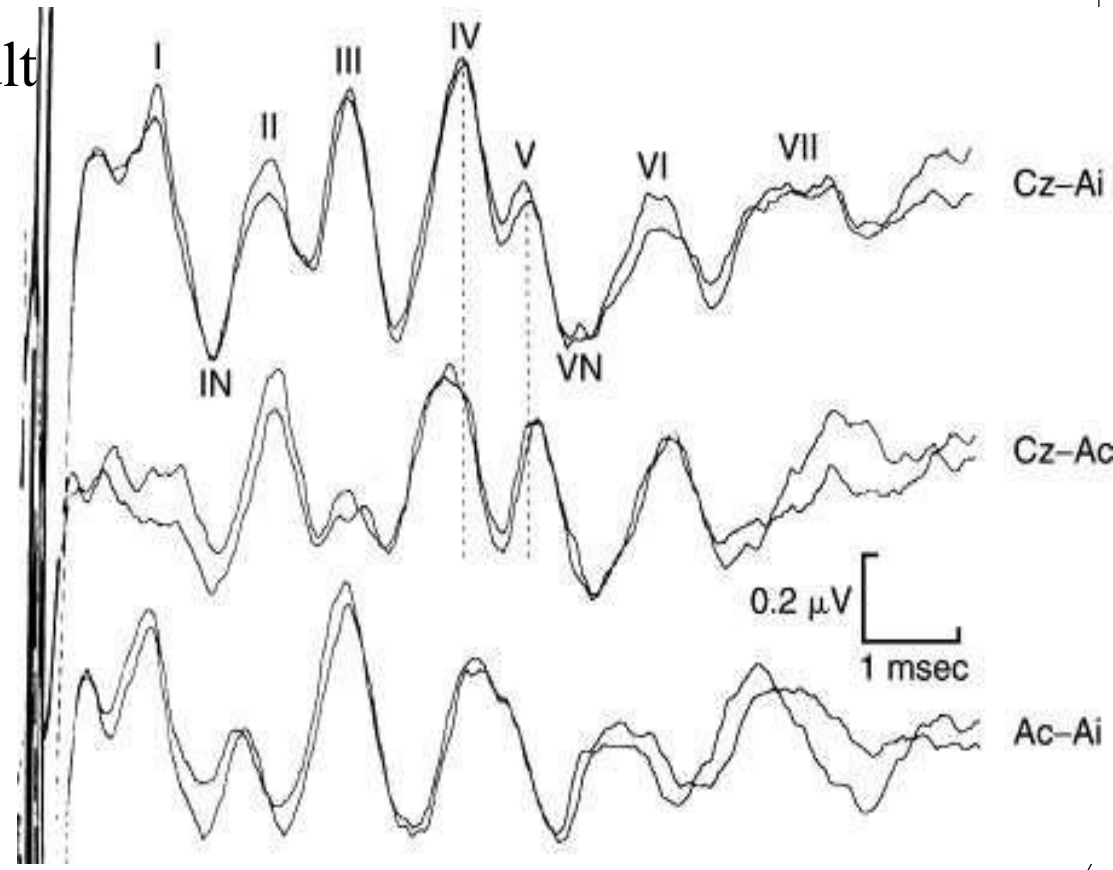
- From auditory nerve as it passes the internal auditory meatus and moves from a nerve encased in bone to one surrounded by cerebrospinal fluid
- Field includes positivity at the mastoid and far-field negativity around the vertex

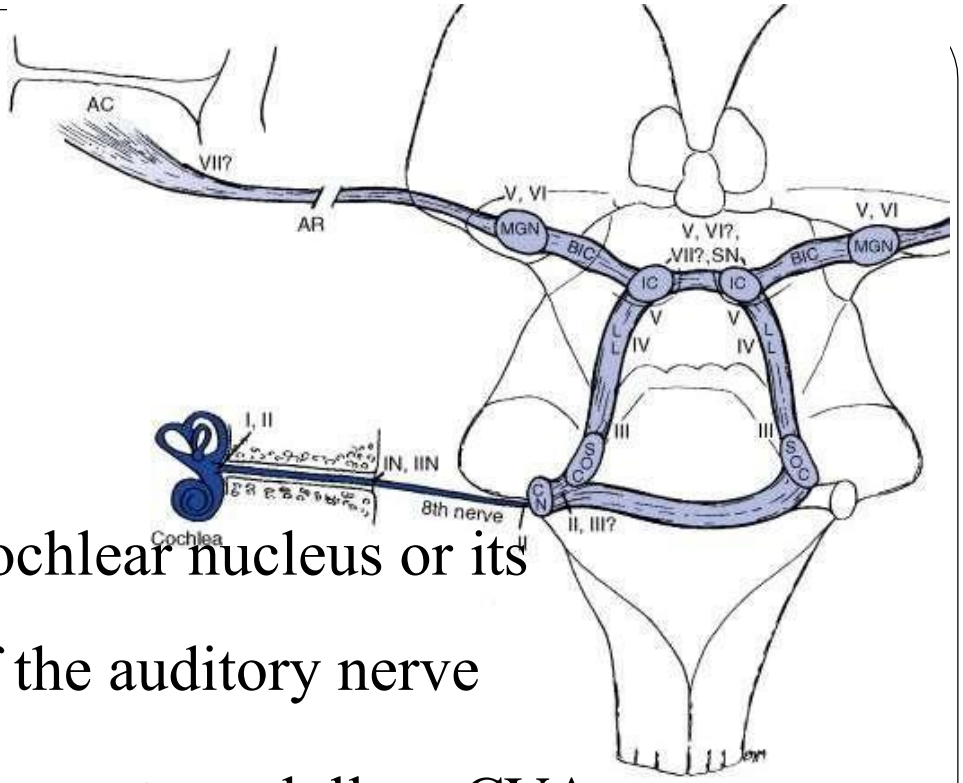


- In contrast to wave I,

Wave II

- First major upward deflection in the Cz–Ac waveform
- Similar amplitude in the Cz–Ai and Cz–Ac channels
- may be small and difficult to identify in some normal subjects





- Arises from two loci

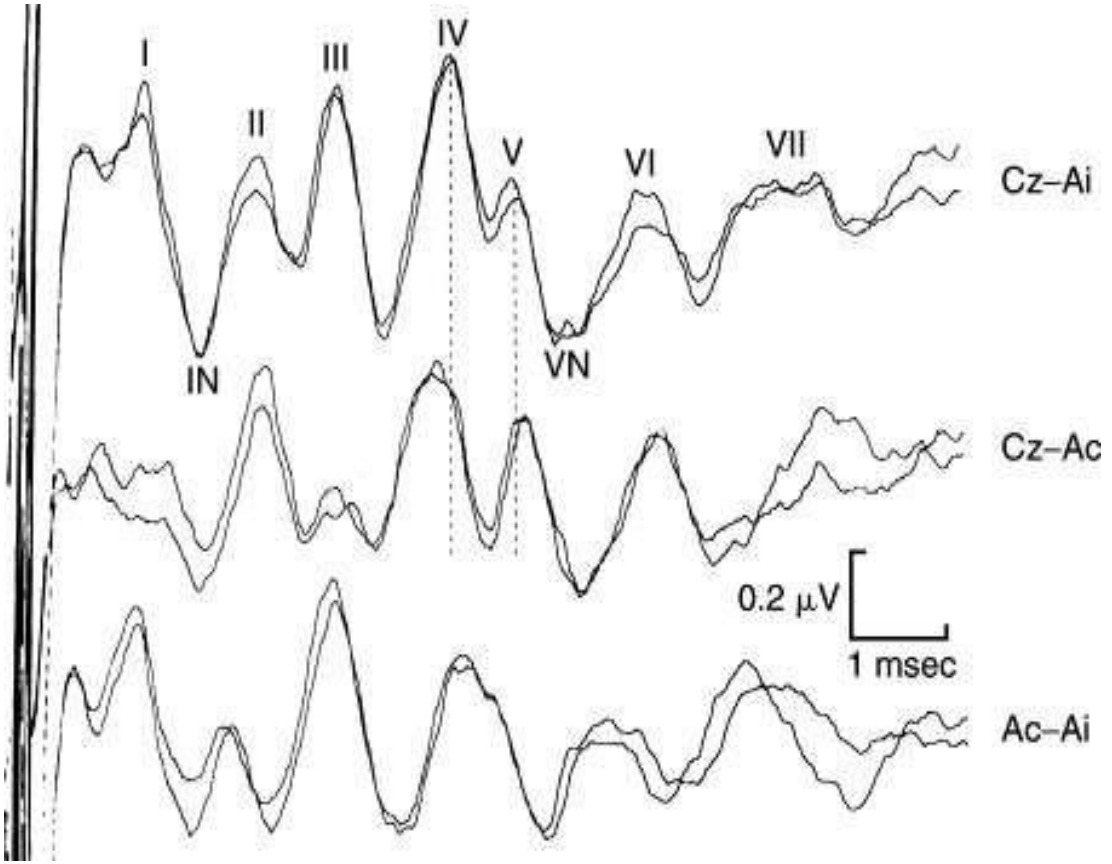
a) distal auditory nerve

b) brainstem, specifically the cochlear nucleus or its outflow and proximal end of the auditory nerve

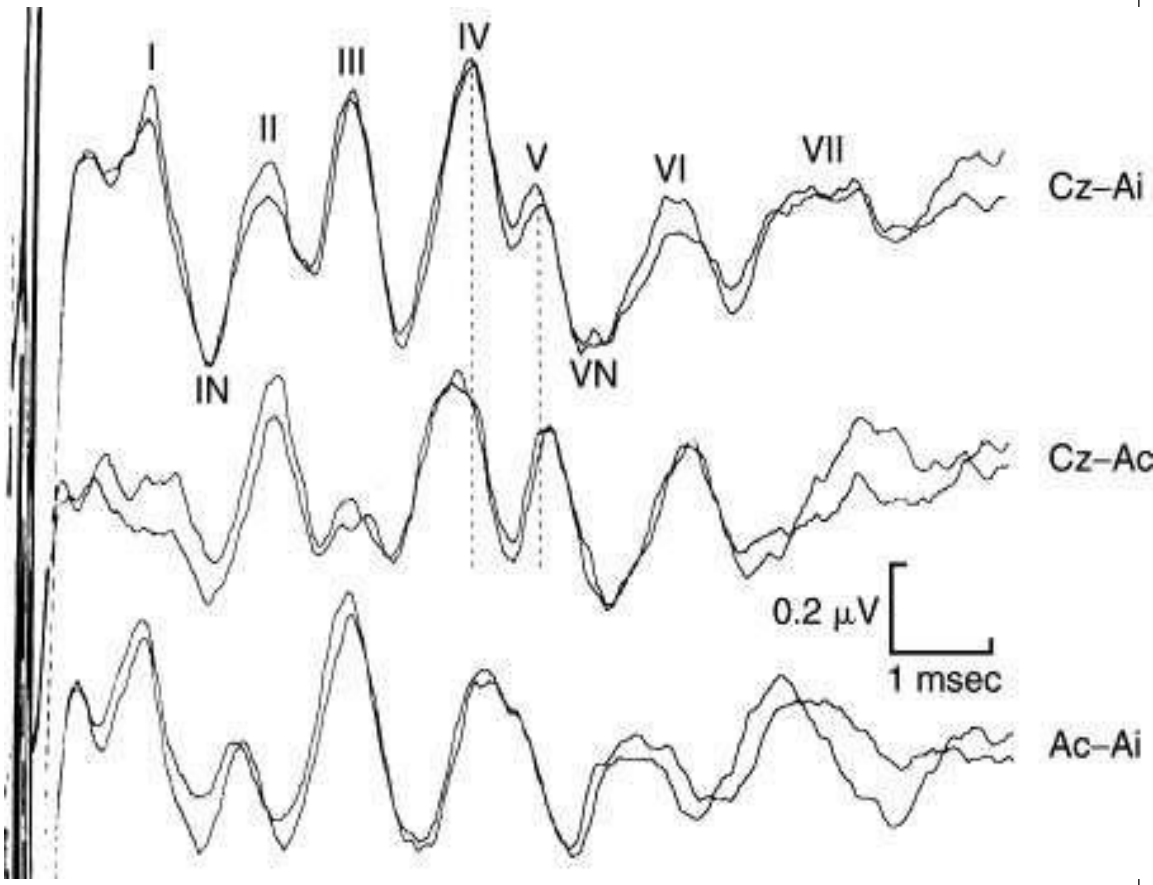
- Earliest component affected by pontomedullary CVAs involving the cochlear nucleus
- Usually predominant over the dorsal part of the head and a clear wave II in the Cz–Ac waveform

Wave IIN

- Arises from auditory nerve as it passes the internal auditory meatus

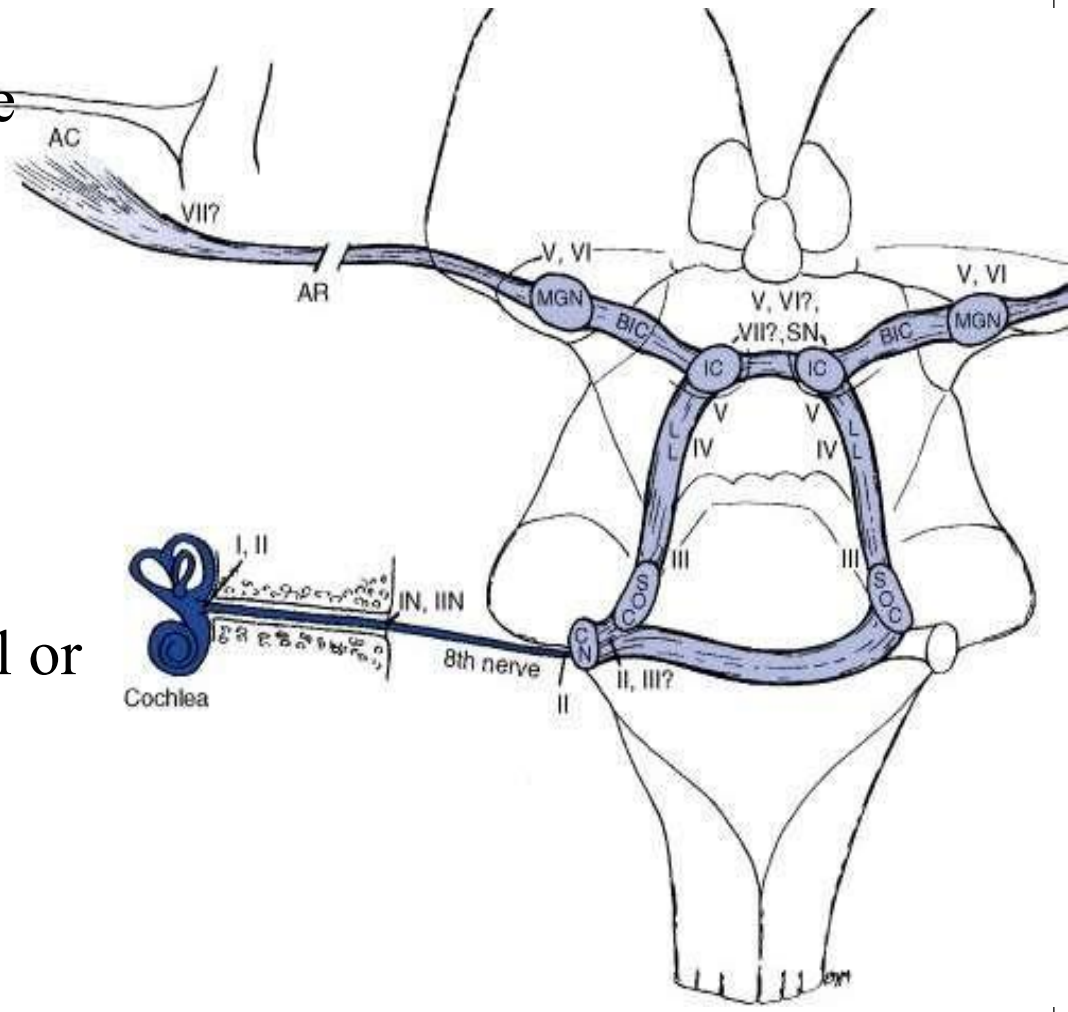


- usually present in both the Cz–Ai and Ac–Ai channels
- substantially smaller in the Cz–Ac



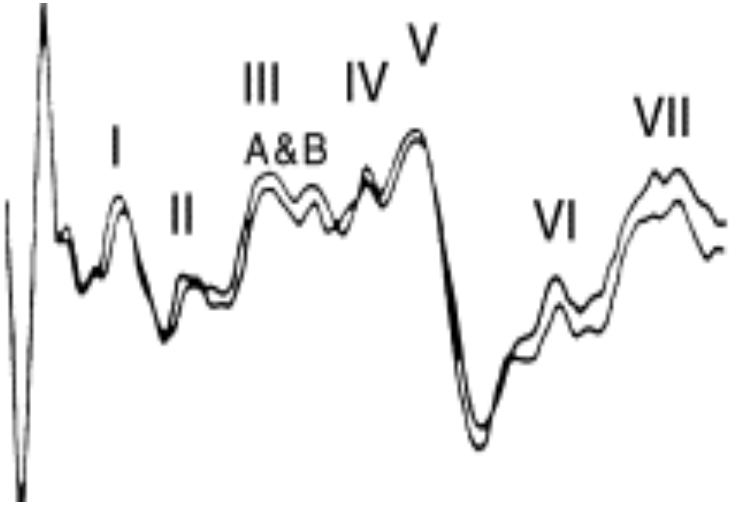
Wave III

- Arises from caudal pontine tegmentum in the superior olivary complexes or their outflow within the lateral lemniscus
- Abnormal either ipsilateral or contralateral to the major pathology in patients with asymmetric lesions



Wave III variants

Bifid wave III



- normal variant

Poorly formed or absent wave II

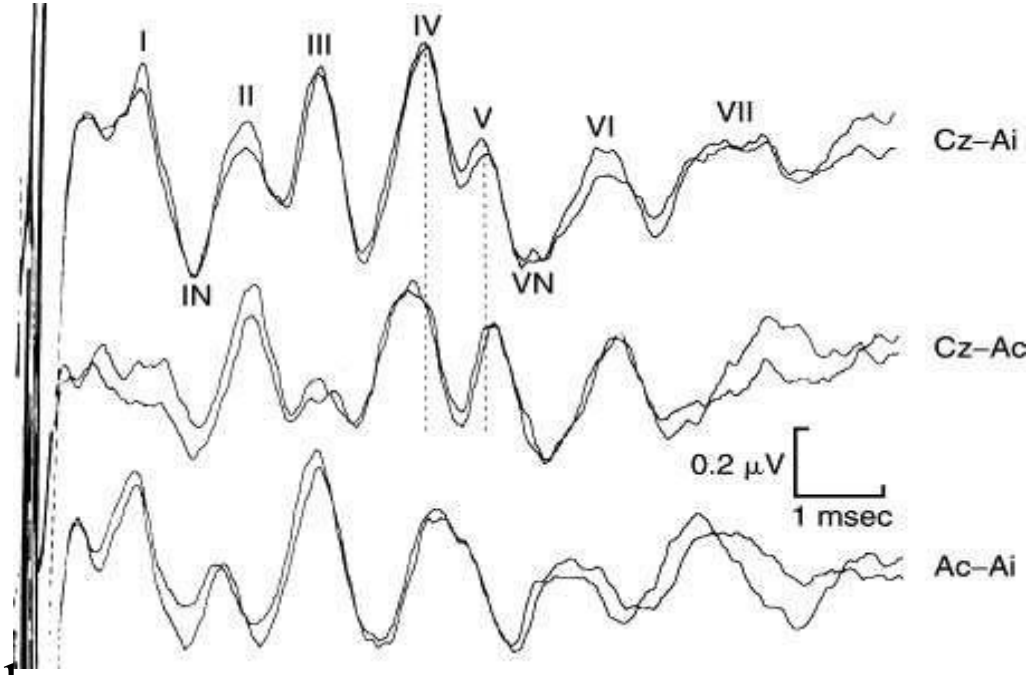
- normal variant in a patient with a clear wave V and a normal I–V interpeak interval

Role of Descending Pathways in BAEPs

- Waves I and II may be quite large or waves II and III are delayed in latency in patients with rostral brainstem pathology
- probably reflects loss of activity in descending inhibitory pathways originating in or traversing the region of the inferior colliculus

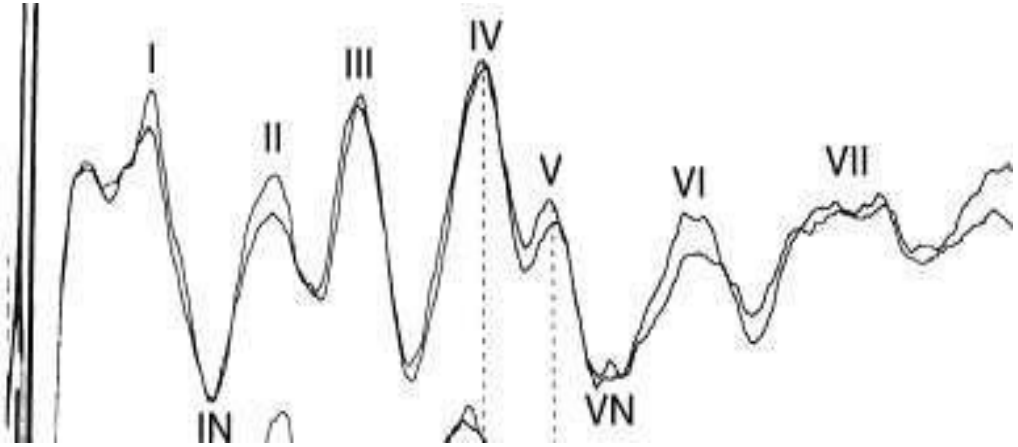
Waves IV and V

- often fused into a IV/V complex
- most prominent component in the BAEP waveform
- morphology varies from one subject to another, and may differ between the two ears in the same

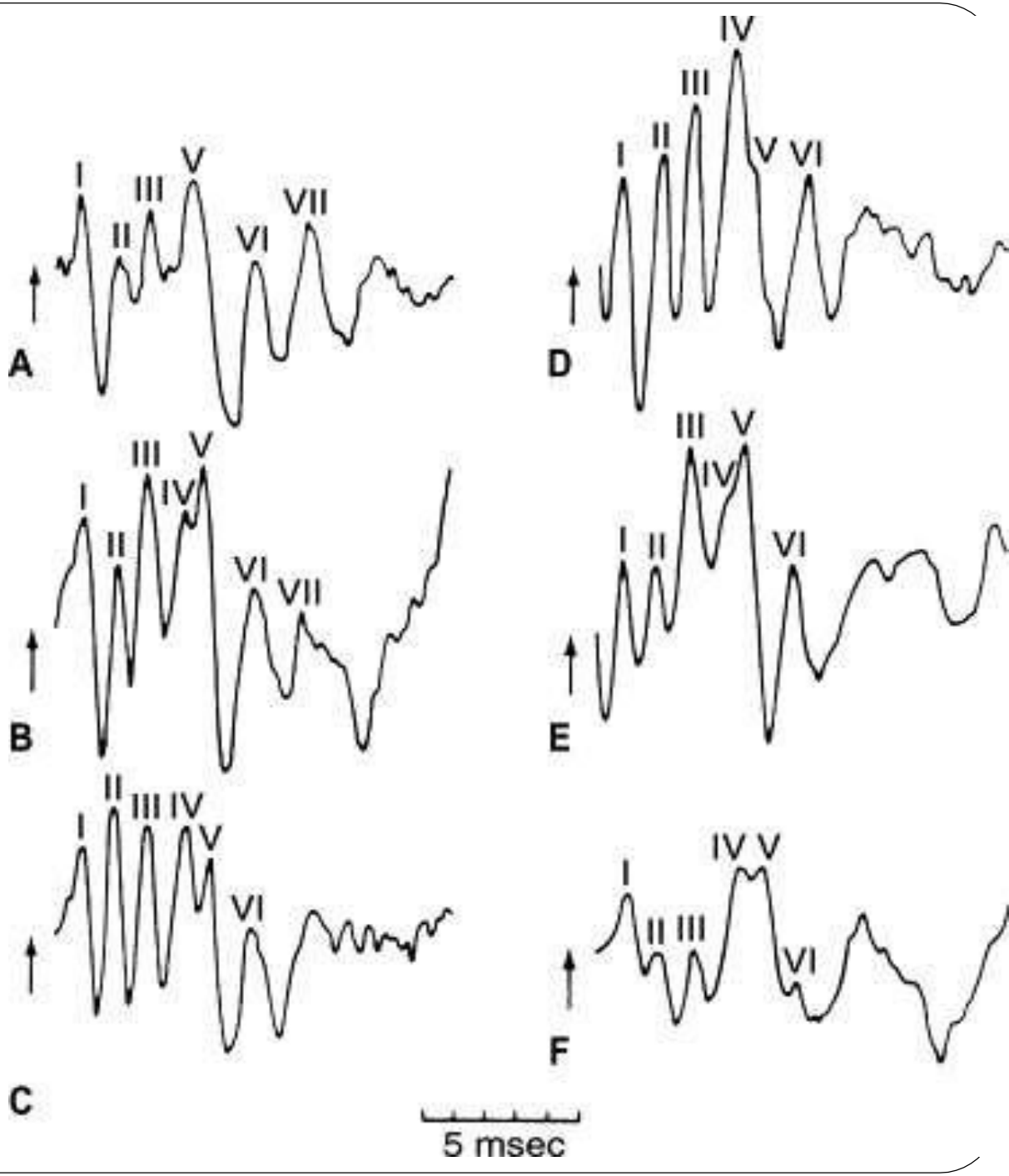


Waves IV and V

- Earliest components that are absent and usually are the earliest that are abnormal in patients with lesions of the midpons, rostral pons, or mesencephalon
- Usually is followed by a large negative deflection that lasts several milliseconds and brings the waveform to a point below the prestimulus b

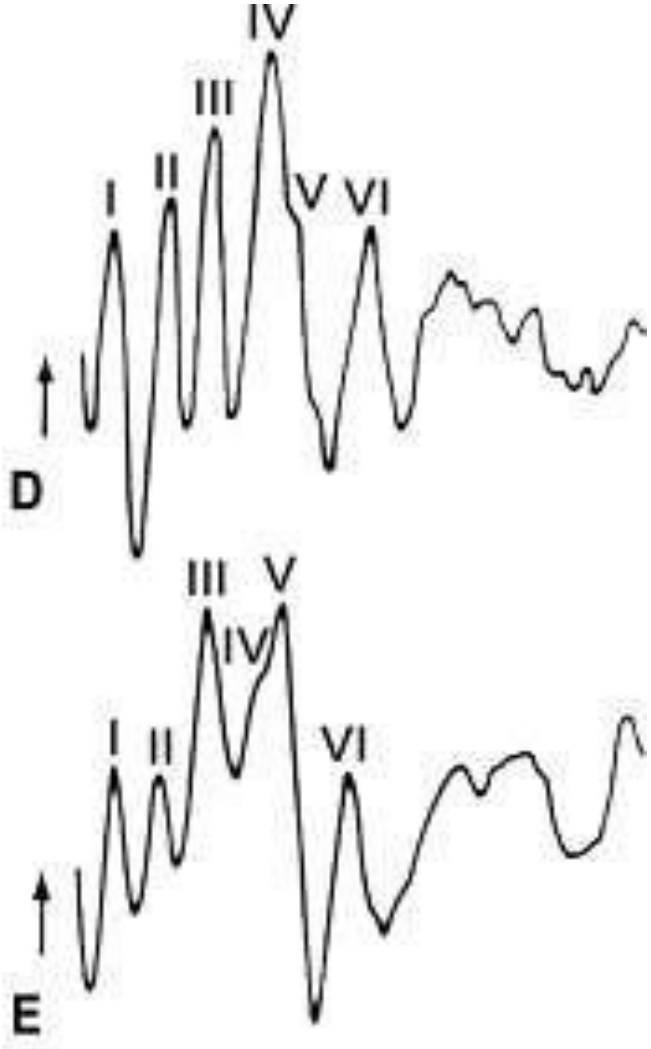


Various IV/V complex morphologies in Cz–Ai waveforms recorded in normal subjects



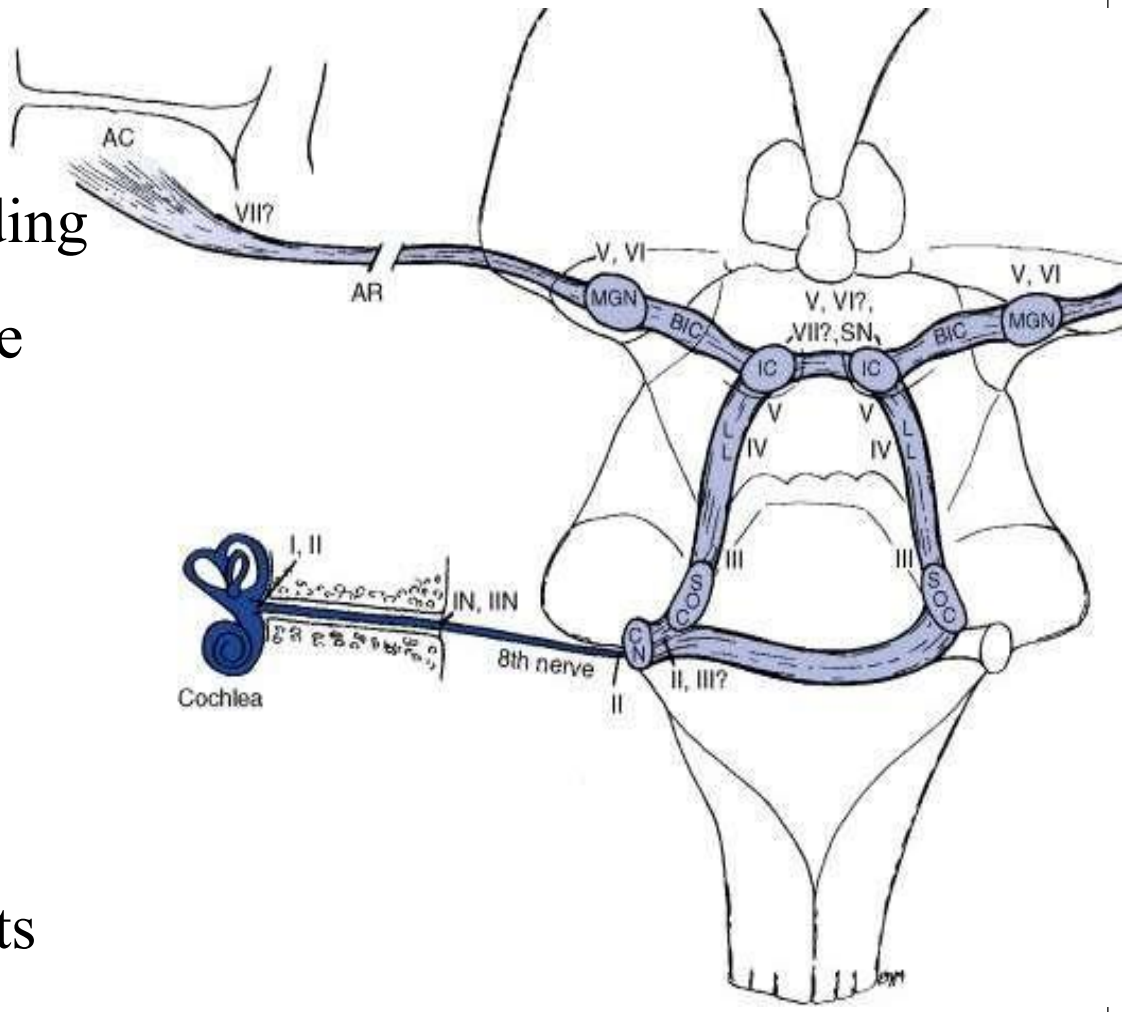
Totally fused IV/V complex Vs single wave IV or V

- Complex has a “base” that is greater than 1.5 msec in duration, whereas the width of a single wave is less than 1.5 msec



Wave IV

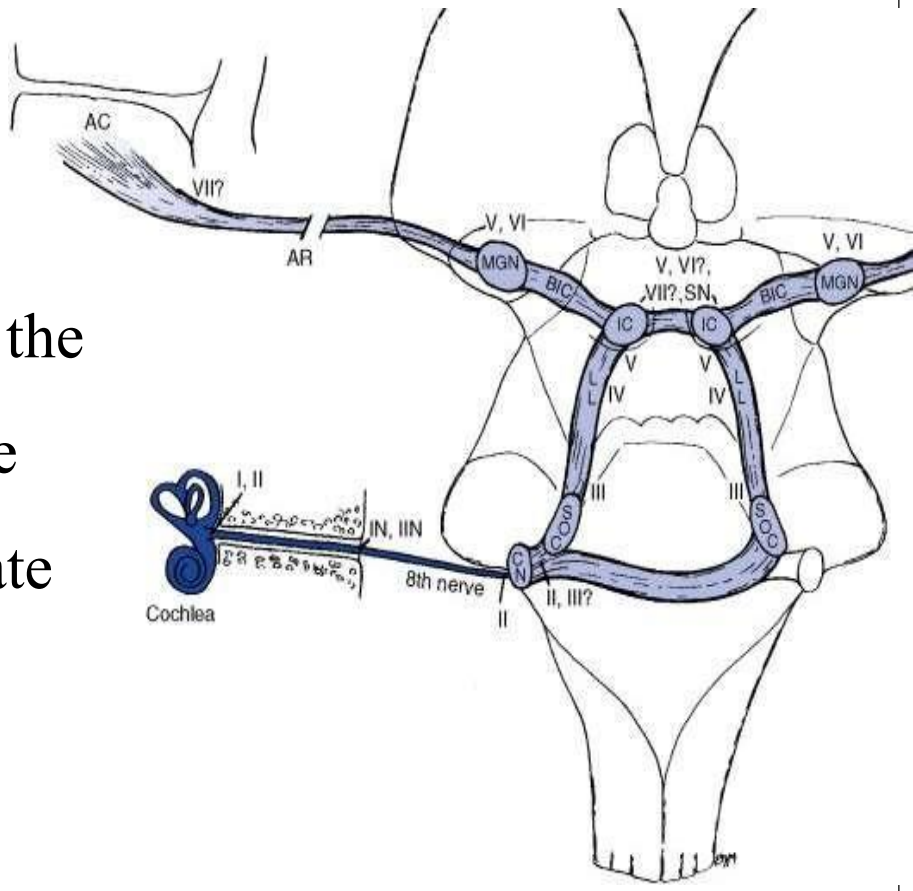
- Reflect activity predominantly in ascending auditory fibers within the dorsal and rostral pons, caudal to the inferior colliculus
- Affected by tumors or cerebrovascular accidents of the midpons



or rostral pons

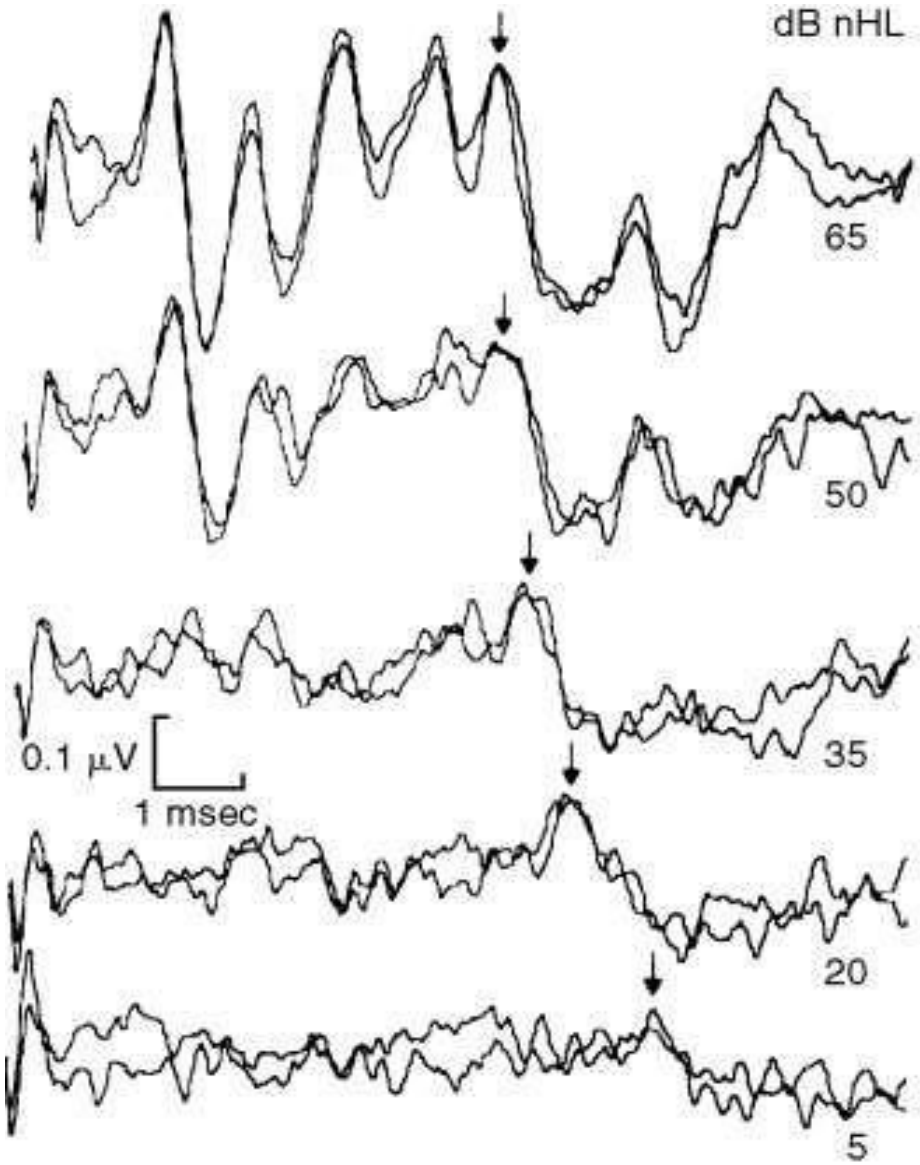
Wave V

- Arises at the level of the mesencephalon, either from the inferior colliculus itself or, from the fibers in the rostral portion of the lateral lemniscus as they terminate in the inferior colliculus
- Intracranial data suggest C/L mesencephalon but clinically associated most often with ipsilateral pathology



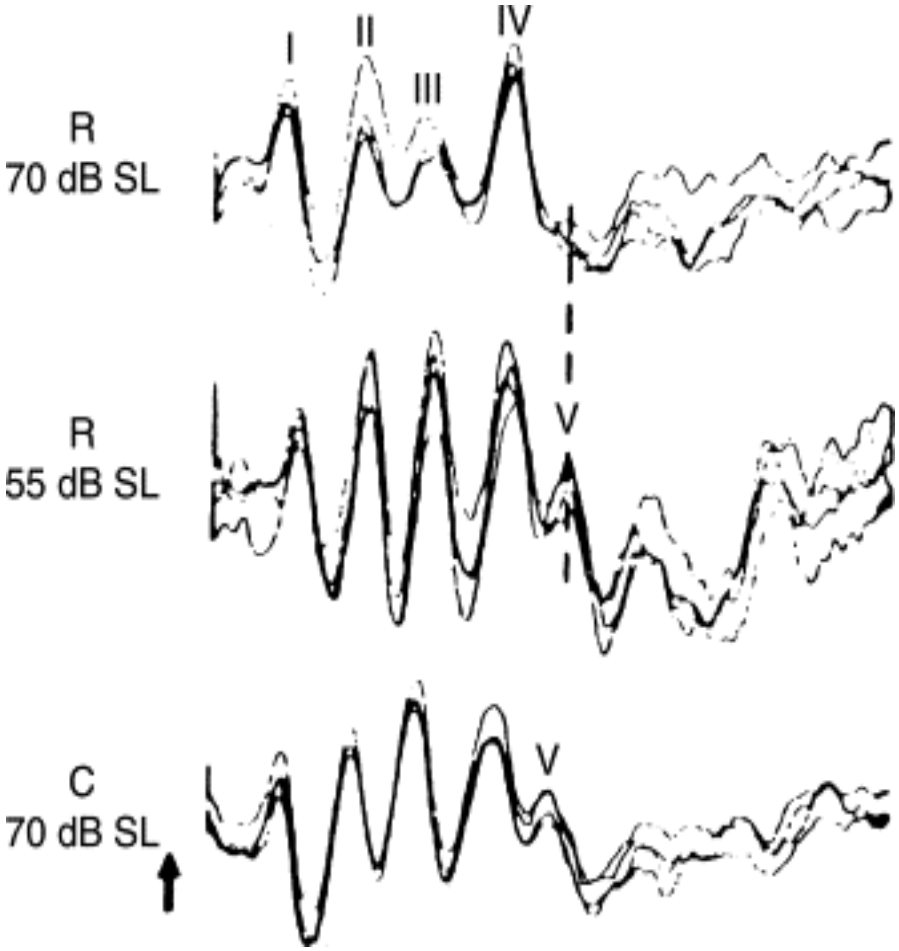
Wave IV *vs* V

- Wave V most resistant to the effects of decreasing stimulus intensity or increasing stimulus rate
- If either of these stimulus modifications is performed progressively until only one component remains, that peak can be identified as wave V



Wave V identification

- Occasionally, wave V may be present following stimulation with one click polarity but not the other
- Therefore, recording a BAEP with the opposite stimulus polarity may be useful if wave V is not identifiable with the standard laboratory

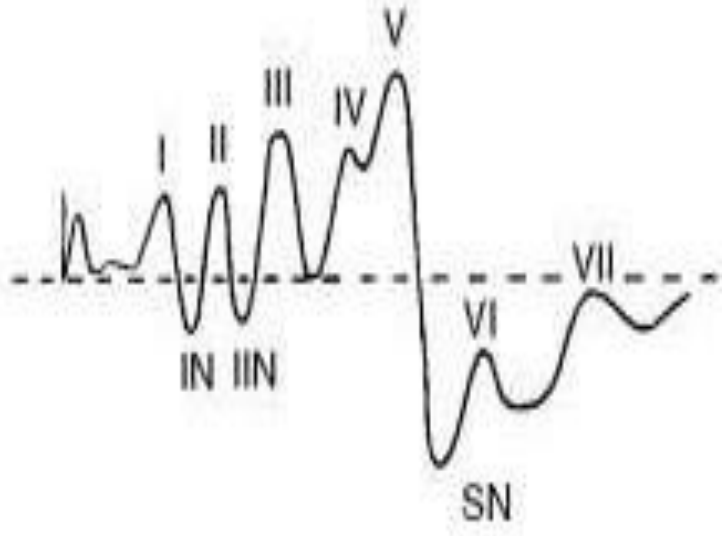


Differential affection of waves IV and V

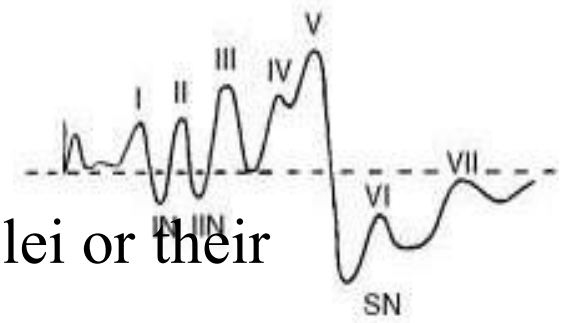
- Multilevel demyelination
- Brainstem infarct
- Small brainstem hemorrhage in the lateral lemniscus

Wave VN

- Downward deflection following wave V(slow negativity (SN)
- Typically wider than the positive components and the earlier negative peaks
- Reflects postsynaptic potentials within brainstem auditory nuclei, primarily the inferior colliculus



Wave VI

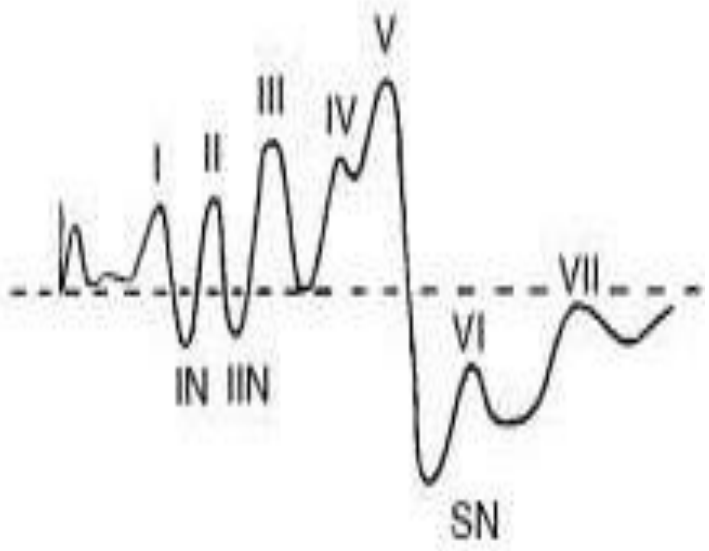


- Generation within the medial geniculate nuclei or their outflow tracts
- Absent in Cz–Ai and Cz–Ac recordings in some normal individuals
- Abnormalities in patients with tumors of the rostral midbrain and caudal thalamus at the level of the medical geniculate nucleus and the brachium of the inferior colliculus

BAEPs cannot be used to assess the status of the

Wave VII

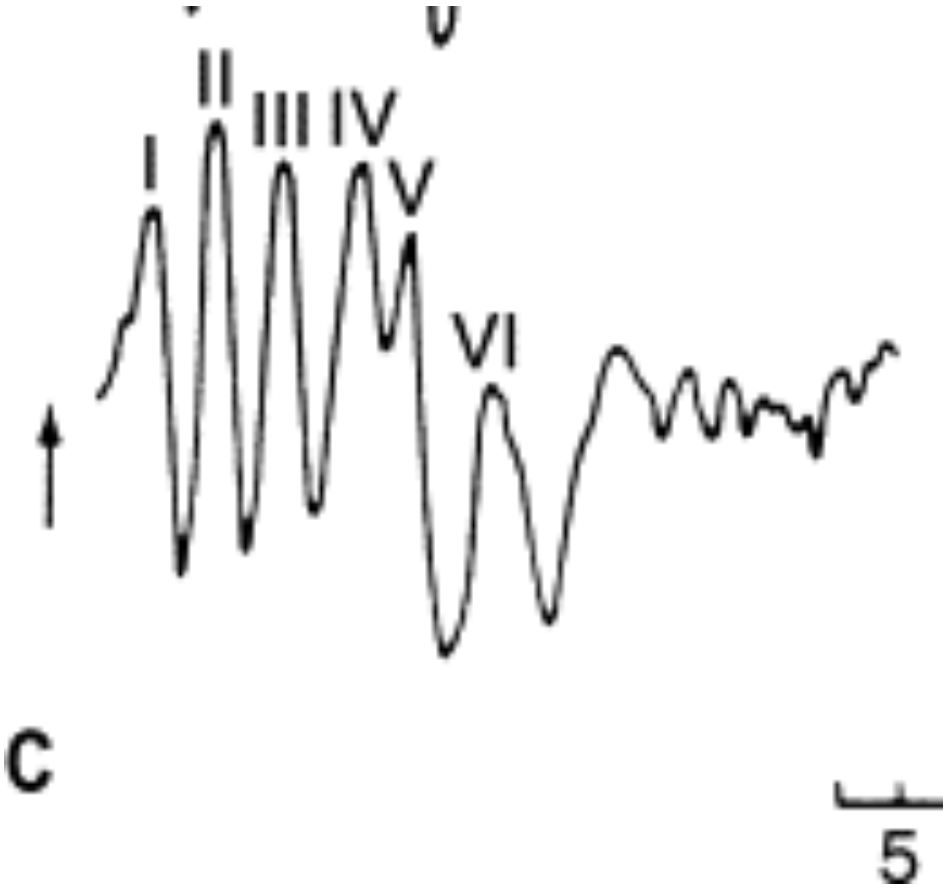
- Often absent in conventionally recorded normal BAEPs
- Generation near the auditory cortex, predominantly contralaterally
- Does not provide clinically useful information about the status of the auditory pathways



Wave V latency measurement

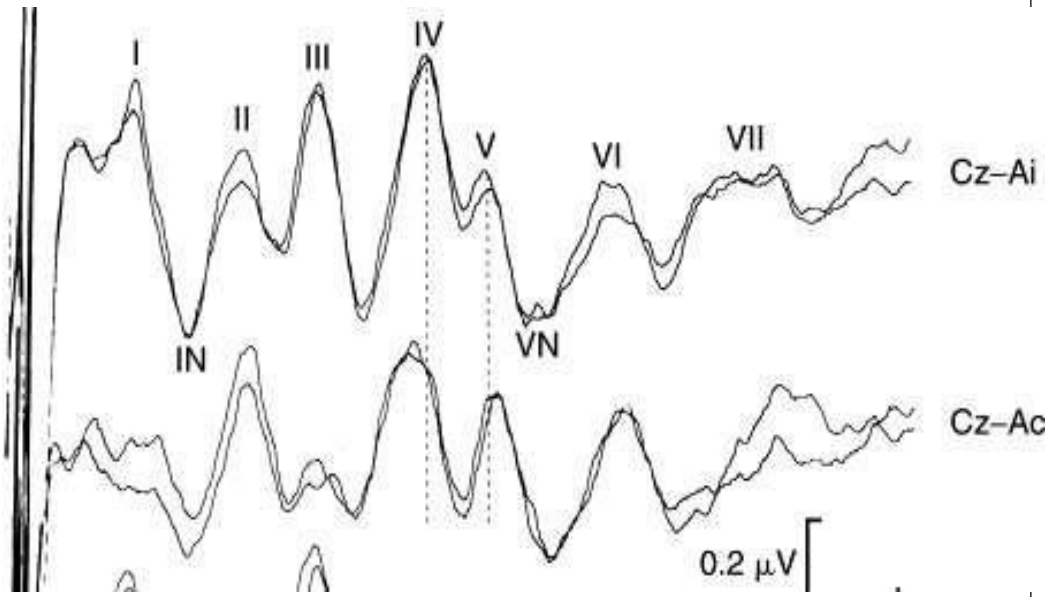
- Should be taken from the

second subcomponent of the IV/V complex, even if this is not the highest peak (in contrast to the amplitude measurement, which is taken from the highest point in the complex)



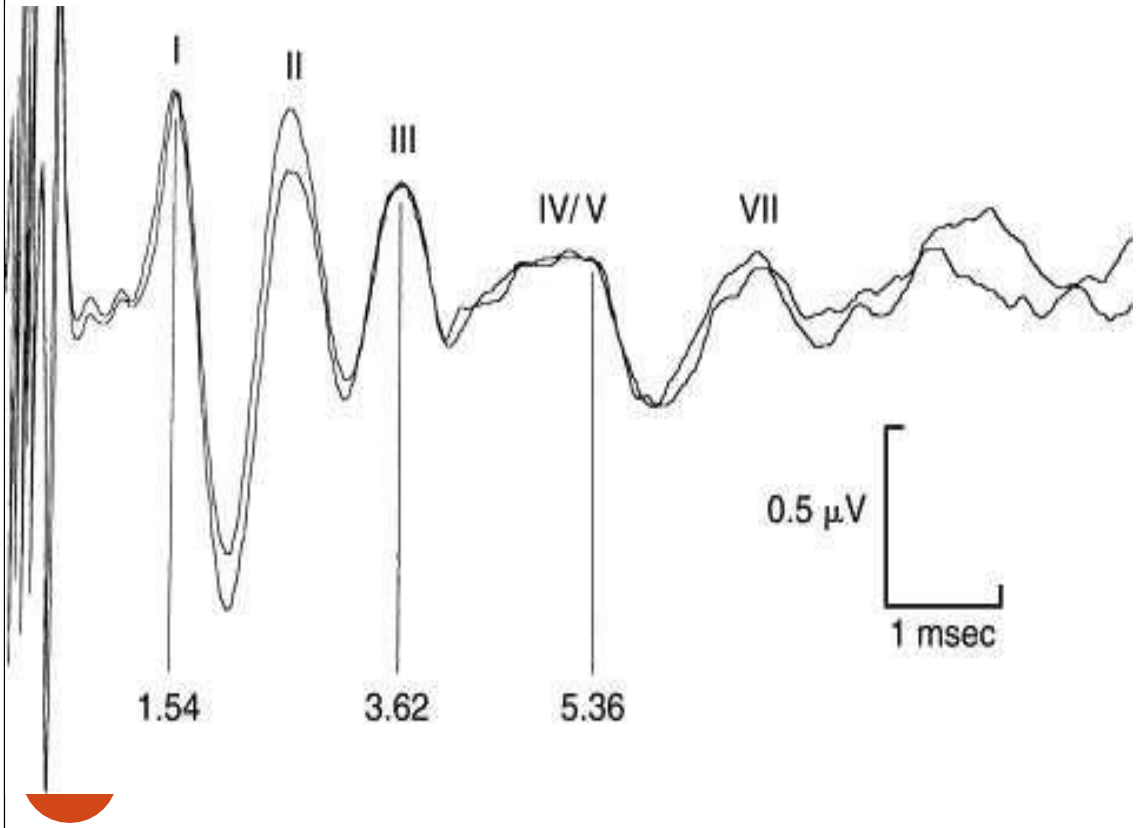
Wave V latency measurement

- Measurement in a Cz–Ac
- Overlapping peaks are separated more clearly because the latency of wave IV is typically earlier, and that of wave V is later, than in the Cz–Ai waveform



IV/V:I amplitude ratio

- With respect to the most negative point that follows it in the waveform (I to IN and IV/V to VN), and their ratio is



27-year-old woman with probable multiple sclerosis

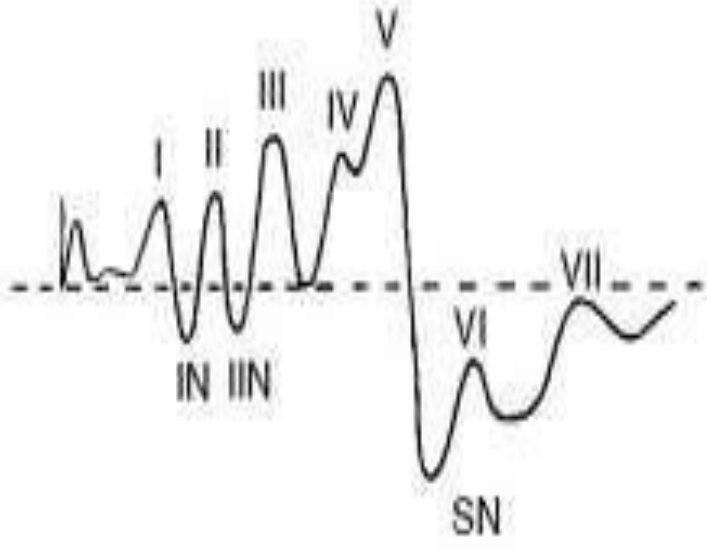
IV/V:I amplitude ratio is 0.28; all absolute latencies and interpeak intervals are normal

Clinical interpretation of BAEPs

- Waves II, IV, VI, and VII are sometimes not identifiable in normal individuals, and their peak latencies display more interindividual variability
- Amplitude measurements of the individual components are also highly variable
- Ratio between the amplitude of the IV/V complex and that of wave I has proved to be a clinically useful measure

Clinical interpretation of BAEP

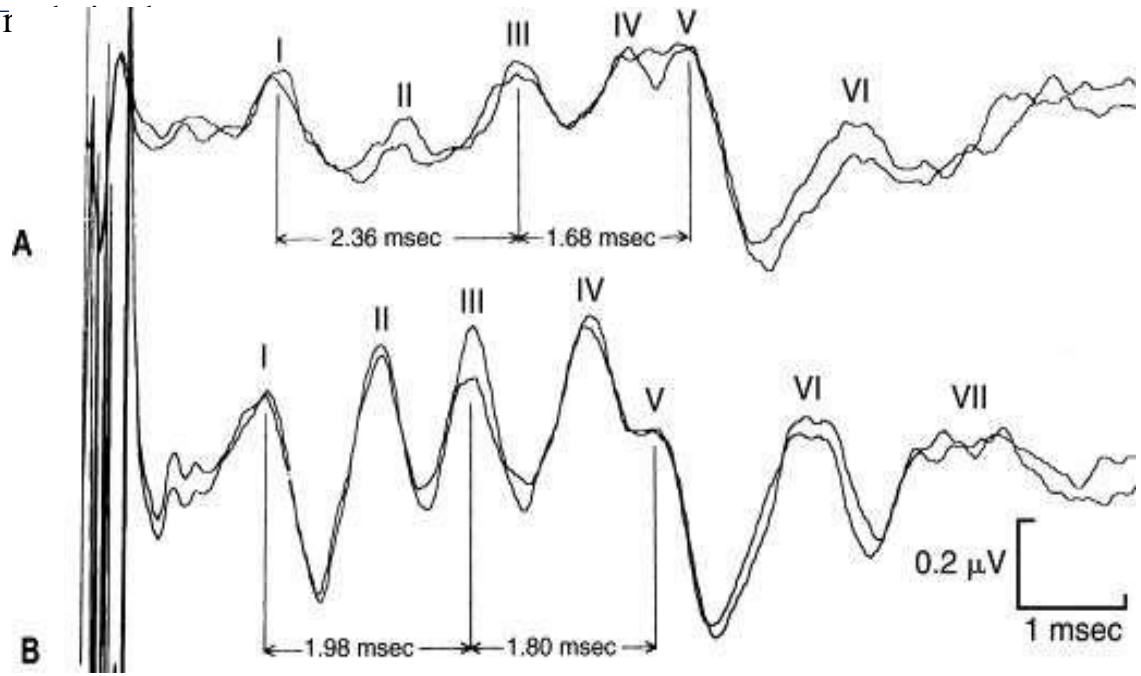
- Identification of waveforms - Presence or absence of waves I, III, and V
- Latencies of waves I, III, and V
- I–III, III–V, and I–V interpeak interv
- Right-left differences of these values
- IV/V:I amplitude ratios



Measurement of right-left differences

- Increases test sensitivity because the intersubject variability of these measures is less than that of the absolute component latencies and interpeak intervals

23-year-old man with left-sided acoustic neuroma I–III, III–V, and I–V interpeak intervals are within normal limits bilaterally, but the right-left differences are abnormally large



Clinical interpretation of BAEPs

Peripheral transmission time (PTT)

- Latency of wave I

Central transmission time (CTT)

- I–V interpeak interval

Normative Data

- Control data should have been acquired under the same conditions used to test the patient, including the polarity, rate, and intensity of the stimulus and the filter settings used for data recording
- Limits of the normal range are typically set at 2.5 or 3 standard deviations from the mean of normally distributed data
- I–V and III–V interpeak intervals are, on average, shorter in women than in men

Normative Data

Latency (ms)

- Wave I=1.50
- Wave III=3.57
- Wave V=5.53

Interpeak intervals

I-III=2.06 III-V=1.96 I-V=4.02

Delay Versus Absence of Components

- Evoked potentials represent the summated activity of large populations of neurons firing in synchrony
- Delay - If delayed uniformly, a delayed evoked potential component will result
- Absence - If the delay is nonuniform due to temporal dispersion
- Either delay or absence of a BAEP peak indicate dysfunction, but not necessarily complete loss of activity, in a part of the infratentorial auditory pathways

Criteria for retrocochlear dysfunction

- Absence of all BAEP waves I through V unexplained by extreme hearing loss determined by formal audiometric testing.
- Absence of all waves following waves I, II, or III.
- Abnormal prolongation of I-III, III-V. and I-V interpeak intervals
- Abnormal diminution of the IV-V/I amplitude ratio, especially when accompanied by other abnormalities.
- Abnormally increased differences between the two ears (interaural differences) when not explained by unilateral or asymmetric middle and/or ear dysfunction determined by appropriate audiometric tests.

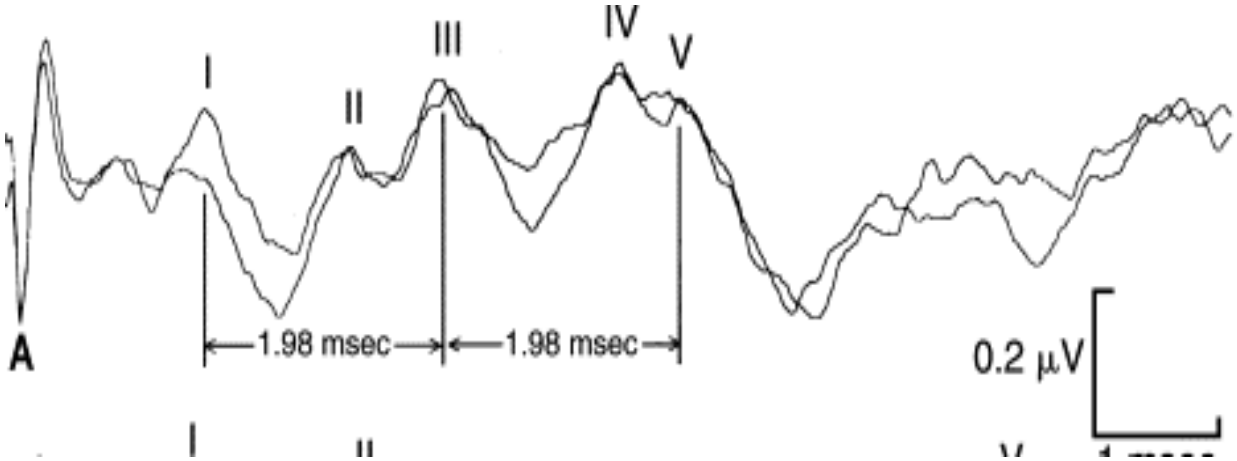
Obtaining formal audiometric testing in patients undergoing

Abnormalities of Wave I

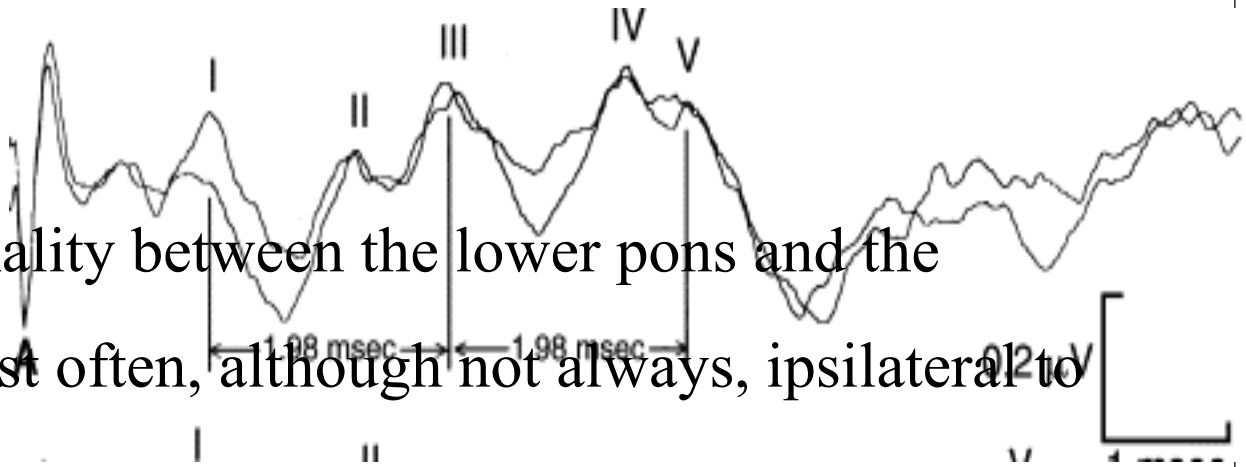
- Reflect peripheral auditory dysfunction, either conductive or cochlear, or pathology involving the most distal portion of the eighth nerve
- Poorly formed or absent wave I but a clear wave V may reflect high-frequency hearing loss.
- May reflect intracranial pathology because the cochlea receives its blood supply from the intracranial circulation via the internal auditory artery

Abnormalities of the I–III Interpeak Interval

- Prolongation reflects an abnormality within the neural auditory pathways between the distal eighth nerve on the stimulated side and the lower pons
- Seen in acoustic neuromas, demyelinating disease, brainstem tumors, or vascular lesions of the brainstem



Abnormalities of the III–V Interpeak Interval



- Reflects an abnormality between the lower pons and the mesencephalon most often, although not always, ipsilateral to the lesion
- Prolongation not an abnormality if the I–V interpeak interval is normal.
- Seen in a variety of disease processes involving the brainstem, including demyelination, tumor, and vascular disease

Abnormalities of the IV/V:I Amplitude Ratio

- Reflects dysfunction within the auditory pathways between the distal eighth nerve and the mesencephalon
- False increase in ratio in
- Decreasing the stimulus intensity
- Suboptimal placement of the Ai recording electrode (may decrease the amplitude of wave I)

BAEPs and Hearing Loss

- can detect subtle neuronal dysfunction that is not clinically apparent on the neurologic and audiologic examination
- Relatively insensitive to isolated low-frequency hearing losses

Central pattern

- CTT (I–V interpeak interval) is prolonged

Peripheral pattern

- Wave I is delayed

A single waveform may contain both abnormalities

Classification of Hearing Loss

Clinical Classification	Location of Pathology	BAEP Classification
Conductive hearing loss	External or middle ear	**Peripheral hearing loss**
Sensorineural hearing loss	Inner ear (cochlea)	
	Eighth nerve or brainstem (retrocochlear)	**”Central” hearing loss**

Latency–intensity curves

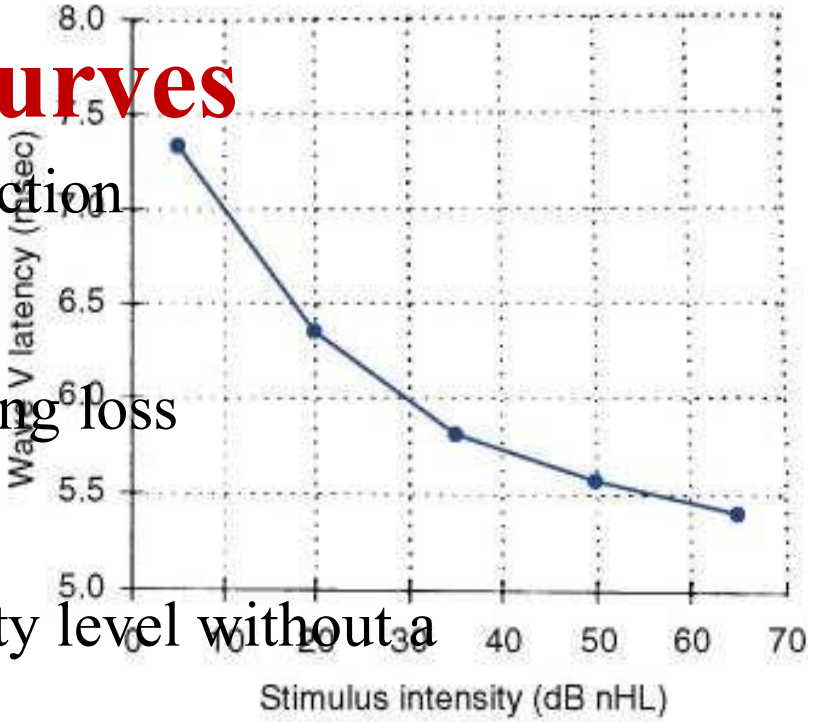
- Latency of wave V graphed as a function of stimulus intensity
- may help to classify a patient's hearing loss

Conductive hearing loss

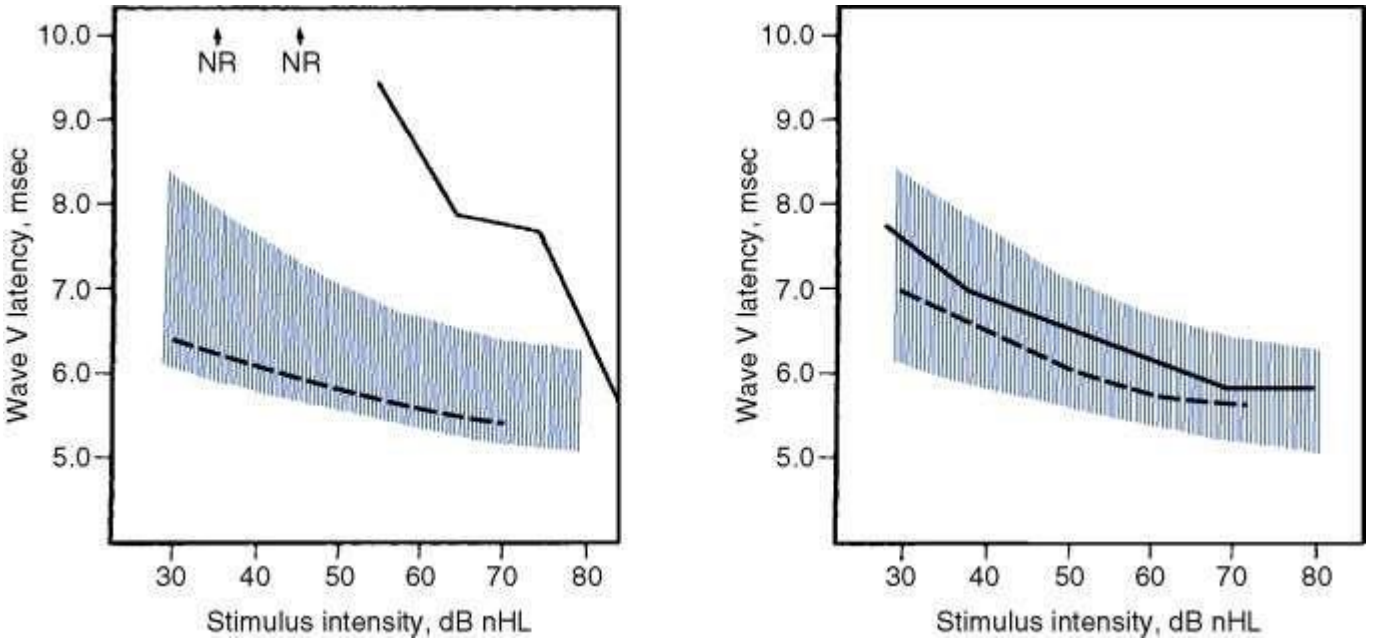
- Shift of the curve to a higher intensity level without a change in its shape

Sensorineural hearing loss

- Change in the shape of the curve with an increased slope



- May increase the sensitivity of BAEPs for detecting small acoustic neuromas



Latency–intensity curves stimulation recorded before and after surgery in left-sided intracanalicular acoustic neuroma

BAEPs abnormal but normal hearing

- Unilateral brainstem lesions because the ascending projections from each ear are bilateral
- Lesions of subsystem involved in sound localization sparing other portions of the brainstem auditory pathways
- Absence of a component may reflect temporal dispersion rather than conduction block, so hearing may even be present when there is no identifiable wave V

BAEPs and functional hearing loss

- Abnormal BAEP study demonstrates the existence of pathology within the auditory system
- Normal study does not prove that the symptoms are psychogenic
- If they maintain a degree of tension in their cranial and neck muscles, the EMG activity picked up by the recording electrodes may be sufficient to prevent recording of an interpretable BAEP study

- Abnormal BAEPs in more than 95 % with acoustic neuromas
- Abnormal BAEPs is less in patients with small (less than 1 cm) tumors
- Small, intracanalicular tumors in whom BAEPs to standard high-intensity stimuli are normal, latency– intensity studies may reveal abnormal cochlear function resulting from compression of the internal auditory artery

Typically originate from the distal vestibular nerve at the vestibular ganglion, and the auditory portion of the nerve may be unaffected early in the course of the disease.

↓ As it enlarges, compress the auditory nerve Prolongation of the I–III interpeak interval

↓

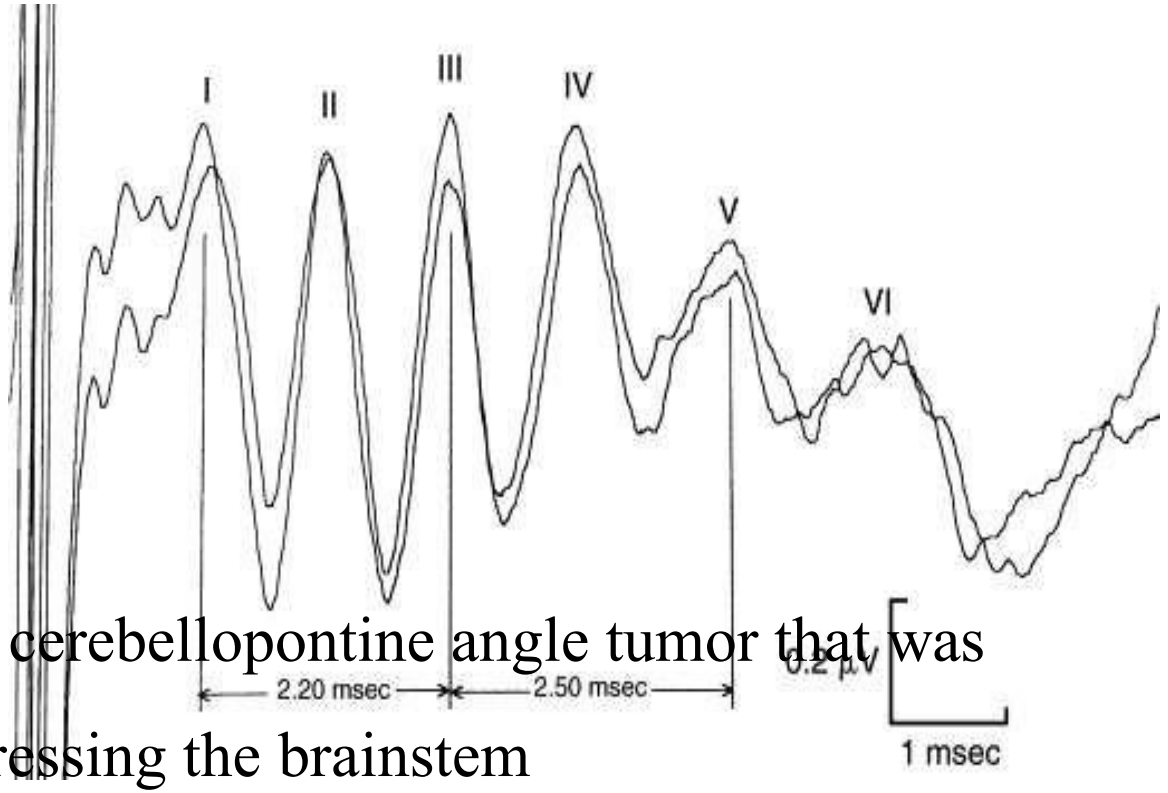
Complete eradication of wave III and subsequent BAEP components

- Wave II may be relatively spared, a reflection of the contribution to that component originating in the distal eighth nerve
- Wave I may become delayed as the degree of cochlear ischemia increases

BAEP in Large Acoustic Neuroma

- Infarction of the cochlea may cause elimination of all BAEPs
- Prolongation of the III–V interpeak interval in response to stimulation of the ear contralateral to the tumor due to compression of brainstem

BAEP in Large Acoustic Neuroma



- Large cerebellopontine angle tumor that was compressing the brainstem
- I–V and III–V interpeak intervals are both abnormally prolonged

BAEP in Other Posterior Fossa Tumors

- Almost always abnormal in brainstem gliomas and other intrinsic brainstem tumors except that within the medulla
- Abnormalities in the I–III or III–V interpeak interval, or a combination of both
- Serial recordings may show deterioration of the BAEPs because of tumor growth
- Response to treatment can be demonstrated as an improvement in conduction within the brainstem auditory pathways

BAEP in Cerebrovascular Disease

- Usually normal in medullary infarcts or lesions confined to the basis pontis, cerebral peduncles, and cerebellar hemispheres
- Presence of BAEP abnormalities is associated with an adverse clinical outcome
- Abnormalities in the I–III or III–V interpeak interval, or a combination of both, may be seen
- If a cochlear stroke accompanies the brainstem stroke, all BAEP components will be absent following stimulation

BAEP in vertebrobasilar TIA

- Abnormalities present in most cases
- Findings tend to resolve over time
- Yield lower if recorded after more than a week
- Persistent BAEP changes may represent small infarcts that are clinically silent

BAEP in Demyelinating Disease

- Can demonstrate a residual abnormality related to a prior symptom that has cleared
- Abnormality rate higher in definite MS and with brainstem lesion.
- Abnormalities in the I–III and/or III–V interpeak interval
- Abnormally small IV/V:I amplitude ratio in the presence of normal component latencies and interpeak intervals
- Prolongations of the PTT (wave I latency) without any otologic cause

BAEP in MS

VIIIn fibers are ensheathed along most of their lengths by

central-type myelin, produced by oligodendrocytes unlike other CNs which have Schwann cells

↓

In MS vulnerable to demyelination along most of its length

↓

Abnormalities of the I–III interpeak interval

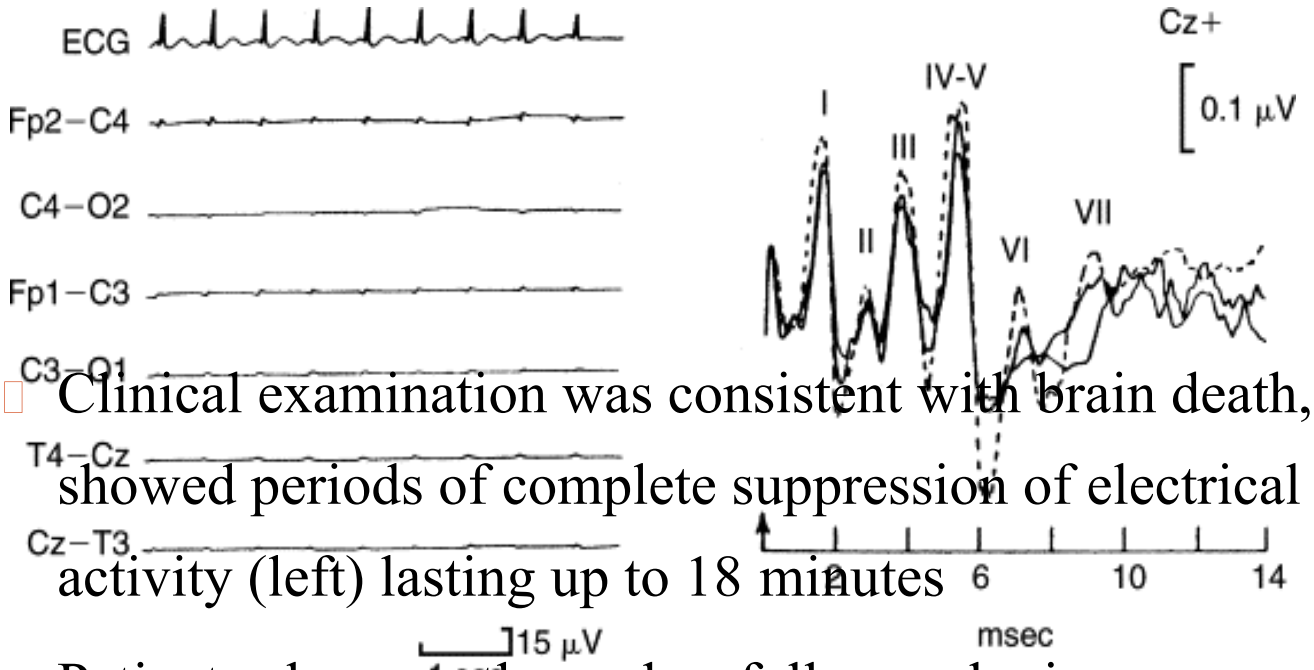
BAEP in Coma

- Markedly abnormal BAEPs are likely to have poor neurologic outcomes attributable to the brainstem damage
- Typically normal in patients with coma caused entirely by supratentorial disease
- May deteriorate subsequently because of transtentorial herniation
- Abnormal BAEPs in patients with supratentorial infarctions or hemorrhages are correlated with poor

BAEP in Coma

- Normal-appearing BAEPs in a patient whose examination shows widespread brainstem dysfunction should prompt suspicion of a metabolic etiology such as a drug overdose
- BAEPs are highly resistant to central nervous system depressant drugs

BAEP in drug overdose



35-year-old woman who was comatose following a mixed drug overdose

- Clinical examination was consistent with brain death, and the EEG showed periods of complete suppression of electrical cerebral activity (left) lasting up to 18 minutes
- Patient subsequently made a full neurologic recovery, and her EEG became normal

BAEP in Locked-in syndrome

- BAEPs may be either normal or abnormal, depending on

  the extent to which the lesion extends outside the ventral pons and involves the auditory pathways

BAEP in brain death

- Contains no identifiable components, or consists of wave I alone, or contains only a wave I followed by a wave IN
- Rarely, waves II and IIN may also be present and reflect the contribution to these components from the auditory nerve
- Although consistent with brain death, negative BAEP cannot be used as evidence that the brainstem is nonfunctional

Intra operative BAEP monitoring

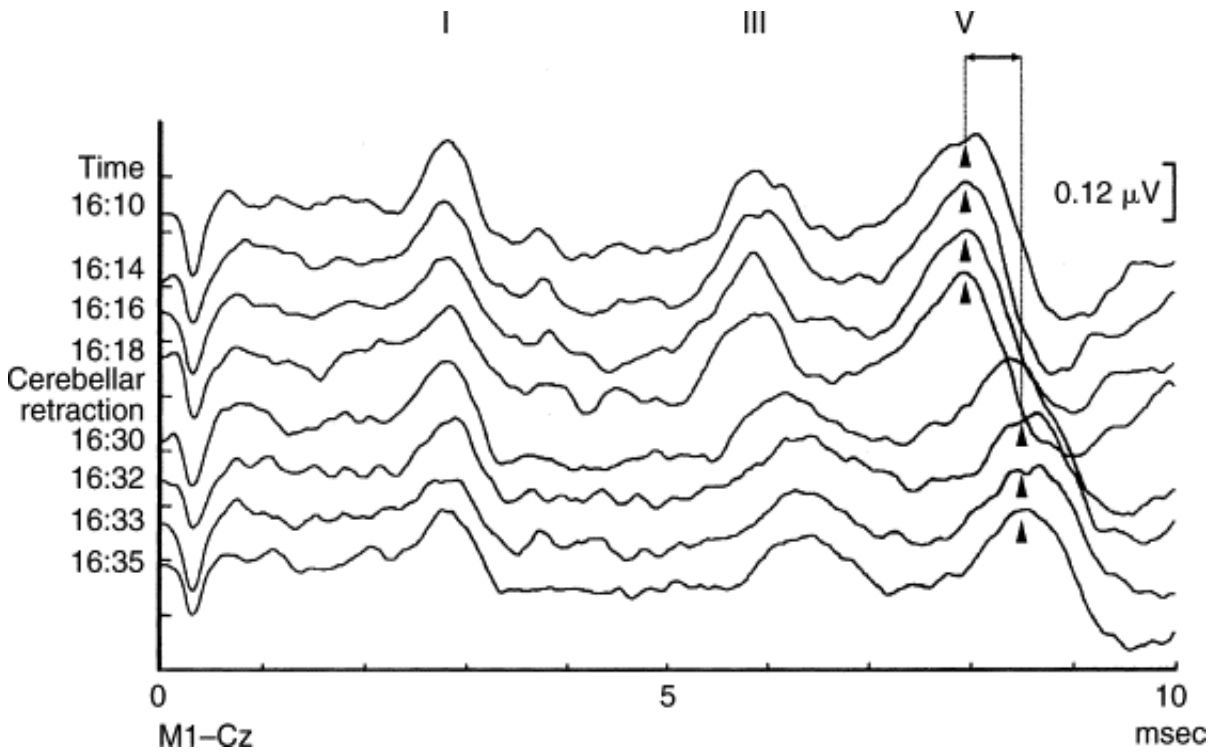
- esp during surgery in the cerebellopontine angle with the goal of preserving auditory nerve function
- bulky earphone replaced by a small insertable earphone
- faster stimulation rate typically about 30 Hz compared with 10 Hz which allows more rapid signal acquisition
- Stable, robust BAEPs are recorded readily in the presence of general anesthetic agents

Intra operative BAEP

monitoring

- During surgical manipulation threatening the auditory

nerve, a loss of wave V amplitude of 50 percent or more or an increase in wave V latency by 0.5 msec generally is recognized as a potentially important alteration, particularly when it occurs suddenly



BAEPs in infants and children

- To detect and measure hearing loss in children who cannot be tested behaviorally
- To evaluate the auditory brainstem pathways in children who may have neurologic problems
- Requires close cooperation between audiologists and neurologists because it is impossible to interpret these responses correctly without paying careful attention to both the ear and the brain.

ANNEXURE 2
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH
SLIMS

1	U15MB287	GAYATHRI .M
2	U15MB288	GOGUL SUGAN. K
3	U15MB289	GOKULA KRISHNAN. E
4	U15MB290	GOWTHAM. M .R
5	U15MB291	GOWTHAM.S
6	U15MB292	HARIHARAN.S
7	U15MB293	HARINI .L
8	U15MB294	ILAMATHI.S
9	U15MB295	ILAYARAJA .B.U
10	U15MB296	JAMZER. J
11	U15MB297	JANARTHANAM. M
12	U15MB298	JANISHA MARAGATHA J P
13	U15MB299	JAWATH. S
14	U15MB300	JAYA AKSHAIY. J

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Brainstem evoked response audiometry **(ENT08)**
STUDENT NAME:
UNIVERSITY NO:

1.Earliest age for doing BERA
a. In utero b. At birth
c. 3 months d. 6months

2.BERA is most accurate at;
a.28wk b.30 wk
c.32wk d.34wk

3.True about BERA findings in acoustic neuroma
a.Latency of waveV increased in the affected ear
b.Latency of wave I increased in the affected ear
c.No waves on BERA
d. No change in BERA

4.Brainstrem evoked response audiometry true is:
a.Can differentiate cochlear and retrocochlear lesion
b.cannot differentiate the site of lesion in sensorineural hearing loss
c.. Can differentiate barbiturate poisionong from other causes of coma
d.As a screening procedure for infants

5.In normal adult, waveV is generated from
a. cochlear nucleus b. superior olivary complex
c. Lateral lemniscus d. Inferior colliculus

6. To distinguish between cochlear and post cochlear damage
The test is done
a.BERA b.Impedance audiometry
c.Pure tone audiometry d.All of the above

7. which is the investigation of choice in assessing hearing loss in infants
a) Impedance audiometry b)BERA
c) Free field audiometry d) behavior audiometry

8) A 6month old child developed labrinthintis following meningitis

a)BERA b)Impedance audiometry
c)Pure tone audiometry d) OAE

9) screening test for neonate in ICU
a)Distortion product OAE b) OAE
c) BERA d) Impedance audiometry

10. objective method of hearing test
a) tuning fork test b) Pure tone audiometry
c) Speech audiometry d) BERA

DR.GIRISH.S

PRE TEST

5.In normal adult, waveV is generated from

a. cochlear nucleus b. superior olivary complex

X c. Lateral lemniscus d. inferior colliculus

6. To distinguish between cochlear and post cochlear damage

The test is done

a.BERA b.Impedance audiometry

c.Pure tone audiometry d.All of the above

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a) Impedance audiometry b)BERA

c) Free field audiometry d) behavior audiometry

8) A 6month old child developed labrinthintis following meningitis

a)BERA b)Impedance audiometry

c)Pure tone audiometry d) OAE

9) screening test for neonate in ICU

X a)Distortion product OAE b) OAE

c) BERA d) Impedance audiometry

10. objective method of hearing test

a) tuning fork test b) Pure tone audiometry

X c) Speech audiometry d) BERA

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Brainstem evoked response audiometry **(ENT08)**

STUDENT NAME: Jawath-S

UNIVERSITY NO: U15MB299

4

1.Earliest age for doing BERA

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c)Pure tone audiometry d) OAE

9) screening test for neonate in ICU

a)Distortion product OAE b) OAE

c) BERA d) Impedance audiometry

10. objective method of hearing test

a) tuning fork test b) Pure tone audiometry

c) Speech audiometry d) BERA

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Brainstem evoked response audiometry **(ENT08)**

STUDENT NAME: Hariharan.S

UNIVERSITY NO: U15MB292.

2

1.Earliest age for doing BERA

a. In utero b. At birth

X c. 3 months d. 6months

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d.As a screening procedure for infants

POST TEST

5.In normal adult, waveV is generated from

a. cochlear nucleus b. superior olivary complex

c. Lateral lemniscus d. Inferior colliculus

6. To distinguish between cochlear and post cochlear damage

The test is done

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c.Pure tone audiometry d.All of the above

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8) A 6month old child developed labrinthintis following meningitis

a)BERA b)Impedance audiometry

c)Pure tone audiometry d) OAE

9) screening test for neonate in ICU

a)Distortion product OAE b) OAE

c) BERA d) Impedance audiometry

10. objective method of hearing test

a) tuning fork test b) Pure tone audiometry

c) Speech audiometry d) BERA

(10)

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Brainstem evoked response audiometry **(ENT08)**

STUDENT NAME: Hariharan .S

UNIVERSITY NO: U15MB292.

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c) BERA d) Impedance audiometry

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a) tuning fork test b) Pure tone audiometry

c) Speech audiometry d) BERA

8

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Brainstem evoked response audiometry **(ENT08)**

STUDENT NAME: Jawath .S

UNIVERSITY NO: U1SIMB299.

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c.. Can differentiate barbiturate poisionong from other causes of coma

d.As a screening procedure for infants

ANNEXURE 4



Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _____ has actively participated in the Value Added Course on Hands on training and an Extensive Discussion on BERA held during Sep 2018 – Dec 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.K.R. Jothikumar
RESOURCE PERSON

Dr.R.Venkataramanan
COORDINATOR



Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Dr.Harini.L (U15MB293) has actively participated in the Value Added Course on Hands on training and an Extensive Discussion on BERA held during Sep 2018 – Dec 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.K.R. Jothikumar
RESOURCE PERSON

Dr.R.Venkataramanan
COORDINATOR

Annexure 5
Course/Training Feedback Form
Student Feedback Form

Course Name: Hands on training and an ExtensiveDiscussion on BERA

Subject Code: **ENT08**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Annexure 5

Course/Training Feedback Form

Student Feedback Form

Course Name: Hands on training and an ExtensiveDiscussion on BERA

Subject Code: **ENT08**

Name of Student: HARIHARAN. S Roll No.: 115HB292

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear	✓				
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned		✓			
4	Lectures were clear and easy to understand	✓				
5	Teaching aids were effective		✓			
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Excellent

Annexure 5

Course/Training Feedback Form

Student Feedback Form

Course Name: Hands on training and an ExtensiveDiscussion on BERA

Subject Code: **ENT08**

Name of Student: L. HARINI Roll No.: 1SMB293

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

SL NO	Particulars	1	2	3	4	5
1	Objective of the course is clear		✓			
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Satisfactory

ANNEXURE 6

Date : 15/12/2018

From
Dr.Venkataramanan.R,
Dept of Otorhinolaryngology,
SLIMS
Bharath Institute of Higher Education and Research,
Puducherry.

Through Proper Channel

To
The Dean,
SLIMS,
Bharath Institute of Higher Education and Research,
Puducherry.

Sub: Completion of value-added course: Hands on training and an ExtensiveDiscussion on BERA reg.

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled:**Hands on training and an Extensive Discussion on BERA**on Sep 2018 to Dec2018. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards
Dr.K.R.Jothikumar
<HOD Sign and Seal>




AN EXTENSIVE DISCUSSION ON BERA


AN EXTENSIVE DISCUSSION ON BERA


AN EXTENSIVE DISCUSSION ON BERA

SRI LAKSHMI NARAYANA INSTITUE OF MEDICAL SCIENCES AND HOSPITAL, PUDUCHERRY

Date: 27/07/2018

From
Dr. Somasundaram,
Professor and Head,
Dept. of Pharmacology,
Sri lakshmi narayana institue of medical sciences and hospital, Puducherry

To
The Dean,
Sri lakshmi narayana institue of medical sciences and hospital, Puducherry

Sub: Permission to conduct value-added course: PHARMACOECONOMICS

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **PHARMACOECONOMICS** from Sep. 2018 to Feb 2019. We solicit your kind permission for the same.

Kind Regards

Dr. Somasundaram

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

Dean: Dr.Jayalakshmi, HOD:Dr.Somasundaram Expert: Dr.Somasundaram, Dr.S.Jaikumar

The committee has discussed about the course and is approved.

Dean Subject Expert HOD

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Gandhi Agaram, Kudapakkam Post,
Villianur Commune, Puducherry-605502.

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

31/07/2018

Sub: Organising Value-added Course: Pharmacoeconomics .

With reference to the above mentioned subject, it is to bring to your notice that Dept. of Pharmacology from Sri Lakshmi Narayana institue of medical sciences and hospital, Puducherry is organising **"Pharmacoeconomics course" September 2018 to January 2019**. The course content is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 27/08/2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Encl: Copy of Course content

Annexure 2 – Course Proposal

Course Title: Pharmacoeconomics

CourseObjective:

Overview of Pharmacoeconomics
Types of P_E studies
Introduction to the concept of costs
Health economic in economic evaluations
Pharmacoeconomic models for conducting economic analysis
Cost effective analysis
Cost utility analysis
Cost minimization concept
Health technology assessment in India
Decision tree models for conducting cost- effective analysis
Designing a P-E model in excel
Real world evidence in health care
Mankov model in P-E
Mankov model in excel
Protocol discussion – P/E studies

CourseOutcome: An attempt to identify, measure, and evaluate the end results of health care services. It may include not only clinical and economic consequences, but also outcomes, such as patient health status and satisfaction with their health care.

Course Audience: IInd year MBBS students

Course Coordinator: Dr. Santhanalakshmi. P

Course Faculties with Qualification and Designation:

1. **Dr. Somasundaram, Hod and Professor, Dept. of Pharmacology**
2. **Dr.S.Jaikumar, Associate professor, Dept. of Pharmacology**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours	faculty
1	04/9/18	Overview of Pharmacoeconomics	4-6 pm	2 hrs	**Dr. Somasundaran**
2	18/09/18	Types of P_E studies	4-6 pm	2 hrs	
3	09/10/18	Introduction to the concept of costs	4-6 pm	2 hrs	
4	16/10/18	Health economic in economic evaluations	4-6 pm	2 hrs	
5	23/10/18	Pharmacoeconomic models for conducting economic analysis	4-6 pm	2 hrs	
6	30/10/18	Cost effective analysis	4-6 pm	2 hrs	
7	06/11/18	Cost utility analysis	4-6 pm	2 hrs	
8	13/11/18	Cost minimization concept	4-6 pm	2 hrs	Dr.S.Jaikumar
9	20/11/18	Health technology assessment in India	4-6 pm	2 hrs	
10	27/11/18	Decision tree models for conducting cost-effective analysis	4-6 pm	2 hrs	
11	04/12/18	Designing a P-E model in excel	4-6 pm	2 hrs	
12	11/12/18	Real world evidence in health care	4-6 pm	2 hrs	
13	18/12/18	Mankov model in P-E	4-6 pm	2 hrs	
14	08/01/19	Mankov model in excel	4-6 pm	2 hrs	
15	09/01/19	Protocol discussion – P/E studies	4-6 pm	2 hrs	
			Total Hours	30	

REFERENCE BOOKS: i). A concise book on Pharmacoeconomics

ii). Research Methodology in Pharmacoeconomics

VALUE ADDED COURSE

1. Name of the programme& Code

Pharmacoeconomics

2. Duration& Period

30 hrs &September 2018– January 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short answers *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7.No. of times offered during the same year:

September 2018– January 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- September 2018– January 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength& Year**
1	PH07	**Pharmacoeconomics**	Dr.G.Somasundaram Dr.Jaikumar	2nd MBBS	20 (Sep 18 – Jan 19)

10. Course Feed Back

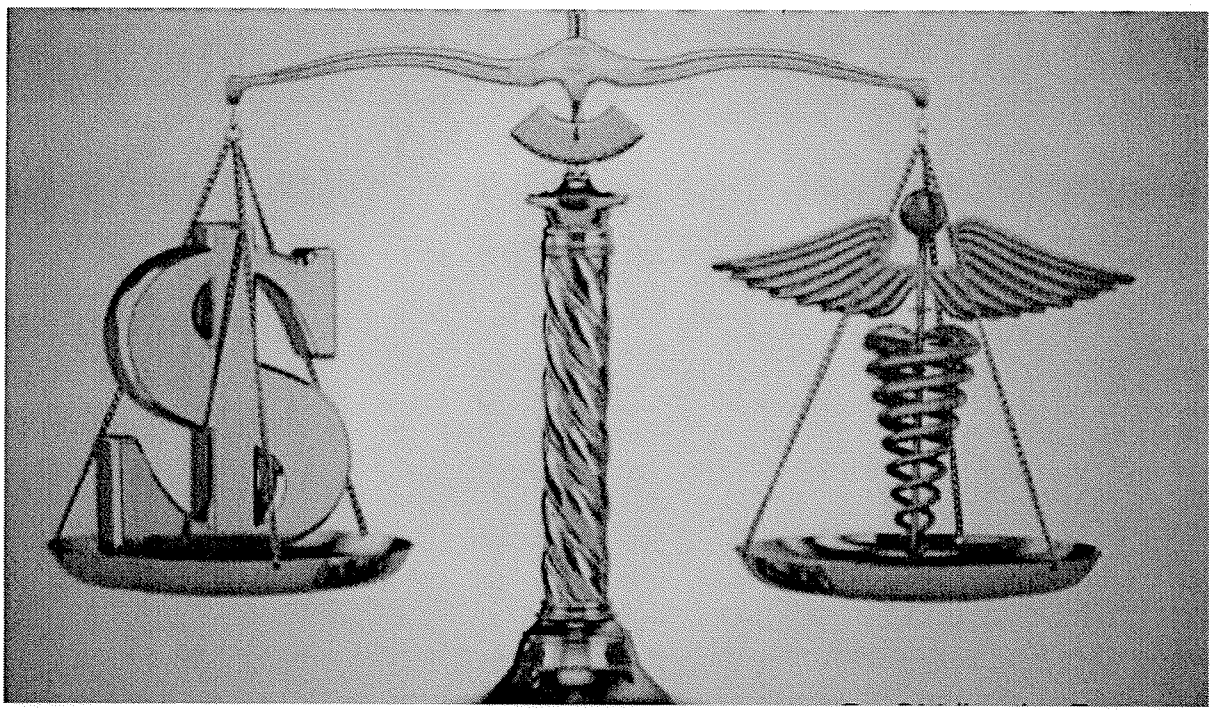
Enclosed as Annexure- V

RESOURCE PERSON

COORDINATOR

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502

PHARMACOECONOMICS



PARTICIPANT HAND BOOK

COURSE DETAILS

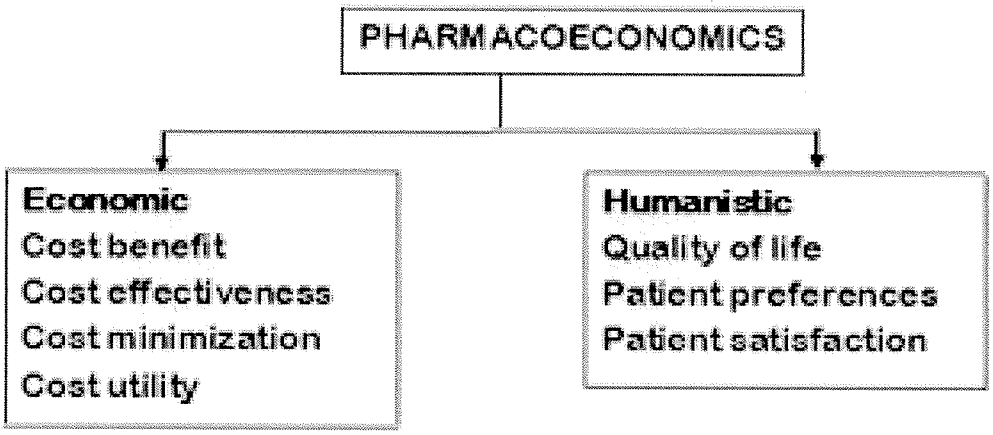
BIHER

SLIMS

Particulars	Description
Course Title	Pharmacoeconomics
Course Code	PH07
Objective	Overview of Pharmacoeconomics Types of P-E studies Introduction to the concept of costs Health economic in economic evaluations Pharmacoeconomic models for conducting economic analysis Cost effective analysis Cost utility analysis Cost minimization concept Health technology assessment in India Decision tree models for conducting cost-effective analysis Designing a P-E model in excel Real world evidence in health care Mankov model in P-E Protocol designing in P-E studies
Further learning opportunities	Health economics and outcomes research
Key Competencies	On successful completion of the course the students will have knowledge in the branch of Pharmacoeconomics
Target Student	2nd MBBS Students
Duration	30hrs Sep. 2018 – Jan 2019
Theory Session	18hrs
Practical Session	12hrs
Assessment Procedure	Multiple choice questions

Introduction:

Pharmacoeconomics can be defined as the branch of economics that uses cost-benefit, cost-effectiveness, cost minimization, cost-of-illness and cost-utility analyses to compare pharmaceutical products and treatment strategies (Brinsmead 2003). Pharmacoeconomics and health outcomes research are playing an increasingly important role in informing clinical development and market access decisions of new innovative medicines. It mainly works on the health economics which particularly focuses upon the costs and benefits of drug therapy



Pharmacoeconomics: Needs and Challenges

Multi-factorial Variability of Drug Pricing

Enumerable factors affect the prices of drug; some of them are as follows:

i. The sector in which medicines are purchased: The price is often higher in the private sector due to distilentor's costs and profiteering.

ii. The types of procurement agent: e.g. different prices may be paid for the same product by a public sector purchaser, such as Ministry of Health

iii. The distribution route. A patient who purchases a medicine at a hospital pharmacy may have to pay more if the hospital pharmacy purchased the product from a local wholesaler than if it has been purchased by tender and supplied through public health sector distribution system10. Many times hospital pharmacy may have limited stock of the generic drugs which one is cheaper than the branded drugs prescribed to the patient on routine basis and patient has to purchase the branded drugs in the emergency condition.

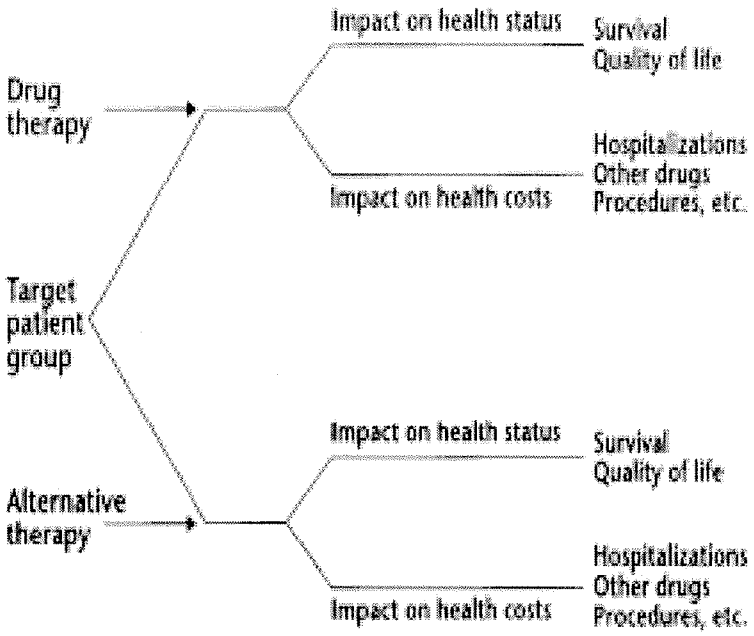
Need of Pharmacoeconomics

Pharmacoeconomics identifies measures and compares the cost and consequences of pharmaceutical products and services and describe the economic relationship involving drug research, drug production distribution, storage, pricing and used by the people. It runs through the thread of our socioeconomic system, which regulates and influences all the sectors involved in pharmaceuticals. The demand for and the cost of health care are increasing in all countries as the improvement of health technologies. All over the world, patients are affected by high price of medicines. In a developing country like India, 85% of total health expenditure is financed by house-hold out of pocket expenditure. Many poor people frequently face a choice between buying medicines or buying food or other necessities due to limited resources and high pricing of drug. So medicine prices do matter. Pharmacoeconomics has become more important over the past 20 years, due to an increases emphasis on efficient drug therapies for disease, which increase health cost etc. Pharmacoeconomics is a subdivision of health economics and results from that discipline coming of age through consolidation to diversification. Health economics, as a branch of economics is itself relatively young. Basically the pharmacoeconomics is needful in following manner:

- In Industry- Deciding among specific research and development alternatives.
- In Government- Determining program benefits and prices paid.
- In Private Sector- Designing insurance benefit coverage

Aims and Objectives of Pharmacoeconomic Evaluation

Implementation of pharmacoeconomic evaluation will help to reduce monetary burden on the consumers (by insuring global pricing strategy) for the effective management of health care system as the principle of pharmacoeconomic evaluation is to make more efficient use of limited resources for maximization of health care benefit at lower cost . In this way, it can be applied in practice to take decisions about drug therapies.



The Fundamentals

Types of Cost

Costs involved in pharmacoeconomic evaluation can be mainly divided into financial cost (mandatory cost) and economic cost (resource for which no mandatory payment is made) opportunity cost is the benefit foregone when selecting one therapy alternative over the next best alternative. Several costs can be measured when weighing up the cost of any invention. The first step in any cost analysis is identification of the various costs. These can be direct, indirect and intangible. Direct i.e. costs from the perspective of the healthcare funder: including staff costs, capital costs, drug acquisition costs. It includes physicians' fees, cost of administering the medication, costs of treating an adverse drug reaction, etc. Indirect i.e. costs from the perspective of society as a whole: for example, these might include loss of earnings, loss of productivity, loss of leisure time, due to the illness, and cost of travel to hospital etc. This would include not just the patient themselves but also their family and society as a whole. Intangible i.e. the pain, worry or other distress; which a patient or their family might suffer. These may be impossible to measure in monetary terms, but are sometimes captured in measures of quality of life.

The cost can be measured in following ways:

- Cost / unit
- Cost / treatment
- Cost / person

- Cost / person / year
- Cost / case prevented
- Cost / life saved
- Cost / DALY (disability-adjusted life year)

Outcomes

The second fundamental component of a pharmacoeconomic study is outcomes or benefits. A cost-benefit analysis compares the costs and outcomes of alternative therapies and the outcome is then expressed in monetary terms (Brien et al 1997). Cost-benefit analysis allows researchers to make comparisons across a wide variety of alternatives. It compares the costs involved in implementing a programme with the value of the outcome. Since the endpoints are measured in monetary terms, different endpoints can be studied, such as a surgical procedure compared with a pharmaceutical intervention

Methods of Pharmacoeconomic

Evaluation Pharmacoeconomic evaluations include any study designed to assess the costs (resources consumed) and consequences (clinical, humanistic) of alternative therapies The evaluation mechanisms delineated were often helpful in demonstrating the cost impact of innovative treatments, therefore granting them greater acceptance by healthcare providers, administrators, and the public.

There are basically four types of pharmacoeconomic studies.

- Cost-minimization analysis (CMA)
- Cost-effectiveness analysis (CEA)
- Cost-utility analysis (CUA)
- Cost-benefit analysis (CBA)

Cost Effective Analysis (CEA) CEA is a technique designed to assist a decision-maker in identifying a preferred choice among possible alternatives. Generally, cost-effectiveness is defined as a series of analytical and mathematical procedure that aid in the selection of a course of action from various alternative approaches. CEA evaluates multiple drug treatments for the same condition. The cost of the drug treatments are weighed against the effectiveness of the drug (Thwaits et al 1998). The costs

of drug treatments include acquisition costs, physician involvement, and nursing costs for administration of the drug. The effectiveness of drug treatment is measured in tangible measures such as length of hospital stay, duration of treatment required, and mortality rate. The results of a CEA are expressed as cost/outcome for both therapies. Pharmacoeconomic analysis should be incorporated in the clinical trial itself. However, for the majority of drugs, CEA is done on the basis of pre-existing data available in the medical literature. CEA is the most commonly applied form of economic analysis in the literature, and especially in drug therapy (Lee et al 1991). It does not allow comparisons to be made between two totally different areas of medicine with different outcomes. The key measure of these evaluations is the incremental cost effectiveness ratio (ICER), which can be determined as follows:

Incremental cost effectiveness ratio= Cost of drug A - Cost of drug B Benefits of drug A - Benefits of drug B

Cost Utility Analysis (CUA) CUA is a type of evaluation in which drugs/interventions with different outcomes can be compared. CUA is the most appropriate method to use when comparing programs and treatment alternatives that are life extending with serious side effects (e.g., cancer chemotherapy), those which produce reductions in morbidity rather than mortality (e.g., medical treatment of arthritis), and when HRQOL is the most important health outcome being examined (Bootman 1995). CUA is employed less frequently than other economic evaluation methods because of a lack of agreement on measuring utilities, difficulty comparing QALYs (quality adjusted life years) across patients and populations, and difficulty quantifying patient preferences.

Applications of Pharmacoeconomics

I. One of the primary applications of pharmacoeconomics in clinical practice today is to aid clinical and policy decision making. Through the appropriate application of pharmacoeconomics, practitioners and administrators can make better, more informed decisions regarding the products and services they provide. Complete pharmacotherapy decisions should contain assessments of three basic outcome areas whenever appropriate: economic, clinical, and humanistic outcomes (ECHO). Traditionally, most drug therapy decisions were based solely on the clinical outcomes (e.g., safety and efficacy) associated with a treatment alternative

II. II. Pharmacoeconomic data can be a powerful tool to support various clinical decisions, ranging from the level of the patient to the level of an entire healthcare system. Fig. 8

shows various decisions that can be supported using pharmacoeconomics, including effective formulary management, individual patient treatment, medication policy, and resource allocation. For discussion purposes, the application of pharmacoeconomics to decision making is divided into two basic areas: drug therapy evaluation and clinical pharmacy service evaluation.

Conclusion

The perspective of a pharmacoeconomic evaluation is paramount because the study results will be highly dependent on the perspective selected. When evaluating published pharmacoeconomic studies, factors should to be considered are study objective, study perspective, pharmacoeconomic method, study design, choice of interventions, costs and consequences, discounting, study results, sensitivity analysis and study conclusions. Majority of pharmacoeconomic guidelines provide only general and vague recommendation in many areas may be because of no consensus among the developers and challenge of sustenance for relatively young science of pharmacoeconomics. Therefore strict guidelines having uniform global standards should be formulated by an independent body comprising of people from academia, industry and health authorities. Upon implementation it would be helpful towards prescribing a rational drug therapy and pharmacist, the bridge between patients and doctors, will dispense as well as help in purchasing drugs for hospital pharmacies. This would also help in reducing the monetary burden on institutions and public.

VALUE ADDED COURSE

Participant list of Value added course: **Pharmacoeconomics on Sep 2018 to Jan 2019**

Sl. No	Name of the Student	Register No	Signature
1	NEHA ROY	U18MB331	Neha
2	NIDHI MADHUSOODANAN	U18MB332	Nidhi Ma
3	PADMASREELEKHA N.P.M	U18MB333	Padmasree
4	PICHIKALA DEEPAK MAHESH	U18MB334	Pichikala
5	PON ROBSON R D	U18MB335	Pon Robson
6	POOJA PODALAPALLI	U18MB336	BOJA
7	POOJA KUMARI	U18MB337	Pooja Kumari
8	POORANA PORKODI R	U18MB338	Poorana
9	PORKAVIN S.S	U18MB339	S. S. Porkavin
10	PRADEEP V S	U18MB340	Pradeep
11	PRAGATHI S N	U18MB341	Pragathi
12	PRAKRITI KAR	U18MB342	Prakriti Kar
13	PRANESH R.R	U18MB343	Pranesh
14	PRANITHRAJ .K	U18MB344	Pranithraj
15	RABEENA .M	U18MB345	Rabeena
16	RACHEL SWARNA MARY B	U18MB346	Mary
17	RADHIKA GUPTA	U18MB347	Radhika Gupta
18	RAGHAV BHUSKUTE	U18MB348	Raghav Bhuskute
19	RAJALAKSHMI K	U18MB349	Rajalakshmi
20	RAJAVIGNESHWARI G	U18MB350	Rajavigneshwari G.

S. Somasundaram

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Osudu, Agaram Village, Koodapakkam post, Puducherry – 605502

Topic- **PHARMACOECONOMICS** Code: PH07

1. Which of the following statements represents the *best* definition of pharmacoeconomics?

a) Description and analysis of the costs of drug therapy to health care systems and to society

b) Process of identifying, measuring and comparing the costs, risks, and benefits of programs, services, or therapies and determining which alternative produces the best health outcomes for the resources invested

c) Putting principles, methods, and theories into practice to quantify the value of pharmacy products and services used in the real world

d) Studies that attempt to identify, measure, and evaluate the results of health care services in general

2. Which of the following statements is *true* regarding the perspective (point of view) of a pharmacoeconomic analysis?

a) Should be conducted from a single perspective.
b) Should be conducted from multiple perspectives.
c) Costs and consequences should be identified and measured relative to the perspective(s) selected.
d) Societal perspective is the only relevant and valid perspective for a local pharmacoeconomic analysis.

3. There are various categories of health care costs. Which of the following *best* represents a direct medical cost and an indirect nonmedical cost, respectively?

a. Pain and transportation
b. Drugs and suffering
c. Mortality and morbidity
d. Medical professional time and lost productivity

4. Which of the following statements *best* describes economic outcomes?

a) Medical events that occur as a result of a disease or treatment
b) Direct, indirect, and intangible costs compared with the consequences of medical treatment alternatives
c) Consequences of disease or treatment on patient functional status or quality of life
d) Cost savings associated with a disease or treatment alternative

5. Which of the following are distinguishing characteristics of a full economic evaluation?

a) Comparison of two or more treatment options
b) Determination of the least expensive treatment alternative
c) Examination of both the costs and consequences of the treatment alternatives

d) a and c
e) a and b

6. When quantifying the value of a clinical pharmacy service, your goal is to express the benefits associated with this service in a dollar value. Which economic evaluation method would you employ?

a) Cost-benefit analysis
b) Cost-effectiveness analysis
c) Cost-minimization analysis
d) Cost-utility analysis

7.The economic evaluation method known as cost-effectiveness analysis would be best applied in which of the following cases?

a) When comparing two or more treatment alternatives that differ in humanistic outcome
b) When comparing two or more treatment alternatives that are equal in clinical outcome
c) When comparing two or more treatment alternatives that differ in clinical outcome
d) When comparing two or more treatment alternatives that differ in cost

8. The appropriate use of cost-minimization analysis requires which of the following to be *true*?

a) Costs must include measures of lost productivity.
b) Outcomes must be adjusted for quality of life.
c) Data must be obtained from similar sources.
d) Consequences for each alternative must be equivalent.

9. Which of the following statements provides the *best* description of an incremental cost-effectiveness ratio?

a) A summary measurement of efficiency
b) The cost per benefit of a new strategy, independent of other treatment alternatives
c) The extra cost to obtain an extra benefit realized from switching from one alternative to another
d) The cost per quality-adjusted life year gained

10. Which of the following statements about the application of pharmacoeconomics to pharmacy decision making is *false*?

a) Pharmacoeconomics can be a powerful tool for determining the value of drug use guidelines.
b) Pharmacoeconomics should be the only consideration when making a drug therapy decision.
c) Pharmacoeconomics can assist P&T committees in incorporating clinical, economic, and humanistic outcomes of drug therapy into formulary management decisions.
d) Pharmacoeconomics can provide data to support resource allocation decisions.

Answers

1-A

2-B

3-C

4-A

5-C

6-A

7-C

8-A

9-B

10-B

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that NEHA ROY has actively participated in the Value Added Course on "PHARMACOECONOMICS" held during Sep. 2018 to Feb 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. S. Jai Kumar
Dr. Jayasheela. J

RESOURCE PERSON

Dr. Somasundaram

COORDINATOR

Student Feedback Form

Course Name: Pharmacoeconomics

Subject Code: **PH 07**

Name of Student: Neha Roy Roll No.: U18MB331

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful			✓		✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

SRI LAKSHMI NARAYANA INSTITUE OF MEDICAL SCIENCES AND HOSPITAL, PUDUCHERRY

From

Date: 27.02.2019

Dr.G.Somasundaram
Professor and Head,
Department of Pharmacology
Sri Lakshmi Narayana Institute of Medical sciences
Pondicherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical sciences
Pondicherry.

Sub: Completion of value-added course: Pharmacoeconomics

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **Pharmacoeconomics September. 2018 to February 2019.** We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

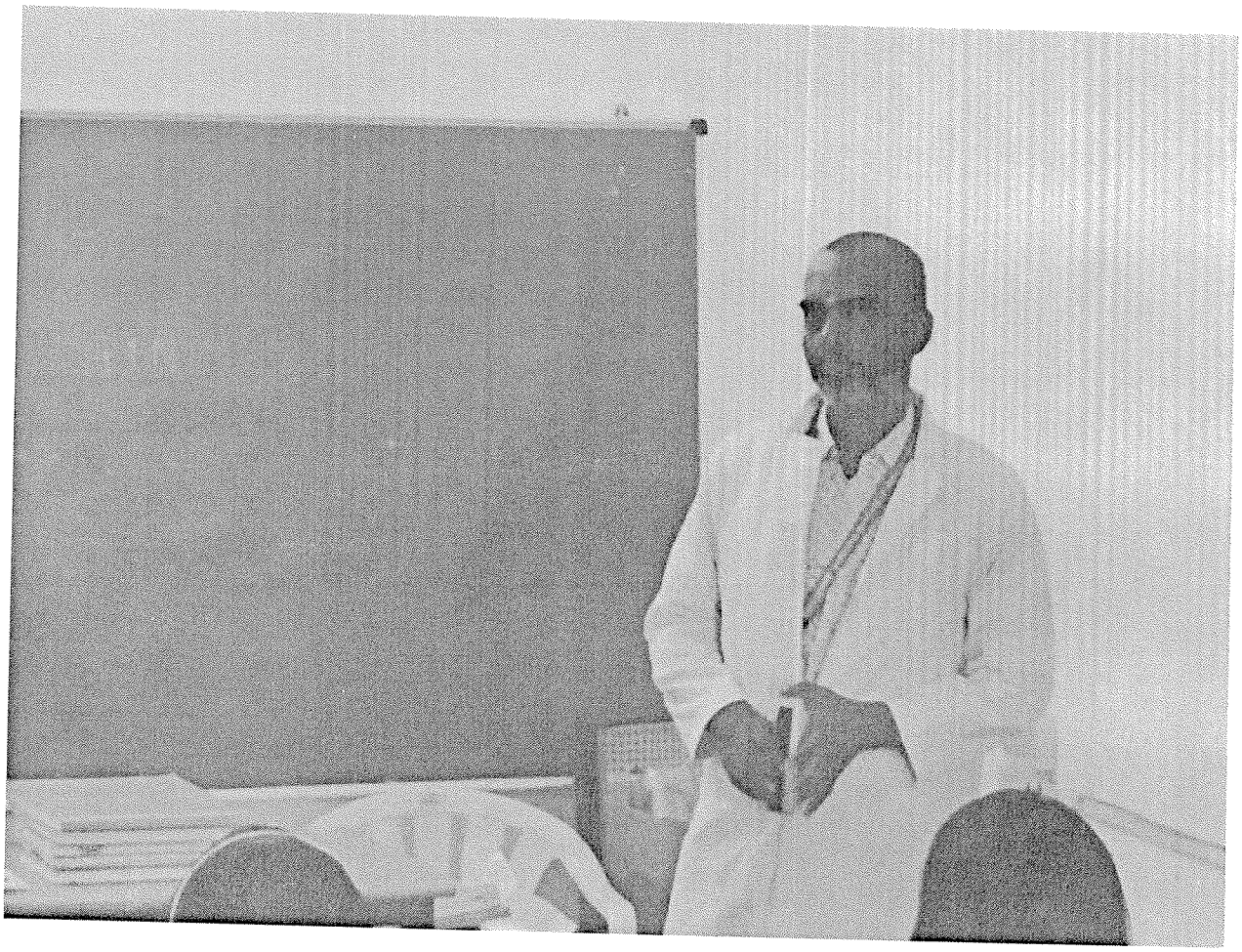
Kind Regards

Dr.G.Somasundaram

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502

Encl: Certificates

Photographs



Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY – 605 502

Date:06.09.2018

From
Dr.S.Rajini
Professor and Head,
Department of Community Medicine,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Puducherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Puducherry

Sub: Permission to conduct value-added course: LIFE SKILL EDUCATION

Respected Madam,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: LIFE SKILL EDUCATION from September 2018 – February 2019. We solicit your kind permission for the same.

Kind Regards

Rajini S
PROFESSOR & HOD
DEPARTMENT OF COMMUNITY MEDICINE
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

HEAD OF THE DEPARTMENT

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY – 605 502

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:
The Dean: Dr jayalakshmi
The HOD: Dr Rajini
The Expert: Dr. Barathalakshmi.J
Dr.Thiruselvakumar

The committee has discussed about the course and is approved.

Resource person 1

PROFESSOR & HOD
DEPARTMENT OF COMMUNITY MEDICINE
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502.

Resource person 2

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

HEAD OF THE DEPARTMENT
(Sign and seal)

DEAN
(Sign and Seal)

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY – 605 502

06.09.2018

CIRCULAR

Sub: Organising Value-added Course: LIFE SKILL EDUCATION reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing VALUE ADDED COURSE on **"LIFE SKILL EDUCATION"** for duration September 18 to February 19

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before **September 13th , 2018**.Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

DEAN

VALUE ADDED COURSE

1. Name of the programme & Code

Life skill education and PSM02

2. Duration & Period

30 hrs & Sept 2018 – Feb 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year: 1

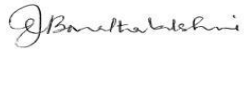
8. Year of discontinuation: - 2020

9. Summary report of each program year-wise

Value Added Course- Sept 2018 – Feb 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PSM02	Life skill education	Dr. Barathalakshmi.J Dr.Thiruselvakumar	IIIrd MBBS	13 (Sept 18 – Feb 28)

10. Course Feed Back

Enclosed as Annexure- V





RESOURCE PERSON **COORDINATOR**

Annexure 1
Course proposal

Course Title: **LIFE SKILL EDUCATION**

Course Objective:

1.Introduction to Life skills
2.Self awareness
3.Communication
4.Interpersinal relationship
5.Career Guidelines
6.summary

Course Outcome: Improvement in their knowledge on Life skill education
Course Audience: Pre-Final year students
Course Coordinator: Dr.S.Rajini
Course Faculties with Qualification and Designation:
1.Dr.J.Barathalakshmi, Associate Professor
2.Dr.D.Thiruselvakumar, Associate Professor
Course Curriculum/Topics with schedule (Min of 30 hours)

s.no	Date	Topic	Resource person	Time	Hrs
1	13.09.18	Introduction to life skills education	Dr Thiruselvakumar	4-6 pm	2
2	20.09.18	Self awareness	Dr Barathalakshmi	4-6 pm	2
3	10.10.18	Empathy	Dr Thiruselvakumar	4-6 pm	2
4	17.10.18	Critical thinking	Dr Barathalakshmi	4-6 pm	2
5	24.10.18	Creative thinking	Dr Thiruselvakumar	4-6 pm	2
6	07.11.18	Decision making	Dr Barathalakshmi	4-6 pm	2
7	14.11.18	Problem solving	Dr Thiruselvakumar	4-6 pm	2
8	12.12.18	Effective communication	Dr Barathalakshmi	4-6 pm	2
9	19.12.18	Interpersonal relationship	Dr Thiruselvakumar	4-6 pm	2
10	8.01.19	Coping with stress	Dr Barathalakshmi	4-6 pm	2
11	22.01.19	Coping with emotion	Dr Thiruselvakumar	4-6 pm	2
12	29.01.19	Public speaking	Dr Barathalakshmi	4-6 pm	2
13	05.02.19	Career planning	Dr Thiruselvakumar	4-6 pm	2
14	12.02.19	Conflict resolution	Dr Barathalakshmi	4-6 pm	2
15	19.02.19	Career guidance centres	Dr Thiruselvakumar	4-6 pm	2
					30 hrs

REFERENCE BOOKS:

1. Aparna N, Raakhee AS. Life skill education for adolescents: its relevance and importance. Education Sciences and Psychology. 2011(2):3-7.

2. Munsi K, Guha D, Bengal W, Bengal W. Status of life skill education in teacher education curriculum of saarc countries: A comparative evaluation. Journal of Education and Social Policy. 2014 Jun;1(1):93-9.

LIFE SKILL EDUCATION

HANDBOOK

Life Skill Education

LIFE SKILL

EDUCATION

Life Skill Education

CONTENTS

PAGES

Module - I

4 - 8

Module - II

9 - 18

Module - III

19 - 23

Module – IV

24 - 29

MODULE – I

INTRODUCTION TO LIFE SKILL EDUCATION

Definition of Life skills

A skill is a learned ability. Life Skills are those competencies that assist people in

functioning well in the environments in which they live. Life skills have been defined by the World

Health Organisation as “the abilities for adaptive and positive behaviour that enable individuals to

deal effectively with the demands and challenges of everyday life”. UNICEF defines life skills as

“a behaviour change or behaviour development approach designed to address a balance of three

areas: knowledge, attitude and skills”.

Life skills include psychosocial abilities and interpersonal skills that help people take

decisions, solve problems, think critically, communicate effectively, build healthy relationships,

empathize with others, and cope with the stress and strain of life in a healthy and productive manner.

Essentially, there are two kinds of skills - those related to thinking called "thinking skills" and skills

related to dealing with others called "social skills". While thinking skills relate to the personal level,

social skills include interpersonal skills. It is the combination of these two types of skills that are

needed for achieving assertive behaviour and negotiating effectively.

Components of life skills

The Ten core Life Skills as laid down by WHO are:

1. Self-awareness
2. Empathy
3. Critical thinking
4. Creative thinking
5. Decision making
6. Problem Solving
7. Effective communication
8. Interpersonal relationship
9. Coping with stress
10. Coping with emotion

Self-awareness includes recognition of 'self'and identifying our strengths and weaknesses,

desires and dislikes. Developing self-awareness can help us to recognise when we are stressed or

under pressure. It is often a prerequisite to effective communication and interpersonal relations, as

well as for developing empathy with others.

Empathy is the ability to imagine what life is like for another person. To have a successful relationship with our loved ones and society at large, we need to understand and care about other peoples' needs, desires and feelings. Without empathy, our communication with others will amount

to one-way traffic.5

Life Skill Education

Critical thinking is an ability to analyze information and experiences in an objective manner. Critical thinking helps us to recognise and assess the factors that influence attitudes and behaviour.

Creative thinking is a novel way of seeing or doing things that generates new ideas, has a shifting perspective conceives something new and builds on other ideas.

Decision making helps us to take appropriate decisions about our lives. It can teach people how to actively make decisions and what effects these different decisions are likely to have.

Problem solving helps us to deal constructively with problems in our lives.

Interpersonal relationship skills help us to establish a rapport with the people whom we interact with. This includes being able to make and keep friendly relationships, maintain good relations with family members, and also being able to end relationships constructively.

Effective communication means that we are able to express ourselves, both verbally and non-verbally, so that our ideas are effectively transmitted to others.

Coping with stress means recognising the sources of stress in our lives, recognizing how this affects us, and acting in ways that help us control our levels of stress, by changing our environment or lifestyle and learning how to relax.

Coping with emotions means involving recognising emotions within us and others, being aware of how emotions influence behaviour and being able to respond to emotions appropriately.

Need for Life skill training

Life skills as an approach is designed to enhance efforts to positively develop or change behaviour related to healthy functioning in society. This focus on behaviour change distinguishes life skills from other approaches. Another distinguishing factor of the life skills approach is the existence of a balance of three components: (i) Knowledge or information,

(ii) Attitudes and values and (iii) **S**kills as the most effective method of developing or changing behaviors. This skill component consists of interpersonal and psycho-social skills such as assertion,

negotiation, decision making, empathy building, values clarification, stress and coping skills. Whereas information acquisition strategies might focus mainly on the knowledge component, the life skills approach encompasses and balances all three of these components, namely Knowledge, Attitudes and Skills.

Practical experience shows that behaviour is substantially more difficult to change and requires more intensive approaches than knowledge and attitude change. The goal of the life skills

approach is to promote healthy, sociable behaviour and to prevent or reduce risk behaviours, as well

as make an impact on knowledge and attitudinal components.

Life Skill a Life Course approach

(a) Critical thinking skills

Critical thinking is the ability to think clearly and rationally. It includes the ability to engage in reflective and independent thinking. Someone with critical thinking skills is able to do the following:6

- understand the logical connections between ideas
- identify, construct and evaluate arguments
- detect inconsistencies and common mistakes in reasoning
- solve problems systematically
- identify the relevance and importance of ideas
- reflect on the justification of one's own beliefs and values

Critical thinking is not a matter of accumulating information. A person with a good memory and who knows a lot of facts is not necessarily good at critical thinking. A critical thinker is able to deduce consequences from what he knows, and he knows how to make use of information to solve problems, and to seek relevant sources of information to inform himself.

Critical thinking should not be confused with being argumentative or being critical of other people. Although critical thinking skills can be used in exposing fallacies and bad reasoning, critical thinking can also play an important role in cooperative reasoning and constructive tasks. Critical thinking can help us acquire knowledge, improve our theories, and strengthen arguments. We can use critical thinking to enhance work processes and improve social institutions.

Critical thinking is also regarded as intellectually engaged, skillful, and responsible thinking that facilitates good judgment because it requires the application of assumptions, knowledge, competence, and the ability to challenge one's own thinking. Critical thinking requires the use of self-correction and monitoring to judge the rationality of thinking as well as reflexivity. When using critical thinking, individuals evaluate the quality of that thinking. Critical thinking process requires

active argumentation, initiative, reasoning, envisioning and analyzing complex alternatives, and making judgments.

Critical thinkers demonstrate particular attributes. Critical thinkers tend to:

(1)

Be capable of taking a position or changing a position as evidence dictates

(2)

Remain relevant to the point

(3)

Seek information as well as precision in information

(4)

Be open minded

(5)

Take the entire situation into account

(6)

Keep the original problem in mind

(7)

Search for reasons

(8)

Deal with the components of a complex problem in an orderly manner

(9)

Seek a clear statement of the problem

(10)

Look for options

(11)

Exhibit sensitivity to others' feelings and depth of knowledge

(12)

Use credible sources

Critical thinkers use these skills appropriately and usually without prompting. They

are

generally predisposed to think critically and to evaluate the outcome of their thought processes.7

(b) Decision making skills

Decision Making is the act of choosing between two or more courses of action.

Decision making can be broken down into the following steps:

• Objectives must first be established

• Objectives must be classified and placed in order of importance

• Alternative actions must be developed

• The alternative must be evaluated against all the objectives

• The alternative that is able to achieve all the objectives is the tentative decision

• The tentative decision is evaluated for more possible consequences

• The decision is implemented.

(c) Interpersonal/ communication skills

Interpersonal skills are the life skills we use every day to communicate and interact

with other people, both individually and in groups. People who have worked on developing strong

interpersonal skills are usually more successful. Interpersonal communication is the process by

which people exchange information, feelings, and meaning through verbal and non-verbal messages:

it is face-to-face communication. Interpersonal communication is not just about what is actually said

- the language used - but how it is said and the non-verbal messages sent through tone of voice, facial

expressions, gestures and body language.

Most of us engage in some form of interpersonal communication on a regular basis.

How well we communicate with others is a measure of our interpersonal skills. Interpersonal

communication is a key life skill and can be used to:

• Give and collect information.

• Influence the attitudes and behaviour of others.

• Form contacts and maintain relationships.

• Make sense of the world and our experiences in it.

• Express personal needs and understand the needs of others.

• Give and receive emotional support.

• Make decisions and solve problems.

• Anticipate and predict behaviour.

• Regulate power.

(d) Coping and Self management skills

It refers to skills to increase the internal locus of control, so that the individual

believes that they can make a difference in the world and affect change. Self esteem, self-awareness,

self-evaluation skills and the ability to set goals are also part of the more general category of self

management skills. Anger, grief and anxiety must all be dealt with, and the individual learns to cope

loss or trauma. Stress and time management are key, as are positive thinking and relaxation

techniques.8

Everybody is exposed to stressful situations, both positive and negative. Stress is an integral element in the lives of all creatures, and it plays an important role in survival. Stress can have negative effects on our physical and emotional health. We all develop defense mechanisms to avoid or lessen psychological pain. Coping skills are ways in which we learn to deal with various stressors. Each person copes with stress differently. Over time, we all construct coping strategies that are appropriate for us.

The first step when confronted with a stressful situation is to remove our self physically from the stressor. Doing this will give you time away from the stressor to process how you feel. Once you are away from the stressor, take some deep breaths, sit down, and allow yourself to feel. Feel whatever feelings come to you—do not suppress them.

Self-Management is the ability to manage personal reactions to responsibilities and challenges in work and life. This involves managing time and adapting to changing situations. It requires a reflection on your experiences and their effect on the physical and mental state. Self Management requires the background skills of. Self management is an essential skill for an effective manager. Self management skills include being

- Analytical
- Calm
- Imaginative
- Resourceful
- Well-organized

Having a clear understanding of your thought and, behavior patterns helps you understand other people. This ability to empathize facilitates better personal and professional relationships.9

MODULE II

COMMUNICATION SKILLS

Communication is a process by which meaning is assigned and conveyed in an attempt to create shared understanding. This process requires a wide range of skills in interpersonal transactions, listening, observing, speaking, questioning, analyzing and evaluating. It is through communication that social relationships are built.

Definition

In society, we all interact with messages. Without interactions, a society cannot survive.

Social interaction is always through messages. So we can also define communication as *"a social interaction through messages."* Communication is a process whereby information is enclosed in a package and is channeled and imparted by a sender to a receiver via some medium. The receiver then decodes the message and gives the sender a feedback. All forms of communication require a sender, a message, and an intended recipient; however the receiver need not be present or aware of the sender's intent to communicate at the time of communication in order for the act of communication to occur. Communication requires that all parties have an area of communicative commonality. There are verbal means using language and there are nonverbal means, such as body language, sign language and eye contact, through media, i.e., pictures, graphics and sound, and writing.

In a simple model of communication, information is sent in some form as spoken language from sender to a receiver. This common conception simply views communication as a means of sending and receiving information. According to this view, communication consists of the following elements:

1. A sender, who produces a message.

2. A message, which contains the information to be transmitted

3. A channel, to which signals are adapted for transmission

4. A receiver, who 'decodes' or reconstructs the message from the signal.

5. A feedback, which is the response towards the received information

I. The Sender

The following aspects of the sender influences the process of communication

- Sender's Communication Skills
- Sender's Attitudes
- Sender's Knowledge Level
- Sender's Social Position
- Sender's Culture
- Feedback received by Sender

The **sender's communication skills** involve listening, speaking, writing, reading, nonverbal communication, thinking, and reasoning.

The **sender's attitudes** are defined as one's generalized tendency to feel one way or another about something.10

Sender's knowledge level refers to the information level of the sender regarding the matter which is communicated.

Sender's social position is the rank and level at which the sender is placed in the society.

Sender's culture which is the sum total of all the capab ilities that the sender acquires as part of group life.

II. The Message

The message has three components:

a) **Content** which is simply communicating what you desire to communicate.

b) **Context** which involves adapting your presentation of the content to your audience.

c) **Treatment** which is the arrangement or ordering of the content by the speaker.

III.The Receiver

The receiver of the information has to use the same skill set as the sender. Communication skills, attitudes, knowledge level, social positions, culture, and feedback are all important. Also if the receiver perceives the sender as credible, objective, and having expertise in the topic being discussed, then the receiver is more likely to accept the message being sent. The goal of communication is for the receiver to accept an accurate message from the sender.

IV. Channels

There are two types of channels for communication

a) Sensory channels based on the five senses of sight, sound, touch, smell, and taste. The sender is more likely to gain the receiver's attention if the sender uses two or more sensory channels to send information.

b) Institutional channels are the methods to transmit information, i.e. face-to-face communication, printed materials, and electronic media etc. Each institutional medium requires one or more of the sensory channels to carry the message from the sender to the receiver.

c) Feedback

Feedback allows us to determine the effectiveness of the communication. It includes verbal and nonverbal responses to another person's message. There are five main types of feedback:

- **Evaluative:** Making a judgment about the worth, goodness, or appropriateness of the other person's statement.
- **Interpretive:** Attempting to explain what the other person's statement means.
- **Supportive:** Attempting to assist the other communicator.
- **Probing:** Attempting to gain additional information or clarify a point.
- **Understanding:** Attempting to discover what the other communicator means.11

Types of Communication

Based on the channels, purpose, style and other factors, there are various types of communication.

Types of communication based on the communication channels used are:

1.

Verbal Communication

2.

Nonverbal Communication

Verbal Communication

Verbal communication is the form of communication in which message is transmitted verbally. When we talk to others, we assume that others understand what we are saying

because we know what we are saying. But when people use their own attitude, perception, emotions

and thought about the matter which is communicated, it creates barrier in delivering the right meaning. So in order to deliver the right message, you must think from your receiver's point of view.

Verbal communication is further divided in to

- Oral communication
- Written Communication

Oral Communication

In oral communication spoken words are used. It includes face to face conversations, speech, telephonic conversation, video, radio, television, voice over internet. In oral communication, communication is influence by pitch, volume, speed and clarity of speaking.

Written communication

In written communication, written signs or symbols are used to communicate. A written message may be printed or hand written. In written communication message can be transmitted via email, letter, report, memo etc. message in written communication is influenced by the vocabulary and grammar used, writing style, precision and clarity of the language used. Written communication is most common form of communication being used in business. So it is considered core among business skills.

Nonverbal Communication

Nonverbal communication is the sending or receiving of wordless messages. We can say that communication other than oral written, such as gestures, body language, posture, tone of voice or facial expressions, is called nonverbal communication. Nonverbal communication is all about the body language of speaker.

Nonverbal communication helps receiver in interpreting the message received.

Often, nonverbal signals reflect the situation more accurately than verbal messages. Sometimes nonverbal response contradicts verbal communication and hence affects the effectiveness of message.12

Nonverbal communication has the following three elements;

- Appearance of the speaker and surroundings
- Body Language
- Sounds

Based on purpose and style; there are two main categories of communication and they both bears their own characteristics. Communication types based on style and purpose are;

Formal Communication

In formal communication, certain rules, conventions and principles are followed while communicating message. Formal communication occurs in formal and official style. In formal communication, use of slang and foul language is avoided and correct pronunciation is required. Hierarchy of authority needs to be followed in formal communication.

Informal Communication

Informal communication is done using channels that are in contrast with formal communication channels. It is a communication for societal affiliations of members in an organisation and face to face discussions. It happens among friends and family. In informal communication use of slang words, foul language is not restricted. Usually informal communication is done orally and using gestures.

Components- Verbal and Non Verbal Communication

All forms of communication can be categorized as either verbal or nonverbal. In turn, both verbal and nonverbal communication can be subdivided into either vocal or non vocal. Much of the communication that takes place between people is verbal; that is, it is based on language. Nonverbal communication involves those nonverbal stimuli in a communication that are generated by both the speaker and his or her environment and that have potential message value for the source or receiver. Basically it is sending and receiving messages in a variety of ways without the use of words. It is both intentional and unintentional. It includes

- touch
- glance
- eye contact
- gestures
- facial expression intonation
- dress
- posture

Effective interpersonal communication

Effective communication helps us better understand a person or situation and enables us to

resolve differences, build trust and respect, and create environments where creative ideas, problem

solving, affection, and caring can flourish. Much of what we try to communicate to others and

what others try to communicate to us gets misunderstood, which can cause conflict and frustration

in personal and professional relationships. By learning effective communication skills, we can better

connect with your spouse, kids, friends, and coworkers.

Effective communication is about more than just exchanging information; it is about

understanding the emotion behind the information. Effective communication can improve

relationships at home, work, and in social situations by deepening your connections to others and

improving teamwork, decision-making, and problem solving. It enables you to communicate even

negative or difficult messages without creating conflict or destroying trust. Effective

communication combines a set of skills including nonverbal communication, attentive listening, the

ability to manage stress in the moment, and the capacity to recognize and understand your own

emotions and those of the person you're communicating with.

Listening

Listening is one of the most important aspects of effective communication. Successful

listening means not just understanding the words or the information being communicated, but also

understanding how the speaker feels about what they're communicating.

Effective listening can:

• **Make the speaker feel heard and understood** which can help build a stronger, deeper

connection between you.

• **Create an environment where everyone feels safe** to express ideas, opinions, and

feelings, or plan and problem solve in creative ways.

• **Save time** by helping clarify information, avoid conflicts and misunderstandings.

• **Relieve negative emotions.** When emotions are running high, if the speaker feels that he or

she has been truly heard, it can help to calm them down, relieve negative feelings, and allow for real understanding or problem solving to begin.

Tips for effective listening

• **Focus fully on the speaker,** his or her body language, and other nonverbal cues. Try repeating the words of the speaker over and over and stay focused.

• **Avoid interrupting** or trying to redirect the conversation to your concerns. Listening is not the same as waiting for your turn to talk. You can't concentrate on what someone's saying if you're forming what you're going to say next. Often, the speaker can read your facial expressions and know that your mind's elsewhere.

• **Avoid seeming judgmental.** In order to communicate effectively with someone, you don't

have to like them or agree with their ideas, values, or opinions. However, you do need to set aside your judgment and withhold blame and criticism in order to fully understand a person.

• **Show your interest** in what's being said. Nod occasionally, smile at the person, and make sure your posture is open and inviting. Encourage the speaker to continue with small verbal

comments.14

Life Skill Education

When we communicate things that we have interest in, we do so mainly using nonverbal sign. Non verbal communication, or body language, includes facial expressions, body movement and gestures, eye contact, posture, the tone of the voice, and even muscle tension and breathing. The way a person looks, listens, moves, and reacts tells more than when words are used.

Tips for improving nonverbal communication

• **Practice observing people.** Observing how others use body language can teach to receive and use nonverbal signals when conversing with others.

• **Be aware of individual differences.** People from different countries and cultures tend to use different nonverbal communication gestures, so it's important to take age, culture, religion, gender, and emotional state into account when reading body language signals.

• **Look at nonverbal communication signals as a group.** Don't read too much into a single gesture or nonverbal cue. Consider all of the nonverbal signals you receive, from eye contact to tone of voice to body language.

• **Use nonverbal signals that match up with your words.** Nonverbal communication should reinforce what is being said, not contradict it.

• **Adjust the nonverbal signals according to the context.** The tone of voice should be different in different contexts. Also the emotional state and cultural background of the interacting person should be taken into account.

• **Use body language to convey positive feelings** even when you're not actually experiencing

them. It will make you feel more self-confident and help to put the other person at ease.

Public Speaking

The art of speaking publicly can be shaped through confidence and practice. Knowing what to do when is the key. It should look natural and easy, flow subtly and not seem mechanical. Public speaking is the process of speaking to group of people in a structured, deliberate manner to inform, influence or entertain the listeners. In public speaking, there are five basic elements – i) Who is saying

ii) What is said

iii) To whom it is said

iv) What medium is used

v) What are the effects

Good orators should be able to change the emotions of their listeners, not just inform them. Interpersonal communication and public speaking have several aims like motivating, leadership development, personal development, large group communication and mass communication. Public

speaking can be a powerful tool to use for purposes such as motivation, influence, persuasion, informing, translation or simply entertaining.15

Tips for effective public speaking

1. **Have knowledge about the topic which you are talking about**: Talk about something

which you are interested in. Collect as much information about it as possible. Use stories and examples in your talk.

2. **Practice your talk**: Rehearse your speech in its entirety. Practice with a timer and allow time for the unexpected.

3. **Know the audience**: Try to create a rapport with the audience. It's easier to speak to a group of friends than to strangers.

4. **Know the stage**: Arrive early, walk around the speaking area and practice using the microphone and any visual aids.

5. **Relax**: Begin by addressing the audience. It gives time to calm yourselves. Transform nervousness into enthusiasm.

6. **Don't apologize**: Don't apologize for any nervousness or problem-the audience probably never noticed it.

7. **Concentrate on the message-not the medium**: Focus your attention on your message and your audience and forget all your anxieties and nervousness.

8. **Reflect confidence**: Your speech should represent you as an authority and as a person. Experience builds confidence, which is the key to effective speaking.

Dress appropriately for the occasion. Look pleasant, enthusiastic, confident and proud. Appear relaxed, even if you feel nervous. Speak clearly and show appropriate emotions and feelings relevant to your topic. Establish rapport with your audience. Speak loud enough so that your voice reaches the back of the room. Vary the tone of your voice and dramatize if necessary. If a microphone is available, adjust and adapt your voice accordingly.

Appropriate body language adds to the effectiveness of the talk. Use audio-visual aids or if necessary. Master the use of presentation software such as power point well before your

presentation. Speak with conviction as if you really believe in what you are saying. Persuade your

audience effectively. The material you present orally should have a logical progression. It should

start from introduction and proceed to the body with strong supporting arguments, accurate and up

to-date information and reach at the conclusion. Maintain sincere eye contact with your audience.

Use your eye contact to make everyone in your audience feel involved. Be ready for the feedback

from the audience. Always be prepared for the unexpected. Keep the audience interested in your

presentation by using humorous stories and examples. If you are using audio-visual aids in your

presentation, be well prepared. Give handouts at the appropriate time.

The most important aspect of a talk is to know when to stop talking. Do not extend your

speech for a long time. End your presentation with an interesting remark or a punch line. Leave

your listeners with a positive note and a sense of completion. Thank the audience.16

Interview Facing

An interview is also a type of communication. It mainly consists of the interviewer and the

interviewee. The interviewer asks questions to the interviewee. A job interview is a process in which

a potential employee is evaluated by an employer for potential employment. The interview is usually

preceded by the evaluation of submitted resumes from interested candidates, from whom a small

number of candidates are called for interviews.

A typical job interview has a single candidate meeting with one or more number of persons

representing the employer. In most of the job interviews, the interviewers ask the candidates

questions about their past jobs, personality, work style and other factors relevant to the job. The

candidate will usually be given a chance to ask any questions at the end of the interview. These

questions are encouraged as they allow the interviewee to acquire more information about the job and the company, as well as demonstrate the candidate's strong interest in them.

Tips for successful interview

1. Be on time.

2. Learn as much as you can about the company's mission, objectives, goals and future plans.

3. Bring resumes

4. Dress in a clean conservative manner

5. Don't make jokes

6. Don't talk bad about your previous boss

7. Don't play with your face/hair

8. Have good eye contact

9. Talk about goals

10. Have achievements

11. Be able to express why you want to work in that field/industry and what you do to further your knowledge.

12. At the end of the job interview make sure you have some questions to ask.

13. Send a thank you note

Group Discussion

The term suggests a discussion among a group of persons. The group will usually have 8 to 12 members who will express their views on a topic of current issue. Within a time limit of 20 to 30 minutes, the abilities of the members of the group are measured. Group discussion is a very important round in any selection process. The selection committee conducts GD to measure whether

the candidate has certain personality traits and or skills that it desires in its members. Some of the qualities measured through a Group discussion are:17

- Ability to work in a team .
- Communication skills.
- Leadership skills.
- Reasoning ability.
- Initiativeness.
- Assertiveness.
- Creativity.
- Flexibility.
- Ability to think and act independently.

Prerequisites of a group discussion

A group discussion requires the following components

- Topic given by panelists.
- Planning and preparation.
- Knowledge with self-confidence.
- Communication skills
- Presentation skills
- Body language and personal appearance.
- Cool and composed nature

- Listening skills.
- Co-operation.

Tips for effective participation in group discussion

1) The first thing is that the panel should notice you. Merely making a meaningful contribution and helping the group arrive at a consensus is not enough. You must ensure that the group hears you. You need to be assertive. It depends on you how you guide the group in the right direction. This gives you the chance to showcase your leadership skills. Most importantly, you have to make your chances. Many group discussion participants often complain that they did not get a chance to speak. The fact is that in no group discussion will you get a chance to speak. There is nothing more unacceptable in a GD than keeping one's mouth shut or just murmuring things which are inaudible.

2) The second most essential thing is that your contribution to the group should be meaningful. For that you need to have a good knowledge base. You should be able to think logically and hence put forth you ideas cohesively. The quality of what you said is more valuable than the quantity. It doesn't help if you shout at the top of your voice and speak at great length, what matters most is what you speak and how it creates an impact on the group as well as the evaluators.18

3) The last most important thing is that you must be clearly seen to be attempting to build a consensus. This shows your ability to work in a team, your ability to adjust yourself in new surroundings and help others in your team to reach a definite conclusion amidst difference of opinions. After all this is what all group discussions aim at: to be able to discuss and arrive at a consensus.

To effectively participate in a group discussion, the following aspects should be taken care of.

a) Be Yourself: be as natural as possible and don't try to be someone you are not.

b) Take time to organize your thought. Don't suddenly jump to any conclusion. Think before you speak so that you don't speak anything irrelevant to the topic being discussed.

c) Don't make the mistake of looking at the panel while you are speaking. Always look at your group members while you are speaking.

d) Try to find clarification if you have any doubts regarding the subject, before the discussion commences.

e) Use appropriate body language

f) Be assertive, speak yourself and let others speak as well.

g) Maintain objectivity.

h) Show your leadership skill. Motivate the other members of the team to speak.

Tips to make group discussion effective

- Make original points and support them by substantial reasoning.
- Listen to the other participants actively and carefully.
- Whatever you say must be with a logical flow and validate it with an example as far as possible.
- Make only accurate statements.
- Modulate the volume, pitch and tone.
- Be considerate to the feelings of the others.
- Try to get your turn.
- Be an active and dynamic participant by listening.
- Talk with confidence and self-assurance.

Things to avoid in group discussion

- Don’t be shy or nervous
- Don’t interrupt another participant before his argument is over.
- Don’t speak in favour
- Don’t change opinions.
- Don’t make fun of any participant even if his arguments are funny.
- Don’t engage yourself in sub-group conversation.
- Don’t repeat and use irrelevant materials.19

MODULE III

CAREER PLANNING

Choosing a Career

Career refers to the progress and actions taken by a person throughout a lifetime, especially related to that person's occupations. A career is often composed of the jobs held, titles earned and work accomplished over a long period of time, rather than just referring to one position. Choosing a Career is a crucial step in a person’s life. The decision of a career requires much care and thought. Selecting a Career is a process which involves different steps. Some of the important steps to be followed in choosing a Career includes Career Planning, Career management etc.

Career Planning

Career planning may be defined as “A goal that you desire to achieve in a selected field or occupation with a well thought out plan to get you there.”

A career goal helps you focus and make decisions on what you want to do for a living. It directs you, motivates you and helps you to accomplish what you want. A career goal helps you focus and make decisions on what you want to do for a living. A career goal can be a specific job—such as a clerk or teacher—or a career goal can be a particular field you want to work in, such as transportation or education.

A career goal may help you discover your talent, skills and abilities and possibilities that you wouldn't have thought of. Many possibilities exist with any career you choose. Having a career goal can guide you to doing what you want to do in your life—rather than just aimlessly drifting from job to job. Once you choose a career, it would be helpful to think strategically about the steps needed to accomplish the goal.

With every goal there is an anticipated desired outcome called expectation. Our expectations help keep us motivated. When we realize our goal, we often feel joy and satisfaction. Career planning is simply goal planning with the intention of setting goals for jobs and career. Career planning is getting information, and with that information, you make a goal, and then plan the steps needed to obtain that goal.

Career planning is not planning for a field on a one-time basis, but it’s a continuing process; in fact, it is a lifetime process. As we grow up, our interests and needs also change. Career planning also changes accordingly. Career planning is estimating, predicting and calculating all the steps necessary to achieving your goals. The career planning process can be divided into six steps:

1.

Self-Assessment

2.

Career Exploration

3.

Targeting

4.

Career Preparation

5.

Marketing Yourself

6.

Career Management

Having a career plan keeps you focused and motivated. It helps you to anticipate problems

and barriers that may come and what you can do to avoid the problem or barrier, solve it20

and continue on, or it may point out your deficiency or weakness so you can get the skills or resource

needed to deal with the potential barrier. Career planning will give you confidence that you are in

charge of your career and life and you have the power to decide, act, and do what you want to

accomplish your goals.

Need and importance of Career Guidance

Career guidance refers to services and activities intended to assist individuals, of any age

and at any point throughout their lives, to make educational, training and occupational choices and

to manage their careers. Such services may be found in schools, universities and colleges, in training

institutions, in public employment services, in the workplace, in the voluntary or community sector

and in the private sector. The activities may take place on an individual or group basis, and may be

face-to-face or at a distance. They include providing career information, counseling interviews,

career education programmes, work search programmes etc.

Career guidance centres

Career guidance centres help to assess people's interests, personality, values and skills, and also help them explore career options and research graduate and professional schools. Career counseling provides one-on-one or group professional assistance in exploration and decision making tasks related to choosing a major/occupation, or further professional training. The field is vast and includes career placement, career planning, learning strategies and student development. One of the major functions of Career guidance centres is to provide information and guidance on Career opportunities. Some of the major sources of Career information are Job Fair, Career Magazines, Computerised job Search etc.

Sources of career information

Job Fair

A job fair is also referred commonly as a career fair or career expo. It is a fair or exposition for employers, recruiters and schools to meet with prospective job seekers. Expos usually include company or organization tables or booths where resumes can be collected and business cards can be exchanged. In the college setting, job fairs are commonly used for entry level job recruiting. Often sponsored by career centers, job fairs provide a convenient location for students to meet employers and perform first interviews. Electronic job fairs offer the same convenience online.

Job fairs are good places to meet many company representatives from corporations of all

industries and sizes during a short period of time. Every job fair has a set of similar, basic elements

or processes that require your attention. Job fair networking can be generally described as the

process of interacting with, obtaining contact details of, and getting to know corporate recruiters.

Career Magazines

Career Magazines also provide information on career and job opportunities, but they are published

periodically as magazines.21

Computerised job Search

In Computerised job Search, job opportunities are searched through Websites that provide the

relevant information.Eg: www.monster.com, www.naukri.com etc

Applying for a Job

The Resume, also called the Bio Data or the Curriculum Vitae is perhaps the most important

document that assists you in your job search. It is this document that represents your skills, accomplishments

and experience to the prospective employer. The most important role of the Resume is to create an interest

in the employer to meet you and discuss the job opening face to face through an interview. The resume

should be able to pace a person in a job interview which is the most crucial step towards getting the

job.

Resume

A résumé is a document used by individuals to present their background and skill sets.

Résumés can be used for a variety of reasons but most often to secure new employment. A typical

résumé contains a summary of relevant job experience and education. The résumé is typically one

of the first items, that is used to screen applicants, often followed by an interview, when seeking

employment.

Most successful resumes have a few things in common in terms of their layout. These are:

•Contact Information

•Job Objective

•Education

•Work History/Experience

•Reference

The order and amount of information you give for each of these depends on the resume

format you use. There are many resume formats you can choose from such as the chronological

format, the functional format, the skilled format and so on. To start, your contact information should

simply state your name, mailing address, permanent mailing address, and phone numbers, fax

numbers and/or email addresses you want employers to contact you at. This information must

always be at the top of your resume.

Your job objective is best positioned directly below your contact information. It must be

short and precise. Using a specific job title like mechanical engineer or administrative assistant is

usually best. Where you place the education section of your resume depends on how relevant this

information is to the job you're applying for. It also depends on how relevant and substantial your

work experience is. In this section you need to place your most recent or highest degree first. Choose

the one that is most relevant to your job objective in the number one spot. Then put the name of the

school below.22

Life Skill Education

The information you include in your work history / experience section depends on the resume

format you have chosen. This is not an autobiography; you may not want to include every job you

ever did. Unless of course all the experience you have had is relevant to the job you're currently

seeking. In this section state the positions you've held, the dates you held the positions and the

relevant and specific tasks you accomplished.

A curriculum vitae, commonly referred to as CV, is a longer, more detailed synopsis than a

resume. It includes a summary of your educational and academic background, as well as teaching

and research experience, publications, presentations, awards, honors, affiliations, and other details.

Summary: The summary should be short and sweet, no more than four or five lines of text and

should highlight your key skills and attributes. This should portray a highly favourable picture of

you and indicate your strengths which are relevant to the position you are applying for. Your

summary, however, must be completely truthful

Major Achievements: After the summary you should list three to six major achievements that are

directly related to the job you are applying for. It is important to pick achievements that are relevant

as this shows that you have understood what the recruiter is looking for.

If possible you should mention facts and figures, although you may feel that these are confidential

and you may not want to disclose them. They do however make the CV more interesting and give

the recruiter a better idea of your capabilities.

Work Experience: Your work experience should come next and should describe your responsibilities, skills attained and achievements in each position that you have had. This should always be in reverse chronological order, starting with your most recent position and working backwards from there. You should concentrate on your two most recent jobs, unless these are not relevant to the position you are applying for or you were only in these positions for a short time.

Mention budgetary responsibilities, number of staff managed (if applicable) and try and give a good

picture of where you fitted into the organisation and what interactions you had with other companies

and departments.

Education / Qualifications: Provide details of your educational qualifications in this section.If your

educational achievements are not so excellent, then you should not waste too much space on it, because your work experience will be far more important to the recruiter. It goes without saying that you must actually have all the qualifications you have claimed for yourself.

IT Skills / Training / Other Skills: You should list your up-to-date IT skills, training and other skills

(such as language skills and typing speeds if relevant). For IT skills you may want to include hardware (PCs, Macs), operating systems (Windows 95/98) and applications (Microsoft Word, Excel, PowerPoint).

Personal Details: This should include your date of birth and age, marital status (optional) and nationality (optional).23

Hobbies/Interests: Hobbies and interests are generally not considered very important on a CV. However they may be able to tell a recruiter a lot about your personality, leadership potential and team working skills. So they should not be overlooked completely.

References: References do not generally needed to be included on a CV unless specifically asked

for.

Follow up Communication

Employers—in any kind of labor market—are not going to looking for you. You need to follow-up on your contact with employers—either by phone or by mail, depending on the circumstances. Be sure to follow-up on ALL resumes that you send to employers. This will separate you from the competition and help you glean more information about the hiring process.

If the job posting does not have a contact number, look up the company on the web and use the contact information provided. When you call, ask to speak to the person in charge of the particular job opening. You will most likely be directed to Human Resources. Find out who you would report to and contact them via phone preferably or email.24

Self Esteem

MODULE IV

SELF MANAGEMENT

Self-esteem is how we value ourselves; it is how we perceive our value to the world and how valuable we think we are to others. Self-esteem affects our trust in others, our relationships, our work – nearly every part of our lives. Positive self-esteem gives us the strength and flexibility to take charge of our lives and grow from our mistakes without the fear of rejection.

Following are some outward signs of positive self-esteem:

Confidence

Self-direction

Non-blaming behavior

An awareness of personal strengths

An ability to make mistakes and learn from them

An ability to accept mistakes from others

Optimism

An ability to solve problems

An independent and cooperative attitude

Feeling comfortable with a wide range of emotions

An ability to trust others

A good sense of personal limitations

Good self-care

The ability to say no

Feelings of low self-esteem often build up over a lifetime. It may take time, hard work, and it may require professional counseling. But there are some simple, positive thinking techniques that can be used to help improve self-esteem. These are called affirmations. Using affirmations to stop negative self-talk is a simple, positive way to help increase self-esteem. Affirmations are encouraging messages we can give ourselves every day until they become part of our feelings and beliefs. Affirmations work best when a person is relaxed. But since people are often upset when they are giving themselves negative self-messages, they may need to counter negative messages with positive ones.

Self awareness

Self-awareness is the capacity for introspection and the ability to recognize oneself as an individual separate from the environment and other individuals. As a form of intelligence, self

awareness can be an understanding of one's own knowledge, attitudes, and opinions.

Self control25

Life Skill Education

Self-control is the ability to control one's emotions, behavior, and desires in order to obtain some reward, or avoid some punishment. Some reward or punishment is operating in the short term which precludes, or reduces, the later reward or punishment.

Emotional Quotient and Social Quotient

Emotional quotient (EQ) is a measurement of a person's ability to monitor his or her emotions, to cope with pressures and demands, and to control his or her thoughts and actions. The ability to assess and affect situations and relationships with other people also plays a role in emotional intelligence. This measurement is intended to be a tool that is similar to intelligence quotient (IQ), which is a measurement of a person's intellect. There is much debate surrounding the legitimacy of EQ, however, primarily because there is no standard of measurement. Measurements of people's emotional intelligence quotients are used in many settings. The idea is very popular in the corporate world, where many businesses use EQ tests to help their employees determine and measure their emotional responses to various situations.

Social intelligence is the capacity to effectively negotiate complex social relationships and environments. Social intelligence is an aggregated measure of self- and social-awareness, evolved social beliefs and attitudes, and a capacity and appetite to manage complex social change. A person

with a high social intelligence quotient (SQ) is no better or worse than someone with a low SQ, but

they have different attitudes, hopes, interests and desires.

Social intelligence is defined as "the ability to deal efficiently and thoughtfully, keeping

one's own identity, employing apposite social inputs with a wider understanding of social

environment; considering empathetic co-operation as a base of social acquaintance." Social

Intelligence or SQ is a statistical abstraction similar to the 'standard score' approach used in IQ tests

with a mean of 100. Scores of 140 or above are considered to be very high. SQ has until recently

been measured by techniques such as question and answer sessions. These sessions assess the

person's pragmatic abilities to test eligibility in certain special education courses; however some

tests have been developed to measure social intelligence.

People with low SQ are more suited to work with low customer contact, because they may

not have the required interpersonal communication and social skills for success on with

customers.People with SQs over 120 are considered socially skilled, and may work well with jobs

that involve direct contact and communication with other people.

Coping with emotions- Stress and strain

Stress is a feeling of strain and pressure. Symptoms may include a sense of being

overwhelmed, feelings of anxiety, irritability, insecurity, nervousness, social withdrawal, loss of

appetite, depression, panic attacks, exhaustion, high or low blood pressure, insomnia, sexual

dysfunction, migraine, gastrointestinal difficulties, and for women, menstrual symptoms. It may

also cause more serious conditions such as heart problems. Small amounts of stress may be desired,

beneficial, and even healthy. Positive stress helps improve athletic performance. It also plays factor

in motivation, adaptation, and reaction to the environment. Excessive amounts of stress however,

may lead to many problems in the body that could be harmful. Stress can be

external and related to the environment, but may also be created by internal perceptions that cause

an individual to have anxiety or other negative emotions surrounding a situation, such as pressure,

discomfort, etc., which they then deem stressful.

Individuals deal with perceived threats that may be stressful, in various ways. There are

different ways for coping, or defense mechanisms. There are productive and counterproductive

ways to handle stress. Because stress is perceived, the following mechanisms do not necessarily

deal with the actual situation that is causing an individual stress. However, they may be considered

coping mechanisms if they allow the individual to cope better with the negative feelings or anxiety

that they are experiencing due to the perceived stressful situation, as opposed to actually fixing the

concrete obstacle causing the stress.

Some of the important ways of stress management are:

- Affiliation – involves dealing with stress by turning to a social network for support.
- Humor – the individual steps outside of a situation in order to gain greater perspective, and

also to highlight any comic aspect to be found in their stressful circumstances.

- Sublimation – allows an "indirect resolution of conflict with neither adverse consequences

nor consequences marked by loss of pleasure. Essentially, this mechanism allows channeling

of troubling emotions or impulses into an outlet that is socially acceptable.

- Positive reappraisal – redirects thoughts to good things that are either occurring or have not

occurred. This can lead to personal growth, self-reflection, and awareness of the

power/benefits of one's efforts.

• Displacement - This is when an individual redirects their emotional feelings about one situation to another, less threatening one.

• Repression – Repression occurs when an individual attempts to remove all their thoughts, feelings, and anything related to the stressful situation out of their awareness in order to be disconnected from the entire situation.

• Reaction formation – An individual substitutes their feelings or thoughts or behavior with the exact opposite.

• Acting out – Often viewed as counter-normative, or problematic behavior. Instead of reflecting or problem-solving, an individual takes maladaptive action.

• Passive aggression – When an individual indirectly deals with his or her anxiety and negative thoughts originating from their stress by acting in a hostile or resentful manner towards others.

Depending on the situation, all of these coping mechanisms may be adaptive, or maladaptive.

Conflict resolution- Steps and stages

There are situations where different people with different goals and needs come into conflict. However, conflict is not a bad thing: As long as it is resolved effectively, it can lead to personal and professional growth. In many cases, effective conflict resolution can make the difference between positive and negative outcomes.By resolving conflict successfully, we can

solve many of the problems that it has brought to the surface. Some of the benefits of conflict resolution are:

• **Increased understanding:** The discussion needed to resolve conflict expands people's awareness of the situation, giving them an insight into how they can achieve their own goals without undermining those of other people.

• **Increased group cohesion:** When conflict is resolved effectively, team members can develop stronger mutual respect and a renewed faith in their ability to work together.

• **Improved self-knowledge:** Conflict pushes individuals to examine their goals in close detail, helping them understand the things that are most important to them, sharpening their focus, and enhancing their effectiveness.

However, if conflict is not handled effectively, the results can be damaging.

Conflict resolution is conceptualized as the methods and processes involved in facilitating the peaceful ending of conflict. Often, committed group members attempt to resolve group conflicts by actively communicating information about their conflicting motives or ideologies to the rest of the group and by engaging in collective negotiation. Ultimately, a wide range of methods and procedures for addressing conflict exist, including but not limited to negotiation, mediation, diplomacy, and creative peace building.

Some important steps of conflict resolution are:

1. Create an Effective Atmosphere
2. Clarify Perceptions
3. Focus on Individual and Shared Needs
4. Build Shared Positive Power
5. Look to the Future, then Learn from the Past
6. Generate Options
7. Develop "Doables"

8. Make Mutual Benefit Agreements

Developing Positive thinking and Assertiveness

Positive thinking is an important aspect of stress management. Positive thinking just means

that you approach the unpleasantness in a more positive and productive way. You think the best is going to

happen, not the worst.

Positive thinking often starts with self-talk. Self-talk is the endless stream of unspoken thoughts that

run through your head every day. These automatic thoughts can be positive or negative. Some of

your self-talk comes from logic and reason. Other self-talk may arise from misconceptions that you

create because of lack of information. If the thoughts that run through your head are mostly negative,

your outlook on life is more likely pessimistic. If your thoughts are mostly positive, you're likely an

optimist — someone who practices positive thinking.

The benefits that positive thinking may provide include:28

- Increased life span
- Lower rates of depression
- Lower levels of distress
- Greater resistance to the common cold
- Better psychological and physical well-being
- Reduced risk of death from cardiovascular disease
- Better coping skills during hardships and times of stress

Assertiveness is a skill regularly referred to in social and communication skills training. Often

wrongly confused with aggression, assertive individuals aim to be neither passive nor aggressive in

their interactions with other people. Although everyone acts in passive and aggressive ways from

time to time, such ways of responding often result from a lack of self confidence and, therefore, are

inappropriate expressions of what such people really need to say. It is a form of behavior

characterized by a confident declaration or affirmation of a statement without need of proof; this

affirms the person's rights or point of view without either aggressively threatening the rights of

another or submissively permitting another to ignore or deny one's rights or point of view.

When you act assertively you act fairly and with empathy. The power you use comes from

your self-assurance and not from intimidation or bullying. When you treat others with such fairness

and respect, you get that same treatment in return. You are well liked and people see you as a leader

and someone they want to work with.

Developing Assertiveness

Some people are naturally more assertive than others. If your disposition tends more towards

being either passive or aggressive, you need to work on the following skills to develop your

assertiveness. Some important ways to develop assertiveness are:

Value yourself and your rights

• Understand that your rights, thoughts, feelings, needs and desires are just as important as

everyone else's.

• Recognise your rights and protect them.

• Believe you deserve to be treated with respect and dignity at all times.

• Stop apologizing for everything.

Identify your needs and wants, and ask for them to be satisfied.

• Don't wait for someone to recognize what you need

• Understand that to perform to your full potential, your needs must be met.

• Find ways to get your needs met without sacrificing others' needs in the process.29

Acknowledge that people are responsible for their own behavior.

• Don't make the mistake of accepting responsibility for the how people react to your assertive statements

• As long as you are not violating someone else's needs, then you have the right to say or do what you want.

Express negative thoughts and feelings in a healthy and positive manner.

• Allow yourself to be angry, but always be respectful.

• Do say what's on your mind, but do it in a way that protects the other person's feelings.

• Control your emotions.

• Stand up for yourself and confront people who challenge you and/or your rights.

Receive criticism and compliments positively.

• Accept compliments graciously.

• Allow yourself to make mistakes and ask for help.

• Accept feedback positively – be prepared to say you don't agree but do not get defensive or angry.

Learn to say "No" when you need to.

- Know your limits and what will cause you to feel taken advantage of.
- Know that you can't do everything or please everyone and learn to be OK with that.
- Go with what is right for you.
- Suggest an alternative for a win-win solution.

Being assertive means knowing where the fine line is between assertion and aggression and balancing on it. It means having a strong sense of yourself and acknowledging that you deserve to get what you want. And it means standing up for yourself even in the most difficult situations.

Assertiveness can be learned and developed, and although it won't happen overnight, by practicing the techniques presented here you will slowly become more confident in expressing your needs and wants. As your assertiveness improves, so will your productivity and efficiency.

ANNEXURE II

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

TOPIC: LIFE SKILLS EDUCATION

SL. NO	NAME OF THE STUDENTS	SIGNATURE
1	DHANUSH KODALI	
2	DHIVYA KUMARI .P	
3	DIVYA .S	
4	DIVYA DHARSHINI .N	
5	EVANGELINE PRETTY .G	
6	EZHILARASI. R	
7	FATHIMA BANU. A	
8	GAYATHRI .M	
9	GOGUL SUGAN. K	
10	GOKULA KRISHNAN. E	
11	GOWTHAM. M .R	
12	GOWTHAM.S	
13	HARIHARAN.S	

ANNEXURE III

LIFE SKILLS

MULTIPLE CHOICE QUESTIONS

Course Code: PSM02

ANSWER ALL THE QUESTIONS

1. Those competencies that assist people in functioning well in the environments in which they live

   a. Lifeskills
   b) Jobskills
   c)Personalskills
   d) Functioningskills

2. The abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everydaylife.

   a. Lifeskills
   b) Jobskills
   c)Personalskills
   d) Functioningskills

3. Accordingto_____, life skills are the abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everydaylife.

   a. WHO
   b)UNICEF
   c)IMF
   d)UNEDP

4. defines life skills as "a behaviour change or behaviour development approach designed to address a balance of three areas: knowledge, attitude andskills".

   a. WHO
   b)UNICEF
   c)IMF
   d)UNEDP

5. A behaviour change or behaviour development approach designed to address a balance of three areas: knowledge, attitude andskills

   a) Lifeskills
   b) Jobskills
   c)Personalskills
   d) Functioningskills

6. Recognition of 'self' and identifying our strengths and weaknesses, desires anddislikes.

   b) Self-awareness
   b)Empathy
   c)Criticalthinking
   d) Creativethinking

7. The ability to imagine what life is like for anotherperson

   c) Self-awareness
   b)Empathy
   c)Criticalthinking
   d) Creativethinking

8. A novel way of seeing or doing things that generates new ideas, has a shifting perspective

conceives something new and builds on other ideas.

d) Self-awareness b)Empathy
c)Criticalthinking d) Creativethinking

9. …… can teach people how to actively make decisions and what effects these different decisions are likely tohave.

e) Self-awareness b)Empathy
c)Criticalthinking d) Decisionmaking

10. …….includes being able to make and keep friendly relationships and also being able to end relationshipsconstructively.

f) Interpersonalrelationshipskills b)Empathy
c)Criticalthinking d) Decisionmaking

11. …….means that we are able to express ourselves, both verbally and non-verbally, so that our ideas are effectively transmitted toothers.

g) Interpersonalrelationshipskills b) Effectivecommunication
c)Criticalthinking d) Decisionmaking

12. _____….helps us to deal constructively with problems in ourlives.

h) Problemsolving b) Effectivecommunication
c)Criticalthinking d) Decisionmaking

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

LIFE SKILLS

MULTIPLE CHOICE QUESTIONS

Course Code: PSM02

ANSWER ALL THE QUESTIONS

1. Those competencies that assist people in functioning well in the environments in which they live

   a. Lifeskills
   b) Jobskills
   c)Personalskills
   d) Functioningskills

2. The abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everydaylife.

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   c)Personalskills
   d) Functioningskills

3. Accordingto_____, life skills are the abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everydaylife.

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   c)IMF
   d)UNEDP

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   b)UNICEF
   c)IMF
   d)UNEDP

5. A behaviour change or behaviour development approach designed to address a balance of three areas: knowledge, attitude andskills

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   b) Jobskills
   c)Personalskills
   d) Functioningskills

6. Recognition of 'self' and identifying our strengths and weaknesses, desires anddislikes.

   b) Self-awareness
   b)Empathy
   c)Criticalthinking
   d) Creativethinking

7. The ability to imagine what life is like for anotherperson

   c) Self-awareness
   b)Empathy
   c)Criticalthinking
   d) Creativethinking

8. A novel way of seeing or doing things that generates new ideas, has a shifting perspective conceives something new and builds on otherideas.

a) Self-awareness b)Empathy

c)Criticalthinking d) Creativethinking

9. can teach people how to actively make decisions and what effects these different decisions are likely tohave.

e) Self-awareness b)Empathy

c)Criticalthinking d) Decisionmaking

10. includes being able to make and keep friendly relationships and also being able to end relationshipsconstructively.

f) Interpersonalrelationshipskills b)Empathy

c)Criticalthinking d) Decisionmaking

11. means that we are able to express ourselves, both verbally and non-verbally, so that our ideas are effectively transmitted toothers.

g) Interpersonalrelationshipskills b) Effectivecommunication

c)Criticalthinking d) Decisionmaking

12. _helps us to deal constructively with problems in ourlives.

h) Problemsolving b) Effectivecommunication

c)Criticalthinking d) Decisionmaking

ANNEXURE IV

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that **GOWTHAM M.R** has actively participated in the Value Added Course on **LIFE SKILL EDUCATION** held during Sept 2018 – Feb 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

DR.THIRUSELVAKUMAR, MD
RESOURCE PERSON
ASSOCIATE PROFESSOR

DR.S.RAJINI MD
COORDINATOR
PROFESSOR & HOD,
DEPT OF COMMUNITY MEDICINE

DR.G. JAYALAKSHMI, MD
DEAN, SLIMS

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that **DHANUSH KODALI** has actively participated in the Value Added Course on **LIFE SKILL EDUCATION** held during Sept 2018 – Feb 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

DR.D.THIRUSELVAKUMAR, MD
RESOURCE PERSON
ASSOCIATE PROFESSOR

DR.S.RAJINI MD
COORDINATOR
PROFESSOR & HOD,
DEPT OF COMMUNITY MEDICINE

DR.G. JAYALAKSHMI, MD
DEAN, SLIMS

ANNEXURE V

Course Name: **LIFE SKILL EDUCATION**

Subject Code: **PSM 02**

Name of Student: SANDIYA.T Roll No.: 70

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 Outstanding; 4 - Excellent; 3 Good; 2 Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Good.

Date: 16/10/2018

Signature

Course Name: **LIFE SKILL EDUCATION**

Subject Code: **PSM 02**

Name of Student: PIRAI NILA.M Roll No.: 61

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 Outstanding; 4 - Excellent; 3 Good; 2 Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Good.

Date: 16/10/2018

Signature

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY – 605 502

Date : 20.02.19

From
Dr.S.Rajini
Professor and Head,
Department of Community Medicine,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Puducherry

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Puducherry

Sub: Completion of value-added course: Life Skill Education

Respected Madam,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Life Skill Education from September 2018 to February 2019 for Pre-final year students . We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Rajini S
PROFESSOR & HOD
DEPARTMENT OF COMMUNITY MEDICINE
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Dr.S.Rajini



SLIMS,PONDICHERRY

Date 08/05/18

From

DR.R.CHIDHAMBARAM ,
Professor and Head,
Dept.of radio-diagnosis and Imaging Sciences ,
SLIMS,PONDICHERRY
Bharath Institute of Higher Education and Research,
Chennai.

To

The Dean,
SLIMS
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course:

INTEGRATED PHYSIOLOGY IN GIT-BARIUM STUDIES

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled **INTEGRATED PHYSIOLOGY IN GIT-BARIUM STUDIES** on 08/05/18. We solicit your kind permission for the same.

Kind Regards

Chidha

DR.R.CHIDHAMBARAM

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. R Chidhambaram

The Expert: Dr. T. Jothi baran

The committee has discussed about the course and is approved.

Dean Subject Expert HOD

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

BIHER SLIMS

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

25.05.2018

Sub: Organising Value-added Course: INTEGRATED PHYSIOLOGY IN GIT-BARIUM STUDIES. reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"INTEGRATED PHYSIOLOGY IN GIT-BARIUM STUDIES"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before May to June 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content

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VALUE ADDED COURSE

1. **Name of the programme & Code :**
   Integrated physiology teaching-barium studies in GIT
   RAD 08
2. **Duration & Period**
   30 hrs & September 2018– January 2019 & February2019 – August 2019
3. **Information Brochure and Course Content of Value Added Courses**
   Enclosed as Annexure- I
4. **List of students enrolled**
   Enclosed as Annexure- II
5. **Assessment procedures:**
   Multiple choice questions- *Enclosed as Annexure- III*
6. **Certificate model**
   Enclosed as Annexure- IV
7. **No. of times offered during the same year**:
   September 2018– January 2019 & February2019 – August 2019
8. **Year of discontinuation: 2019**

9. **Summary report of each program year-wise**

Value Added Course- September 2018 - August 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	**RAD 08-1**	**Integrated physiology teaching-barium studies in GIT**	Dr.M.sivasubramaniyan	MBBS	20 (Sep18 – Jan19)
2	**RAD 08-2**	**Integrated physiology teaching-barium studies in GIT**	Dr.Mohamad Hasan	MBBS	20 (Feb18-Aug19)

10. **Course Feed Back**

Enclosed as Annexure- V

RESOURCE PERSON **COORDINATOR**

Course Proposal

Course Title: **INTEGRATED PHYSIOLOGY IN GIT-BARIUM STUDIES**

CourseObjective: TO DEMONSTRATE INTEGRATED PHYSIOLOGY IN GIT-BARIUM STUDIES

CourseOutcome: BETTER UNDERSTANDING OF INTEGRATED PHYSIOLOGY IN GIT-BARIUM STUDIES

Course Audience: ANY MEDICAL STUDENT

Course Coordinator: PROF.DR.G.BALACHANDRAN

Course Faculties with Qualification and Designation:

1. **DR.G.BALACHANDRAN,MBBS,MD,DNB,DMRD.PROF. AND HOD**
2. **DR.SIVASUBRAMANIYAN,MBBS,DNB,ASST PROFESSOR**
3. **DR.MOGHAMAED HASSAN,MBBS,MDRD,ASST PROFESSOR**

Course Curriculum/Topics with schedule (Min of 30 hours)-ENCLOSED

SlNo	Date	Topic	Time	Hours
1	03-09-2018	INTRO	2:00 PM	2 hours
2	04-09-2018	OESOPHAGUS PHYSIOLOGY	2:00 PM	2 hours
3	05-09-2018	OESOPHAGUS ANATOMY-1	2:00 PM	2 hours
4	06-09-2018	OESOPHAGUS ANATOMY-2	2:00 PM	2 hours
5	07-09-2018	STOMACHPHYSIOLOGY	2:00 PM	2 hours
6	08-09-2018	STOMACHANATOMY	2:00 PM	2 hours
7	09-09-2018	STOMACHANATOMY	2:00 PM	2 hours
8	10-09-2018	SMALL INTESTINE PHYSIOLOGY	2:00 PM	2 hours
9	11-09-2018	SMALL INTESTINE ANATOMY	2:00 PM	2 hours
10	12-09-2018	SMALL INTESTINE ANATOMY	2:00 PM	2 hours
11	13-09-2018	LARGE INTESTINE PHYSIOLOGY	2:00 PM	2 hours
12	14-09-2018	LARGE INTESTINE ANATOMY	2:00 PM	2 hours
13	15-09-2018	LARGE INTESTINE ANATOMY	2:00 PM	2 hours
14	16-09-2018	PANCREAS-1	2:00 PM	2 hours
15	17-09-2018	PANCREAS-2	2:00 PM	2 hours
			Total Hours	30

REFERENCE BOOKS: (Minimum 2)
1.GANONG.
2.GUYTON

Annexure- II

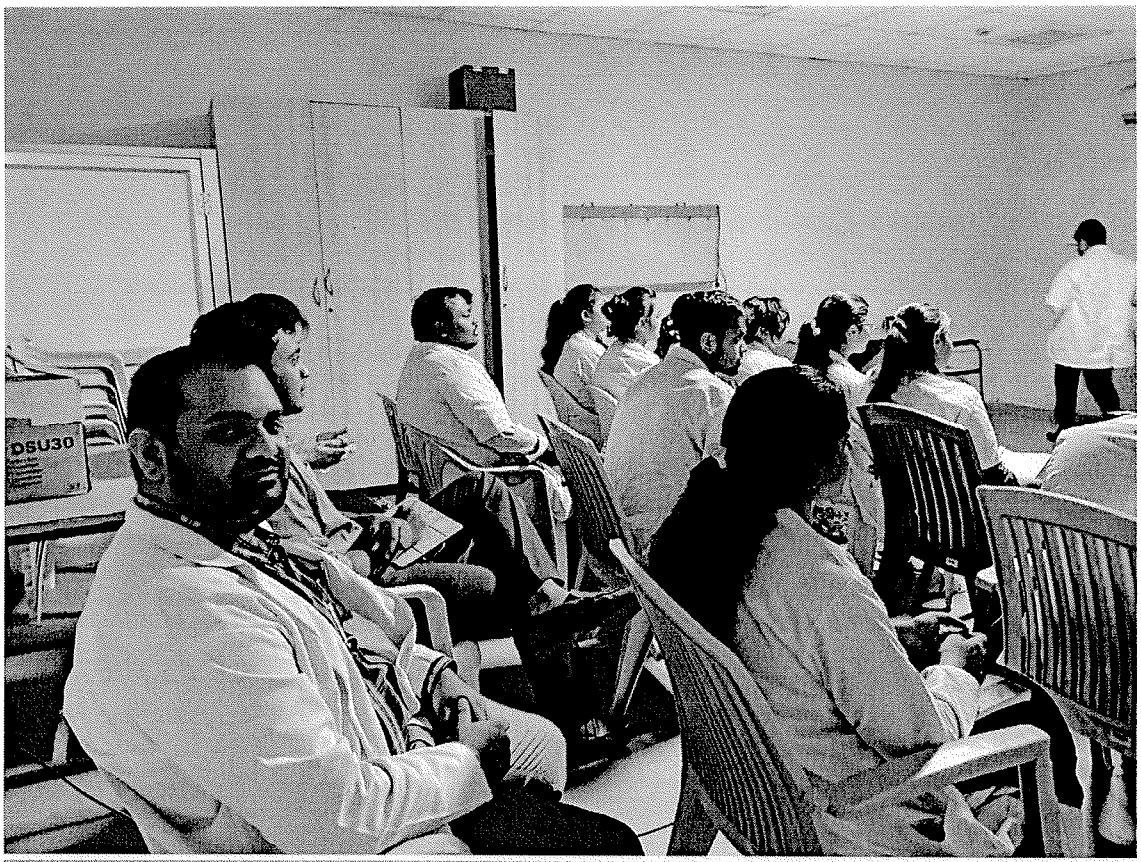
VALUE ADDED COURSE

TOPIC:- *BARIUM STUDIES IN GIT TRACT*

List of Students Enrolled OCT. 2016

IST YEAR MBBS STUDENTS			
Sl.NO.	NAME OF THE STUDENT	UNIVERSITY REG. NO.	signature
1	NANDU ARAVIND	U16MB340	
2	NEELU.S.P	U16MB341	
3	NEITOUNUO MARY PIENYII	U16MB343	
4	NIKITA VERMA	U16MB342	
5	NISHA AGRAWAL	U16MB344	
6	NOUNETSHUNUO KELIO	U16MB345	
7	PALAYULLA VALAPPIL VARUN	U16MB346	
8	PARTHASARATHY .S	U16MB347	
9	PATIL NAMRATA YASHANAND	U16MB348	
10	PAVETHRA .A	U16MB349	
11	POOJA KUMARI	U16MB350	
12	PRADEEP .T	U16MB351	
13	PRASHANT.S	U16MB352	
14	PRIYADARSHINI .K	U16MB353	
15	PRIYADARSHINI .S	U16MB354	
16	PRIYADARSHINI .U	U16MB355	
17	PRIYADHARSHINI .V	U16MB357	
18	PRIYADHARSHINI.S	U16MB358	
19	PRIYANK VATS	U16MB356	
20	RADHIKA .C	U16MB359	
21	RAJASHREE .M	U16MB360	
22	RAJAT TYAGI	U16MB361	
23	RAJEEV RANJAN SINGH	U16MB362	
24	RAMAPRIYA .M	U16MB363	
25	RIYAS AHAMED .M	U16MB364	
26	RUCHI YADAV	U16MB365	
27	RUPESH RANJAN	U16MB366	
28	SAI PRAVAN KUMAR .B	U16MB367	
29	SAJUTI DEY	U16MB368	
30	SAKTHIMALAR .R	U16MB369	

RESOURCE PERSON **COORDINATOR**





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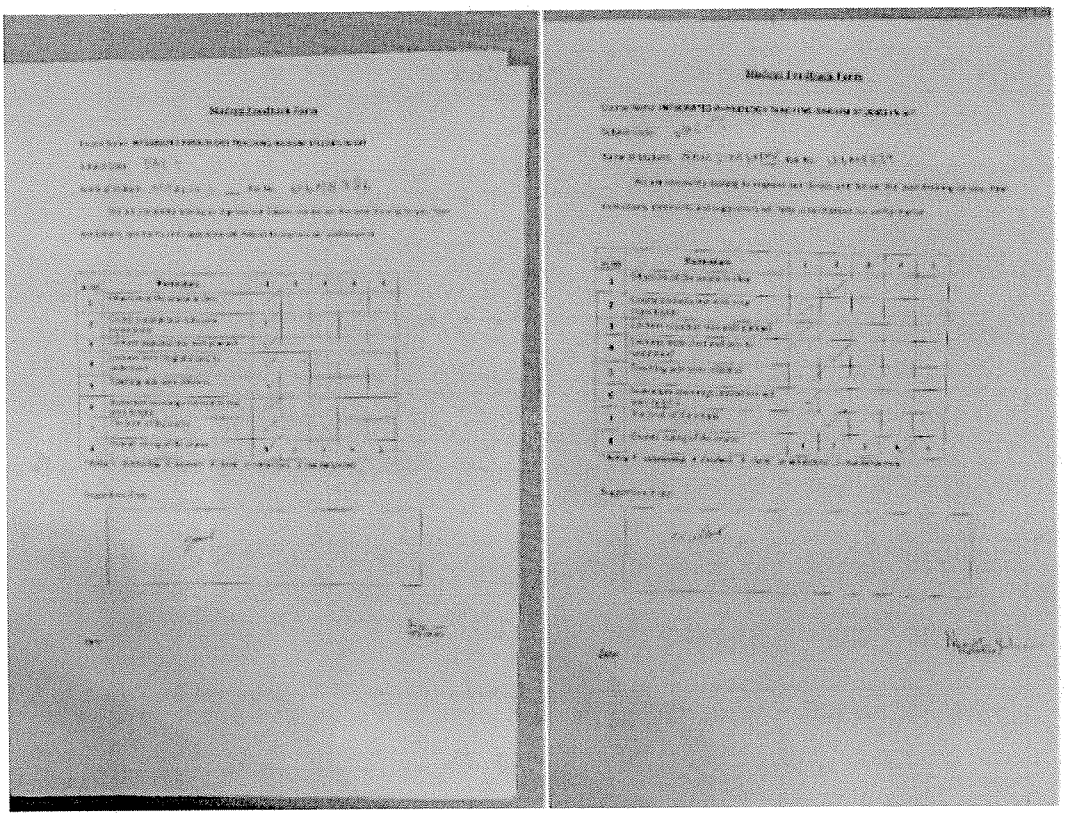

6. Concerning the peritoneal spaces:
(a) The right subphrenic space extends from the right coronary ligament postero-inferiorly to the falciform ligament medially.
(b) In the supine position the hepatorenal space (Morrison's pouch) is more dependant than the right paracolic gutter.
(c) The lesser sac is posterior to the pancreas.
(d) Fluid collections in the pelvis that spread to the left subphrenic space, generally involve the lesser sac.
(e) Subphrenic collections are more common on the left than the right.

7. Concerning the peritoneal spaces:
(a) The right inframesocolic space is in direct communication with the pelvis.
(b) The paracolic gutters are retroperitoneal recesses on the posterior abdominal wall lateral to the ascending and descending colon.
(c) There are two potential spaces posterior to the bladder in women.
(d) In the supine position the Pouch of Douglas is the most dependent portion of the peritoneum.
(e) The peritoneum is reflected on the prostate.

8. In the pelvic peritoneum:
(a) The rectum is covered by peritoneum on the front up to the junction of the middle and lower thirds.
(b) The peritoneum is reflected on the infero-lateral aspect of the bladder bilaterally.
(c) The broad ligaments contain the fallopian tubes.
(d) The left limb of the sigmoid mesocolon is attached medially to the left psoas muscle.
(e) The left ureter runs in the apex of the sigmoid mesocolon.

9. In the abdomen:
(a) The superior mesenteric vessels lie in the small bowel mesentery.
(b) The root of the transverse mesocolon is confluent with the root of the small bowel mesentery.
(c) The greater omentum inserts into the antero-superior aspect of the transverse colon.
(d) The lesser omentum forms the anterior surface of the lesser sac.
(e) The inferior extent of the lesser omentum attaches to the porta hepatis.

10. Regarding the peritoneal ligaments:
(a) Between the two layers of the right coronary ligament is the bare area of the liver.
(b) The gastro-splenic ligament is a continuation of the lesser omentum from the stomach to the spleen.
(c) The falciform ligament contains the ligamentum venosum in its free edge.
(d) The phrenicocolic ligament is continuous with the splenorenal ligament.
(e) The hepatoduodenal ligament transports the portal triad.

Name NAMPETA GHORAI Batch 016MB340

GIT TRACT

1. Regarding the abdomen:
(a) By the fifth week of fetal life the gut tube within the peritoneal cavity is suspended by the dorsal mesentery.
(b) The blind ending hind gut is closed by the cloacal membrane.
(c) The superior mesenteric artery supplies the gut from the inferior half of the duodenum to the splenic flexure.
(d) The coeliac axis supplies the gut from the upper oeosphagus to the superior half of the duodenum.
(e) The inferior mesenteric artery supplies the hind gut distal to the hepatic flexure up to the anal canal.

2. During embryological development:
(a) A condensation of endoderm in the dorsal mesogastrium forms the spleen.
(b) In the third week of fetal life the liver arises from a hepatic diverticulum which buds from the duodenum.
(c) The dorsal pancreatic bud arises from the hepatic diverticulum.
(d) The pancreas may form a complete ring around the duodenum.
(e) The ventral pancreatic duct forms the accessory pancreatic duct.

3. In the development of the gut:
(a) The cranial limb of the primary intestinal loop gives rise to most of the ileum.
(b) During the sixth week of fetal life the midgut herniates into the umbilical cord.
(c) During the 24th week of fetal life the midgut retracts into the abdomen.
(d) The mesenteries of the ascending and descending colon blend with the posterior peritoneal wall.
(e) The lower part of the anal canal is ectodermal in origin.

4. In developmental anomalies of the gut:
(a) Failure of recanalization of the lumen of the midgut may result in atresia or stenosis of the bowel.
(b) Meckel's diverticulum represents the remains of the embryonic right umbilical vein.
(c) In an undescended caecum, neonatal intestinal obstruction is caused by Ladd's band.
(d) Ischaemic changes to the bowel in the fetal umbilical hernia may result in atresia or stenosis of the bowel.
(e) The embryonic vitello intestinal duct gives rise to the appendix.

5. Regarding the peritoneum:
(a) It is a closed sac in both male and female.
(b) The greater and lesser sac communicate through the epiploic foramen.
(c) The flow of peritoneal fluid is directed in a cephalad direction by the negative intra-abdominal pressure generated in the upper abdomen by respiration.
(d) The peritoneal cavity is divided by the greater omentum into the supramesocolic and inframesocolic compartments.
(e) The root of the transverse mesocolon extends from the infra-ampullary segment of the duodenum through the head and along the lower edge of the body and tail of the pancreas.

Date: 08/06/19

From

Dr.R.Chidhambaram
Professor and Head,
Department of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: **INTEGRATED PHYSIOLOGY IN GIT-BARIUM STUDIES**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: : **INTEGRATED PHYSIOLOGY IN GIT-BARIUM STUDIES** for 20 medical students (batch 2) .

We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr.R.Chidhambaram

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

Encl: Certificates

Photographs

SRI LAKSHMI NARAYANA

INSTITUTE OF MEDICAL SCIENCES

DEPARTMENT OF RADIOLOGY AND IMAGING SCIENCES

INTEGRATED

PHYSIOLOGY TEACHING

BARIUM STUDIES IN GIT TRACT

BIHER

SLIMS

COURSE CONTENTS

PROCEDURE IN BARIUM STUDIES

POSITIONING IN BARIUM STUDIES

IDENTIFYING NORMAL ANATOMY OF GIT IN BARIUM STUDIES

IDENTIFYING SMALL BOWEL AND LARGE BOWEL

INTRODUCTION

Barium suspension is made up of finely ground barium sulphate particles in the range of 0.3–1.0 μm. A non-ionic suspension maintains a stable suspension and prevents clumping. The resulting solution has a pH of 5.3, which makes it stable in gastric acid.
There are many preparations of barium suspensions in use.

Preparations are diluted with water to reduce the density and must be shaken well immediately before use.

Differing properties are required for optimal coating, which varies according to the anatomical site.

1. Barium swallow (e.g. Baritop 100% w/v or E-Z HD 200%–250% 100–150 mL, as required).

2. Barium meal (e.g. E-Z HD 250% w/v). A high-density, low-viscosity barium delivers a thin coating which is still sufficiently dense for satisfactory opacification in double contrast studies. Simethicone and sorbitol provide antifoaming and coating properties.

3. Barium follow-through (e.g. E-Z Paque 60%–100% w/v 300 mL; can be reduced to 150 mL if performed after a bariummeal).
Sorbitol induces osmotic hyperperistalsis, especially when combined with Metoclopramide and Gastrografin, and is partially resistant to flocculation.

4. Small bowel enema (e.g. either a 300 mL can of Baritop 100% w/v or two tubs of E-Z Paque, made up to 1500 mL; 60% w/v).

5. Barium enema (e.g. Polibar 115% w/v 500 mL or more, as required).
Reduced density between 20% and 40% w/v for single contrast examinations.

Advantages
1. The main advantage of barium over water-soluble contrast agents is better coating resulting in better mucosal detail.
2. Low cost.

Disadvantages
1. Precludes accurate subsequent abdominal CT interpretation with potential delays of up to 2 weeks to allow satisfactory clearance of the barium.
2. High morbidity associated with barium entering the peritoneal cavity.

Complications

1. Perforation. Water-soluble contrast medium should be the initial agent used for any investigation in which there is a risk or suspicion of perforation. Barium leak into the peritoneal cavity is rare but extremely serious, resulting in pain and severe hypovolaemic shock.
Treatment consists of intravenous fluid resuscitation, emergency surgery and washout with antibiotics. Mortality is in the order of 50%; of those that survive, 30% will develop granulomata and peritoneal adhesions. Mediastinal and pleural cavity barium also has a significant mortality rate.

2. *Aspiration.* Aspirated barium is relatively harmless. Sequelae include pneumonitis and granuloma formation. Physiotherapy is required (for both aspirated barium and LOCM) if the patient is unable to voluntarily clear the barium before the patient leaves hospital.

3. *Intravasation.*

BARIUM SWALLOW

Indications: Suspected Oesophageal Pathology

1. Endoscopy negative dysphagia or odynophagia (painful swallow)
2. Motility disorders
3. Globus sensation
4. Assessment of tracheo-oesophageal fistulae
5. Failed upper GI endoscopy
6. Timed barium swallow to monitor achalasia therapies

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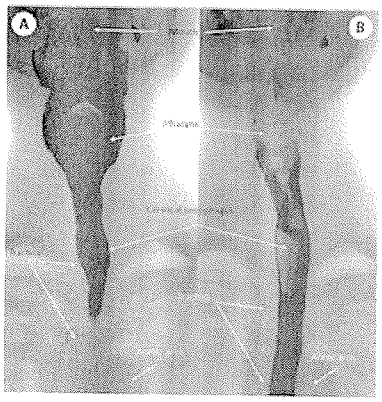
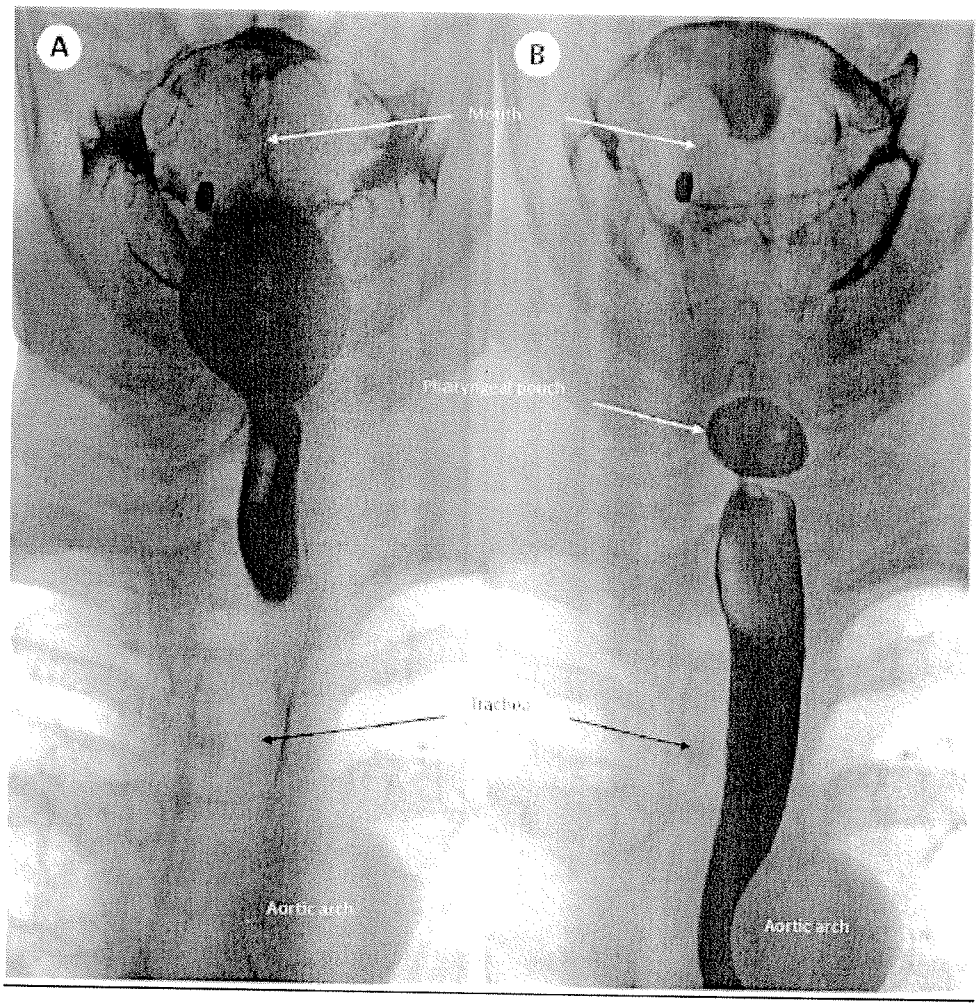
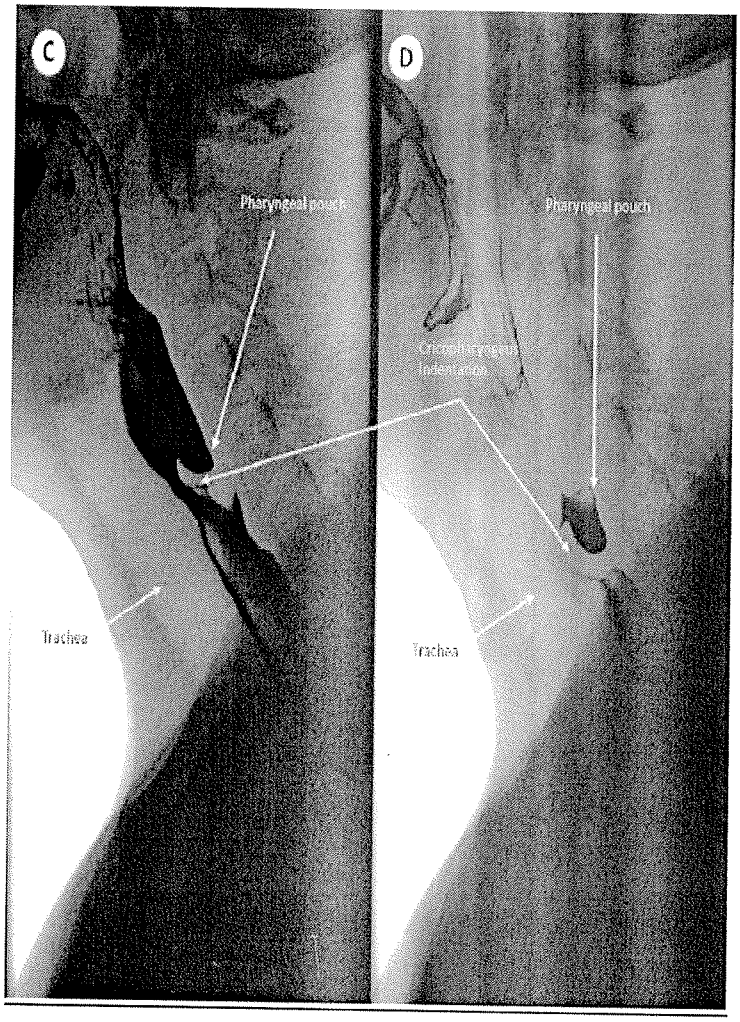
BARIUM SWALLOW







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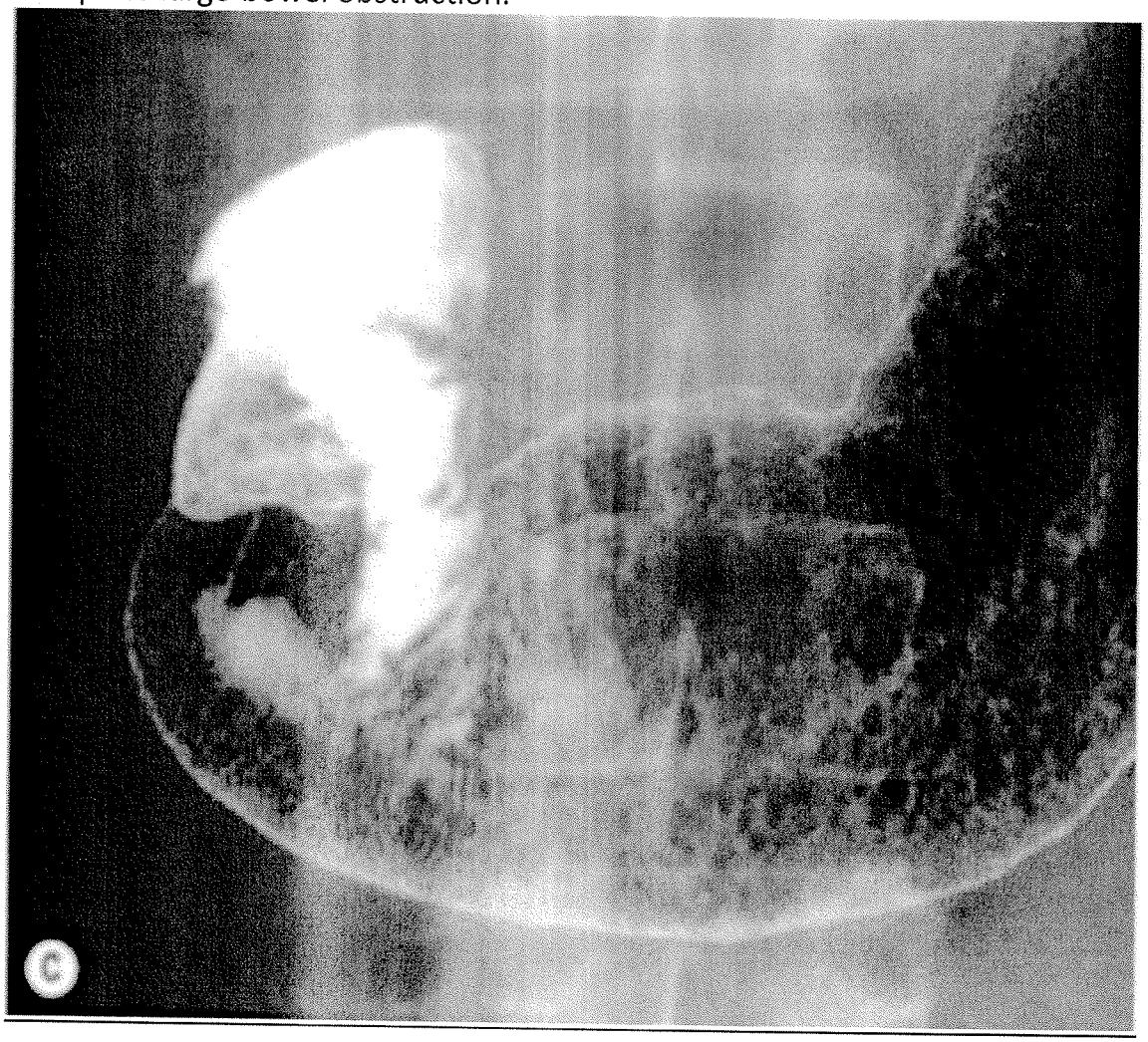
BARIUM MEAL

Indications
1. Failed upper gastrointestinal endoscopy or patient unwilling to undergo endoscopy
2. Gastro-oesophageal reflux disease where lifestyle changes and empirical therapies are ineffective
3. Partial obstruction
Contraindications
Complete large-bowel obstruction.



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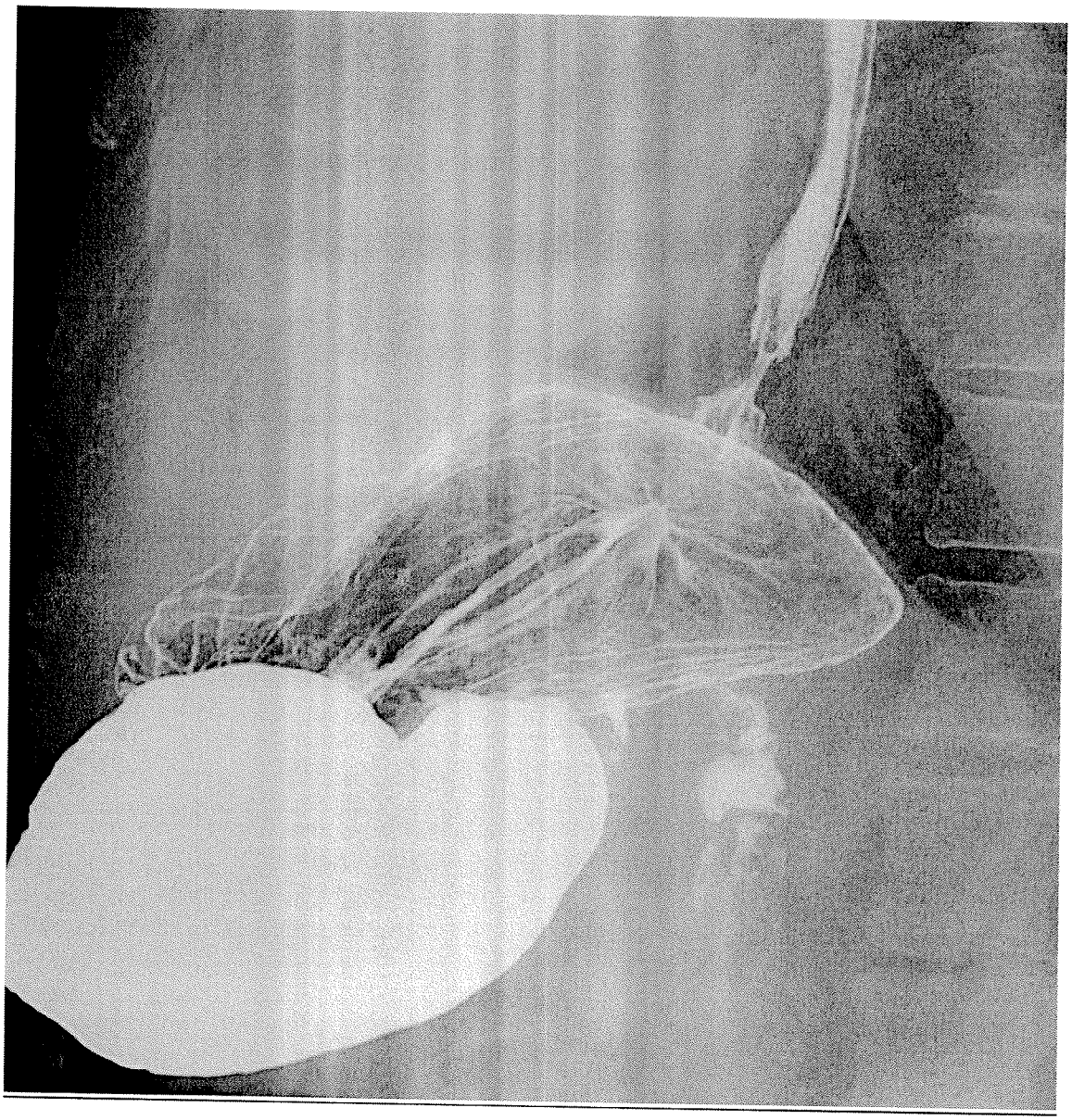

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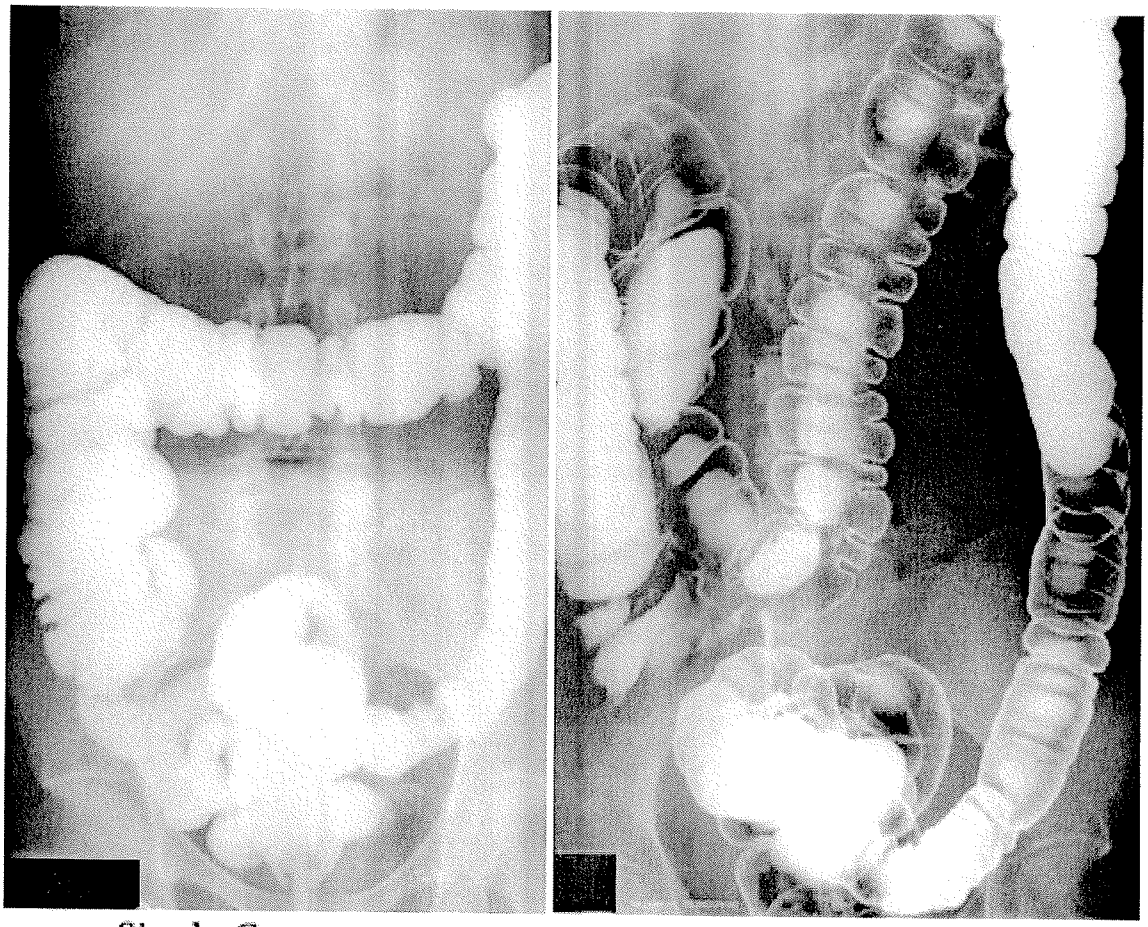
BARIUM ENEMA

Indications
1. To identify/confirm the level of suspected large bowel obstruction and to assess the degree of narrowing (e.g. sometimes helpful in stent planning).
2. Rarely, to show the extent and severity of mucosal lesions in active ulcerative colitis.

Contraindications
1. Toxic megacolon
2. Rectal biopsy (as for barium enema)
3. Chronic ulcerative colitis
4. Crohn's colitis.



Single Contrast Double Contrast

VENUE:

LECTURE HALL:II

TIME : SAT 2 TO 4 PM.

BIHER SLIMS

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Date29.08.2018

From
DR.Vijayaragavan
Associate Professor and Head,
Department of orthopaedics,
SLIMS,
Bharath Institute of Higher Education and Research,
Pondicherry.

To
The Dean,
SLIMS,
Bharath Institute of Higher Education and Research,
Pondicherry.

Sub: Permission to conduct value-added course: Sports injury management.

Respected Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled:Sports injury management on 17.09.2018 We solicit your kind permission for the same.

Kind Regards

DR.Vijayaragavan

Dr. R. VIJAYA RAGAVAN, DNB.,
Reg. No 68472
Asso Professor Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean:DR.JAYALASKHMI

TheHOD :DR.VIJAYARAGAVAN

The Expert:Dr.Boblee James

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
DEAN Sri Lakshmi Narayana Institute of Medical Sciences Osudu, Ageram Kudapakkam, Post, Villanur Commune Puducherry-605 502.	Department of Orthopaedics Sri Lakshmi Narayana Institute of Medical Sciences Pondicherry - 605 502.	Dr. R. VIJAYA RAGAVAN, DNB., Reg. No. 68472 Asso Professor Orthopaedics Sri Lakshmi Narayana Institute of Medical Sciences Osudu, Kudapakkam, Puducherry-605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

07.06.2020

Sub: Organising Value-added Course: SPORTS INJURY MANAGEMENT

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **SPORTS INJURY MANAGEMENT**.30HRS& SEP18-NOV18.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before SEP18-NOV18. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Kudapakkam, Post,
Villianur Commune Puducherry-605 502.

OFFICE OF THE DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Course Proposal

Course Title: Sports injury management

CourseObjective:To assess various sports injuries

CourseOutcome:evaluation and management

Course Audience: 16

Course Coordinator:DR.Jayalakshmi.

Course Faculties with Qualification and Designation:

1.DR.Vijayaragavan DNB ORTHO

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1	17/9/18	TYPES OF SPORTS INJURIES	4-5pm	1hr
2	21/9/18	SPORTS INJURY TREATMENT	4-5pm	1hr
3	25/9/18	SPORTS INJURY PREVENTION	4-5pm	1hr
4	28/9/18	USE PROPER TECHNIQUE	4-5pm	1hr
5	4/10/18	PROPER EQUIPMENT	4-5pm	1hr
6	8/10/18	SPORTS INJURY STATISTICS	4-5pm	1hr
7	12/10/18	RISKS	4-5pm	1hr
8	18/10/18	LACK OF CARE	4-6pm	2hrs
9	22/10/18	DIAGNOSIS	4-5pm	1hr
		PRACTICAL:		
1	26/10/18	PRACTICAL SESSION	3-8	5
2	31/10/18	PRACTICAL SESSION	3-8	5
3	5/11/18	PRACTICAL SESSION	3-8	5
4	9/11/18	PRACTICAL SESSION	3-8	5
			Total Hours	30

REFERENCE BOOKS:

1)SPORTS INJURIES	**CHRISTOPHER.M.NORRIS**
2)ANATOMY OF SPORTS INJURIES	**RAJESH TRIPATHI**

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VALUE ADDED COURSE

1. Name of the programme & Code

Sports injury management – OR09

2. Duration & Period

30 hrs & SEPTEMBER 2018– NOVEMBER 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short notes- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 SEP 2018– NOV 2018

8. Year of discontinuation: 2019

Value Added Course- September 2018 -NOV 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	OR09	Sports injury management	Dr. Vijayaragavan	THIRD YEAR MBBS	16 (SEP 18 – NOV 2018)

9. Summary report of each program year-wise

10. Course Feed Back *Enclosed as Annexure- V*

RESOURCE PERSON
Dr.VIJAYARAGAVAN

COORDINATOR
DR.JAYALAKSHMI

Dr. R. VIJAYA RAGAVAN, DNB.,
Reg. No 68472
Asso Professor Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

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SPORTS INJURY MANAGEMENT

17/09/2018



PARTICIPANT HAND BOOK

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Particulars	Description
Course Title	Sports injury & its management
Course Code	OR09
Objective	1. Types of sports injuries 2. Sports injury treatment 3. Sports injury prevention 4. Use proper technique 5. Proper equipment 6. Sports injury statistics 7. Risks 8. Lack of care 9. Diagnosis
Further learning opportunities	Sports injuries & prevention
Key Competencies	On successful completion of the course the students will have knowledge on sports injuries
Target Student	Pre final years Students
Duration	30hrs SEP-NOV 2018
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Short notes

Sports injuries occur during exercise or while participating in a sport. Children are particularly at risk for these types of injuries, but adults can get them, too.

You're at risk for sports injuries if you:

- haven't been regularly active
- don't warm up properly before exercise
- play contact sports

Read on to learn more about sports injuries, your treatment options, and tips for preventing them in the first place.

Types of sports injuries

Different sports injuries produce different symptoms and complications. The most common types of sports injuries include:

- **Sprains.** Overstretching or tearing the ligaments results in a sprain. Ligaments are pieces of tissue that connect two bones to one another in a joint.
-
- **Strains**. Overstretching or tearing muscles or tendons results in a sprain. Tendons are thick, fibrous cords of tissue that connect bone to muscle. Strains are commonly mistaken for sprains. Here's how tell them apart.
-
- **Knee injuries.** Any injury that interferes with how the knee joint moves could be a sports injury. It could range from an overstretch to a tear in the muscles or tissues in the knee.
-

- **Swollen muscles**. Swelling is a natural reaction to an injury. Swollen muscles may also be painful and weak.
-
- **Achilles tendon rupture.** The Achilles tendon is a thin, powerful tendon at the back of your ankle. During sports, this tendon can break or rupture. When it does, you may experience sudden, severe pain and difficulty walking.
-
- **Fractures**. Bone fractures are also known as broken bones.
-
- **Dislocations**. Sports injuries may dislocate a bone in your body. When that happens, a bone is forced out of its socket. This can be painful and lead to swelling and weakness.
-
- **Rotator cuff injury.** Four pieces of muscle work together to form the rotator cuff. The rotator cuff keeps your shoulder moving in all directions. A tear in any of these muscles can weaken the rotator cuff.
-

Sports injuries treatment

The RICE method is a common treatment regimen for sports injuries. It stands for:

- rest
- ice
- compression
- elevation

This treatment method is helpful for mild sports injuries. For best results, follow the RICE method within the first 24 to 36 hours after the injury. It can help reduce swelling and prevent additional pain and bruising in the early days after a sports injury. Here's how to follow RICE, plus a recovery timeline.

Both over-the-counter and prescription medications are available to treat sports injuries. Most of them provide relief from pain and swelling.

If your sports injury looks or feels severe, make an appointment to see your doctor. Seek emergency care if the injured joint shows signs of:

- severe swelling and pain
- visible lumps, bumps, or other deformities
- popping or crunching sounds when you use the joint
- weakness or inability to put weight on the joint
- instability

Also seek emergency attention if you experience any of the following after an injury:

- difficulty breathing
- dizziness
- fever

Serious sports injuries can require surgery and physical therapy. If the injury doesn't heal within two weeks, contact your doctor for an appointment.

Sports injuries prevention

The best way to prevent a sports injury is to warm up properly and stretch. Cold muscles are prone to overstretching and tears. Warm muscles are more flexible. They can absorb quick movements, bends, and jerks, making injury less likely.

Also take these steps to avoid sports injuries:

Use the proper technique

Learn the proper way to move during your sport or activity. Different types of exercise require different stances and postures. For example, in some sports, bending your knees at the right time can help avoid an injury to your spine or hips.

Have the proper equipment

Wear the right shoes. Make sure you have the proper athletic protection. Ill-fitting shoes or gear can increase your risk for injury.

Don't overdo it

If you do get hurt, make sure you're healed before you start the activity again. Don't try to "work through" the pain.

When you return after letting your body recover, you may need to ease yourself back into the exercise or sport rather than jumping back in at the same intensity.

Cool down

Remember to cool down after your activity. Usually, this involves doing the same stretching and exercises involved in a warmup.

Resume activity slowly

Don't be tempted to nurse your injury for too long. Excessive rest may delay healing. After the initial 48-hour period of RICE, you can start using heat to help relax tight muscles. Take things slowly, and ease back in to exercise or your sport of choice.

Sports injuries statistics

Sports injuries are common in younger adults and children. More than 3.5 million children and teens are injured as part of an organized sports or physical activity each year, estimates Stanford Children's Health. One-third of all injuries in children are related to sports, too.

The most common sports injuries in children are sprains and strains. Contact sports, like football and basketball, account for more injuries than noncontact sports, like swimming and running.

A 2016 studyTrusted Source found that 8.6 million people, ages 5 to 24, have a sports injury every year in the United States. Researchers note males ages 5 to 24 make up more than half of all sports injury episodes.

The lower body is most likely to be injured (42 percent). The upper extremities make up 30.3 percent of injuries. Head and neck injuries combine for 16.4 percent of sports injuries.

Deaths from sports injuries are rare. When they do happen, they're most likely the result of head injury.

Risks

Anyone may find themselves coping with a sports injury, regardless of the last time they suited up for the baseball diamond or squared off with a linebacker on the gridiron. But some factors put you or a loved one at an increased risk for injury.

Childhood

Because of their active nature, children are especially at risk for sports injuries. Children often don't know their physical limits. That means they may push themselves to injury more easily than adults or teenagers.

Age

The older you grow, the more likely you are to experience an injury. Age also increases the odds that you have sports injuries that linger. New injuries may aggravate these previous injuries.

Lack of care

Sometimes, serious injuries start off as small ones. Many injuries that result from overuse, such as tendonitis and stress fractures, can be recognized early by a doctor. If they're left untreated or ignored, they can develop into a serious injury.

Being overweight

Carrying around extra weight can put unnecessary stress on your joints, including your hips, knees, and ankles. The pressure is magnified with exercise or sports. This increases your risk for sports injury.

Children or adults who plan to begin participating in sports can benefit by having a physical examination by a doctor first.

Diagnosis

Many sports injuries cause immediate pain or discomfort. Others, like overuse injuries, might be noticed only after long-term damage. These injuries are often diagnosed during routine physical examinations or checkups.If you think you have a sports injury, your doctor will likely use the following steps to get a diagnosis. These include:

- **Physical examination.** Your doctor may attempt to move the injured joint or body part. This helps them see how the area is moving, or how it's not moving if that's the case.
- **Medical history.** This involves asking you questions about how you were injured, what you were doing, what you've done since the injury, and more. If this is your first time visiting this doctor, they may also ask for a more thorough medical history.
- **Imaging tests.** X-rays, MRIs, CT scans, and ultrasounds can all help your doctor and healthcare providers see inside your body. This helps them confirm a sports injury diagnosis.

If your doctor suspects you have a sprain or strain, they may recommend you follow the RICE method.Follow these recommendations and keep an eye on your symptoms. If they get worse, that can mean you have a more serious sports injury.

Call your doctor

Call your doctor if there are signs of swelling or if it hurts to place weight on the affected area. If the problem is in the location of a previous injury, seek medical attention right away.

Contact a healthcare provider if you don't see any improvement after 24 to 36 hours of RICE.

Because a child's skeleton isn't fully developed, the bones are weaker than an adult's. Take extra precautions with a child's sports injuries. What looks like a tissue injury may in fact be a more serious fracture.

Don’t ignore your symptoms. Remember, the earlier you get a diagnosis and treatment, the sooner you’ll recover and get back in the game.

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VALUE ADDED COURSE

SPORTS INJURY MANAGEMENT

OR09

4. List of Students Enrolled SEP 2018- NOV 2018

Pre final Year MBBS Student			
Sl. No	**Name of the Student**	**Roll No**	**sign**
1	BHASKARAN .K.C	U16MB275	
2	BHAVANI . K.M	U16MB276	
3	BLESSY AMALA RISHA .J	U16MB277	
4	CAREENA DANIEL	U16MB278	
5	CHANDRA PRAKASH.M	U16MB279	
6	CHINJU S.R	U16MB280	
7	DASARI VENKATA SAI MOUNISH	U16MB281	
8	DEBARPITA NATH	U16MB282	
9	DEEBAK .I	U16MB283	
10	DEEKSHITH D.R	U16MB284	
11	DEEPIKAA D.V	U16MB285	
12	DELFI MARY .E	U16MB286	
13	DEVIKA.U.M	U16MB287	
14	DHAKSHANA .M	U16MB288	
15	EDA SAI VENKATA TEJA	U16MB289	
16	GAURAV KUMAR	U16MB290	

RESOURCE PERSON
Dr.VIJAYARAGAVAN

Dr. R. VIJAYA RAGAVAN, DNB.,
Reg. No 68472
Asso Professor Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

COORDINATOR
DR.JAYALAKSHMI

DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
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Course/Training Feedback Form

Course: SPORTS INJURY MANAGEMENT
Date: 9/11/18
Name: DELFI MARY.E
Reg NO.
Department:ortho

Q 1: Please rate your overall satisfaction with the format of the course:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 2: Please rate course notes:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 3: The lecture sequence was well planned

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 4: The lectures were clear and easy to understand

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 5: Please rate the quality of pre-course administration and information:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 6: Any other suggestions:

Comments:

Thank you for taking the time to complete this survey, your comments are much appreciated.

OPTIONAL Section: Name _____ Date _____
Signature _____

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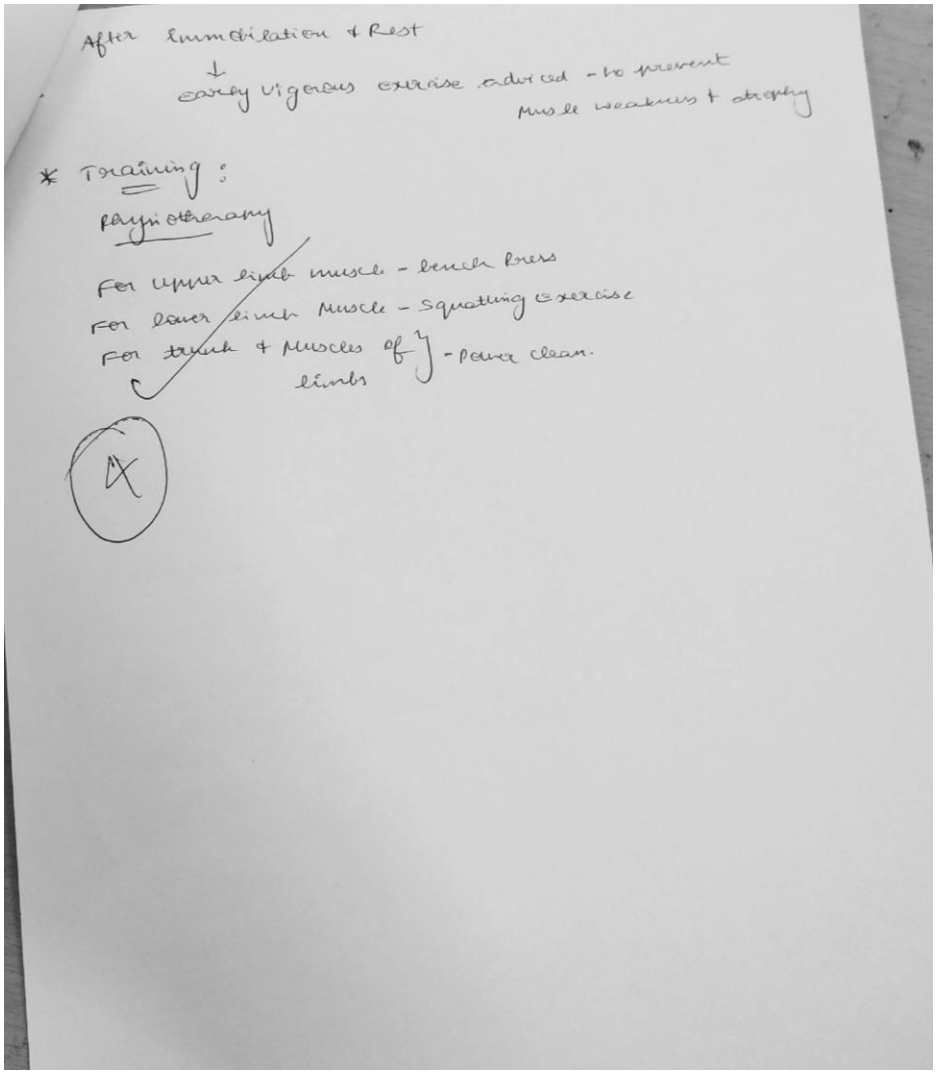
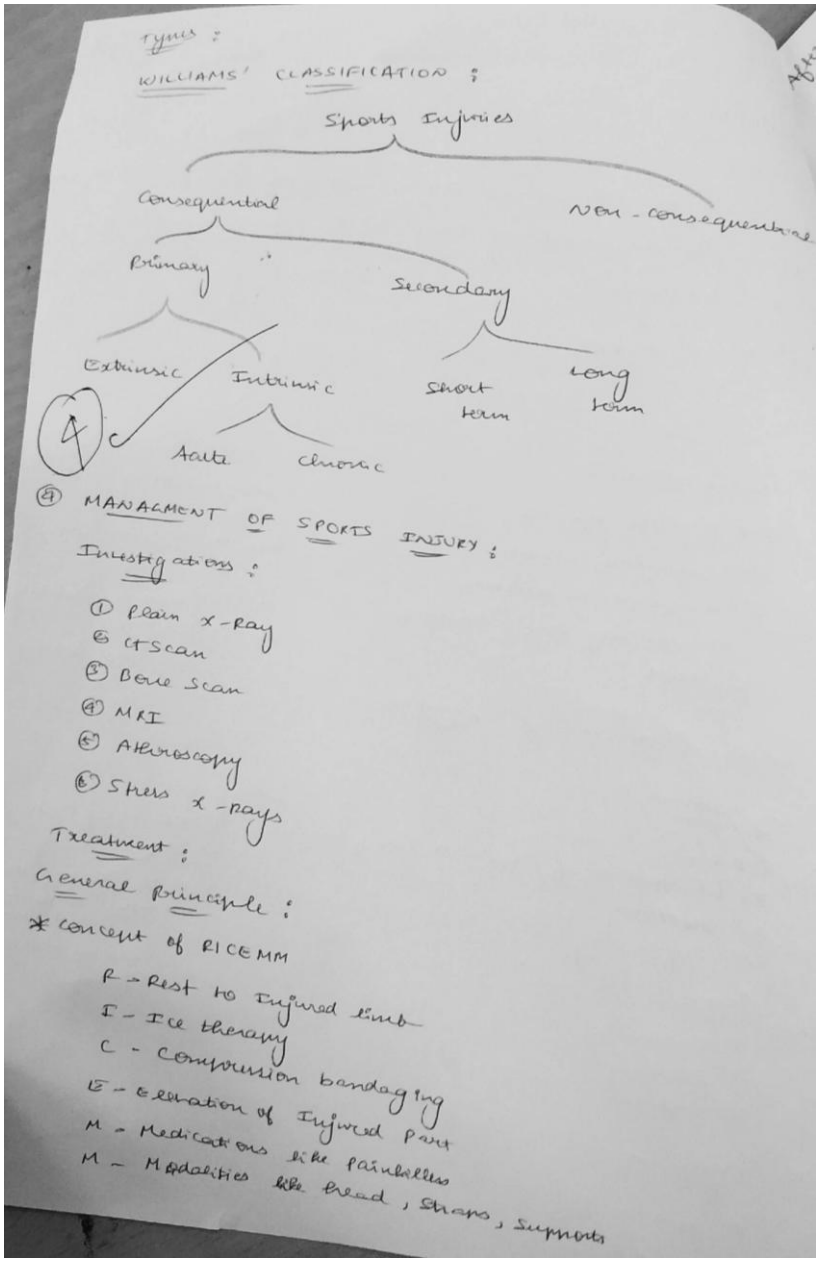

After Immobilation & Rest
↓
early vigorous exercise advised - to prevent
muscle weakness & atrophy
* Training :
Physiotherapy
For upper limb muscle - bench press
For lower limb muscle - Squatting exercise
For trunk & muscles of limbs - Power clean.



Types :

WILLIAMS' CLASSIFICATION :

Sports Injuries

Consequential

Non - consequential

Primary

Secondary

Extrinsic

Intrinsic

Short term

Long term

Acute

Chronic

④ MANAGEMENT OF SPORTS INJURY :

Investigations :

① Plain x-ray
② CT Scan
③ Bone Scan
④ MRI
⑤ Arthroscopy
⑥ Chest x-rays

Treatment :

General Principle :

* Concept of RICEMM

R - Rest to Injured limb
I - Ice therapy
C - Compression bandaging
E - Elevation of Injured part
M - Medications like painkillers
M - Modalities like Exercises, Braces, Supports

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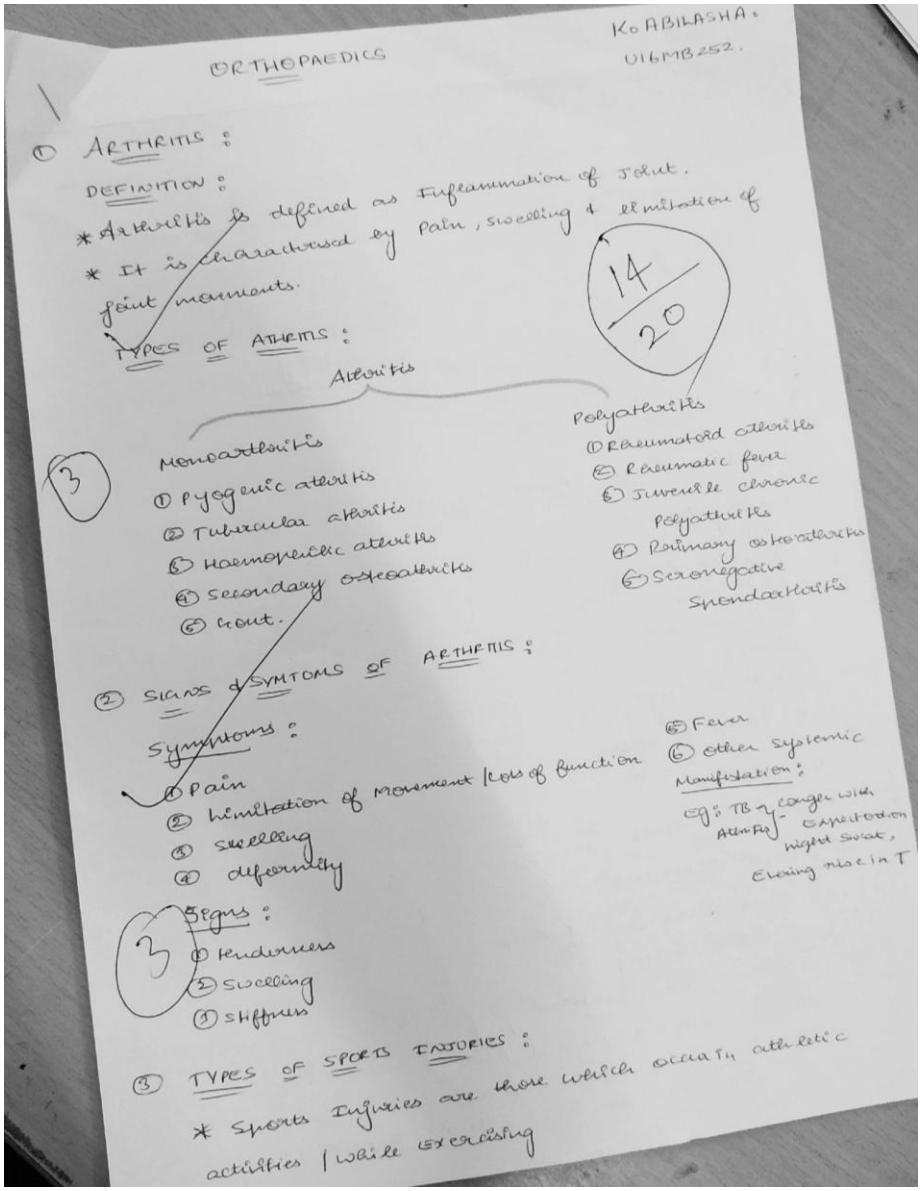

ORTHOPAEDICS

K. ABILASHA.
U16MB252.

① ARTHRITIS :

DEFINITION :

* Arthritis is defined as Inflammation of Joint.
* It is characterised by Pain, swelling & limitation of joint movements.

14/20

TYPES OF ATHRITIS :

Athritis

Monoarthritis
① Pyogenic athritis
② Tubercular athritis
③ Haemophilic athritis
④ Secondary osteoathritis
⑤ Gout.

Polyathritis
① Rheumatoid athritis
② Rheumatic fever
③ Juvenile chronic Polyathritis
④ Primary osteoathritis
⑤ Seronegative Spondarthritis

3

② SIGNS & SYMTOMS OF ARTHRITIS :

Symptoms :
① Pain
② Limitation of movement / loss of function
③ swelling
④ deformity
⑤ Fever
⑥ other systemic Manifestation :
Eg: TB - Athritis - cough with expectoration, night sweat, Evening rise in T

Signs :
① tenderness
② swelling
③ stiffness

3

③ TYPES OF SPORTS INJURIES :

* Sports Injuries are those which occur in athletic activities / while Exercising

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(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _DELFI MARY.E_ has actively participated in the Value Added Course on *Sports injury management* held during SEP 2018 – NOV 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. VIJAYARAGAVAN
RESOURCE PERSON

Dr. Jayalakshmi
COORDINATOR

OFFICE OF THE DEAN

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Student Feedback Form

Course Name: **SPORTS INJURY MANAGEMENT**
Subject Code: OR09

Name of Student: Bhavani K.M Roll No.: U16MB276

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Bhavani
Signature

Date: 9/11/18

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Date :9.11.2018

From
DR.Vijayaragavan,
Department of orthopaedics,
SLIMS,
Bharath Institute of Higher Education and Research,
Pondicherry.

Through Proper Channel

To
The Dean,
SLIMS,
Bharath Institute of Higher Education and Research,
Pondicherry.

Sub: Completion of value-added course: Sports injury management.

Respected Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **sports injury management** on 09.11.2018. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

DR.VIJAYARAGAVAN

Dr. R. VIJAYA RAGAVAN, DNB.,
Reg. No 68472
Asso Professor Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

Encl: Certificates

Photographs

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Sri Lakshmi Narayana Institute of Medical Sciences

Date: 06.9.2018

From

Dr. Vijay Kumar
Assistant Professor and Head,
Department of TB & Chest,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Diagnosis and Treatment of Bronchial Asthma

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Diagnosis and Treatment of Bronchial Asthma** for interns October to November 2018 . We solicit your kind permission for the same.

Kind Regards

Dr. Vijay Kumar

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. Jaya lakshmi**

The HOD: **Dr. Vijay Kumar**

The Expert: **Dr. Prakash Rao Balan**

The committee has discussed about the course and is approved.

Dean

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

BR Subject Expert

HOD

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Circular

20.09.2018

Sub: Organising Value-added Course: DIAGNOSIS AND MANAGEMENT OF BRONCHIAL ASTHMA.

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing

" DIAGNOSIS AND MANAGEMENT OF BRONCHIAL ASTHMA". The course content is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30.9.2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean
Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Course Proposal

Course Title: **DIAGNOSIS AND MANAGEMENT OF BRONCHIAL ASTHMA**

Course Objective:

1. To know how to properly Treat BRONCHIAL ASTHMA patients.

Course Outcome: Better management of Bronchial Asthma patients

Course Audience: Medical Interns of 2018 Batch

Course Coordinator: Dr.Vijay Kumar

Course Faculties with Qualification and Designation:

1.Dr.Vijay kumar, Assistant professor
2.Dr.Prakash Rao Balan, Senior resident
Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Resource faculty	Time	Hours
1.	1/10/2018	Introduction epidemiology ,etiology of bronchial asthma	Dr.vijay kumar	2-6p..m	4
2.	4/10/2018	Pathophysiology of bronchial asthma	Dr.prakash rao balan	2-6pm	4
3.	6/10/2018	Pathology of bronchial asthma	Dr.vijay kumar	2-6p.m	4
4.	8/10/2018	Clinical presentation of BA	Dr.prakash rao balan	2-6p.m	4
5.	11/10/2018	Diagnosis of bronchial asthma	Dr.vijay kumar	2-6p.m	4
6.	13/10/2018	Prognosis of BA	Dr.prakash rao balan	2-6p m	4
7.	15/10/2018	Complications of BA	Dr.vijay kumar	2-6P.M	4
8.	18/10/2018	Management of BA	Dr.prakash rao balan	2-6p.m	4
9.	20/10/2018	Pharmacologic management of BA	Dr.vijay kumar	4-6p.m	2
		Total			34hrs

REFERENCE BOOKS:

1.National Heart Lung and Blood Institute N. Global initiative for asthma. Global strategy for asthma management and prevention. NHBLI/WHO workshop. 1995:NIH Publication no. 95-3659. 2.

2.Schunemann HJ, Jaeschke R, Cook DJ, Bria WF, El-Solh AA, Ernst A, Fahy BF, et al. An official ATS statement: grading the quality of evidence and strength of recommendations in ATS guidelines and recommendations. Am J Respir Crit Care Med 2006;174:605-14. 3.

3.Asher I, Bissell K, Chiang CY, El Sony A, Ellwood P, Garcia-Marcos L, Marks GB, et al. Calling time on asthma deaths in tropical regions-how much longer must people wait for essential medicines? Lancet Respir Med 2019;7:13-5.

VALUE ADDED COURSE

1. Name of the programme & Code

DIAGNOSIS AND MANAGEMENT OF BRONCHIAL ASTHMA & CT 02

2. Duration & Period

34 hrs & October -November 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

October -November 2018

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- October – November 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	CT 02	**Diagnosis and management of Bronchial asthma**	Dr. Vijay Kumar	CRRI Interns	8 students OCT -NOV 2018

10. Course Feed Back

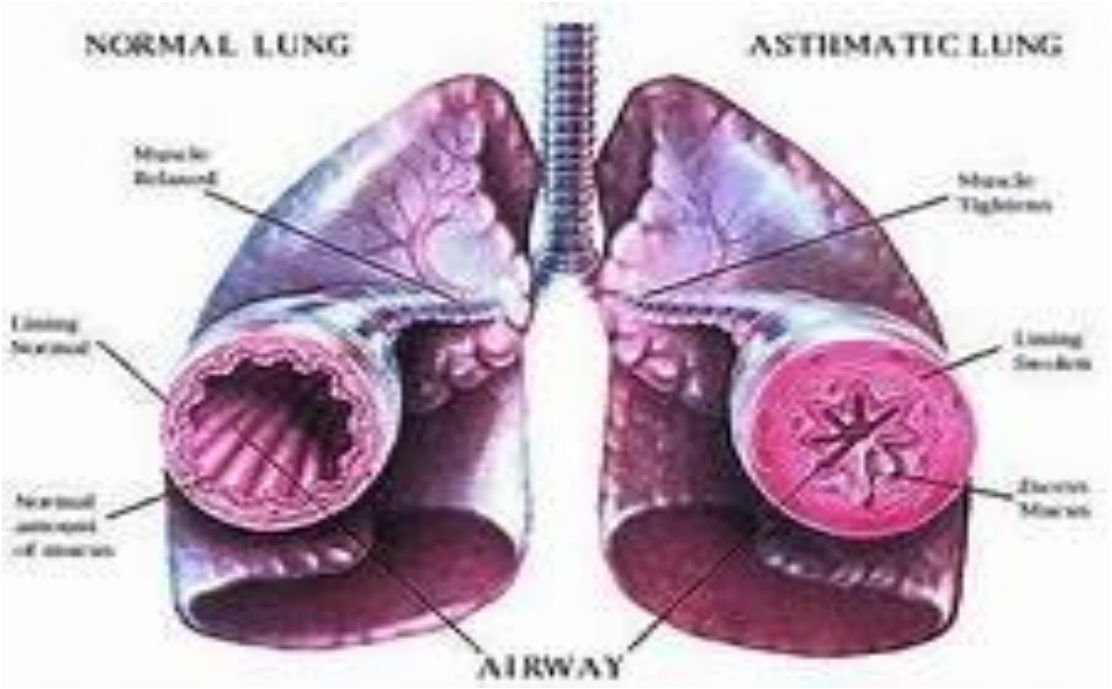
Enclosed as Annexure- V

RESOURCE PERSON **COORDINATOR**

Dr. Prakash Rao Balan **Dr. Vijay Kumar**

BRONCHIAL ASTHMA





PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	Diagnosis and Management of Bronchial asthma
Course Code	02
Objective	1.DEFINITION OF ASTHMA 2.PHENOTYPES OF ASTHMA 3.SYPTOMS OF ASTHMA: 4.DIAGNOSTIC FLOWDIAGRAM FOR BRONCHIAL ASTHMA 5.DIAGNOSTIC CRITERIA FOR BRONCHIAL ASTHMA: 6.SELECTING THE INITIAL PHARMACOLOGICAL TREATMENT FOR BRONCHIAL ASTHMA 7.NON PHARMACOLOGICAL INTERVENTIONS FOR ASTHMA 8.MANAGEMENT OF ASTHMA EXACERBATIONS:
Further learning opportunities	**Bronchial asthma and standard guidelines and how to differentiate from COPD**

Key Competencies	On successful completion of the course the students will have skill in handling patients with bronchial asthma
Target Student	**Interns**
Duration	32hrs +2 hrs MCQ ,October to November 2016
Theory Session	34 hrs
Assessment Procedure	Multiple choice questions

1.DEFINITION OF ASTHMA:

Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation.

It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation.

Airflow limitation may later become persistent

2.PHENOTYPES OF ASTHMA:

Many clinical phenotypes of asthma have been identified.Some of the most common are:

• **Allergic asthma**: This is the most easily recognized asthma phenotype, which often commences in childhood and is associated with a past and/or family history of allergic disease such as eczema, allergic rhinitis, or food or drug allergy.

Examination of the induced sputum of these patients before treatment often reveals eosinophilic airway inflammation.

Patients with this asthma phenotype usually respond well to inhaled corticosteroid (ICS) treatment.

• **Non-allergic asthma**: Some patients have asthma that is not associated with allergy.

The cellular profile of the sputum of these patients may be neutrophilic, eosinophilic or contain only a few inflammatory cells (paucigranulocytic). Patients with non-allergic asthma often demonstrate less short-term response to ICS.

• **Adult-onset (late-onset) asthma**: Some adults, particularly women, present with asthma for the first time in adult life.

These patients tend to be non-allergic, and often require higher doses of ICS or are relatively refractory to corticosteroid treatment.

Occupational asthma (i.e. asthma due to exposures at work) should be ruled out in patients presenting with adult-onset asthma.

• **Asthma with persistent airflow limitation**: Some patients with long-standing asthma develop airflow limitation that is persistent or incompletely reversible.

This is thought to be due to airway wall remodeling.

• **Asthma with obesity**: Some obese patients with asthma have prominent respiratory symptoms and little eosinophilic airway inflammation.

3.SYMPTOMS OF ASTHMA:

The following features are typical of asthma and, if present, increase the probability that the patient has asthma:

Respiratory symptoms of wheeze, shortness of breath, cough and/or chest tightness:

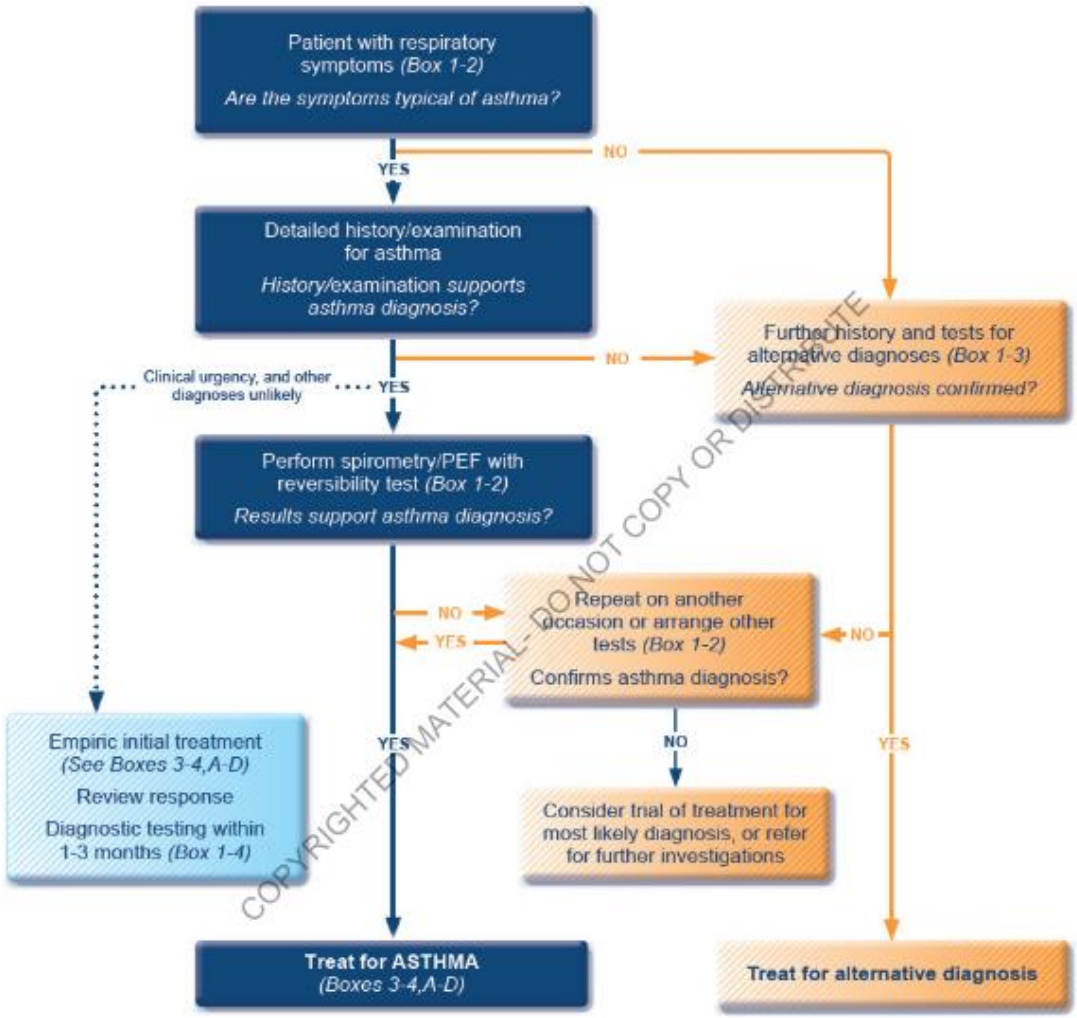
• Patients (especially adults) experience more than one of these types of symptoms

• Symptoms are often worse at night or in the early morning

• Symptoms vary over time and in intensity

• Symptoms are triggered by viral infections (colds), exercise, allergen exposure, changes in weather, laughter, or irritants such as car exhaust fumes, smoke or strong smells.

4.DIAGNOSTIC FLOWDIAGRAM FOR BRONCHIAL ASTHMA:



5.DIAGNOSTIC CRITERIA FOR BRONCHIAL ASTHMA:

DIAGNOSTIC FEATURE	CRITERIA FOR MAKING THE DIAGNOSIS OF ASTHMA
1. History of variable respiratory symptoms	
Wheeze, shortness of breath, chest tightness and cough Descriptors may vary between cultures and by age, e.g. children may be described as having heavy breathing	• Generally more than one type of respiratory symptom (in adults, isolated cough is seldom due to asthma) • Symptoms occur variably over time and vary in intensity • Symptoms are often worse at night or on waking • Symptoms are often triggered by exercise, laughter, allergens, cold air • Symptoms often appear or worsen with viral infections

2. Confirmed variable expiratory airflow limitation	
Documented excessive variability in lung function* (one or more of the tests below)	The greater the variations, or the more occasions excess variation is seen, the more confident the diagnosis
AND documented expiratory airflow limitation*	At a time when FEV_1 is reduced, confirm that FEV_1/FVC is reduced (it is usually >0.75–0.80 in adults, >0.90 in children[10])
Positive bronchodilator (BD) reversibility test* (more likely to be positive if BD medication is withheld before test: SABA ≥4 hours, LABA ≥15 hours)	*Adults*: increase in FEV_1 of >12% and >200 mL from baseline, 10–15 minutes after 200–400 mcg salbutamol (albuterol) or equivalent (greater confidence if increase is >15% and >400 mL). *Children*: increase in FEV_1 of >12% predicted
Excessive variability in twice-daily PEF over 2 weeks*	*Adults*: average daily diurnal PEF variability >10%** *Children*: average daily diurnal PEF variability >13%**
Significant increase in lung function after 4 weeks of anti-inflammatory treatment	*Adults*: increase in FEV_1 by >12% and >200 mL (or PEF† by >20%) from baseline after 4 weeks of treatment, outside respiratory infections
Positive exercise challenge test*	*Adults*: fall in FEV_1 of >10% and >200 mL from baseline *Children*: fall in FEV_1 of >12% predicted, or PEF >15%
Positive bronchial challenge test (usually only performed in adults)	Fall in FEV_1 from baseline of ≥20% with standard doses of methacholine or histamine, or ≥15% with standardized hyperventilation, hypertonic saline or mannitol challenge
Excessive variation in lung function between visits* (good specificity but poor sensitivity)	*Adults*: variation in FEV_1 of >12% and >200 mL between visits, outside of respiratory infections *Children*: variation in FEV_1 of >12% in FEV_1 or >15% in PEF† between visits (may include respiratory infections)

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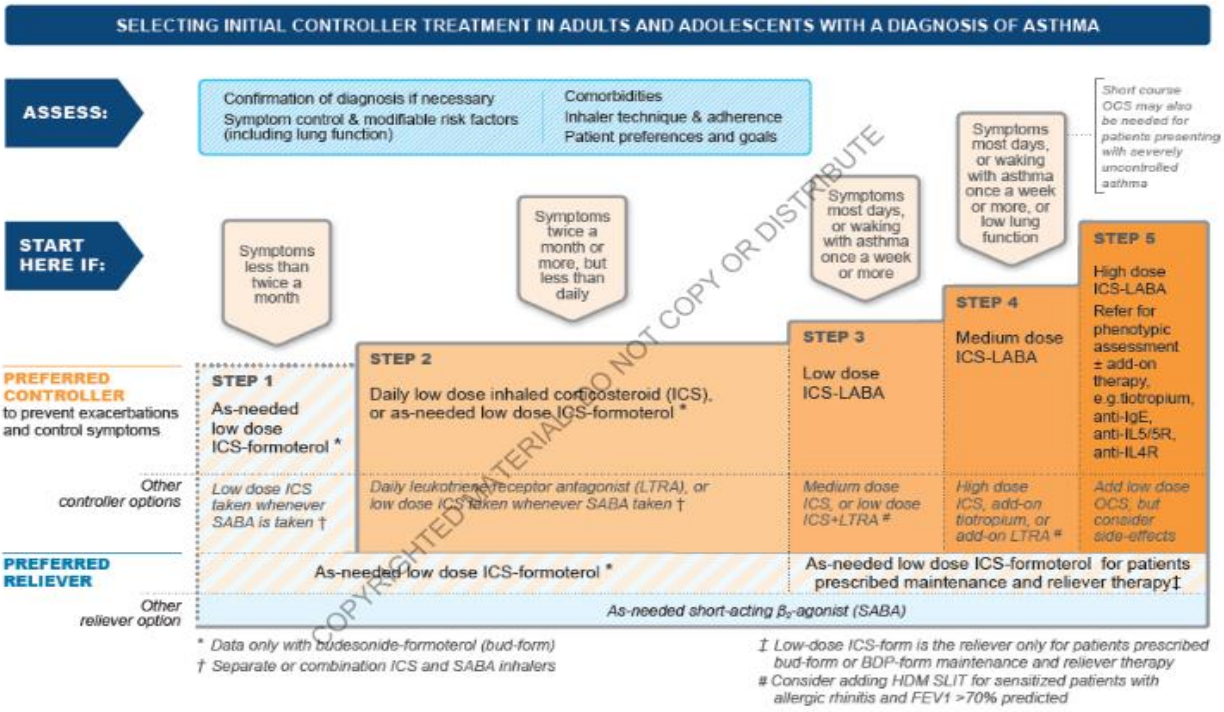
6.SELECTING THE INITIAL PHARMACOLOGICAL TREATMENT FOR BRONCHIAL ASTHMA:



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7.NON PHARMACOLOGICAL INTERVENTIONS FOR ASTHMA:

Intervention	Advice/recommendation (continued on next page)	Evidence
Cessation of smoking and ETS exposure	• At every visit, strongly encourage people with asthma who smoke to quit. Provide access to counseling and smoking cessation programs (if available)	A
	• Advise parents/carers of children with asthma not to smoke and not to allow smoking in rooms or cars that their children use	A
	• Strongly encourage people with asthma to avoid environmental smoke exposure	B
	• Assess smokers/ex-smokers for COPD or overlapping features of asthma and COPD (asthma–COPD overlap, ACO, Chapter 5, p.129), as additional treatment strategies may be required	D
Physical activity	• Encourage people with asthma to engage in regular physical activity for its general health benefits	A
	• Provide advice about prevention of exercise-induced bronchoconstriction with regular ICS	A
	• Provide advice about prevention of breakthrough exercise-induced bronchoconstriction with ○ warm-up before exercise ○ SABA before exercise ○ low dose ICS-formoterol before exercise	 A A B
	• Regular physical activity improves cardiopulmonary fitness, but confers no other specific benefit on lung function or asthma symptoms, with the exception of swimming in young people with asthma	B
	• There is little evidence to recommend one form of physical activity over another	D
Avoidance of occupational exposures	• Ask all patients with adult-onset asthma about their work history and other exposures	A
	• In management of occupational asthma, identify and eliminate occupational sensitizers as soon as possible, and remove sensitized patients from any further exposure to these agents	A
	• Patients with suspected or confirmed occupational asthma should be referred for expert assessment and advice, if available	A
Avoidance of medications that may make asthma worse	• Always ask about asthma before prescribing NSAIDs, and advise patients to stop using them if asthma worsens	A
	• Always ask people with asthma about concomitant medications	D
	• Aspirin and NSAIDs (non-steroidal anti-inflammatory drugs) are not generally contraindicated unless there is a history of previous reactions to these agents (see p.92)	A
	• Decide about prescription of oral or ophthalmic beta-blockers on a case-by-case basis. Initiate treatment under close medical supervision by a specialist	D
	• If cardioselective beta-blockers are indicated for acute coronary events, asthma is not an absolute contra-indication, but the relative risks/benefits should be considered	D
Healthy diet	• Encourage patients with asthma to consume a diet high in fruit and vegetables for its general health benefits	A

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Intervention	Advice/recommendation	Evidence
Avoidance of indoor allergens	• Allergen avoidance is not recommended as a general strategy in asthma	A
	• For sensitized patients, there is limited evidence of clinical benefit for asthma in most circumstances with single-strategy indoor allergen avoidance	A
	• Remediation of dampness or mold in homes reduces asthma symptoms and medication use in adults	A
	• For patients sensitized to house dust mite and/or pets, there is limited evidence of clinical benefit for asthma with avoidance strategies (only in children)	B
	• Allergen avoidance strategies are often complicated and expensive, and there are no validated methods for identifying those who are likely to benefit	D
Weight reduction	• Include weight reduction in the treatment plan for obese patients with asthma • For obese adults with asthma a weight reduction program plus twice-weekly aerobic and strength exercises is more effective for symptom control than weight reduction alone	B B
Breathing exercises	• Breathing exercises may be a useful supplement to asthma pharmacotherapy for symptoms and quality of life, but they do not improve lung function or reduce exacerbation risk	A
Avoidance of indoor air pollution	• Encourage people with asthma to use non-polluting heating and cooking sources, and for sources of pollutants to be vented outdoors where possible	B
Avoidance of outdoor allergens	• For sensitized patients, when pollen and mold counts are highest, closing windows and doors, remaining indoors, and using air conditioning may reduce exposure to outdoor allergens	D
Dealing with emotional stress	• Encourage patients to identify goals and strategies to deal with emotional stress if it makes their asthma worse	D
	• There is insufficient evidence to support one stress-reduction strategy over another, but relaxation strategies and breathing exercises may be helpful	B
	• Arrange a mental health assessment for patients with symptoms of anxiety or depression	D
Avoidance of outdoor air pollutants/weather conditions	• During unfavorable environmental conditions (very cold weather or high air pollution) it may be helpful to stay indoors in a climate-controlled environment, and to avoid strenuous outdoor physical activity; and to avoid polluted environments during viral infections, if feasible	D
Avoidance of foods and food chemicals	• Food avoidance should not be recommended unless an allergy or food chemical sensitivity has been clearly demonstrated, usually by carefully supervised oral challenges	D
	• For confirmed food allergy, food allergen avoidance may reduce asthma exacerbations	D
	• If food chemical sensitivity is confirmed, complete avoidance is not usually necessary, and sensitivity often decreases when asthma control improves	D

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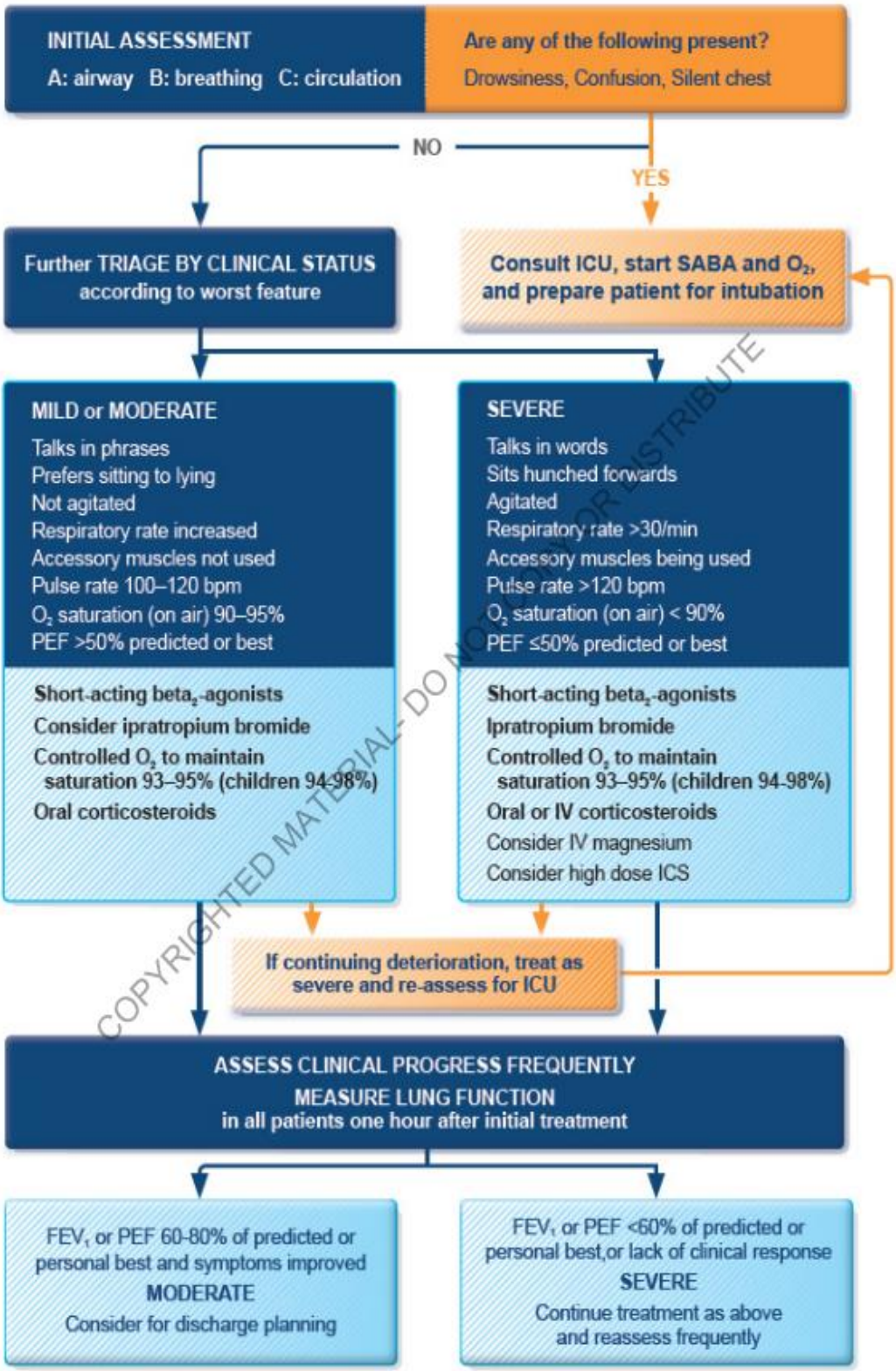
NSAID: non-steroidal anti-inflammatory drugs; SABA: short-acting beta2-agonist

8.MANAGEMENT OF ASTHMA EXACERBATIONS:

Exacerbations of asthma are episodes characterized by a progressive increase in symptoms of shortness of breath, cough, wheezing or chest tightness and progressive decrease in lung function, i.e. they represent a change from the patient's usual status that is sufficient to require a change in treatment.



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Annexure- II

VALUE ADDED COURSE

DIAGNOSIS AND TREATMENT OF BRONCHIAL ASTHMA & CT02

4. List of Students Enrolled OCT 2018 -NOV 2018

1st Year MBBS Student			SIGNATURE
Sl. No	Name of the Student	Roll No	
1	PRAVEENKUMAR.V	U14MB289	
2	PREMKUMAR. P	U14MB290	
3	PRIATHAM SWAMINATHAN.S	U14MB291	
4	PRITHVIRAJAN. R	U14MB292	
5	PRIYADHARSHINI.K	U14MB293	
6	PRIYADHARSHINI.P	U14MB294	
7	RAJALINGAM. N	U14MB295	
8	RAJESWARI. J	U14MB296	

RESOURCE PERSON

COORDINATOR

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

DIAGNOSIS AND TREATMENT OF BRONCHIAL ASTHMA

MULTIPLE CHOICE QUESTIONS.

8/10

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

CANDIDATE AND ASSESSOR INFORMATION

Course code: CT02

Candidate Name	RAJALINGAM. M	Assessor Name	Dr. VIJAY KUMAR
Date of Assessment	20.10.2018	Assessor Position	ASSISTANT PROFESSOR & HOD

1. Asthma is basically:

A. An infectious disease

B. An autoimmune disease

C. An atopic disease

D. A malignant disease

2. The characteristic feature of persistent asthma is:

A. Family history of disease

B. Airway inflammation

C. Need for oral steroids

D. Nocturnal wheezing

3. Simple instrument to roughly determine lung function is a:

A.Barometer

B. Manometer

C.Peak flow meter

D.Sphygmomanometer

4. The following drug cannot cause asthma:

A. Beta-blocker

B. Histamine

C. Ibuprofen

D. Atropine

5. Which of the following tests cannot detect airway inflammation?

A.Bronchial mucosal biopsy

B. Sputum eosinophil counts

C. Bronchoalveolar lavage

D. Spirometry

6. The parameter to detect reversibility in airflow obstruction on a spirometry

test is:

A. FEV1

B. FVC

C. MVV

D. RV

7. The following bronchodilator is most commonly used when doing a reversibility test:

A. Salbutamol

B. Adrenaline

C. Theophylline anhydrous

D. Atropine

8. Bronchoprovocation tests usually use histamine to challenge the airways. Besides histamine, _____ can also be used:

A. Ipratropium bromide

B. Adrenocorticotrophic hormone

C. Prednisolone

D. Methacholine

9.In an acute severe attack of asthma, it is important to get a chest x-ray done to rule out:

A. A pleural effusion

B. A pneumothorax

C. Lung malignancy

D. COPD

10. The following are helpful in determining the severity of an acute attack except:

A. Use of accessory muscles of respiration

B. Ability to complete sentences

C. Peak expiratory flow rate

D. Pedal edema

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

DIAGNOSIS AND TREATMENT OF BRONCHIAL ASTHMA

MULTIPLE CHOICE QUESTIONS.

8/10

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

CANDIDATE AND ASSESSOR INFORMATION

Course code: CT02

Candidate Name	PRAVEEN KUMAR	**Assessor Name**	DR. VIJAY KUMAR.
Date of Assessment	20.10.2018	**Assessor Position**	ASSISTANT PROFESSOR & HOD

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D. COPD

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A. Use of accessory muscles of respiration

B. Ability to complete sentences

C. Peak expiratory flow rate

D. Pedal edema

Sri Lakshmi Narayana Institute of Medical Sciences

This is to certify that __Praveen Kumar.V(U14MB289)_____ has actively participated in the Value Added Course on DIAGNOSIS AND TREATMENT OF BRONCHIAL ASTHMA held during October - November 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry - 605 502, India.

Dr. Prakash Rao Balan
RESOURCE PERSON

Dr. Vijay Kumar
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

CERTIFICATE OF [illegible]

This is to certify that __Rajalingam.M(U14MB295)_____ has actively participated in the Value Added Course on DIAGNOSIS AND TREATMENT OF BRONCHIAL ASTHMA held during October - November 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Prakash Rao Balan
RESOURCE PERSON

Dr. Vijay Kumar
COORDINATOR

Student Feedback Form

Course Name: **DIAGNOSIS AND TREATMENT OF BRONCHIAL ASTHMA**

Subject Code: **CT 02**

Name of Student: RAJALINGAM H Roll No.: 0114MB295

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5 ✓

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

EXCELLENT

Signature

Date: 20 · 10 · 2018

Student Feedback Form

Course Name: **DIAGNOSIS AND TREATMENT OF BRONCHIAL ASTHMA**

Subject Code: **CT 02**

Name of Student: PRAVEEN KUMAR . V Roll No.: 0114MB289

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	✓5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

SATISFACTORY .

Signature

Date: 20 . 10 . 2018

Date: 10.11.2018

From

Dr. Vijay Kumar
Assistant Professor and Head,
Department of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: DIAGNOSIS AND MANAGEMENT OF BRONCHIAL ASTHMA

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: : **DIAGNOSIS AND MANAGEMENT OF BRONCHIAL ASTHMA , OCT – NOV 2018** for 8 interns . We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. Vijay Kumar

Encl: Certificates

Photographs



OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

07.03.2018

Sub: Organising Value-added Course: Biochemical basis of Acquired immunodeficiency syndrome (AIDS). reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Biochemical basis of Acquired immunodeficiency syndrome (AIDS)"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before October to November 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry 605 502.

Encl: Copy of Course content

VALUE ADDED COURSE

1. Name of the programme & Code

Biochemical basis of Acquired immunodeficiency syndrome (AIDS)-Bio 08

2. Duration & Period

30 hrs & November– December 20

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Assessment closed

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time1 November– December 2018

8. Year of discontinuation: 2018

9. Summary report of each program year-wise

Value Added Course- November – December 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	**BIO-08**	Biochemical basis of Acquired immunodeficiency syndrome (AIDS)	**Dr. Jansi Rani**	1st year MBBS	20 students NOV to DEC 2018)

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

1. Dr.Jansi Rani
2. Dr. Kajalakshmy

COORDINATOR

Dr.Jansi Rani

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

Course Proposal

Course Title: Biochemical basis of Acquired immunodeficiency syndrome (AIDS)

Course Objective:

Bringing to the advance knowledge about HIV, present new research findings, and promote and enhance scientific and community collaborations around the world

Promoting HIV responses that are supported by and tailored to the needs of at risk populations or people living with HIV, including women and girls, men who have sex with men, transgender people, sex workers, young people, and people who use drugs

Course Outcome: To advance knowledge about HIV, present new research findings, and promote and enhance scientific and community collaborations

Course Audience: MBBS, AHS

Course Coordinator: Dr.Jansi Rani

Course Faculties with Qualification and Designation:

1. Dr.Jansi Rani, Professor & HOD

2. Dr.kajalakshmy, Assistant Professor

Course Curriculum/Topics with schedule (Min of 30 hours)

Sl. No	Date	Topic	Time	Hours
1.	3-10-2018	Indian and world: scenario 2025	1-2p.m	1 hour
2.	4-10-2018	Testing a. HIV self testing b. HIV testing services c. Access to AIDS diagnosis	4-6p.m	2hour
3.	5-10-2018	Testing a. HIV self testing b. HIV testing services Access to AIDS diagnosis	4-6p.m	2hour
4.	6-10-2018	Biochemical basis of AIDS a. How HIV infects a cell b. How HIV spread c. A3G Deaminase – independent mechanism d. A3G Deaminase –dependent mechanism	4-6p.m	2hour
5.	7-10-2018	Biochemical basis of AIDS a. How HIV infects a cell b. How HIV spread c. A3G Deaminase – independent mechanism	4-6pm	2hour

		d. A3G Deaminase –dependent mechanism		
6.	10-10-2018	Biochemical basis of AIDS a. How HIV infects a cell b. How HIV spread c. A3G Deaminase – independent mechanism d. A3G Deaminase –dependent mechanism	4-6p.m	2hour
7.	12-100-2018	Transmission of HIV a. Sexual transmission b. Transmission through contaminated blood c. Mother to child transmission	4-6p.m	2hour
8.	13-10-2018	Transmission of HIV a. Sexual transmission b. Transmission through contaminated blood c. Mother to child transmission	1-2p.m 5-6p.m	2hour
9.	14-10-2018	Stages of HIV infection a. Acute infection b. Chronic infection	4-6p.m	2hour
10	15-10-2018	Mechanical basis of AIDS a. Chemokine mediated activation b. Cytokines c. Altered transmitter systems (Arachidonic acid, Calcium ions, Glutamate, Nitric oxide and N-methyl D-aspartate receptor,) d. Apoptosis	4-6p.m	2hour
11	16-100-2018	Mechanical basis of AIDS a. Chemokine mediated activation b. Cytokines c. Altered transmitter systems (Arachidonic acid, Calcium ions, Glutamate, Nitric oxide and N-methyl D-aspartate receptor,) d. Apoptosis	4-6p.m	2hour
12	17-10-2018	Mechanical basis of AIDS	4-6p.m	2hour

		a. Chemokine mediated activation b. Cytokines c. Altered transmitter systems (Arachidonic acid, Calcium ions, Glutamate, Nitric oxide and N-methyl D-aspartate receptor,) d. Apoptosis		
13	18-100-2018	Prevention of AIDS	4-6p.m	2hour
14	19-10-2018	Prevention of AIDS	4-6p.m	2hour
15	20-10- 2018	Treatment of AIDS	4-6p.m	2hour
16	24-10-2018	Treatment of AIDS	4-6p.m	2hour
		Total		31 hrs

REFERENCE BOOKS:

1. Primary Immunodeficiency Diseases. Definition, Diagnosis, and Management. Editors: Rezaei, Nima, Aghamohammadi, Asghar, Notarangelo, Luigi D. (Eds.).
2. Primary Immunodeficiency Diseases: A Molecular and Genetic Approach (3 ed.)

Edited by Hans D. Ochs, MD, Dr.med, C. I. Edvard Smith, PhD, and Jennifer M. Puck, MD

Biochemical basis of Acquired immunodeficiency syndrome (AIDS)

PARTICIPANT HAND BOOK

Annexure- I

BIHER

SLIMS

COURSE DETAILS

Particulars	Description
Course Title	**Biochemical basis of Acquired immunodeficiency syndrome (AIDS)**
Course Code	BIO
Topics and content of the course in the Hand book	1. Indian and world: scenario 2025 2. Structure of HIV Biochemical basis of AIDS a. How HIV infects a cell b. How HIV spread c. A3G Deaminase –independent mechanism d. A3G Deaminase –dependent mechanism Transmission of HIV a. Sexual transmission b. Transmission through contaminated blood c. Mother to child transmission Mechanical basis of AIDS a. Chemokine mediated activation b. Cytokines c. Altered transmitter systems (Arachidonic acid,

	Calcium ions, Glutamate, Nitric oxide and N-methyl D-aspartate receptor,) Apoptosis Prevention Treatment
Advantages of learning and evaluation	Bringing to the advance knowledge about HIV, present new research findings, and promote and enhance scientific and community collaborations around the world
Further learning Opportunities	
Key Competencies	
Target Student	MBBS, AHS students
Duration	30hrs Every Nov to Dec 2019 & May to June 2020
Theory Session	30hrs
Practical Session	0hrs
Assessment Procedure	Assessment Evolution by MCQ

INTRODUCTION:

The human immunodeficiency virus (HIV) is a retrovirus belonging to the family of lentiviruses. Retroviruses can use their RNA and host DNA to make viral DNA and are known for their long incubation periods. Like other retroviruses, HIV infects the body, has a long incubation period (clinical latency), and ultimately causes the signs and symptoms of disease, here AIDS. HIV causes severe damage to the immune system and eventually destroys it by using the DNA of CD4+ cells to replicate itself. In that process, the virus eventually destroys the CD4+ cells.

The Healthy Immune System The immune system protects the body by recognizing antigens on invading bacteria and viruses and reacting to them. An antigen is any substance that induces a state of sensitivity and immune responsiveness. These antigens interact with antibodies and immune cells, initiating an immune response. This process destroys the antigen, allowing the body to be free of infections. Types of antigens include bacteria, viruses, fungi, and parasites. When the immune system is weakened or destroyed by a virus such as HIV, the body is left vulnerable to infections.

B Lymphocytes The main function of B lymphocytes is humoral (antibody) immunity. Each B cell can recognize specific antigen targets and can secrete specific antibodies. Antibodies function by coating antigens, which makes the antigens more vulnerable to

phagocytosis (engulfing and ingestion of invading organisms by leukocytes and/ or macrophages), or by triggering the complement system, leading to an inflammatory response. Antibodies are highly specialized serum protein molecules. They are grouped into five classes, each having a specialized function: immunoglobulin G (IgG), IgA, IgM, IgE, and IgD

T Lymphocytes T lymphocytes have two major functions: regulation of the immune system and killing of cells that bear specific target antigens. Each T cell has a surface marker, such as CD4+, CD8+, and CD3+, that distinguishes it from other cells. CD4+ cells are helper cells that activate B cells, killer cells, and macrophages when a specific target antigen is present. There are two main types of CD8+ cells. The first type, cytotoxic CD8+ cells, kills cells infected by viruses or bacteria, as well as cancer cells. The second type of CD8+ cells, T-suppressor cells, inhibits or suppresses immune responses. Normal CD8+ cell count is between 300 and 1,000 cells in adults and children. The normal CD4+:CD8+ ratio is between 1.0 and 2.0. T cells can secrete cytokines (chemicals that kill cells), such as interferon. Cytokines can bind to target cells and activate the

inflammatory process. They also promote cell growth, activate phagocytes, and destroy target cells. Interleukins are cytokines that serve as messengers between white blood cells. Recombinant (laboratory synthesized) interleukins are currently being studied in clinical trials for patients with HIV infection.

Phagocytes Phagocytes include monocytes and macrophages, large white blood cells that engulf and digest cells carrying antigenic particles. Found throughout the body, phagocytes rid the body of worn-out cells, initiate the immune response by presenting antigens to lymphocytes, are important in immune response regulation and inflammation, and carry receptors for cytokines. Dendritic cells, another type of phagocyte, also are antigen-presenting cells. They have long, threadlike extensions that help trap lymphocytes and antigens and are found in the spleen and lymph nodes. Neutrophils are granulocytic phagocytes that are important in the inflammatory response. Complement The complement system consists of 25 proteins. Complement can induce an inflammatory response when it functions with antibodies to facilitate phagocytosis or weaken the

bacterial cell membrane. The complement proteins interact with one another in a sequential activation cascade, promoting the inflammatory process.

HIV's Structure HIV consists of a cylindrical center surrounded by a sphere-shaped lipid bilayer envelope. There are two major viral glycoproteins in this lipid bilayer, gp120 and gp41. The major function of these proteins is to mediate recognition of CD4+ cells and chemokine receptors, thereby enabling the virus to attach to and invade CD4+ cells. The inner sphere contains two single-stranded

Classification of HIV

The two human immunodeficiency viruses, HIV-1 and HIV-2, are members of the family of Retroviruses, in the genus of Lentiviruses. Retroviruses have been found in various vertebrate species, associated with a wide variety of diseases, in both animals and humans. In particular, retroviruses have been found to be associated with malignancies, autoimmune diseases, immunodeficiency syndromes, aplastic and haemolytic anaemias, bone and joint disease and diseases of the nervous system.[1]

The many different strains of HIV-1 have been separated into major (M), new (N) and outlier (O) groups, which may represent three separate zoonotic

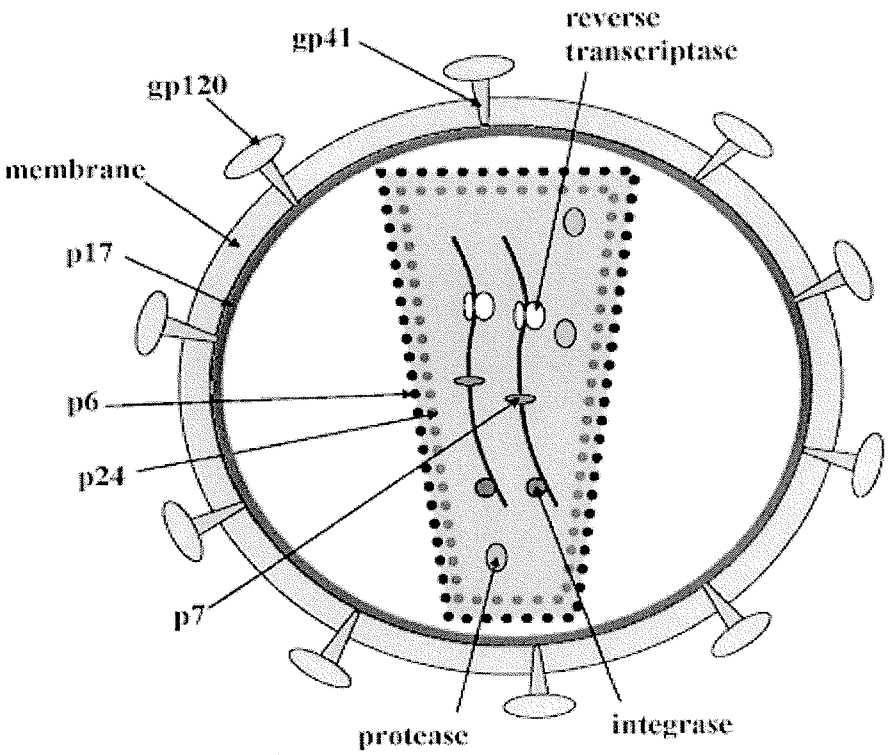
transfers from chimpanzees. Groups N and O are mainly confined to West and Central Africa (Gabon and Cameroon), though cases of Group O have been found world-wide due to international travel, after contact with infected individuals from these areas. The HIV strains in Group M are the ones mainly responsible for the HIV/AIDS pandemic, and they are so diverse that they have been subclassified into subtypes (or clades) A-K. This huge diversity of HIV-1 is important when diagnostic testing, treatment and monitoring are applied as the results may differ between different subtypes or clades (see **HIV Global Genetic Diversity and Epidemiology** below).[1] The diversity of HIV-2 is much less, but subtypes A-H have been proposed

HIV structure

The human immunodeficiency viruses are approximately 100 nm in diameter. It has a lipid envelope, in which are embedded the trimeric transmembrane glycoprotein gp41 to which the surface glycoprotein gp120 is attached (Box 1.1). These two viral proteins are responsible for attachment to the host cell and are encoded by the *env* gene of the viral RNA genome. Beneath the envelope, is the matrix protein p17, the core proteins p24 and p6 and the nucleocapsid protein p7 (bound to the RNA), all encoded by the viral *gag* gene. Within the viral core, lies 2 copies of the ~10 kilobase (kb) positive-sense, viral RNA genome (i.e. it has a diploid RNA genome), together with the protease, integrase and reverse transcriptase enzymes. These three enzymes are encoded by the

viral *pol* gene. There are several other proteins coded for by both HIV-1 and HIV-2, with various regulatory or immuno-modulatory functions, including *vif* (viral infectivity protein), *vpr* (viral protein R), *tat* (transactivator of transcription), *rev* (regulator of viral protein expression) and *nef* (negative regulatory factor). An additional protein found in HIV-1 but not HIV-2 is *vpu* (viral protein U). Similarly, *vpx* (viral protein X) is found in HIV-2 and not HIV-1.

Box 1.1 Structure of the HIV-1 virus (adapted from reference 6). This figure is schematic and somewhat simplified for clarity. For example, the structures of the envelope glycoproteins gp120 and gp41 are actually trimers in reality, not the monomers as shown here.



Transmission of HIV

HIV is considered to be a sexually transmitted infection (STI) because that is its most common mode of transmission. However, unlike some other pathogens that cause STIs, HIV is also commonly transmitted through nonsexual contact with HIV-contaminated blood and from HIV-infected mothers to their children.

Sexual Transmission

The majority of all HIV transmissions worldwide occur through sexual contact. Of these cases, most are the result of heterosexual contact. However, the pattern of transmission varies geographically. In the United States, HIV is transmitted more often in men who have sex with men. The risk of transmission from anal intercourse is especially high, whereas the risk of transmission from oral sex is relatively low.

The risk of HIV transmission increases when people are already infected with other sexually transmitted infections, and especially when they have open sores on their genitals. In fact, the presence of genital sores increases the risk of transmission by about fivefold. The risk of transmission is also greater during the early months of infection when infected people usually have the greatest viral load.

Transmission Through Contaminated Blood

The second most frequent mode of HIV transmission is via contaminated blood and blood products. Blood-borne transmission can occur through needle sharing during intravenous drug use, needle-stick injury in health professionals, transfusion of contaminated blood or blood products, or

medical injections with unsterilized equipment. Theoretically, giving or receiving tattoos or piercings can also transmit HIV, but no confirmed cases have been documented. It is not possible for mosquitoes or other blood sucking insects to transmit HIV.

In 2009 in the United States, intravenous drug users made up 12 percent of all new cases of HIV, and in some areas, more than 80 percent of people who injected drugs were infected with HIV. In rich nations, the risk of acquiring HIV from a blood transfusion is now virtually nil because of careful screening of blood donors and Blood products. In poor nations, on the other hand, screening is less rigorous; therefore, rates of transmission through contaminated blood are higher. Unsafe medical injections and invasive medical procedures are also a significant mode of transmission in poor nations, particularly in sub-Saharan Africa. While it is possible to acquire HIV from the infected organ or tissue transplantation, this is rare because of screening.

Stages of HIV Infection

HIV is a type of virus called a retrovirus. Retroviruses are single-stranded RNA viruses that live as parasites inside host cells. HIV primarily infects helper T cells (CD4+ T cells) as well as some other cells of the human immune system. It spreads from helper T cells to helper T cells and causes illness by killing off the helper T cells.

Acute HIV Infection

After HIV enters the human body, there is a period of rapid viral replication, causing a high viral load in the person's blood and a drop in the number of circulating helper T cells. This stage of infection is called acute HIV infection. It produces an immune system response, in which the number of killer T cells increases. The killer T cells start killing HIV-infected cells, and antibodies to HIV are also produced. As a consequence, the viral load starts to decline, and the number of helper T cells recovers. However, the virus is not eliminated and remains in the body.

Acute HIV infection

may cause no noticeable symptoms, or it may cause a brief period of flu-like illness. The main symptoms of acute HIV infection are illustrated in the figure below. Even when symptoms are present, they are not often recognized as signs of HIV infectiondue to their nonspecific nature.

Symptoms of HIV and AIDS

When a person is first exposed to HIV, they may not show symptoms for several months or longer. Typically, however, they may experience a flu-like illness two to four weeks after becoming infected. People in this early stage of infection have a large amount of HIV in their blood and are very contagious, according to the Centers for Disease Control and Prevention (CDC).

This early illness is often followed by a "latency" phase, in which the virus is less active and no symptoms may be present, according to the U.S. Department of Health and Human Services (HHS). Although symptoms may be absent, people can still transmit HIV to others during this stage. This latent period can last a decade or more.

Left untreated, HIV infection will progress into AIDS, which severely damages the immune system. A weakened immune system makes it harder for the body to fight off other diseases, such as cancer, liver disease, cardiovascular disease and kidney disease, according to the CDC.

It can also make people more susceptible to opportunistic infections, which are infections that occur more frequently and severely in individuals with weakened immune systems. Infections may affect the brain, eyes, gastrointestinal tract, skin, mouth, lungs, liver and genitals, according to the University of California San Francisco Medical Center (UCSF).

According to the UCSF Medical Center, HIV and AIDS may cause the following symptoms:

- Rapid weight loss or "wasting."
- Extreme fatigue.
- Dry cough.
- Recurring fevers or profuse night sweats.
- Swollen lymph glands in the armpits, groin or neck.

- Prolonged diarrhea.
- Sores in the mouth or bleeding from the genitals or anus.
- Pneumonia.
- Blotches on or under the skin or inside the mouth, nose or eyelids.
- Depression, memory loss and other neurological effects.

Diagnosis & tests

The CDC recommends that everyone between the ages of 13 and 64 be tested for HIV at least once, and those at increased risk for infection be tested at least yearly.

According to the CDC, three types of tests can confirm an HIV infection:

A NAT, short for nucleic acid testing, looks for the actual human immunodeficiency virus in the blood. But this expensive test is rarely used for routine screening.

An antigen/antibody test looks for HIV antibodies, which are proteins produced by the immune system after exposure to bacteria or viruses. The blood test also detects HIV antigens — foreign substances that activate the immune system.

The third type is an antibody test that looks for HIV antibodies in blood or oral fluid. These tests can be done with a kit at home and provide results usually within 30 minutes.

However, it may take weeks or months after someone is first infected with HIV for the immune system to develop enough antibodies to the virus for those

proteins to be detectable in an HIV test. And the results of conventional HIV tests that are sent to a laboratory for analysis may take a week or more to be reported. Another rapid HIV test, which may involve swabbing a person's gums, is also available and offers results in about 20 minutes. A positive result on any HIV test should be confirmed with a second, follow-up test.

Treatments & medications

While AIDS remains incurable, patients are living much longer — even decades after infection — because of the development of medications to suppress the virus.

The most effective treatment is known as antiretroviral therapy (ART), which has typically been a combination of at least three medications meant to prevent the patient from becoming resistant to any one drug.

Modern medications for AIDS are more potent and less toxic than in the past, and people take fewer pills, less frequently, Wurcel told Live Science. In fact, most people on ART take only one pill a day, and the treatment is well tolerated with few side effects.

ART can help slow the spread of the virus and lower its amount in the blood, which is known as the "viral load." With daily treatment, that viral load may decrease so much that it becomes undetectable. A person with undetectable HIV

can't transmit the virus to their sex partners, even though HIV is still present in the person's body.

According to the National Institutes of Health, the most common antiretroviral drugs fall into three categories:

- Reverse transcriptase inhibitors, which keep the virus from reproducing.
- Protease inhibitors, which interrupt the replication of the virus at a later step in the virus life cycle.
- And, fusion inhibitors, which prevent the virus from entering and replicating in healthy cells.

Researchers are developing new treatments as alternatives to taking a daily pill, such as long-acting injectable HIV drugs given once a month or every few months, Wurcel said. In the future, there may be an implantable device placed under the skin to deliver ART, so people don't forget to take their medications, she said.

Prevention

More than 56,000 Americans become infected with HIV each year, according to HHS. Preventing infection means avoiding behaviors that lead to exposure to the virus.

Prevention measures include:

- Knowing your HIV status as well as your partner's.

- Using latex condoms correctly during every sexual encounter.
- Limiting the number of sexual partners.
- Abstaining from injectable drug use and never sharing needles or syringes.
- Seeking treatment immediately after suspected HIV exposure, since newer medications known as post-exposure prophylaxis (PEP) may prevent infection if started early.
- Reducing the chance of becoming infected by obtaining pre-exposure prophylaxis (PrEP), which is a daily pill taken by people at high risk for HIV because of their sexual behavior or from injecting drugs.

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Department of Biochemistry – 2018-2019

S.No	Register No.	Student List	Signature
1	U18MB393	VARSHITHA .N	
2	U18MB385	SWARNAB JANA	
3	U18MB360	SAMIKSHA DUBEY	
4	U18MB400	YASHWANTH NAIK R	
5	U18MB381	SUHAIL AHMAD	
6	U18MB361	SANJEEV KUMAR G.S	
7	U18MB386	SWATHI .K	
8	U18MB389	THENDRAL NILAVAN .M	
9	U18MB384	SWAPNIL	
10	U18MB394	VIKAASH .M	
11	U18MB388	TECHI NADAM	
12	U18MB396	VIKRANT SINGH	
13	U18MB382	SUMAN KALYAN SAHOO	
14	U18MB390	TINA CAROLINE J	
15	U18MB397	VINITHA K.C	
16	U18MB387	TADAR YAMING	
17	U18MB392	VAISHNAVI TRIPATHI	
18	U18MB399	WARADKAR ANJUSHA DEEPAK	
19	U18MB391	URVASHI PAL	
20	U18MB383	SUSMITA KHAN	

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY

SRI LAKSHMI NARAYANA INSTITITE OF MEDICAL SCIECNES

Biochemical basis of AIDS

6/10

Where did HIV originate?

a. **A**A chimpanzee
b. **B**Mad cow disease
c. **C**A strain of the hepatitis virus
d. All of the above

1. **What is AIDS?**

A. A fungal infection
B. A rare blood cancer caused by HIV
C. A group of diseases caused by HIV
D. The final stage of HIV

3. What are T cells?

A.T cells are a type of white blood cell
B.T cells scan cells for abnormalities
C.T cells coordinate immune responses
D. All of the above

4. **Opportunistic infections are more frequent and more severe in people with HIV.**

A.True
B.False

5. Which is not considered a common method of transmission for HIV?

A. Blood

B. Genital secretions

C. Breast milk

D. Urine

6. Which is not considered a common method of transmission for HIV?

A. Blood

B. Genital secretions

C. Breast milk

D. Urine

7. Is HIV manageable?

A. No

B. Yes

8. Which is the second most common way of spreading HIV?

a) Sexual intercourse with HIV infected

b) Sharing needles

c) Sharing food

d) From infected mother to child

9. **The first ever instance of AIDS was reported in**

a. USA

b. France

c. Russia

d. None of the above

10. HIV can also spread through

a. Sharing water
b. Breathing in infected droplets
c. Sharing needles
d. Kissing

SRI LAKSHMI NARAYANA INSTITITE OF MEDICAL SCIECNES

Biochemical basis of AIDS

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a. AA chimpanzee
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B.False

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d. None of the above

10. HIV can also spread through

a. Sharing water
b. Breathing in infected droplets
c. Sharing needles
d. Kissing

Annexure- V

Course feedback form

Course title: Date :

Course code:

Department: BIOCHEMISTRY

S.no	Design of the course	1	2	3	4	5
1	The objective of the course clear to you		✓			
2	The course contents met with your expectations			✓		
3	The lecture sequence were well planned		✓			
4	The lectures were clear and easy to understand	✓				
5	The audiovisual teaching aids were effectively used		✓			
6	The instructor's encouraged interaction and was it helpful		✓			
7	The contents were illustrated with examples	✓				
8	Overall Rating of the course		✓			

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

- Good -

Signature

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SANJEEV KUMAR G.S has actively participated in the Value Added Course on **Biochemical basis of Acquired immunodeficiency syndrome (AIDS)** April– May 2018 -19 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Kajalakshmy

RESOURCE PERSON

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Dr. Jansi Rani

COORDINATOR

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY 605 502

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SONALI HESSA has actively participated in the Value Added Course on **Biochemical basis of Acquired immunodeficiency syndrome (AIDS)** April – May 2018-19 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Kajalakshmy

RESOURCE PERSON

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Dr. Jansi Rani

COORDINATOR

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

Annexure- V

Course feedback form

Course title: Date :

Course code:

Department: BIOCHEMISTRY

S.no	Design of the course	1	2	3	4	5
1	The objective of the course clear to you	✓				
2	The course contents met with your expectations		✓			
3	The lecture sequence were well planned		✓			
4	The lectures were clear and easy to understand		✓			
5	The audiovisual teaching aids were effectively used	✓				
6	The instructor's encouraged interaction and was it helpful		✓			
7	The contents were illustrated with examples		✓			
8	Overall Rating of the course		✓			

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Satisfactory

Signature

Date: 06.12.2018

From

Dr. Jansi Rani
Professor and Head,
Department of Biochemistry,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Biochemical basis of Acquired immunodeficiency syndrome (AIDS)

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Biochemical basis of Acquired immunodeficiency syndrome (AIDS)**. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. Jansi Rani

Encl: Certificates

Photographs

Sri Lakshmi Narayana Institute of Medical Sciences

Date: 21-12-2017

From

Dr.Jansi Rani
Professor and Head,
Department of Biochemistry,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Biochemical basis of Acquired immunodeficiency syndrome (AIDS)

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Biochemical basis of Acquired immunodeficiency syndrome (AIDS)** May to June 2018. We solicit your kind permission for the same.

Kind Regards

Dr.Jansi Rani

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean:

The HOD: (Dr. Jansi Rani)

The Expert: Dr. Kajalakshmy

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign & Sel)	(Sign & Seal)	(Sign & Seal)

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502.

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

Sri Lakshmi Narayana Institute of Medical Sciences

Date 05/09/2018

From
Dr.D.Raghavendran
Professor and Head,
Department of Paediatrics,
Sri Lakshmi narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Learning disability course

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Learning Disability Course** from 01/11/2019. We solicit your kind permission for the same.

Kind Regards

Dr.D.Raghavendran

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr.Jayalakshmi

The HOD: Dr Raghavendran

The Expert: Dr Abhijeet

The committee has discussed about the course and is approved.

Dean

Subject Expert

HOD

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

ASSISTANT PROFESSOR
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

10.10.2018

Sub: Organising Value-added Course: Learning disability Course., reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi narayana institute of medical sciences, **Bharath Institute of Higher Education and Research**, is organising **"Learning disability Course"**. The course content and registration form is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 19 october 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
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Encl: Copy of Course content

Course Proposal

Course Title: Learning Disability in Children

Course Objective: To enumerate and discuss the newer modalities available in the diagnosis of TB

Course Outcome: On successful completion of the course the students will identify and diagnose children with learning disabilities

Course Audience: Final year MBBS Students

Course Coordinator: Dr. Raghavendran

Course Faculties with Qualification and Designation:

1. **Dr. Raghavendran – MD Paediatrics – Head of Department**
2. **Dr. Abhijeet Shrivastava –DNB paediatrics– Assistant Professor**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours	Resource person
1.	2.11.2018	Introduction to LDs	2-4 pm	2	Dr. Raghavendran
2.	6.11.2018	Phonological Processing Problems	2-4 pm	2	Dr. Abhijeet Shrivastava
3.	9.11.2018	Language Processing Problems	2-4 pm	2	Dr. Raghavendran
4.	13.11.2018	Memory Difficulties	2-4 pm	2	Dr. Abhijeet Shrivastava
5.	16.11.2018	Visual-Spatial Difficulties	2-4 pm	2	Dr. Raghavendran
6.	20.11.2018	Slow Processing Speed	2-4 pm	2	Dr. Abhijeet Shrivastava
7.	23.11.2018	Executive Functioning	2-4 pm	2	Dr. Raghavendran
8.	27.11.2018	Strategies for Helping with Executive Functioning Difficulties	2-4 pm	2	Dr. Abhijeet Shrivastava
9.	30.11.2018	LDs and Mental Health	2-4 pm	2	Dr. Raghavendran
10.	4.12.2018	Specific learning disabilities	2-4 pm	2	Dr. Abhijeet Shrivastava
11.	7.12.2018	Diagnostic tools in LD	2-4 pm	2	Dr. Raghavendran
12.	11.12.2018	Parental counseling in LD	2-4 pm	2	Dr. Abhijeet

					Shrivastava
13.	14.12.2018	Understanding LDs: Putting it all Together	2-4 pm	2	Dr. Raghavendran
14.	18.12.2018	Summary and discussion	2-4 pm	2	Dr. Abhijeet Shrivastava
15.	21.12.2018	Assessment	2-4 pm	2	Dr. Raghavendran
			Total Hours	30	

REFERENCE BOOKS:

1. **Nelson Textbook of Paediatrics**
2. **IAP textbook of paediatrics**

VALUE ADDED COURSE ON LEARNING DISABILITY IN CHILDREN

1. Name of the programme & Code

Learning Disability Course and PECO 9

2. Duration & Period

30 hrs (November 2018- December 2018)

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

Once (November 2018- December 2018)

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PECO 9	Learning Disability Course	Dr. Abhijeet Shrivastava	Final year MBBS	10 (November 2018- December 2018)

10. Course Feed Back

Enclosed as Annexure-

RESOURCE PERSON

ASSISTANT PROFESSOR
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

COORDINATOR

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

Annexure- I

LEARNING DISABILITY COURSE



PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	Learning disabilities in Children
Course Code	PECO 9
Objective	1. Introduction to LDs 2. Phonological Processing Problems 3. Language Processing Problems 4. Memory Difficulties 5. Visual-Spatial Difficulties 6. Slow Processing Speed 7. Executive Functioning 8. Strategies for Helping with Executive Functioning Difficulties 9. LDs and Mental Health 10. Understanding LDs: Putting it all Together
Further learning opportunities	Specific learning diabilities
Key Competencies	On successful completion of the course the students will identify and diagnose children with learning disabilities
Target Student	Final MBBS Students
Duration	30hrs November 2018- December 2018 30 hrs December 2018 – March 2019
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Multiple choice questions

Table of Contents

Foreword 4
Introduction to LDs 5
What are Learning Disabilities (LDs)? 5
How are LDs Identified? 5
What Do LDs Affect? 5
How Common are LDs? 6
What Causes LDs? 6
What Helps? 6
Phonological Processing Problems 7
Strategies for Helping Kids With Reading Difficulties 8
Language Processing Problems 9
Strategies for Helping Kids with Oral Language Difficulties 9
Strategies for Helping Kids with Written Composition Difficulties 10
Memory Difficulties 11
Verbal Memory 11
Working Memory 12
Visual Memory 12
Strategies for Helping Kids with Working Memory Difficulties 13
Strategies for Helping Kids with Instructions 13
Visual-Spatial Difficulties 15
Visual-perceptual processing 15
Visual-motor processing problems 15
Strategies for Helping Kids with Visual-motor Processing Difficulties: 16
Non Verbal Learning Disability (NLD) 17
What are the differences between NLD and AS? 17
General Strategies for Helping Kids with NLD 18
Strategies for Helping Kids with NLD to Participate in Physical Activity 18
Strategies for Helping Kids with NLD to Socialize 18
Slow Processing Speed 19
Strategies for Helping Kids with Slow Processing 20
Executive Functioning 21
What are the differences between LDs with executive functioning problems and Attention Deficit Hyperactivity Disorder (AHDH)? 21
Strategies for Helping with Executive Functioning Difficulties 22
LDs and Mental Health 23
Strategies for Helping Self Esteem 23
Strategies for Helping Emotional Awareness and Control 23
Strategies for Helping Kids with Social Interactions 24
Strategies for Helping Communication Between Home, School and Other Settings 24
Homework tips: 25
Other Strategies to Help With Emotional Wellbeing 25
Understanding LDs: Putting it all Together 26
Resources 27
Books 27
Organizations 29
Websites 30
Videos 31
Glossary 32

Introduction to LDs

What are Learning Disabilities (LDs)?

LDs are a group of neurological or brain-based problems that affect one or more ways that a person takes in, stores or uses information.

LDs come in many forms and their effects are different from person to person. They relate to:

- Getting information into the brain (Input)
- Making sense of this information (Organization)
- Storing and retrieving information (Memory)
- Getting information back out (Output)

How are LDs Identified?

By definition, people with LDs have average to above average intelligence yet they have very specific impairments in one or more of the psychological processes related to learning. These processes may include:

- Language processing (understanding and expressing information using words)
- Visual-spatial processing (perceiving or organizing visual information)
- Visual-motor processing (carrying out hand-eye activities)
- Phonological processing (identifying and manipulating speech sounds)
- Processing speed (speed of taking in, using or pulling out information)
- Working memory (holding information in mind while also using the information)
- Executive functions (planning and organizing)

LDs are diagnosed most commonly as an outcome of a comprehensive psychological assessment. Using a number of standardized tests that have been given to thousands of people, psychologists will systematically look at how people think, problem-solve, remember, understand and express information.

What Do LDs Affect?

LDs are a life-long condition that affects people differently depending on the situation.

LDs can affect academic functioning, daily life and social life. For example, LDs can interfere with sight reading, reading comprehension, math, and writing. They can also interfere with organization, managing time, following multi-step instructions or interpreting graphs, charts and maps, for example. Some people with LDs have trouble interpreting facial expressions, understanding body language, understanding tones of voice or taking turns in conversations.

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How Common are LDs?

Learning Disabilities (LDs) are very common and affect 5 to 10 percent of Canadians. However, LDs vary greatly in form and intensity: No two LDs are the same.

What Causes LDs?

Learning disabilities are due to genetic, other congenital and/or acquired neuro-biological factors. They often run in families.

LDs are not caused by factors such as cultural or language differences, inadequate or inappropriate instruction, socio-economic status or lack of motivation, although any one of these and other factors may compound the impact of learning disabilities.

Frequently learning disabilities co-exist with other conditions, including attentional, behavioural and emotional disorders, sensory impairments or other medical conditions.

What Helps?

Most people with LDs are resilient, and learn to manage challenges and achieve success. There are a number of factors that help. These include:

- Understanding their LDs and what helps them learn
- Learning how to set realistic goals, to solve problems and to make good choices
- Being open to asking for and getting help
- Not giving up when things get hard
- Believing successes are due to their own efforts
- Believing they can learn from their mistakes
- Feeling respected and connected to others
- Having someone who will listen to them and understand their feelings
- Being an active member of a community or group

To see a full definition of LDs please visit the LDAO website at www.LDAO.ca

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LDs Reflecting Phonological Processing Problems

Reading Disability (also known as Dyslexia) is the most common learning disability accounting for at least 80% of all LDs.

Unlike speech and language, reading is not innate: It has to be taught. Reading requires the ability to decipher a phonetic code, to make sense of the relationship between written symbols (letters) and sounds. Dyslexia reflects a specific problem in processing individual speech sounds *(*e.g., the ssss sound, the mmm sound, etc) in words (phonemes). There can also be problems with holding sounds in sequence in short-term memory (e.g. holding the sequence of sounds in a new word in mind long enough to recognize it). Kids with a Reading Disability may also have difficulties with reading fluency, resulting in reading skills that are accurate but effortful and slow.

There is strong research evidence to suggest that reading disabilities are caused by an impairment in **phonological processing** (i.e., processing the sounds of speech). Individuals with reading disabilities often have difficulty breaking words down into individual sounds (decoding) and/or blending sounds together to read words quickly and accurately. These decoding problems often result in reading comprehension problems.

In the Walk-A-Mile workshop, we demonstrate **phonological processing** problems in the sight reading exercise with difficult sentences.

Terms used	Description	Application (it can be harder to…)
Phonological Processing Phoneme awareness	Ability to identify and manipulate speech sounds (phonemes)	Sound out new words or blend sounds together to form words Rhyme Learn the alphabet when very young (e.g., kindergarten) Learn a second language Spell by using phonics rather than rote memory Participate in activities that require fluent reading (e.g., rules of games, written instructions, ordering from a menu)

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What can Phonological Processing Problems Look Like?

Bill is a creative and motivated student in grade three. He is an enigma to his teachers because he is unable to read. At first, Bill's parents thought that he was just taking a little longer learning how to learn to read, much like he did with learning to speak. Now Bill, his parents, and his teacher are painfully aware of his reading difficulties. Bill can decode words, but he takes a long time to sound out each word. As a result of slow and labored decoding, Bill is unable to understand what he reads. Over the past three months, Bill has become increasingly self-conscious about his reading difficulty. He says he feels stupid and no longer wants to go to school.

Strategies for Helping Kids With Reading Difficulties

- Remember that some kids struggle with reading when planning an activity
- Supplement written material with pictures and repetition over time when teaching a lesson
- Supplement words with symbols or colour coding if classroom organization includes posting schedules or lists
- Help kids preview material that needs to be read (e.g., explain new terms, highlight what is most important)
- Don’t assume that kids understand what they have read (e.g. talk about material and use illustrations to enhance comprehension)
- Break written material into small sections
- Keep reading material short & simple
- Trigger motivation to read by using reading material linked to prior hands-on experience, real-life experiences or specific areas of interest (e.g. high interest books, comic books, magazines)
- Have the kids take turns reading with an adult or read together with him/her in unison
- Be patient and provide extra time for reading
- Offer material in a different way (e.g., books on tape, podcasts)

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LDs Reflecting Language Processing Problems

Difficulties in understanding verbal information and/or in expressing oneself are a common feature of many learning disabilities. These language-based problems may reflect a variety of factors, such as an underdeveloped vocabulary, a concrete style of thinking, difficulties in remembering and keeping track of what is said, or difficulties in organizing one's thoughts, for example. For kids with a language-based LD, it can be hard to find the right words and phrases or to follow a fast-paced conversation, for example. Language-based LDs also get in the way of effective writing: It can be difficult to know how to organize ideas or to identify the main point of a written communication.

What can Language Processing Problems Look Like?

Naomi is a friendly 12 year old girl who loves animals. She often struggles to understand instructions and to follow conversations. In loud or chaotic setting she sometimes doesn't notice if some one is talking to her. Naomi is friendly but sometimes has trouble maintaining friendships. The girls in her class spend a lot of time sharing secrets and telling stories, and Naomi has a hard time joining in these activities. Sometimes when Naomi doesn't understand she acts silly because she is worried that that the other girls will think she is dumb. Naomi has a few friends who are younger that she is: She enjoys playing active games and sports with them. Naomi learns best in a quiet setting with an instructor who teaches using visual aids and checks to make sure Naomi understands each concept.

Strategies for Helping Kids with Oral Language Difficulties

- Encourage kids to describe the word they are looking for
- Give kids plenty of time to speak
- Be as clear and concrete as possible when communicating with kids
- Avoid sarcastic comments (eg., 'I have all day to wait for your response')
- Check to see what kids understand and how they interpret a situation before automatically implementing a consequence
- Provide plenty of warning and opportunity for practice before kids are required to speak in front of the class
- Make cue cards to provide prompts for specific ideas or words
- Encourage kids to elaborate single word or simple sentence responses, or accept less complex responses from them
- Encourage kids to talk about personal experiences and topics that are familiar or of interest to them as these are often the subjects easiest for them to express
- Model good listening skills. It is more important for adults to listen and to allow kids to speak
- Explain new/complex vocabulary or concepts ahead of time

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- Use shorter sentences and simpler words
- Use visuals (pictures, illustrations, gestures) to supplement words
- Allow sufficient time for language to be processed

Strategies for Helping Kids with Written Composition Difficulties

- Encourage kids to complete written work in stages, offering explicit support in proof reading, editing and revising work
- Encourage activities at home that support practicing writing: keeping a journal, corresponding with a pen pal
- Assist kids to write about topics of interest to them

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LDs Reflecting

Memory Difficulties

Some kids with LDs have problems with memory. They are smart thinkers who may have trouble remembering what they see or hear or may struggle to retrieve what they know from memory. Memory impairments can be key factors underlying LDs in math, writing or in reading, and are often problems for everyday life.

Memory is a complex but important part of learning. There are many different theoretical models of memory. A simple but useful model differentiates between verbal memory, visual memory and working memory.

Verbal Memory

Verbal memory refers to the ability to take in oral information and to hold it in mind. For example, we use this type of memory to look up a phone number and then dial it, or to remember the connection between the names of letters and their sounds. Verbal information can be stored with a limited capacity in short-term memory and can be converted to longer-term storage if actively rehearsed.

Kids whose LDs reflect verbal memory problems may have trouble remembering math facts (e.g., learning times tables) or remembering the order of math operations (e.g., borrowing or carrying), for example. Sometimes, verbal memory problems interfere with the ability to keep track of group conversations or to follow a lecture.

In the Walk-A-Mile workshop, we demonstrate **verbal memory** impairments by having the participants listen to long series of numbers and then repeat them back exactly as read.

Terms used	Description	Application (it can be harder to…)
Verbal Memory Short-term Immediate Rote	Memory for words, numbers, sentences, stories Can be meaningful to the person or arbitrary	Phone numbers Instructions Math facts Spellings lists Details from stories or oral instruction

Working Memory

Working Memory refers to the ability to hold information in mind while reorganizing or manipulating it. This type of memory has a limited storage capacity: If overloaded, one usually loses track of the information in mind. We use this type of memory to multi-task, or to think about more than one thing at a time.

Kids whose LDs reflect working memory problems may have trouble carrying out multi-step instructions (i.e., keeping in mind steps while one completes the first instruction) or completing mental arithmetic problems. This type of memory can interfere with reading comprehension because it can be hard to keep track of story characters and plot lines while sounding out new words.

In the Walk-A-Mile workshop, we demonstrate **working memory** impairments by having the participants listen to long series of numbers and letters and then repeat them back in a different order (letters in alphabetical order and numbers in numerical order).

Terms used	Description	Application (it can be harder to…)
Working memory	Holding information in mind while reorganizing or manipulating it Limited capacity	Multi-tasking Listening to a teacher, pulling out relevant information, taking notes Figuring out a tip Following multiple step instructions

Visual Memory

Visual memory refers to the ability to take in visual information and to hold it in mind. Like verbal memory, visual information can be stored with a limited capacity in short-term memory and can be converted to longer-term storage if actively rehearsed.

Kids whose LDs reflect visual memory problems may have trouble remembering the differences between letters (e.g., ‘d’ and ‘b’ – both circles and sticks but one has to remember which side of the circle the stick is on). In school, they may struggle with visual-based subjects, such as mapping in geography, or labeling diagrams in science. Sometimes, kids with visual memory problems have trouble remembering faces.

In the Walk-A-Mile workshop, we demonstrate **visual memory** impairments by having the participants look briefly at an array of visual objects and then recall as many objects as they can remember.

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Terms used	Description	Application (it can be harder to…)
Visual memory	Memory for visual information Can be abstract information or meaningful	Mapping, geography Remembering layout of objects Details of images Labelling diagrams on tests Learning names of numbers or cursive letters

What can Memory Problems Look Like?

Sally is a bright and energetic student in grade eleven. When she was younger, Sally struggled to remember the names of the letters in the alphabet and she often mixed up b's and d's. In grade five, Sally didn't know her math facts and needed to use her fingers or a discrete counter system to add, subtract or multiply. Her teachers and parents thought that Sally was not paying attention because she did not follow instructions. Over time, Sally learned to ask people to repeat instructions and she began to carry a notebook to write down verbal information. Sally uses a calculator for math, which allows her to showcase her strengths in math problem-solving and conceptual understanding. She works best when given instructions one step at a time.

Strategies for Helping Kids with Working Memory Difficulties

- Show kids what to do more than once
- Break tasks into individual steps
- Avoid work settings that have high demand for multi-tasking, such as office reception or keeping track of short orders in a busy coffee shop

Strategies for Helping Kids with Instructions

- Keep rules and directions short, simple and clear
- Give instructions one at a time and repeat, if necessary
- Maintain eye contact while giving instructions
- Have the individual repeat the instructions
- Offer information in small chunks
- Strategies for Helping Kids with Memorization
- Apply mnemonic strategies such as creating acronyms
- Make information meaningful

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- Write it down
- Repetition, repetition, repetition
- Make information visual or multisensory
- Use a calculator or math fact grid during more complex calculations
- Make associations between similar irregular spellings
- Remember distinctive phonological spellings (e.g., yacht is said /yot/ but is spelled /ya/ /ch/ /t/)
- Copy spellings repeatedly to learn by rote
- Use spell check and adaptive technology to ensure accuracy

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LDs Reflecting Visual-Spatial Difficulties

Some kids with LDs have problems in processing or making sense of visual information. Often, these kids have strong sight reading or decoding skills. However, they may have trouble making sense of what they see (perception) or in organizing what they see (visual-spatial organization skills). Impairments in visual-spatial processing can make it harder to learn time/space concepts, such as telling time, understanding measurement, or interpreting charts and graphs. These types of processing impairments can affect one's ability to 'read' body language and non-verbal cues, such as tone of voice, facial expressions, or personal space.

Visual-perceptual processing

Visual-perceptual processing refers to the ability to make sense of visual information. In the Walk-A-Mile workshop, we demonstrate problems in visual-perceptual processing by means of the "Fly" and the "Bearded Man" exercises in which participants are given insufficient perceptual information to make sense of what they see.

Terms used	Description	Application (it can be harder to…)
Perceptual processing Visual-spatial	Ability to make sense of what one sees Putting together visual information	Noticing & understanding facial expressions Understanding a chart or graph Reading a map Following a sewing pattern Putting together an IKEA furniture set

Visual-motor processing problems

Visual-motor processing problems refer to impairments in the coordination of eye-hand movements and/or motor planning. People whose LDs reflect visual-motor problems may have trouble with activities such as printing or copying, or learning to tie shoelaces. They may find it hard to write, may put more pressure on a pencil or pen in order to control the motor movements and may experience fatigue with writing, and may take much longer to write. In addition, people with visual-motor problems may have trouble orienting their body in space and may need more help to learn dressing or may confuse left and right.

In the Walk-A-Mile workshop, **visual-motor processing** problems are demonstrated by the mirror tracing activity.

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Terms used	Description	Application (it can be harder to…)
Visual-motor Fine motor coordination Graphomotor Dysgraphia Perceptual motor	Ability to plan and execute hand movements	Print, write (cursive), copy Control size & spacing of letters on a page Line up numbers in columns Learn to tie shoelaces

Strategies for Helping Kids with Visual-motor Processing Difficulties:

- Provide copies of notes from a classmate or the teacher or employer
- Allow kids to trace rather than draw freehand
- Provide templates for kids to fill in
- Allow kids to use a word processor
- Allow extra time for written work
- Use graph paper to keep columns orderly
- Occupational therapists can offer practical assistance in the development of motor planning skills, coordination, handwriting and organization
- Offer a variety of writing tools (pens/pencils) to allow students to find one that feels comfortable for them.
- Set appropriate expectations about the volume of writing required

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Non Verbal Learning Disability (NLD)

The term, “Non Verbal Learning Disability” (NLD or NVLD) was introduced in the late 1980’s by a neuroscientist based in Windsor, Ontario (Dr. Byron Rourke) who studied a group of children with a ‘social perception’ disability. Individuals with NLDs are intelligent yet struggle with impairments in non-verbal aspects of daily living, such as understanding things from another’s perspective or ‘reading’ social cues.

Kids with NLD may have “meltdowns” or detach themselves by “spacing out” because they are overloaded by trying to work through situations that other kids learn to handle with much less effort. For example, they may avoid or react angrily to any sort of novelty because they are not able to quickly and accurately understand the new situation.

Kids with NLD may talk incessantly. This may be because they rely heavily on their well-developed language skills to interact with others and to cope with confusion and anxiety.

Social problems frequently occur because kids with NLD struggle with the parts of communication that take place without words, such as the idea of “personal space”, or the signals that other people use to convey irritation, anxiety, etc. Often kids may not understand the give and take of play and conversation. They may be unaware that the listener is bored. They may make inappropriate comments and then be bewildered when others become upset because they do not understand the social “rules.”

What are the differences between NLD and AS?

There has been controversy regarding the differentiation between NLD and Asperger Syndrome (AS). The two disorders share common features, including a history of advanced verbal skills, difficulties in processing nonverbal social cues and in adapting to new situations, impairments in executive function, and problems with handwriting and organization. However, AS is characterized by restricted repetitive and stereotypic interests (DSM-IV) which is not a hallmark feature of NLD. More research is needed to understand how NLDs work and how to best help the people who struggle with these types of challenges.

What Can Non Verbal Learning Disabilities Look Like?

Mark is a 16-year-old boy who is described by his parents and teachers as a "loner". Lately, Mark has been feeling depressed and anxious and he says that this is because no one likes him. He often appears untidy and physically awkward and his locker and knapsack are always a mess. Mark's teachers report that he has problems interacting with others. They note that he does not seem to understand or use appropriate social skills and feel that this is the cause of his social problems. At school, Mark struggles with written assignments, despite having a large vocabulary and an ability to speak with adults. His written work is disorganized and poorly structured. His most notable academic difficulties are with math problem solving. Mark's parents and teachers are concerned about his social and emotional well being.

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General Strategies for Helping Kids with NLD

- Provide predictable schedules as much as possible.
- Provide preparation for changes in routines and give notice that they are about to be asked to make a transition in activities.
- Give advance planning and instruction about unfamiliar tasks and situations.

Strategies for Helping Kids with NLD to Participate in Physical Activity

- Teach physical activities explicitly, using verbal instructions, diagrams, and modelling.
- Ask if non-competitive sports are preferable to competitive sports
- Hiking, bicycling, martial arts, weight lifting, camping, swimming and canoeing can provide positive experiences of physical activity.
- Provide kids with opportunities to be active in non-physical extra-curricular activities like drama, music and clubs.
- Offer positive reinforcement for any attempts by kids to carry out physical challenges (reward effort).
- Look at potential underlying causes if kids refuse to participate

Strategies for Helping Kids with NLD to Socialize

- Create small, calm and controlled group settings that provide greater safety and increase the chance for successful social experiences
- Surround kids with others who share interests or talents
- Give kids verbal direction and instruction. Use kids' strengths with language to help them learn what others can observe and learn more easily.
- Help kids to learn to observe and notice others' facial expressions, body language, tone of voice and other social cues.
- Teach kids such details as:
- What is expected in different social, family, and school situations;
- How others feel, how to organize and carry out tasks, etc.
- Expect to repeat direct teaching several times before kids are able to master the skill. It is important to provide this instruction with kindness and patience.
- Model and practice the use of language that is similar to age-peers, rather than relying on "adult" language

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LDs reflecting Slow

Processing Speed

Some kids with LDs need more time to process information. They are smart and have good ideas but may take longer than most to make sense of what is being said or to organize their thoughts. Sometimes, kids with slow processing speed are quick to think but need more time to write than most others. Problems with processing speed can make it hard to finish tests on time, to copy information from the board before it is erased, or to volunteer an answer in class, for example.

In the Walk-A-Mile workshop, processing speed is demonstrated by the "Story of N" exercise.

Terms used	Description	Application (it can be harder to…)
Processing Speed	Speed at which information is identified, understood and responded to Speed & accuracy on rote visual scanning and paper and pencil tasks	Think on one's feet Come up with an answer immediately Make a quick decision Copy work from the board Write information when time is a factor (e.g., taking tests)

What Can Slow Processing Speed Look Like?

Noah is a nine-year-old boy who loves baseball and computer games. He has always been a 'dawdler' and needs constant reminders to get moving in the mornings. Noah is a quiet boy who often lets his friends do the talking for him. He says it is easier to let others put up their hands in class even when he knows the answer because Noah knows it takes him a long time to get his words out. Noah worries that others will think he is not smart and he is beginning to doubt his own intelligence. Noah hates to write because it takes forever and his printing embarrasses him.

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Strategies for Helping Kids with Slow Processing

- Provide additional time to complete work
- Build in resource time to complete class work
- Provide notes or photocopies of lecture material, where possible
- Be specific in telling kids exactly what you want them to do
- Directly assist kids in beginning activity (e.g., point out where to start with a * on page)
- Check with kids part-way through activity to ensure they have not forgotten what to do or have not lost the instructional set
- Avoid asking kids too many questions
- Provide additional time to complete work and modify expectations for amount completed

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LDs Reflecting Problems with Executive Functioning

Some kids with LDs have trouble with tasks of executive functioning, or a set of higher order skills that control and regulate other abilities and behaviors. Executive functions include the ability to start or stop actions, to monitor and change behavior as needed, and to plan or organize, for example. Kids who struggle with executive functioning may have trouble inhibiting impulses or may have a hard time anticipating consequences or being flexible and adapting to new situations. They may have difficulty applying what they have learned in one setting to new situations (generalizability) or may not be able to pay attention to how they are doing something (self monitoring).

In the Walk-A-Mile workshop, difficulties with **executive functioning** is demonstrated by the Stroop exercises.

Terms used	Description	Application (it can be harder to…)
Executive Function Attention Self-monitoring Planning, organization Self-control Initiation	"meta-cognitive" skills (ability to think about thinking) Ability to select, direct and sustain focus Ability to put on the brakes, to inhibit impulses	Identify and carry out steps for a school project Manage frustration in a classroom setting Monitor and adapt tone of voice or volume of speech Stop and think before acting

What are the differences between LDs with executive functioning problems and Attention Deficit Hyperactivity Disorder (AHDH)?

ADHD is one of the most common childhood psychiatric disorders, occurring in 3 to 7% of the population. It is defined as a persistent pattern of problematic symptoms that include difficulty staying focused and paying attention, difficulty controlling behavior, and/or hyperactivity (over-activity). For diagnosis, ADHD has to be present from an early age and evident in at least two settings (e.g., home and school) and it has to be causing significant functional impairments to daily life.

ADHD is technically not a learning disability but it can interfere with learning and it co-occurs in people with LDs up to 40% of the time. By definition, people with ADHD have problems with executive functioning. Often, the main difference between LDs with executive functioning problems and LDs with ADHD is really a difference in severity and intensity of inattention and/or hyperactivity.

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What Can Difficulties with Executive Functioning Look Like?

Purnima is a ten-year-old girl who is full of fun ideas. Her teachers have complained that Purnima never listens and cannot sit in her seat without disrupting the other kids. Purnima's friends think she is energetic and a lot of fun, although sometimes, Purnima doesn't know when to stop. At home, Purnima gets into trouble because she doesn't stop and think of the consequences. Her mother worries about her safety and feels that she needs to watch Purnima more than the others in the family. Purnima's siblings complain that she is always the first to choose activities and to make the rules.

Strategies for Helping with Executive Functioning Difficulties

- Break tasks and routines down into steps. For example, getting ready for breakfast involves the following steps:
    - Getting out of bed
    - Making bed
    - Washing face, brushing teeth
    - Getting dressed, combing hair
    - Going to kitchen, etc.
- Outline the steps needed to complete a project or task, and help kids plan how and when to do each step.
- Discuss a number of alternative approaches to a problem and review the pros and cons of each approach.
- Prepare individuals ahead of time for change.
- Address the same issues and use similar approaches in all settings (eg at home and at school) to best achieve generalization
- Provide more adult supervision of activities than might be expected for their age

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LDs and Mental Health

Having LDs puts kids at greater risk for a number of mental health concerns. As demonstrated by the experiential exercises in the Walk-A-Mile workshop, kids who have LDs may experience feelings of frustration, shame and perceived stigma, hopelessness, and anxiety about not meeting expectations. 40% of people with LDs are estimated to struggle with problems such as anxiety, depression, or low self esteem. In addition, 75% of kids with LDs are estimated to have difficulties with social relationships. Depending on the nature of the LDs, it can be hard for kids to 'read' social cues or to adapt to new social situations, or to regulate their emotions or behaviors in order to fit in with peers. Kids with LDs are at greater risk for bullying and victimization, social isolation and rejection, or for feelings of loneliness.

Research has identified a number of protective factors that help to foster resilience and well being among kids with LDs. People who have personal characteristics such as persistence in the face of adversity, flexibility to pursue alternate strategies when appropriate, and self-awareness are at reduced risk for problems. We also know that helping kids to develop effective skills such as achievable goal-setting and coping strategies to manage stress and frustration is important.

Strategies for Helping Self Esteem

- Support kids to pursue activities in their area of strength or interest
- Plan activities that will give kids the greatest chance of success
- Experiencing success may give kids the motivation to try activities that are more of a challenge for them
- Be supportive of any signs of progress, even when progress is slow
- Kids need to learn that practice can help develop skills and that success is within their reach
- Notice the reactions of classmates to a kid's academic strengths/weaknesses. Sometimes self-esteem and competence increases when students are in an academic environment with peers who are similar to them academically

Strategies for Helping Emotional Awareness and Control

- Look at anger and frustration as possible ways of saying, "I can't" or "It's too hard", which may in fact be the case
- Offer assistance in a supportive way
- Ask what part of what they are doing is frustrating kids: Would they like to learn another way of approaching it?
- Be patient
- Validate feelings of frustration, anger
- Label feelings and emotions in a non-judgmental way

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- Allow kids time to engage in solitary activities in order to give them time to think, reflect, and calm down
- Create a safe, supportive atmosphere, which respects confidential information
- Allow kids to discuss their fears and anxieties. Show that it is ok to talk about them
- Recognize that kids with LD or ADHD may seem to overreact to what you think of as small issues. Remember that their reaction needs to happen to let you know how they are feeling. Try not to overreact in return.

Strategies for Helping Kids with Social Interactions

- Discuss with kids their understanding of what happens to them socially
- Assist them to gain awareness of how they behave with others
- Help them clarify their feelings and make their words consistent with their feelings
- Assist them to review cause and effect (behaviours and responses)
- Offer them meaningful feedback about their behaviour
- Allow kids the opportunity to engage in solitary activities, while taking care to ensure that there are also sufficient opportunities for peer interaction
- Help kids to learn to recognize situations that are potentially problematic and develop strategies to deal with them (i.e. recognizing that large groups are too stimulating, and requesting permission to be in a smaller group)
- Use descriptive, non-judgmental explanations about inappropriate behaviors, being specific and instructional
- Explain social situations verbally, as they happen
- Use real life rather than artificial examples
- Don't just tell the individual what they did wrong. Tell them what to do the next time, giving specific examples
- Kids with LDs may annoy, irritate or frustrate other kids. Allow others to share their frustration in private, out of earshot of the kids with LDs. Help them find positive ways of giving feedback that would be helpful

Strategies for Helping Communication Between Home, School and Other Settings

- Support all facets of the world of a kid with learning disabilities (home, school, recreational settings, religious settings, summer camp, scouts, etc.) to understand this kid's needs and offer flexibility in their approach to them
- Communication with school to develop consistency between home and school, particularly related to how behaviour is labeled, interpreted and handled
- Find out about the special education services available at your kid's school
- Understand your kid's legal rights in accessing support and accommodations

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- Know the rules so that you can take parte in your kid's educational planning
- Get to know the people who make the decisions at the school
- Keep written records
- Gather information from other parents, from health professionals etc.
- Communicate effectively
- Share the child's strengths and interests with the school
- Emphasize the need to find solutions to work collaboratively
- Focus on the big picture rather than on small details

Homework tips:

- Allow timed breaks but limit them to activities that are not too stimulating. Breaks may include changing the place of study
- Set a specific time each night for homework and keep it consistent
- Create a study space that is quiet, uncluttered, organized and equipped with supplies

Other Strategies to Help With Emotional Wellbeing

- Recognize that uncooperative behavior may be the result of feeling confused, anxious and overwhelmed
- Monitor progress with together with kids. Find out which situations are more easily managed and which are more troublesome. Self-evaluation should be used in a manner that strengthens self-esteem
- There are times that parents of kids with learning disabilities need to intervene *directly*. For example:
    - If child/adolescent is being bullied
    - If the school program is not meeting his/her needs
    - If the child/adolescent needs help with homework
    - If the child/adolescent needs assistive devices
    - If the child/adolescent needs mental health support (depression, anxiety, risk of self-harm)
- These kids benefit from frequent check-ins to discuss problems, develop strategies to address problems, and celebrate successes

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Understanding LDs: Putting it all Together

Learning Disabilities (LDs) refer to a variety of neurologically-based disorders that affect a person's ability to take in, understand, remember or express information. Learning Disabilities are the most common form of disability for children aged 5 to 14 years and within Canada**,** LDs are estimated to affect over three million Canadians (Stats Canada, 2006). A lifelong and universal disability, LDs can have a negative impact on academic functioning, social functioning and on tasks of everyday life. Moreover, having LDs is associated with an increased risk for mental health problems including anxiety, depression and lower levels of self esteem.

In this booklet, we have outlined the specific cognitive processes that can be affected by LDs, such as phonological processing, memory or speed of processing, for example. However, each kid with LDs has his/her own profile of strengths and challenges. Often, there is an interaction between the processes that make each person unique. For example, someone whose LDs reflect working memory problems and slow processing speed can have trouble keeping information in mind (working memory) long enough to make sense of it (processing speed) and can end up feeling overloaded and overwhelmed.

One of the most effective strategies for people with LDs is knowledge: Understanding one's own abilities allows one to maximize areas of strength and to compensate for areas of challenge. Over the past decade, advances in research technology have provided us with a better understanding of how the brain works. We also learn from the experiences of kids with LDs and their families. It is our hope that by promoting a community-wide understanding of the mental health needs of kids with learning disabilities, we will create healthier and more supportive communities to foster resilience and wellbeing for our kids.

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Resources

Books

Dane, Elizabeth. *Painful Passages*. NASW Press, 1990. Written by a social worker, this book offers information on understanding and working with individuals with learning disabilities and their families.

Farnham-Diggory, Sylvia. *The Learning Disabled Child.* Harvard University Press, 1992. This book presents a comprehensive overview of learning disabilities.

Fisher, Gary and Cummings, Rhoda. *The Survival Guide for Kids with LD*. Free Spirit Publishing, Inc., 1990. This book was written for children, to help them understand their learning disabilities.

Garber, Stephen, Daniels Garber, Marianne, and Spizman. *Beyond Ritalin.* Harper Perennial, 1992. This book presents an overview of ADHD, the role of medication, and alternate strategies to address issues related to ADHD.

Garcia-Winner, Michelle. *Thinking About YOU Thinking About ME.* Published by Michelle Garcia Winner, SLP, 2002. mwinner@worldnet.att.net. This book provides an overview of social cognitive deficits and offers strategies to develop perspective taking and communication abilities.

Hallowell, Edward and Ratey, John. *Driven to Distraction.* Pantheon Books, 1994. This book was written for laymen and professionals. It presents an overview of ADHD in children and adults.

Lee, Christopher and Rosemary Jackson. *Faking It: A Look into the Mind of a Creative Learner.* Heinemen, NH: Boynton Cook Publishers, 1992. In this book, a young adult describes his experiences growing up with learning disabilities and the process of accepting help through college.

Levine, Mel. All Kinds of Minds. Educators Publishing Service, Inc., 1994. This book was written to help children 11 and under to understand different kinds of learning disabilities.

Levine, Mel. *Educational Care: A System for Understanding and Helping Children with Learning Problems at Home and in School*. Educators Publishing Service, Inc., 1994. This book offers descriptions of learning difficulties, strategies for teachers and parents, and ways to demystify learning difficulties so that children can better understand their problems with learning.

Levine, Mel. *Keeping a Head in School: A Student's Book About Learning Abilities and Learning Disorders*. Educators Publishing Service, Inc., 1987. This book was written for teenagers to help them understand their learning disabilities.

Mate, Gabor. *Scattered Minds: A New Look at the Origins and Healing of Attention Deficit.* Vintage Canada. 2000. A new book on understanding attention deficit, written by a clinician who has ADD.

Mather, Nancy & Goldstein, Sam. *Learning Disabilities and Challenging Behaviors: A Guide to Intervention and Classroom Management.* Paul H. Brooks Publishing Company, 2001. This book was co-written by a psychologist and an educator, to assist teachers in understanding and programming for students with learning disabilities.

Manassis, Katarina. *Keys To Parenting Your Anxious Child.* Barron's Educational Series, Inc., 1996. This book is written to assist parents who are raising anxious children.

Osman, Betty B. *Learning Disabilities: A Family Affair*. Warner Books, reprinted 1989. This book describes the impact of the child with learning disabilities on the family and offers parenting strategies.

Rourke, B.P. (1995). Syndrome of Nonverbal Learning Disabilities: *Neurodevelopmental Manifestations*. New York: Guilford Press.

Shaywitz, Sally. *Overcoming Dyslexia: A New and Complete Science-Based Program for Reading Problems at Any Level.* Alfred A. Knopf, 2003. This book offers up to date information on understanding and treating dyslexia.

Smith, Sally L. *No Easy Answers: The Learning Disabled Child at Home and at School*. Bantam Books, 1981. This book was written to help parents and teachers unlock the mysteries of learning disabilities. The author is a mother, teacher, school administrator and university professor.

Stewart, Kathryn. *Helping a Child With Nonverbal Learning Disorder or Asperger's Syndrome*. Harbinger Publications Inc. 2002. Practical information for those working and/or living with children who have symptoms of Nonverbal Learning Disabilities or Asperger's Syndrome.

Swanson, H.Lee, Harris, Karen L. & Graham, Steve. *Handbook of Learning Disabilities.* The Guilford Press. 2003. This is a comprehensive volume of articles on understanding and remediating learning disabilities.

The Lab School of Washington. *Color Me Successful. I can be successful, just like my role models.* The Lab School of Washington, D.C. This is a colouring book highlighting successful individuals and how they learned to overcome their learning disabilities. 4759 Reservoir Road Northwest, Washington, D.C. 20007, USA, (202) 965-6600.

Thompson, Sue. *The Source for Nonverbal Learning Disorders.* LinguiSystems, Inc., 1997. Practical information for parents of children with nonverbal learning disabilities.

Wong, B.Y. *The ABC's of Learning Disabilities.* Academic Press, 1997. An excellent overview of learning disabilities, a review of current research in the field and academic intervention.

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Organizations

Integra

25 Imperial Street, 4th Floor
Toronto, Ontario
M5P 1B9
www.integra.on.ca
Phone: (416) 486-8055
Fax: (416) 486-1282
Email: info@integra.on.ca

Learning Disabilities Association of Toronto District

121 Willowdale Avenue, Suite 205
Toronto, Ontario
M2N 6A3
www.ldatd.on.ca
Phone: 416-229-1680
Email: admin@ldatd.on.ca

Learning Disabilities Association of Ontario

Suite 1004, Box 39
365 Bloor St. East
Toronto, Ontario
M4W 3L4
www.ldao.ca
Phone: (416) 929-4311
Fax: (416) 929-3905

Learning Disabilities Association of Canada

323 Chapel Street Suite 200
Ottawa, Ontario
K1N 7Z2
www.ldac-taac.ca/index-e.asp
Phone: (613) 238-5721
Fax: (613) 235-5391
Email: info@ldac-taac.ca

Learning Disabilities Association of America

4156 Library Road
Pittsburgh, PA
15234 USA
www.ldanatl.org
Phone: (412) 341-1515
Fax: (412) 344-0224
Email: http://www.ldanatl.org/contact/contact.cfm

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Council For Exceptional Children (C.E.C.)

Division of Learning Disabilities
ERIC Clearinghouse on Disabilities
1920 Association Drive
Reston, VA 20191-1589 USA
www.cec.sped.org
Phone: 1-800-232-7733

Council for Exceptional Children Ontario

www.cecontario.ca

Websites

Learning Disabilities – General:

LD OnLine - The Interactive Guide to Learning Disabilities
http://www.ldonline.org

National Center for Learning Disabilities: The power to hope, to learn, and to succeed.
http://www.ld.org

Smart Kids with Learning Disabilities - An information site for parents of children with learning disabilities
www.SmartKidswithLD.org

Ministry of Education
Special Education Web Site
www.edu.gov.on.ca/eng/general/elemsec/speced/speced.html

Special Needs Opportunity Window
www.snow.utoronto.ca

Attention Deficit Hyperactivity Disorder:

Attention Research Update - a web-site administered by David Rabiner, Ph.D, Senior research Scientist, Duke University
www.helpforadd.com/info

NLD/Aspergers:

NLD on the Web!
www.nldontheweb.org

NLDline! - Dedicated to improving awareness among professionals and parents about Nonverbal Learning Disabilities
www.nldline.com

Asperger's Society of Ontario
www.aspergers.ca

O.A.S.I.S.: Online Asperger Syndrome Information and Support www.udel.edu/bkirby/asperger

Videos

Learning Disabilities and Discipline: Richard Lavoie's Guide to Improving Children's Behaviour

Videotape and discussion guide, 1996

Learning Disabilities and Social Skills with Richard Lavoie: Last One Picked... First One Picked On

Videotape and discussion guide, 1994

Understanding Learning Disabilities: How Difficult Can This Be? The F.A.T. City Workshop with Richard Lavoie

Videotape and discussion guide, 1989
PBS Video
1320 Braddock Place, Alexandria, VA 22314 USA
(800) 344-3337

Glossary

Please Note: Terms change over time; this is common to all fields, but especially true in newer fields, when concepts are named and refined as our understanding deepens. You will notice if you research a number of different sites, books or articles, that different terms describe similar or identical disabilities, and the same term can mean different things, depending on the country of origin.

ADHD – (Attention Deficit Hyperactivity Disorder) ADHD often affects people who have LDs, and is beginning to be seen as a type of LD itself. It is also a term that changes very frequently, mostly because there are two distinct subcategories: one sort of ADHD includes hyperactivity, and the other does not. ADHD generally interferes with attention span, impulse control, and (sometimes) hyperactivity.

Auditory Processing – the way we understand information we hear. LDs affecting this process can affect the accuracy of what's heard, memory of what's heard, organization of what's heard, or figure-ground discrimination of sounds.

Cognitive – another way of talking about intelligence. Cognition means thinking.

Dysgraphia – learning disabilities that affect written expression.

Dyscalculia – learning disabilities that affect mathematics

Dyslexia – learning disabilities that affect language. Commonly misunderstood to be a condition that causes letters to appear backwards and upside down, but in reality much more complicated. The bottom line of dyslexia is now thought to be a problem with the sounds in words (phonological awareness).

Executive functions – the skills need to plan, manage, and evaluate things in everyday life as well as school and work.

Expressive / Receptive – refer to transmitting or receiving information.

Fine-motor/Gross-motor control – the ability to accurately use either fine-motor or gross-motor muscle control. Fine-motor muscle control refers to small muscles doing small things – threading a needle, holding a pen. Gross-motor muscle control are large – like dancing or jumping.

Figure-Ground Discrimination – this can refer to visual or auditory information, and describes the ability to distinguish important details from surrounding information. An example of visual figure-ground discrimination would be being able to see the words on a page and ignore a background design. Auditorily, it would be being able to pay attention to a lecture and ignore the sounds of rustling paper and people whispering.

Impulsivity – people with poor impulse control do not always think before they act, or consider the consequences of actions.

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Memory (Long-Term) – memory that stores information for later use. For example, the phone number of your best friend or a family member that you have memorized is stored in your long- term memory.

Memory (Short-Term) – memory that holds information briefly while you use it. For example, when you read a phone number and then dial it, the number is held in your short-term memory.

Memory (Working) – memory that holds an idea while you are using it - for example, your working memory holds a formula when you are working on a math problem.

Multisensory Teaching - using many senses (visual/auditory, kinesthetic-tactile) and pathways in the brain simultaneously in order to enhance memory and learning.

Nonverbal LDs – learning disabilities that affect all learning not related to language, including social skills and physical coordination. Also called NLDs or NVLDs.

Organizational Problems – can include problems with managing time, organizing tasks, and organizing space.

Processing Speed – how quickly or slowly a person is able to use, take in, or bring out information. It is not related to cognitive ability – just to speed and fluency.

Phonemic Awareness/Phonological Awareness – the ability to recognize the distinct sounds in words, which is required for further language development.

Social perception – the ability to interpret social situations, for example by 'reading' facial expressions, tone of voice, body language and other verbal and nonverbal cues. Individuals who have trouble using social perceptions to guide their behaviour may have social skills difficulties.

Social Skills – the skills we use in society to get along socially. For example, we learn when it is appropriate to interrupt a conversation, and how close to stand to people when we're chatting. Some LDs interfere with learning these rules, which causes social struggles – loneliness, conflict, awkwardness, etc.

Visual-Motor Integration – the coordination of visual information with motor processes.

Visual Processing – the way we understand information from our eyes. LDs affecting this can affect the accuracy of what's seen, memory of what's seen, understand what's seen, or figure- ground discrimination. Visual Tracking – the way we follow a line of text on a page - can also be affected .

VALUE ADDED COURSE

Learning Disability Course and PECO 9

List of Students Enrolled (November 2018- December 2018)

Final Year MBBS Student			
Sl. No	**Name of the Student**	**Roll No**	**Signature**
1	AARTHI .H	U15MB250	
2	ABARNA. M	U15MB251	
3	ABINAYA.J	U15MB252	
4	ADARSH .S	U15MB253	
5	AGILAN .A	U15MB254	
6	AKSHAYA .S	U15MB255	
7	AKSSHAYA .M.R	U15MB256	
8	AMARNATH. S	U15MB257	
9	AMUDHESAR .K.M	U15MB258	
10	ANANDH.S	U15MB259	
11	ARCHITH VIGNESH .B	U15MB260	
12	ARJUNBALAJI .A	U15MB261	
13	ARUL NIVETHINI V.A	U15MB262	
14	ARUL PRINCE. E	U15MB263	
15	ARUN PRASAD. K	U15MB265	
16	ARUNA .S	U15MB266	
17	ARUNKUMAR .S	U15MB264	
18	ASAN THASTHAGIR. M	U15MB267	
19	ASWIN. B	U15MB268	
20	BALAMANI KANDAN. S	U15MB269	

Subject Expert
ASSISTANT PROFESSOR
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

HOD
PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

AARTHI · H
UNI·NO : U15MB250

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

LEARNING DISABILITY COURSE

MULTIPLE CHOICE QUESTIONS

Course Code: PECO 9

1. Developmental disorders can be broadly categorized into

- Autism and attention deficit/hyperactivity disorder.
- ✓ Learning difficulties, autism and attention deficit/hyperactivity disorder.
- Infant depression and attention deficit/hyperactivity disorder.
- Learning difficulties and childhood schizophrenia.

2. **A child with dyslexia but with no other difficulties would be classified as having:**

- Attention deficit/hyperactivity disorder.
- A learning difficulty.
- ✓ Autism.
- A specific learning difficulty.

3. **The most common causes of learning difficulties are:**

- Perinatal infection (e.g. rubella).
- Postnatal trauma (e.g. encephalitis).
- ✓ Deprived upbringing.
- Genetics (e.g. Down's syndrome).

4. **Autism is characterised by impairments in which of the following areas:**

- Social interaction.
- Patterns of behaviour.
- Communication.
- All of the above.

5. **Which of the following has not been suggested to be a cause of autism?**

- The measles,mumps and rubella vaccine.
- Metal metabolism disorder.
- Genetics.
- Overproduction of the neurotransmitter serotonin.

6. **Within attention deficit/hyperactivity disorder, which of the following is notclassified as a problem relating to poor attention?**

- Experiences difficulties in waiting in turn.
- Easily distracted.
- Dislikes tasks involving mental effort, e.g. homework.
- Appears routinely forgetful.

7.

Within attention deficit/hyperactivity disorder ,which of the following is not classified as a problem relating to hyperactivity-impulsivity

- Doesn't appear to listen when being told something or spoken to.
- Rather than sitting still, squirms in seat and fidgets.
- Experiences difficulties in playing quietly.
- Talks excessively.

8.

What is the suggested reason why the prevalence rates of ADHD is higher in the US (5–8%) than in the UK (0.5–1%)?

- The higher consumption rate of fast food in the US is a primary cause of the disorder.
- ADHD may be underdiagnosed in the UK.
- Pharmaceutical companies in the US encourage the diagnosis of the disorder.
- Children in the US watch more TV than those in the UK.

9.

Which of the following areperinatal risk factors associated with ADHD?

- Maternal alcohol misuse.
- Low birth weight.
- Maternal stress.
- All of the above.

10. **The most widely prescribed pharmacological treatment for ADHD is:**

- Diazepam.
- Ritalin.
- Risperidone.
- Lithium.

015MB250
ABARNA

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Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that __AGILAN .A_____U15MB254_____ has actively participated in the Value Added Course on *Learning Disability in Children* held during November 2018- December 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Abhijeet Shrivastava

RESOURCE PERSON

Dr. Raghavendran

COORDINATOR

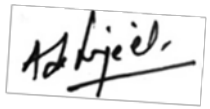
Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that __ABINAYA.J_____U15MB252_____ has actively participated in the Value Added Course on *Learning Disability in Children* held during November 2018- December 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.



Dr. Abhijeet Shrivastava

RESOURCE PERSON



Dr. Raghavendran

COORDINATOR

Student Feedback Form

Course Name: **Learning Disability in Children**

Subject Code: **PECO9**

Name of Student: Abinaya. J Roll No.: 115MB252

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

nil

Date: 21.12.2018

Abinaya
Signature

Date: 03.01.2019

From

Dr. Raghavendran V
Professor and Head,
Department of Pediatrics,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Learning Disability Course

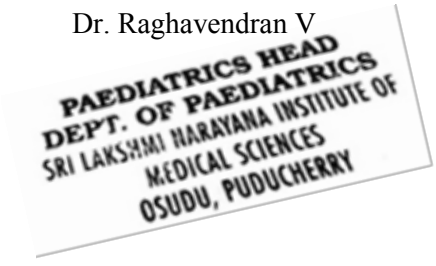
Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Learning Disability Course** from November to December 2018 for 20 final year MBBS students. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,



Dr. Raghavendran V



Encl: Certificates

Photographs



PECO9 – LEARNING DISABILITY COURSE, NOV 2018

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSSUDU AGARAM VILLAGE; KUDAPAKKAM POST,PONDICHERRY - 605003

Date 8.10.2018

From
Dr. PAMMY SINHA ,
HOD
Pathology
SriLakshmiNarayanaInstituteofMedicalSciences,Puducherry
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
SriLakshmiNarayanaInstituteofMedicalSciences,Puducherry
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Pathology assessment of tumor tissue

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: pathology assessment of tumor tissue Nov 2018- Jan 2019

. We solicit your kind permission for the same.

Kind Regard

Dr. PAMMY SINHA ````

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. PAMMY SINHA

The Expert: Dr. PARTHO PROTIM BARMAN

The committee has discussed about the course and is approved.

Dean
(Sign &Seal)

Subject Expert
(Sign &Seal)

HOD
(Sign &Seal)

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

Professor Dept. of Pathology
Sri Lakshmi Narayana Institute of Medical Science
Osudu, Kudapakkam, Puducherry-605 502

PROFESSOR & HEAD, DEPT OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSSUDU AGARAM VILLAGE; KUDAPAKKAM POST,PONDICHERRY - 605003

Circular

15.10.18

Sub: Organising Value-added Course: Pathology assessment of tumor tissue

With reference to the above mentioned subject, it is to bring to your notice that **SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES Bharath Institute of Higher Education and Research**, is organising"**_Pathology assessment of tumor tissue _from Nov 2018-Jan** 2019_____". The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 27.10.2018 . Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

Course Proposal

Course title:Pathology assessment of tumor tissue

CourseObjective:

1. To understand the general concepts of pathology assessment of tumor tissue
2. Should know about the initial pathology assessment
3. Should be able to asssit gross examination and staining of histopathological sections

CourseOutcome: Should know about the general concepts of pathological assessment of tumor tissue

Course Audience: IInd year MBBS

Course Coordinator: Dr. partho protim barman

Course Faculties with Qualification and Designation:

1. **Dr.A.Partho Protim barman**
2. **Dr.Pammy Sinha**
3. **Dr. sivaganesh @porko.G**

Course Curriculum/Topics with schedule (Min of 30 hours)

SINo	Date	Topic	Faculty	Time	Hours
1.	3.11.2018	Introduction to pathology assessment of tumor tissue	Dr. Partho protim Barman	1.30-4 pm	2.5 hrs
2.	10.11.2018	Types of pathology lab	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs
3.	17.11.2018	Members of pathology labs	Dr. sivaganesh @porko.G	1.30-4 pm	2.5 hrs
4.	24.11.2018	Conventional preparations	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs
5.	1.12.2018	Specimen preparation	Dr. Partho protim Barman	1.30-4 pm	2.5 hrs
6.	8.12.2018	Types of biopsies	Dr. sivaganesh @porko.G	1.30-4 pm	2.5 hrs
7.	15.12.2018	Liquid biopsy	Dr. Partho protim Barman	1.30-4 pm	2.5 hrs
8.	22.12.2018	Tissue fixation	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs

		Practical Class	Dr. sivaganesh @porko.G		
9.	29.12.2019	Gross examination	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs
10.	5.1.2019	Histology staining	Dr. sivaganesh @porko.G	1.30-4 pm	2.5 hrs
11.	12.1.2019	General concepts about special stain and IHC markers	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs
12	19.1.2019	Assesment and giving feed back	Dr. Partho protim Barman	1.30-4 pm	2.5 hrs
		Total			30 hrs

REFERENCE BOOKS:

1. MANUAL OF SURGICAL PATHOLOGY SUSAN C. LISTER

VALUE ADDED COURSE

1. Name of the programme& Code

Pathology assessment of tumor tissue PA09

2. Duration& Period

30 hrs NOV 2018- JAN 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short notes questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7.No. of times offered during the same year:

1 TIME [NOV 2018 - JAN 2019]

8. Year of discontinuation: 2020

9. Summary report of each program year-wise

Value Added Course- NOV 2018- JAN 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength& Year**
1	PA09	PATHOLOGY ASSESSMENT OF TUMOR TISSUE	Dr. PARTHO PROTIM BARMAN	IInd MBBS	NOV 2018- JAN 2019

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

Dr. PARTHO PROTIM BARMAN
Professor Department of Pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

COORDINATOR

PROFESSOR & HEAD DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF MEDICAL SCIENCES.
PUDUCHERRY - 605 502.

COURSE DETAILS

Particulars	Description
Course Title	Pathology assessment of tumor tissue
Course Code	PA09
Objective	1.Objectives 2. Introduction 3. Types of pathology labs 4. Members of pathology labs 5. Specimen preparation 6. Types of biopsies 7. Liquid biopsy 8. Tissue fixation 9. Initial pathology assessment 10.Gross examination 11. Histology staining 12. Markers
Further learning opportunities	Immunohistochemistry
Key Competencies	On successful completion of the course the students will have knowledge in the assessment of tumor tissue
Target Student	2nd MBBS Students
Duration	30hrs NOV 2018- JAN 2019
Theory Session	20hrs
Practical Session	10hrs
Assessment Procedure	Short answers

This course highlights the importance of pathologic evaluation of tissue in establishing a diagnosis of cancer and provides a basic summary of the processes and tests used in the pathology laboratory culminating in the final pathology report. Topics include the workings of the pathology laboratory; tumor sampling techniques, including liquid biopsies; handling of tissue in the pathology lab; and common laboratory testing methodologies performed on tumors used to establish diagnosis, provide prognostic information, guide therapy and monitor response to therapy.

Objectives

Upon successful completion of this module, participants should demonstrate:

- Improved understanding of the importance of pathologic evaluation of tissue to establish diagnosis and guide therapy for patients.
- Basic understanding of the various types of pathology laboratories and members of the pathology laboratory.
- Improved understanding of the various biopsy techniques used to sample tumors.
- Basic understanding of tissue fixation techniques and the importance of pre-analytical variables in ensuring accurate ancillary testing.
- Improved understanding of how biomarker testing is used in oncology.
- Improved understanding of the methodology and clinical utility of common molecular and immunohistochemical tests used in oncology.

Introduction to the Pathology Laboratory

Health care providers may be unfamiliar with the workings of the pathology laboratory. The delivery of a specimen to the pathology laboratory initiates a complex series of events resulting in a pathologic diagnosis/interpretation. The following section reviews the importance and key objectives in the pathologic evaluation of tissue and provides information on the types and members of the pathology laboratory.

Importance of pathologic examination

The diagnosis of cancer is not conclusively established, nor safely assumed, in the absence of a tissue diagnosis, nor should definitive therapy for cancer, with rare exception, be undertaken. Policies supporting this practice are written into the bylaws of most hospitals and are regularly monitored by hospital tissue committees and accrediting agencies.

The goal of pathology examination of tissue is to provide accurate, specific and sufficiently comprehensive diagnoses to enable the treating physician to develop an optimal plan of treatment. There are hundreds of varieties tumors, most with characteristic biology, that require accurate diagnosis by pathologists. Data on markers with prognostic and predictive significance are also routinely incorporated into pathology reports, allowing individualized treatment plans for patients. It is not only important to obtain sufficient tissue for a specific diagnosis of malignancy, but for many malignancies, additional tissue is required for prognostic and predictive ancillary studies.

While some have postulated that we are moving toward a gene/mutation driven categorization of tumors replacing disease site clinics and treatment planning (e.g., PIK3CA mutated carcinomas instead of "ovarian" cancer or "breast" cancer), data is accumulating that histology, morphology, disease site location and microenvironment in addition to genomic changes are still important factors in understanding the disease biology for treatment planning.

Types of pathology labs

Hospital labs

Almost all hospitals contain a laboratory to support the clinical services offered at the hospital. The specific pathology services would include both anatomic (surgical pathology, cytopathology, autopsy) and clinical (laboratory medicine) pathology at most hospitals. Most, if not all, inpatient and many outpatients seen by hospital-affiliated physicians require tests performed by hospital labs.

Reference labs

Reference labs are usually private, commercial facilities that do both high volume and specialty (high complexity and/or rare) laboratory testing. Most of these tests are referred from physician's offices, hospital facilities and other patient care facilities such as nursing homes. Reference labs, typically located at a site other than the healthcare facilities, are often used for specialized tests that are ordered only occasionally or require special equipment for analysis.

Public health labs

Public health laboratories are typically run by state and local health departments to diagnosis and protect the public from health threats such as outbreaks of infectious disease. These labs perform tests to monitor the prevalence of certain diseases in the community which are a public health concern, such as outbreaks of foodborne or waterborne illnesses or detection of unique infectious agents.

Members of the pathology lab

The staff of most clinical laboratories is diverse. A non-comprehensive summary of the major types of individuals found in these laboratories is provided below.

Anatomic pathology which encompasses surgical pathology, cytopathology and autopsy pathology includes the following:

- **Pathologists:** Physicians with special training in the diagnosis and detection of disease. Practicing pathologists may be subspecialty or general pathologists, depending on the types of cases they review on a daily basis. Some pathologists may perform a subspecialty fellowship in a specific area of pathology such as cytopathology, hematopathology, dermatopathology, nephropathology, neuropathology, etc.
- **Pathologists' assistants (PAs):** These individuals assist with the gross description and dissection of surgical cases and biopsies, working closely with supervising pathologists. PAs may also assist in the technical aspects of intraoperative assessment such as frozen section and selection of tissue for research and clinical trials (tissue procurement).
- **Cytotechnologists:** These individuals assist in screening specimens that are composed of small samples of cells rather than whole sections of tissue, e.g., Pap smear specimens. After screening and marking diagnostic cells in slides, a cytotechnologist refers cases with abnormal cells to pathologists for review. Other common cytologic specimens include fine needle aspirations (FNAs), washings or scrapings of cells and other body fluids.
- **Histotechnologists:** These individuals manage the processing of tissue in the laboratory and perform the technical components of making slides from tissue for evaluation by a pathologist. These components include the process of fixing the tissue, embedding it in paraffin, sectioning tissue onto slides and staining of the tissue on slides.

Clinical pathology which encompasses laboratory medicine includes the following:

- **Pathologists/PhD scientists:** These professionals provide direction of clinical labs to ensure accurate and timely reporting of lab tests and serve as a resource for result interpretation to clinicians. Individuals often have specific training in one or more of the following areas: clinical chemistry, microbiology, molecular pathology, hematology, immunology and blood banking
- **Medical laboratory technicians:** These health care professionals perform laboratory testing and analysis on body fluids and other specimens to help determine the presence or absence of disease.

Phlebotomists: These health care professionals are trained to draw blood from a patient for clinical testing, transfusions, donations or research.

Specimen Preparation

Obtaining sufficient tissue and practicing proper specimen handling (which begins even before the specimen arrives in the pathology laboratory) are essential components for accurate pathologic diagnoses. The following section reviews the various types of biopsies, including liquid biopsies, used to sample tumors and important aspects of tissue fixation.

Tumor sampling

Although many types of tests may be used to make assessments that are *suggestive* of cancer, only a biopsy can be used to *confirm* a cancer diagnosis.

Tissue biopsy

A biopsy is the removal of a small amount of tissue for pathology assessment. The goal of tissue biopsy is to obtain diagnostic tissue while minimizing morbidity, limiting potential tumor spread and avoiding interference with future treatments.

Needle biopsies

- If the tumor is palpable near the surface, the needle is guided by palpation.
- If the tumor is deeper in the body, then the needle is guided by imaging (typically ultrasound or CT scan)

Core needle biopsy

- Uses a hollow needle that is slightly larger than the one used in FNA.
- Removes a small cylinder of tissue (about 1/16 inch in diameter and about 1/2 inch in length).
- Less invasive than surgery, but often requires local anesthesia.
- Advantages: In most cases, more tissue is obtained as compared to FNA, allowing more detailed ancillary studies to be performed. Histologic architecture is preserved as compared to FNA.
- Limitations: Limited sampling and inaccessibility of some masses (secondary to size, depth, density or location).

Surgical biopsies

- Either local or general anesthesia is required.
- More invasive than needle biopsies.
- Recovery time is required, increased morbidity and cost as compared to needle biopsy.

Incisional biopsy

- A portion of a large tumor is removed.
- Typically only performed if the tumor is too large or too invasive to be removed in its entirety, or attempts at needle biopsy were non-diagnostic.
- *Excisional biopsy* - The entire tumor or suspicious area is removed.

Excisional biopsy

- The entire tumor or suspicious area is removed.
- Typically some of the surrounding normal tissue is removed as well (termed the surgical margin).
- If an excisional biopsy specimen is found to be cancerous, the pathologist will examine the surgical margin to ensure that the tumor was removed in its entirety. This is determined based on whether there is a wide enough rim of normal tissue around the tumor.

Other types of biopsies

Scrape or brush cytology

- A small spatula or brush is used to scrape cells from the tissue being tested.
- Most common example is a Pap test.
- Other tissues commonly sampled in this way include the esophagus, the stomach, the bronchi, and the mouth.

Endoscopic biopsy

- An endoscope is a thin, flexible, lighted tube that has a lens or camera on the end.
- Forceps may also be attached to the end of the tube and used to remove a small tissue sample of a suspicious area identified via the camera.
- An endoscope is used to visualize and biopsy different parts of the body, including the nose, sinuses, throat, esophagus, stomach and upper intestine.
- Some endoscopes are called a different name when they are used on a particular anatomic area. A bronchoscope is used to visualize and biopsy the lungs and bronchi. A colonoscope is used to visualize and biopsy the colon and rectum. A laparascope is used to visualize and biopsy the interior of the abdomen.

Bone marrow aspiration and biopsy

- Used to diagnose hematologic cancers including lymphoma, leukemia and multiple myeloma.
- Typically performed at the same time to examine the bone marrow.
- Bone marrow aspiration is used to sample a small amount of the liquid component of bone marrow. Bone marrow biopsy is used to remove a small amount of the solid tissue component of bone marrow.
- A wide needle is pushed into the bone. A sample of the liquid portion is removed using a syringe attached to the needle. The needle is then rotated to remove a sample of the bone.
- Most frequently performed on the pelvic bone.

Sentinel lymph node mapping and biopsy

- Termed *sentinel* lymph nodes because they "stand watch" over the tumor. They are lymph nodes that drain lymph fluid from the tumor tissue. A sentinel lymph node is defined as the first node or group of nodes to which cancer cells are most likely to spread from a primary tumor. Sentinel lymph node biopsy is most commonly used to help stage breast cancer and malignant melanoma, but it has been used for a variety of cancer types.
- Mapping involves using a colored dye and/or a radioactive material to trace the routes of lymph drainage from the tumor to identify the sentinel node(s).
- The sentinel node(s) are then removed and examined microscopically to determine if they contain cancerous cells. A negative sentinel lymph node biopsy result suggests that the cancer has not spread to regional lymph nodes or other organs. If the sentinel lymph node(s) are negative, then no additional regional lymph nodes are removed at surgery because the tumor has not yet metastasized to the lymph nodes. If cancerous cells are found, then the remaining lymph nodes in the area may be removed in a process termed *lymph node dissection.*

Liquid biopsy

Liquid biopsy technology is a rapidly emerging field. The terminology liquid biopsy came about because we are rapidly moving to an era where some of the traditional assessments done with a tissue biopsy (e.g., molecular marker testing) can now be done in blood, urine or other bodily fluid that is less invasive than a tissue biopsy. Currently, about 40 companies have developed assays to detect cell-free circulating DNA (cfDNA), circulating tumor DNA (ctDNA), or circulating tumor cells (CTCs).

Tumors shed cells (CTCs) into the bloodstream, which can be isolated for analysis. The challenge is that there are very few tumor cells, but there are a number of advantages in isolating them for analysis. The most obvious advantage is that the patient would not need to undergo an invasive biopsy procedure and only would have a blood sample drawn. This permits easier serial analysis over time to monitor a tumor's changes to better guide therapy changes as the tumor progresses. Additionally, tumors are heterogeneous, making it challenging to obtain a molecular representation of the tumor from a small biopsy sample (such as those from fine needle aspiration or core needle biopsy). Treating a patient with a tumor based on the analysis of a small biopsy may result in only a portion of the cells being effectively targeted. Using CTCs, the heterogeneity of a tumor is better represented, as the cells can come from multiple locations within a tumor as well as from multiple tumors in the case of metastatic disease. Research has shown that the number of CTCs reflects the state of disease — having more CTCs corresponds with more disease. Circulating tumor cells that have been isolated can also be sequenced individually or as a group to identify actionable targets for treatment. Several companies, e.g, CellSearch, Biocept, etc., have commercialized CTC analysis. A challenge in utilizing CTCs for diagnostics is the low numbers found in the blood at any time. While the numbers increase with metastatic state, they are still few compared to the number of red and white blood cells. Companies have developed proprietary collection methods to stabilize the CTCS in the samples sent to them overnight for isolation upon arrival in the lab. Further research is needed to improve this approach.

Dying cells release DNA into the bloodstream (cfDNA). Tumor cells do this as well (ctDNA), but typically, only a small portion of the total DNA is found in the blood. The amount of tumor DNA found in the blood typically correlates with stage, increasing with stage and number of metastases. Multiple approaches are used by different companies to analyze the ctDNA molecularly, but the most common utilize polymerase chain reaction or next-generation sequencing to identify molecular alterations in the DNA. The same advantages of isolating CTCs for analysis vs. biopsies apply to ctDNA, but it is often possible to obtain higher quantities of ctDNA than CTCs.

Currently, a few companies are expanding the concept of liquid biopsies, by using other bodily fluids, such as urine and cerebral spinal fluid (for brain tumors and metastases). Urine provides an interesting option if proven successful because the sample can be collected at home and shipped by the patient, providing the most convenient and least invasive option of all. For more information, see the section "Liquid Biopsies."

Tissue fixation



Tissue fixation serves several purposes during the pathologic evaluation of specimens. Fixation preserves tissue by preventing autolysis by cellular enzymes, helps prevent decomposition of tissue by bacteria and molds, hardens tissue to facilitate sectioning, inactivates infectious agents and enhances tissue avidity for dyes. Fixation also has undesirable effects on tissue such as alteration of protein structure (loss of antigenicity), loss of soluble tissue components and degradation of DNA and RNA.

Types of fixatives

- Formalin: The standard fixative used in the pathology laboratory is 10% phosphate-buffered formalin. It fixes most tissues well and is compatible with most ancillary testing such as immunohistochemistry and molecular tests.

- **Bouin solution (picric acid, formaldehyde and acetic acid):** Fixation in Bouin solution results in sharp hematoxylin and eosin staining and is preferred by some pathologists. Disadvantages include decreased sensitivity of immunohistochemical tests and increased degradation of DNA and RNA by picric acid.
- **B5 (mercuric chloride, sodium acetate and formalin):** B5 is often used for routine fixation of lymph nodes, spleens and other tissue if a lymphoproliferative process is suspected. B5 provides rapid fixation with excellent cytologic details and antigen preservation for lymphoid markers. Tissue may become brittle if over-fixation occurs with B5, and special procedures for disposal are needed due to the presence of mercury.
- **Glutaraldehyde:** The fixative glutaraldehyde is used for tissue that is to be evaluated by electron microscopy.

Creating formalin-fixed paraffin-embedded tissue blocks

After appropriate fixation, tissue, in blocks, is placed into a processor that dehydrates tissue through a series of graded alcohol baths and infiltrates the tissue with paraffin wax, resulting in a formalin-fixed paraffin-embedded tissue block. Tissue from these blocks is then sectioned thinly (0.4 μm to 0.5 μm) using a microtome and placed onto a glass slide. Tissue on the slides is stained with hematoxylin and eosin and covered with a coverslip before examination by a pathologist.

Effect of time on fixation

Several factors related to tissue fixation may affect the results of ancillary studies such as immunohistochemical and molecular testing. Autolysis begins immediately after tissue is removed from a patient. Although autolysis can be reduced by refrigeration, delays before fixation can adversely affect the diagnostic quality of tissue. The time between when a specimen is removed from a patient to when it is in contact with formalin is called the cold ischemic time. Extended cold ischemic times (greater than 1 hour) may result in false-negative testing for markers such as estrogen receptor, progesterone receptor and HER-2. It is important that specimens are transported to the lab in a timely fashion to avoid extended cold ischemic times. An adequate amount of fixative in the specimen container is usually considered to be 15 to 20 times the volume of the tissue. However, even in this short time, changes in phosphorylation of important proteins occur (both increase and decrease at specific sites has been noted).

The process of fixation is a chemical reaction that usually requires a minimum of 6 hours (even for small biopsy specimens) to reach sufficient tissue fixation. Certain tissue types, such as those containing a high content of adipose tissue, and larger specimens require longer fixation times. Larger tissues from resections may also require opening up to enable the fixative to enter all areas and provide even fixation. Both under-fixation and over-fixation of tissue may result in loss of antigenicity and degradation of RNA and DNA. Specific ASCO/College of American Pathologists guidelines for fixation of breast specimens exist to preserve antigenicity of tissue for hormone receptor and HER-2 testing. Breast specimens are to be fixed for a minimum of 6 hours and no more than 72 hours in 10% neutral buffered formalin. These guidelines may be applied to other specimen types in an attempt to standardize pre-analytical variables for ancillary testing.

Initial Pathology Assessment

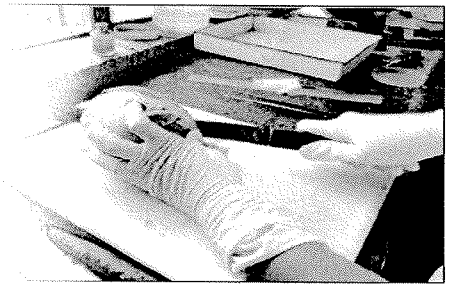
Visual inspection of the gross specimen and tissue staining are two important aspects of assessing tumors in the pathology lab and are briefly summarized in the following section.

Gross examination

Gross examination is the visual macroscopic inspection of the tumor, without the use of a microscope. All anatomic structures present, and the tissue specimen's size, color and consistency, are recorded. Gross examination helps the pathologist determine the size of the specimens to dissect and assess. Histologic sections that best demonstrate the features seen at gross description, including assessment of margins (if applicable) are taken during gross examination. Inking of margins also is performed at gross examination. The process provides important diagnostic information used for staging and prognosis, and a picture may be taken as part of the record.

Grossing is an art

A knowledge of what needs be taken for microscopic study is crucial for the diagnosis.



Histology staining



Histo[illegible] e microscopic appearance of stained cell and tissue structures of a specimen. The char[illegible] istology of cells/tissue is used to identify all of the pathologic processes involving a sp[illegible]

Com[illegible] l histologic stains include:

- [illegible]xylin (nuclei) and eosin (cytoplasm) staining (H&E)
  H&E is the standard stain performed for routine examination of tissue under the [illegible]microscope to form the cornerstone of pathologic diagnoses. Hematoxylin is a [illegible]lark blue or violet stain that binds to DNA and RNA in the nucleus of cells. Eosin [illegible]s a red or pink stain that binds to cytoplasmic proteins.
- [illegible] variety of special stains are available to evaluate pathologic processes, a few of [illegible]re quickly summarized below:

Alcian blue
- Identification of acid mucins within cells (may be used to facilitate identification of Barrett's mucosa in biopsy specimens).

Congo red
- Detection of amyloid within tissue.

Mucicarmine
- Detection of mucin within neoplasms, supporting classification as adenocarcinoma (e.g. non-small cell lung carcinomas).

Periodic acid-Schiff
- Detection of glycogen or mucin within neoplasms.

Trichome stain
- Primarily used to demonstrate collagen and muscle in normal tissue (e.g. detection of increased fibrosis in the liver).

Risk markers

The field of cancer genetics is focused on the evaluation of important risk markers and inherited disease. Most well-known are markers such as *BRCA1* and *BRCA2* for inherited risk of breast/ovarian cancer. Other examples include markers for Lynch syndrome (hereditary nonpolyposis colorectal cancer) and Li-Fraumeni syndrome. Individuals with Lynch syndrome have mutations in genes typically involved in repair of DNA (*MLH1*, *MSH2*, *MLH3*, *MSH6*, *PMS1*, *PMS2* and *TGFBR2*) giving them a much higher likelihood of developing colon cancer as well as other cancers (eg, endometrial, ovarian, pancreatic) at an earlier age. Mutations in the tumor suppressor gene *TP53* and *CHEK2* may indicate the patient has Li-Fraumeni syndrome, which affects children or young adults and leads to development of multiple types of tumors in their lifetime.

Diagnostic markers

Whereas pathology and morphology are important to determine if a tumor is benign or cancerous, molecular markers can help confirm diagnosis. An example of this is the use of *BCR-ABL* fusion marker to confirm the diagnosis of leukemia. This marker is also useful for the prediction of response to treatments and to monitor disease. The CA-125 marker is often used to help determine if a mass in the ovaries is potentially cancerous.

Prognostic markers

Prognostic markers are used to help a physician assess the potential outcome for a patient regardless of treatment. They can help assess the aggressiveness of disease. An example of a prognostic marker is CA19-9 in pancreatic cancer, which can help assess the operability of the tumor and provide insight into potential survival. The expression of CD44 is often associated with poor prognosis in bladder cancer, whereas expression of cyclin D1 is associated with a better prognosis with lower odds of recurrence.

Predictive markers

Predictive markers are used to determine potential for response to a specific treatment. Targeted therapies often use companion diagnostics to direct treatment decisions. These tests use predictive markers to identify which drugs may provide a favorable response for a patient. Examples include the *EML4-ALK* fusion gene for treatment with crizotinib (Xalkori, Pfizer) in non-small cell lung cancer and *BRAF* V600E mutation for treatment of melanoma with vemurafenib (Zelboraf, Genentech).

Response markers

Markers of response are often considered the same as predictive markers. However, with the introduction of circulating tumor DNA tests, it is now possible to monitor response over time, not just at baseline.

VALUE ADDED COURSE

PATHOLOGY ASSSSMENT OF TUMOR TISSUE , PA09

List of Students Enrolled NOV 2018- JAN 2019

2nd Year MBBS Student			Signature
Sl. No	Name of the Student	Roll No	
1	DISHAL K P	U17MB291	
2	DIVYA PRIYA K	U17MB292	
3	DIVYANSHI SINGH	U17MB293	
4	ELAKIYA BALA	U17MB294	
5	FEMI SREE.R.A.	U17MB295	
6	GANJI KARTHIK	U17MB296	
7	GAUTHAMAN.M	U17MB297	
8	GOKULAVAANI G K	U17MB298	
9	GOWTHAM BJ	U17MB299	
10	GRANDHI KARISHMA	U17MB300	
11	GREESHMA SHAJI .K	U17MB301	
12	GUDDATI KOTA SATYA SAI NAGA S RAMESH	U17MB302	
13	GURUNATHAN S	U17MB303	
14	HARSH BHARTI	U17MB304	
15	HENRITTA.I	U17MB305	
16	HIYA SAIKIA	U17MB306	
17	HRITHICK MANICKAM R	U17MB307	
18	JAYASHREE SAIKIA	U17MB308	
19	JITHU MOHAN	U17MB309	
20	KAILA PRASANTH KUMAR	U17MB310	

RESOURCE PERSON

Dr. PARTHO PROTIM BARMAN
Reg. No:42668
Professor Department. of Pathology
Sri Lakshmi Narayana Institute of Medical Science
Osudu, Kudapakkam, Puducherry-605 502.

COORDINATOR

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES
PUDUCHERRY - 605 502.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Course Code: PA09

PATHOLOGY ASSESSMENT OF TUMOR TISSUE

SHORT ANSWERS 6X3= 30

I. ANSWER ALL THE QUESTIONS

1. WHAT ARE THE KEY OBJECTIVES OF THIS COURSE
2. NAME THE TYPES OF PATHOLOGY LABS
3. WRITE IN SHORT ABOUT SPECIMEN COLLECTION AND PREPARATION
4. LIST THE TYPES OF BIOPSIES
5. WRITE IN SHORT ABOUT TISSUE FIXATION AND GROSSING TECHNIQUES
6. WHAT ARE THE STAINING METHODS

Gurunathan. S
U17MB303 Pathology Assessment of Tumor tissue

20/30

1) Key objectives for Tumor Tissue patients.

→ improved understanding of the importance of pathologic evaluation of tissue to establish diagnosis and guid therapy for patients

→ Basic understanding of the various dype of pathology laboratories and Member the pathology laboratory.

→ improved understanding of various biopsy techniques used to sample tumors.

→ Basic understanding tissue fixation techniques and the importance of pre analytic variables in ensuring accurate ancillary testing

2) Narme of the types of PATHOLOGY LAB

1) hospital labs
2) Reference labs
3) Public health labs

3) Specimen collection and preparation:

1) Collection

i) Preparation of the patients
ii) collection of specimen
iii) Praesing the specimen
iv) Storing and lor transposing the specimen

4) types of Biopsy.

1) image guided
2) fine needle
3) core needle
4) excisional.
5) shave.
6) Punch
7) endoscopic

6) staining Method

1) oil staining
2) acid fast staining
3) gram staining
4) gel staining
5) water soluble staining

2) staining procedure of hematoxine

- deparaffinization
- dehydration
- hematoxylin
- differentiation
- Rhinsing
- eosin
- dehydration
- clearing
- cover-slipping

PATHOLOGY ASSESSMENT OF TUMOR TISSUE

Jayashree. S

22

U17MB308

1) * Improved understanding of importances of pathologic evaluation of tissue to establish diagnosis and guide therapy for patient

* Basic understanding of the various types of pathology laboratories and members of pathology laboratory

* Improved understanding of various biopsy techniques used to sample tumors

* Improved understanding of how biomarker testing is used in oncology

* Improved understanding of the methodology and clinical utility of common molecular and immunohistochemical tests used in oncology

2) * Types of pathology labs

* Hospital labs
* Reference labs
* public health labs
* A

3. Specimen collection / preparation

1. separate serum from red cells within two hours of venipuncture

2. Mix specimen with additive immediately after collection.

3. Allow specimens collected in a clot tube (eg. red top or gel (barrier tube) to clot before centrifugation

4. Draw the tubes in the proper sequence

5 Avoid patient identification errors

4. Types of Biopsies

* Image guided Biopsy
* Fine needle aspiration biopsy
* core needle biopsy
* vacuum - assisted biopsy
* Excisional Biopsy
* Shave biopsy
* punch biopsy
* Endoscopic biopsy

5. Tissue fixation.

In the fields of histology, pathology and cell biology fixation is the preservation of biological tissue from decay due to autolysis or putrefaction. It terminates any ongoing biochemical reaction and may also increase the treated tissue, mechanical strength or stability

Student Feedback Form

Course Name: **PATHOLOGY ASSESSMENT OF TUMOR TISSUE**

Subject Code: **PA09**

Name of Student: Dishal K P Roll No.: U17MB291

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

None

Signature

Date:

Student Feedback Form

Course Name: **PATHOLOGY ASSESSMENT OF TUMOR TISSUE**

Subject Code: **PA09**

Name of Student: Jithu Mohan U17MB309 Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5 ✓

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

NONE

Signature

Date:

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that KAILA PRASANTH KUMAR has actively participated in the Value Added Course on PATHOLOGY ASSESSMENT OF TUMOR TISSUE held during NOV 2018- JAN 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Partho protim barman

Dr. PARTHO PROTIM BARMAN
RESOURCE PERSON
Professor Department. of Pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. Pammy Sinha
COORDINATOR
PROFESSOR & HEAD DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that GAUTHAMAN. M has actively participated in the Value Added Course on PATHOLOGY ASSESSMENT OF TUMOR TISSUE held during NOV 2018- JAN 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Partho protim barman
RESOURCE PERSON

Dr. Pammy Sinha
COORDINATOR

19.1.2019

FROM

Dr.Pammy sinha
Professor and Head,
Department of pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Pathology assessment of tumor tissue

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: : FNAC technique and staining procedure in IInd MBBSNOV 2018- JAN 2019 for 20 students . We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr.PAMMY SINHA

PROFESSOR & HEAD, DEPT OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY

Encl: **Certificates**

Photographs



SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Osudu, Agaram Village, Kudapakkam Post, Pondicherry – 605 502.

DEPARTMENT OF PHYSIOLOGY

Date: 12.9.2018

From
Dr.V.Senthil kumar
Professor and Head,
Physiology
Sri Lakshmi Narayana Institute of Medical sciences
Puducherry

To
The Dean,
Sri Lakshmi Narayana institute of Medical sciences
Puducherry

Sub: Permission to conduct value-added course: Certificate course in lifestyle modification for metabolic syndrome & Code: PHY C09

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Certificate course in lifestyle modification for metabolic syndrome & Code: PHY C09 from November 2018– January 2019. We solicit your kind permission for the same.

Kind Regards

Dr.V.Senthil kumar

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean:Dr.G.Jayalakshmi

The HOD: Dr.V.Senthil kumar

The Expert:Dr.R.Vijayakumar

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign &Seal)	(Sign &Seal)	(Sign &Seal)

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Dr. R. VIJAYAKUMAR
PROFESSOR IN PHYSIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village, Pondicherry - 605 502

PROFESSOR & HOD
DEPARTMENT OF PHYSIOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Ref. No. SLIMS/Dean Off/VAC / 320 **Circular** **Date: 20.9.2018**

Sub: Organising Value-added Course: Certificate course in lifestyle modification for metabolic syndrome & Code: PHY C09-Reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical sciences, is organizing "Certificate course in lifestyle modification for metabolic syndrome & Code: PHY C09".The course content is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before October 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content.

Course Proposal

Course Title: **Certificate course in lifestyle modification for metabolic syndrome**

Code: PHY C09

Course Objective: At the end of the course, the participants should know

- Definition of metabolic syndrome
- The role of lifestyle modification in the management ofMetabolic Syndrome
- Principles and main strategies of Lifestyle modifications based
- Strategies to engage patients in lifestyle modification
- Cognitive restructuring in lifestyle modification programs
- Alternative behaviors
- New frontiers of lifestyle modification programs
- Practical recommendations for diet and physical exercise in lifestyle modification programs

Course Outcome: On successful completion of the course the students will have the knowledge on various lifestyle modifications in treatment and prevention of metabolic syndrome.

Course Audience: Ist year M.B.B.S students (2018- 2019)

Course Coordinator: DR.V.Senthilkumar

Course Faculties with Qualification and Designation

Dr.R.Vijayakumar,Msc,PhD, Professor,Physiology

Dr.V.Anebaracy,M.B.B.S,M.D,Assistant Professor,Physiology

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Faculty	Hours
1	3/11/2018	❖ Definition of metabolic syndrome ❖ The role of lifestyle modification in the management of Metabolic Syndrome	1.30 pm to 6.30 pm	Dr.R.Vijayakumar	2
2	10/11/2018	❖ Principles and main strategies of lifestyle modifications based	2 pm to 6 pm	Dr.V.Anebaracy	5
3	17/11/2018	❖ Strategies to engage patients in lifestyle modification	2 pm to 5 pm	Dr.R.Vijayakumar	4
4	24/11/2018	❖ Cognitive restructuring in lifestyle modification programs	2 pm to 5 pm	Dr.V.Anebaracy	3
5	1/12/2018	❖ Alternative behaviors	1.30 pm to 6.30 pm	Dr.R.Vijayakumar	5
6	8/12/2018	❖ New frontiers of lifestyle modification programs	2 pm to 6 pm	Dr.V.Anebaracy	4

7	5/1/2019	❖ Practical recommendations for diet and physical exercise in lifestyle modification programs	1.30 pm to 6.30 pm	Dr.R.Vijayakumar	5
			Total Hours		30

REFERENCE BOOKS:

1. The 5 AM Club: Own Your Morning, Elevate Your Life by Robin Sharma (Author)

2. World's Best Inspirational Books to Change Your Life (Box Set of 3 Books) by Joseph Murphy Dale Carnegie, Napoleon Hill (Author)

VALUE ADDED COURSE

1. Name of the programme & Code

Certificate course in lifestyle modification for metabolic syndrome & Code: PHY C09

2. Duration & Period

30 hrs & November 2018– January 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

One time from November 2018– January 2019

8. Year of discontinuation: 2020

9. Summary report of each program year-wise

Value Added Course- November 2018– January 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PHYC09	Certificate course in lifestyle modification for metabolic syndrome	Dr.R.Vijayakumar Dr.V.Anebaracy	1st MBBS	20 (November 2018– January 2019)

10. Course Feed Back

Enclosed as Annexure- V

VSK

RESOURCE PERSON:

Dr.R.Vijayakumar R. Vijayakumar

RESOURCE PERSON:

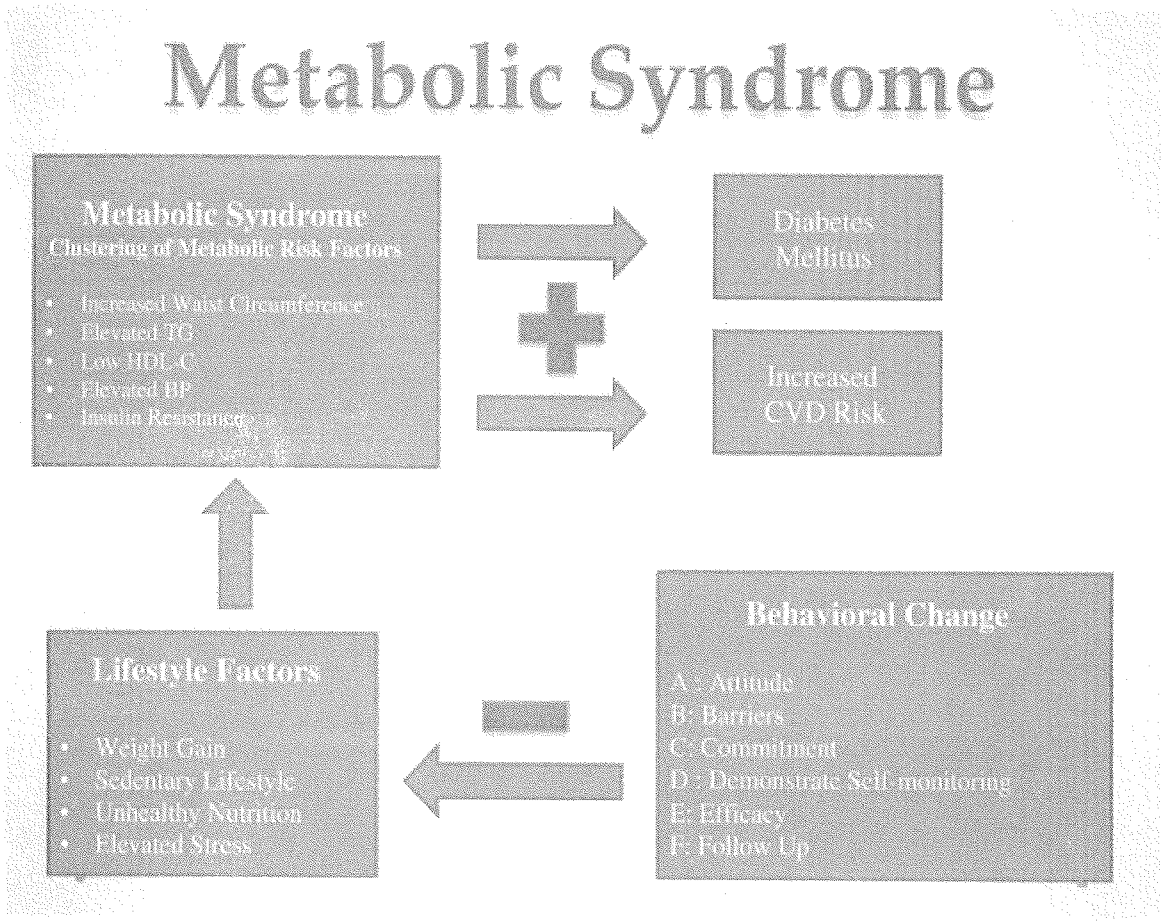
Dr.V.Anebaracy

COORDINATOR:

Dr.V.Senthil kumar

CERTIFICATE COURSE IN LIFESTYLE MODIFICATION FOR METABOLIC SYNDROME

CODE: PHY C09



PARTICIPANT HAND BOOK

BIHER

SLIMS

COURSE DETAILS

Particulars	Description
Course Title	Certificate course in lifestyle modification for metabolic syndrome
Course Code	Code: PHY C09
Objective	❖ Definition of metabolic syndrome ❖ The role of lifestyle modification in the management ofMetabolic Syndrome ❖ Principles and main strategies of lifestyle modifications ❖ Strategies to engage patients in lifestyle modification ❖ Cognitive restructuring in lifestyle modification programs ❖ Alternative behaviors ❖ New frontiers of lifestyle modification programs ❖ Practical recommendations for diet and physical exercise in lifestyle modification programs
Further learning opportunities	Advance course in lifestyle modification.
Key Competencies	• On successful completion of the course the students will have the knowledge on various lifestyle modification in treatment and prevention of metabolic syndrome.
Target Student	1st MBBS Students
Duration	30 hrs & November 2018-January 2019
Theory Session	20hrs
Practical Session	10hrs
Assessment Procedure	Long answer question and short answer questions.

CERTIFICATE COURSE IN LIFESTYLE MODIFICATION FOR METABOLIC SYNDROME

Lifestyle modification based on behavior therapy is the most important and effective strategy to manage the metabolic syndrome. Modern lifestyle modification therapy combines specific recommendations on diet and exercise with behavioral and cognitive strategies. The intervention may be delivered face-to-face or in groups, or in groups combined with individual sessions. The main challenge of treatment is helping patients maintain healthy behavior changes in the long term. In the last few years, several strategies have been evaluated to improve the long-term effect of lifestyle modification. Promising results have been achieved by combining lifestyle modification with pharmacotherapy, using meals replacement, setting higher physical activity goals, and long-term care. The key role of cognitive processes in the success/failure of weight loss and maintenance suggests that new cognitive procedures and strategies should be included in the traditional lifestyle modification interventions, in order to help patients build a mind-set favoring long-term lifestyle changes. These new strategies raise optimistic expectations for an effective treatment of metabolic syndrome with lifestyle modifications, provided public health programs to change the environment where patients live support them.

Introduction

The metabolic syndrome (MS) is a clinical condition characterized by a cluster of abnormalities, including visceral obesity, hyperinsulinemia and insulin resistance,type 2 diabetes, dyslipidemia, hypertension, fatty liver, and elevated uric acid, a procoagulant state, whose borders are only provisionally set by different international agencies . The focus is given to visceral obesity, which is

considered the pivotal alteration according to the International Diabetes Federation, and to atherogenic dyslipidemia, which covers two of the five diagnostic criteria. The prevalence of MS is increasing worldwide in parallel with the alarming rise of obesity; according to the National Health and Nutrition Examination Survey, MS is estimated to affect up to 36% of the US adult population, with a lower prevalence in Europe. Although the accepted cutoffs of individual variables do not constitute per se evidence of risk factors, the clustering of abnormalities carries a high risk of the diabetes and cardiovascular diseases. In particular, the presence of MS is associated with a two- to four-fold increase of cardiovascular disease-related morbidity and mortality even in the absence of clinically evident cardiovascular disease or diabetes mellitus.

The role of lifestyle modification in the management ofMetabolic Syndrome:

Weight reduction represents the principal goal of most inter- vention studies on MS. There is complete agreement that weight loss is associated with significant improvements in the clinical abnormalities of MS, including blood glucose, lipid profile, and blood pressure,and even a moderate weight loss (7% reduction) in 4 weeks can improve the metabolic profile, despite the persistence of a high body mass index (BMI). However, the greater the BMI loss, the larger are the metabolic improvements.

Principles and main strategies of lifestyle modifications based on behavior therapy:

Behavior therapy has been designed to provide patients with a set of principles and techniques to modify their eating and activity habits. Originally, the treatment was exclusively based on the learning theory (ie, behaviorism). The theory postulates that the behaviors causing obesity (excess eating and low exercising) are largely learnt and therefore could be modified or relearnt. The theory also postulated that positive changes in eating and exercising can be achieved by modifying the environmental cues (antecedents) and

the reinforcements of these behaviors (consequences). The intervention was later integrated with cognitive strategies (eg, problem solving and cognitive restructuring) and with specific recommendations on diet and exercise. The treat- ment is different from typical psychotherapy. The aim is not to treat a psychiatric disorder, but rather to change eating and exercise behaviors. In addition, lifestyle intervention does not address the potential causes of the problematic behaviors, but it is focused to teach skills to change them.

Strategies to engage patients in lifestyle modification:

Some of the key principles and strategies to engage patients in lifestyle modification, derived from motivational interviewing, are listed below: Conceptualization of motivation. Motivation is a dynamic entity waxing and waning as a function of shifting per- sonal, cognitive, behavioral, and environmental deter- minants. This means that patients' motivation may require continuous attention, not only during the engaging process, but also in the course of treatment.Collaborative therapeutic style. Clinicians should adopt a collaborative therapeutic style as opposed to a confrontational approach. The collaborative style of cognitive behavior therapy has been considered as one of the main reasons for its higher success compared to other interventions to engage patients with resistance.

- Acceptance and change. Clinicians should validate patients' experience within the framework of a balance between acceptance and change, firmness, and empathy.
- Functional analysis. Clinicians should make a functional analysis of the pros and cons of changing lifestyle because change is facilitated by communicating in a way that elicits the person's own reasons for and the advantages of change.
- Roll with resistance. Clinicians should not address resistance with confrontation, but with a collaborative evaluation of the variables involved in maintaining the unhealthy lifestyle.

BIHER SLIMS

- Support self-efficacy. Self-efficacy refers to a person's belief that he/she is capable of keeping a specific behavior; it plays an important role in achieving health behavior change. In the evaluation interview, clinicians should promote self-efficacy by raising the hope that lifestyle changes can be attained. Later, during the program, self-efficacy should be promoted by designing an individualized eating and physical activity program that patients are confident to stick to.
- Be sensitive to stigma against individuals with obesity.Stigma influences the decision of patients with obesity to start treatment.To prevent stigma, clinicians should recognize that obesity and MS are medical conditions and not the product of lack of willpower and treat patients with respect and support.
- Educate patients. Clinicians should inform patients of the negative aspects of unhealthy lifestyles and the benefits of engaging in healthy behavior on the management of MS. Table 2 shows the main topics to cover when educating patients on MS and lifestyle modification. A strategy to promote patients' engagement in treatment is also giving detailed information about aims, duration, organization procedures, and the results of lifestyle modification, using written material.[16] In reluctant patients, it might be helpful to propose treatment as a sort of experiment, with a possible return to the old habits in the absence of benefits.

Main topics to cover when educating patients on MS and on lifestyle modification

1. **Definition and diagnosis**

   The MS is a cluster of conditions that increase the risk of developing vascular disease (heart disease, strokes, and peripheral vascular disease)

2. **Prevalence**

MS affects up to 25% of the population in the United States and 15% of the population in Europe,It increases with age (<10% in individuals aged 20–29, 20% in individuals aged 40–49, and 45% in individuals aged 60–69)·The 'obesity epidemic' is considered the main factor responsible for the increasing prevalence of MS·

3. Causes

It is linked to insulin resistance. The causes of insulin resistance have not yet been completely clarified. It probably involves a variety of genetic and environmental factors. Both being overweight and inactive contribute to the disease state.

4. Consequences

MS increases the risk of developing type 2 diabetes and CVD and the risk for CVD mortality.Other conditions that are associated with MS are, notably, polycystic ovary syndrome, fatty liver, cholesterol, gallstones, asthma, sleep disturbances, and some forms of cancer.

5. Management

Weight loss with lifestyle modification (hypocaloric diet, increased physical activity, and cognitive behavior therapy to help patients modify eating and activity habits) is the key procedure to manage MS. Research data indicate that a lifestyle intervention produce a marked reduction in the prevalence of MS and a decline of body weight, waist circumference, fasting glucose, triglycerides, and blood pressure. The treatment may be delivered in groups and/or individually by a multidisciplinary team trained in lifestyle modification, which includes a registered dietitian,a behavioral psychologist, and an exercise specialist, coordinated by a physician. It includes weekly sessions for the first 6 months, followed by two sessions a month in the following 6 months,Specific treatment of lipid (eg, hypertriglyceridemia) and nonlipid risk factors (eg, hypertension and hyperlycemia) may be added to the lifestyle modification.

Practical recommendations for diet and physical exercise

in lifestyle modification programs

Dietary recommendations

1000–1200 kcal/day for overweight women, and 1200–1600 kcal/day for overweight men and heavier for more active women.The diet should provide S55% calories from carbohydrates, S30% from lipids (7%–10% from saturated fats), and15% from proteins.Total calories should be moderately increased according to the daily amount of physical activity.Diets are designed to create a calorie deficit of 500–1000 kcal/day,

producing a weight loss of 0.5–1.0 kg/week

Physical exercise recommendations:

Engage in moderate-to-vigorous exercise for at least 60 min on most days (at least 5 days/week).Walking may be the favorite exercise, as unstructured exercise may be included in routine daily activities.Check the baseline number of steps by a pedometer, then add 500 steps at 3-day intervals to a target value of 10,000–12,000 steps/day,Jogging (20–40 min/day), biking, or swimming (45–60 min/day) may replace walking.Physical exercise is intended to produce a calorie deficit of at least 400 kcal/day, favoring weight loss, maintaining muscle mass, and preventing weight cycling.

Goal setting

Patients entering lifestyle modification programs are encouraged to set specific and quantifiable weekly goals (ie, increasing physical activity by 1000 steps/week or eating only at meals), which should be realistic and

moderately challenging. Goal achievement is associated with a sense of accomplishment, which is reinforcing and enhances self-efficacy, a construct associated with long-term weight loss.

Particular attention should be paid to patients' weight loss expectation, since higher weight loss expectations are associated with attrition. A few data indicate that encour aging participants to seek only a modest initial weight loss does not facilitate weight maintenance and produces a lower weight loss than standard treatment. In the initial phase oftreatment, it is more useful to have patients focus on weekly weight loss (eg, losing from ½ to 1 kg per week) and to detect and promptly address any warning sign of weight loss dissatisfaction, thus minimizing the risk of attrition. In our clinical experience, unrealistic weight loss expectations may be easily changed later when patients have reached some intermediate goals and the rate of weight loss is declining.

Specific strategies to change weight goals have been recently described in the modern cognitive behavioral treatments of obesity.A crucial aspect favoring the modification ofunrealistic weight goals is the development of a trusting and collaborative clinician-to-patient relationship. This is also a key factor to avoid the sense of abandonment that patients report as one of the main reasons of attrition.

Stimulus control

These procedures are based on the principles of classical and operant conditioning. Stimulus control is aimed at modifying the environment (ie, external eating cues) to make it more conductive to choices supporting changes in eating and exercising. Patients should be instructed both to remove triggers of excessive eating (eg, keeping tempting food out of sight or avoiding buying it) and to increase positive cues for exercising (eg, lay out exercise clothes before going to bed) and for desirable behavior (eg, putting the food sheet on the table to facilitate its real-time compilation during eating). Stimulus control may also be used to reinforce the adherence to eating control and exercising by establishing a reward system (eg, encouraging patients to set weekly behavioral goals and to

reward themselves in case of achievement, but not through food or inactivity). Encouraging patients to use cognitive rewards (eg, 'I've been OK,' 'I'm doing great,' and 'I have the ability to lose weight and to have an active lifestyle') once they reach their lifestyle goals it may also help patients reduce their frustration associated with limited weight loss and strengthen their confidence in controlling body weight and maintaining a healthy lifestyle.

Positive reinforcements may also be used by clinicians, who should congratulate the patients on every success they achieve and should never criticize failures. Criticism may produce guilt and loss of self-confidence, leading to attrition. An unconditional acceptance of patients' behavior and a problem-solving approach to cope with barriers will preserve the clinician–patient relationship. This approach will also help patients understand that the long-term success in weight management is related to a set of skills rather than to willpower. Stimulus control may also be facilitated by the involvement of significant others. With the consent of patients, clinicians should involve significant others in the treatment program to create the 'optimum' environment for patients' change. The needs vary from patient to patient, but generally include planning together a written shopping list, eatingthe same foods, exercising together, creating a relaxed environment, and reinforcing patients' positive behaviors.

Alternative behaviors

This procedure is used to manage internal eating cues (eg, emotional stimuli). Patients are trained to identify these cues and to replace eating cues with alternative behaviors. Any alternative behavior works better if it is incompatible with eating (eg, writing, knitting, housekeeping, exercising, and taking a bath). Other behaviors (eg, listening to music)

Cognitive procedures

Proactive problem solving

Proactive problem solving is used to address events that hinder lifestyle weight control adherence. The typical problem- solving approach includes five steps. Step 1 encourages patients to detail the problem

and the chain of events (ie, situations) that preceded the problem. Step 2 helps patients brainstorm any possible solution. Step 3 suggests patients list the pros and cons for each potential solution. In step 4, patients should choose the best option on the basis of the previous analyses to be implemented for a fixed amount of time. Finally, during step 5, the patients evaluate the results achieved. If the solution fails, the process should be repeated.

Initially, it is recommended to practice problem solving in the session with the clinician, encouraging the patient to take the lead whenever possible. As homework, patients should be asked to practice their own problem-solving skills, looking out for events that would be liable to trigger changes in their eating or exercising and addressing them using the problem-solving procedure. Specifically, once patients identify a problem, they should write 'Problem' in the right-hand column of the monitoring record sheet and then turn the sheet over and write out the problem-solving steps. Patients should be advised against solving the problem mentally, as this is much less effective. The emphasis should be on help- ing patients acquire the ability to address or forestall events that would otherwise trigger changes in eating or exercising. As it is important that problems are spotted early, patients

should be encouraged to screen in advance for problems they will meet during the week. In this way, their problem solving becomes 'proactive.'

Cognitive restructuring

Cognitive restructuring is a technique used to help patients identify dysfunctional thoughts and cognitive distortions that interfere with their ability to maintain a lifestyle aimed at weight control and to replace them with more functional ones.All-or-nothing thinking, in particular with regard to success or failure, is a common cognitive bias observed in patients during weight loss. In addition,

for this activity, patients are recommended to practice cognitive restructuring during a session with therapists. Later, clinicians should give patients homework to practice cognitive restructuring every time they notice a tendency to decrease their efforts in lifestyle modification as a consequence of an event. Specifically, when patients identify a dysfunctional thought, they should write 'Dysfunctional thoughts' in the right-hand column of their monitoring sheet and then turn the sheet over and address it by writing out the cognitive restructuring steps.

New frontiers of lifestyle modification programs:

At 3- to 5-year follow-up, 70%–80% of patients treated with lifestyle modification regained all the weight they had lost.These data underline the fact that the major problem of lifestyle modification treatment is weight loss maintenance in the long term. Unfortunately, the mechanisms accounting for weight regain have not been completely understood yet, but they seem extremely complex, including biological, social, behavioral,and cognitive factors. Nevertheless, the observation that at least 20% of patients maintain all the amount of weight loss at 4-year follow-up indicates that weight loss maintenance is possible. In this section, we discuss three potential areas of intervention (biological, cognitive, and environmental) that might improve the long-term maintenance of weight loss.

VALUE ADDED COURSE

Certificate Course in Lifestyle Modification for Metabolic Syndrome &CODE: PHY C09

List of Students Enrolled: November 2018-January 2019

1st Year MBBS Student			
Sl. No	**Name of the Student**	**Registration Number**	**Signature**
1	FAUSTINA BAJWIN .S	U18MB291	
2	G SRI SAI NITISH	U18MB292	
3	GAUR DARSHANA PURUSHOTTAM GAUR	U18MB293	
4	GHATKAR SAYALL KRISHNA	U18MB294	
5	GOKUL M S	U18MB295	
6	GOPIKA .P	U18MB296	
7	HARI BALA SIDDHARTH T.R	U18MB297	
8	HARSHINI R C	U18MB298	
9	HIBA MOIDEEN .K	U18MB299	
10	INDHU S	U18MB300	
11	INDU V	U18MB301	
12	INDUKURI SAI AKANKSHA	U18MB302	
13	IPSITA SETHY	U18MB303	
14	JAGADEESAN S.R	U18MB304	
15	JAHNAVI REDDY .M	U18MB305	
16	JAISHREE .S	U18MB306	
17	JANANI V	U18MB307	
18	JASMEET NIRANJAN	U18MB308	
19	JAYALAKSHMI S	U18MB309	
20	JAYAREDDYGARI SAI RUCHITHA	U18MB310	

Certificate Course in Lifestyle Modification for Metabolic Syndrome

CODE: PHY C09

ANSWER ALL THE QUESTIONS(Total marks=50 marks)

I. Long answer question 1x20=20 marks

1. Explain the role of lifestyle modification in the prevention and management of Metabolic Syndrome.

II. Short answer questions :(5x6=30 marks)

a. Strategies to engage patientsin lifestyle modification

b. Cognitive restructuringin lifestyle modification programs

c. Alternative behaviours

D.New frontiers of lifestyle modification programs

E.Practicalrecommendationsfordietandphysicalexercise in lifestyle modification programs

Harshini R.C
U18MB298

Lifestyle Modification For Metabolic Syndrome.

① Explain the role of lifestyle modification in the Prevention and management of Metabolic Syndrome.

Metabolic Syndrome

Clustering of Metabolic Risk Factors

- × Increased Waist Circumference
- × Elevated TG
- × Low HDL-C
- × Elevated BP
- × Insulin Resistance

→ + →

- Diabetes Mellitus
- Increased CVD risk

↑

Lifestyle Factors

- × Weight Gain
- × Sedentary Lifestyle
- × Unhealthy Nutrition
- × Elevated Stress

←

Behavioral Change

A: Attitude
B: Barriers
C: Commitment
D: Demonstrate Self-monitoring
E: Efficacy
F: Follow up

is a common cognitive bias observed in patients during weight loss.

C:- Alternative behaviors

This procedure is used to manage internal eating cues [eg. emotional stimuli] Patients are trained to identify these cues and to repace eating cues with alternative behaviors. Any alternative behavior work better if it is incompatible with eating [eg, writing, knitting, house keeping, exercising and taking a bath]. Other behaviors [eg listening to music

Make awarded : 24/50

Name of the Assessor : Dr. K. Vijayakumar

Signature of the Assessor : R. Vijayakumar

Certificate Course in Lifestyle modification for Metabolic syndrome.

Gopika P
U18 MB296

1. Long answer Question:

Metabolic syndrome is characterised by obesity, hyperinsulinemia, type 2 DM, dyslipidemia, Hypertension.

Weight loss with lifestyle modification is the key procedure to manage Metabolic syndrome.

Patients entering lifestyle modification programs are encouraged to set specific and quantifiable weekly goals. Particular attention should be paid to patients weight loss expectations, higher weight loss expectations.

Alternate behaviour is used to manage internal eating. Patients are trained to identify these cues and to replace eating cues with alternative behaviours.

Q. d.

New frontiers of lifestyle modification programs :—

This include social, behavioral and cognitive factors.

Cognitive restructuring is a technique used to help patient identify dysfunctional thoughts and cognitive distortions. In addition, patients are recommended to practice cognitive restructuring during a session with therapists.

Q. a Strategies to engage patients in lifestyle modification :—

Cognitive procedures :—

proactive problem solving

It used to address events that hinder lifestyle weight control adherence. The typical

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CERTIFICATE OF MERIT

This is to certify that Faushna Bagwin.s has actively participated in the Value Added Course on Lifestyle modification for metabolic syndrome held during November 2018 - January 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

R. Vijayakumar
Dr.R.Vijayakumar
RESOURCE PERSON

VSK
Dr.V.Senthil kumar
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Hari Bala Siddharth T.R has actively participated in the Value Added Course on Lifestyle modification for metabolic syndrome held during November 2018 - January 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

R. Vijayakumar
Dr.R.Vijayakumar
RESOURCE PERSON

VSK
Dr.V.Senthil kumar
COORDINATOR

Student Feedback Form

Course Name: **Certificate Course in Lifestyle Modification for Metabolic Syndrome**

Subject Code: PHY C09

Name of Student: Harshini R. C Registration Number: U18MB298

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	(4)	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Excellent course. Conducted very well.

Harshini

Signature

Date: 5/1/2019

Student Feedback Form

Course Name: **Certificate Course in Lifestyle Modification for Metabolic Syndrome**

Subject Code: PHY C09

Name of Student: Ghatkal Sayali Krishna Registration Number: U18MS294

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	(4)	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Very good sessions
We want more courses like this

Signature

Date: 5/1/2019

Date: 25.01.2019

From
Dr.V.Senthil kumar
Professor and Head,
Physiology
Sri Lakshmi Narayana Institute of Medical sciences
Puducherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical sciences
Puducherry
.

Through Proper Channel

Sub: Completion of value-added course: Certificate course in lifestyle modification for metabolic syndrome & Code: PHY C09

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Certificate course in lifestyle modification for metabolic syndrome & Code: PHY C09 from November 2018– January 2019 .We solicit your kind action to send certificates for the participants that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

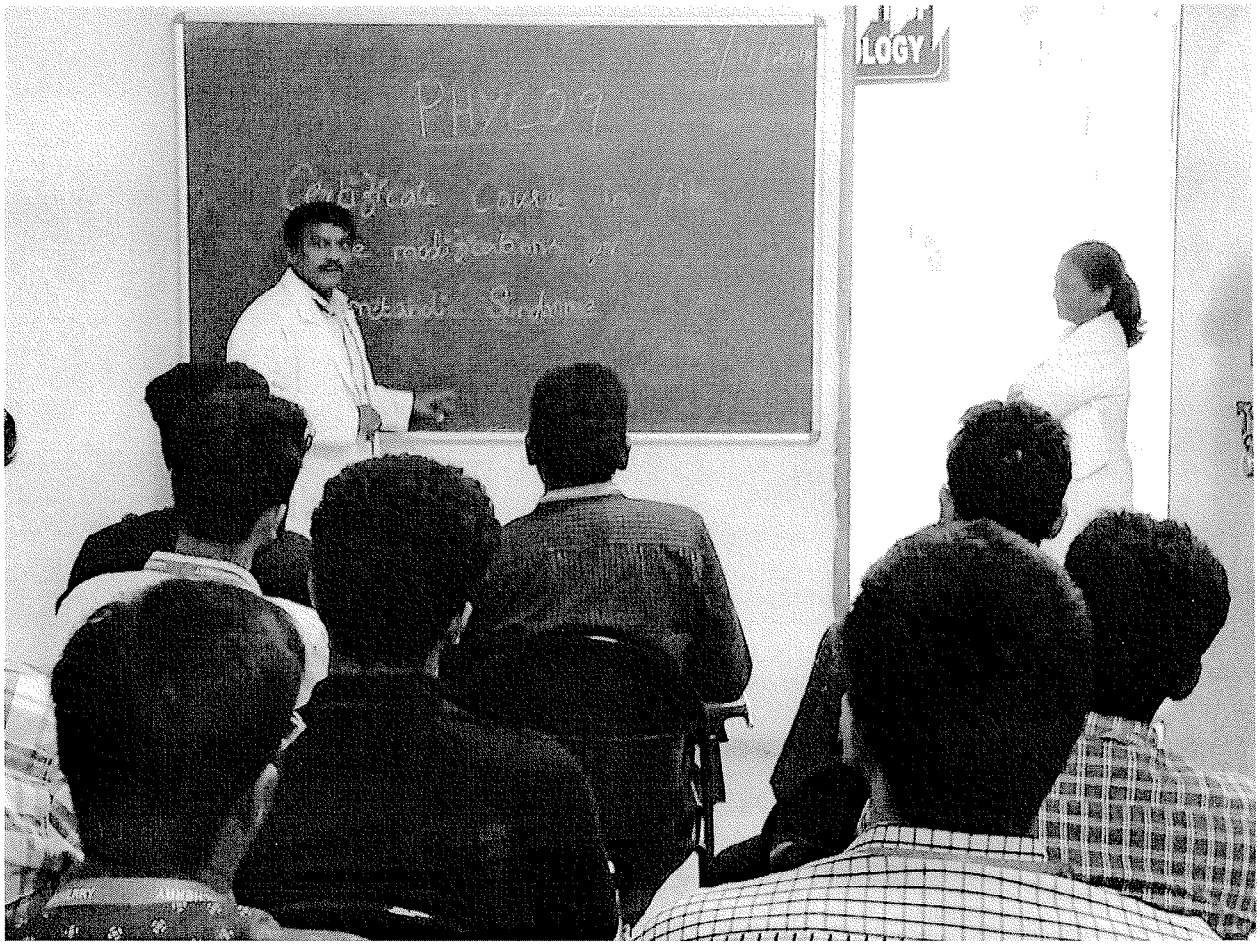
Kind Regards

VSK
Dr.V.Senthil kumar
HOD Physiology

PROFESSOR & HOD
DEPARTMENT OF PHYSIOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Encl: Certificates

Photographs


PHYSICS
LOGY



Sri Lakshmi Narayana Institute of Medical Sciences

Date: 04.11.2017

From

Dr.Jansi Rani
Professor and Head,
Department of Biochemistry,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Basic concept of Auto analyzer of clinical biochemistry laboratory

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Basic concept of Auto analyzer of clinical biochemistry laboratory** for interns May to June 2019. We solicit your kind permission for the same.

Kind Regards

Dr. Jansi Rani

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. G. Jayalakshmi.

The HOD: Dr. Jansi Rani

The Expert: Dr. Kajalakshmy

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign & Seal)	(Sign & Seal)	(Sign & Seal)

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

07.010.2018

Sub: Organising Value-added Course: Basic concepts of Auto analyzer in clinical biochemistry laboratory. reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Basic concepts of Auto analyzer in clinical biochemistry laboratory"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before Nov to Dec 2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content

VALUE ADDED COURSE

1. Name of the programme & Code

Basic concept of Auto analyzer of clinical biochemistry laboratory- BIO 09

2. Duration & Period

30 hrs &November and December 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Assessment- closed

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time November and December 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- May –June 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	BIO-09	Basic concept of Auto analyzer of clinical biochemistry laboratory	Dr. Jansi Rani Dr.Kajalaksmy	MBBS Students	20 students MAY-JUNE 2018)

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

1. **Dr.Jansi Rani**
2. **Dr. Kajalakshmy**

COORDINATOR
Dr.Jansi Rani

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502

Course Proposal

Course Title: **Basic concepts of auto analyzer in biochemical laboratory**

- **Course Objectives:**
- To learn about analyse the samples
- To reduce the analytical errors in clinical laboratory
- the use of **automation in clinical** laboratory enables to perform many tests by analytical instruments with minute use of an analyst

Course Outcome: To improve the quality of sample analysis and to reduce the analytical errors in clinical laboratory

Course Audience: MBBS students 2018 Batch

Course Coordinator: Dr.Jansi Rani

Course Faculties with Qualification and Designation:

1.Dr.Jansi Rani, Professor & HOD

2.Dr.Kajalakshmy, Assistant Professor

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1.	12-11-2018	Introduction of autoanalyzer in clinical biochemistry laboratory	2-3p.m	1
2.	13.11.208	Parts of clinical auto analyzer	4-6p.m	2
3.	14.11.2018	a. Simpler b. Proportionating pump c. Dialyzer d. Constant temperature. e. Flow through colorimeter Recorder	4-6p.m	2
4.	15.11.2018	Basic approaches to automated autoanalyzer	4-6p.m	2

5.	16.11.2018	Basic concepts of autoanalyzer block diagram	4-6p.m	2
6.	17.11.2018	Photometry analyzer	4-6p.m	2
7.	18.11.2018	Photometric analyzer	4-6p.m	2
8.	19.11.2018	Kinetic or enzymatic measurement	4-6p.m	2
9.	20.11.2018	End point procedures	4-6p.m	2
10.	21.11.2018	Centrifugal analyzer	4-6p.m	2
11.	22.11.2018	Random access analyzer	4-6p.m	2
12.	23.11.2018	Reporting	4-6p.m	2
13.	24.11.2018	Applications	4-5p.m	1
14.	25.11.2018	ISE theory	4-6p.m	2
15.	26.11.2018	Safety Regulations	4-6p.m	2
16.	27.11.2018	Advantages and disadvantages of auto analyzer	4-6p.m	2
		Total		31hrs

REFERENCE BOOKS:

1. treitberg GS, Angel L, Sikaris KA, Bwititi PT. Automation in clinical biochemistry: core, peripheral, STAT, and specialist laboratories in Australia. J Lab Autom. 2012;17:387–94
2. Doumas BT. The evolution of clinical chemistry as reflected in textbooks

published in the United States. Clin Chem. 1998;44:2231–3.

3. Rosenfeld L. Clinical chemistry since 1800: growth and development. Clin Chem. 2002;48:186–97.

BASIC CONCEPTS OF AUTOANALYZER IN CLINICAL BIOCHEMISTRY LABORATORY

PARTICIPANT HAND BOOK

Annexure- I

BIHER SLIMS

COURSE DETAILS

Particulars	Description
Course Title	Basic concepts of Auto analyzer in clinical biochemistry laboratory
Course Code	BIO04
Topics and content of the course in the Hand book	1. Introduction of autoanalyzer in clinical biochemistry laboratory 2. Parts of clinical auto analyzer a. Simpler b. Proportionating pump c. Dialyzer d. Constant temperature. e. Flow through colorimeter f. Recorder 3. Basic approaches to automated autoanalyzer 4. Basic concepts of autoanalyzer block diagram 5. Photometry analyzer 6. Photometric analyzer 7. Kinetic or enzymatic measurement 8. End point procedures 9. Applications 10.ISE theory 11.Safety Regulations Advantages and disadvantages of auto analyzer
Advantages of learning and evaluation	• To learn about analyse the samples • To reduce the analytical errors in clinical laboratory the use of **automation in clinical** laboratory enables to

	perform many tests by analytical instruments with minute use of an analyst
Further learning Opportunities	Can be included in the university examination for 1st year MBS practical sections As a responsible for quality and improvement of clinical laboratory
Key Competencies	• The new curriculum focuses on competencies and outcomes. It gives a list of emphasis to skill development in all places To reduce the analytical errors in clinical laboratory
Target Student	MBBS students
Duration	30hours Nov to Dec 2018
Theory Session	30hours
Assessment Procedure	To assess the quality of sample analysis

INTRODUCTION:

Annexure- I

INTRODUCTION:

The word automation is inspired by word automatic. Automatic means exercising control without interference. So automation means getting work done by machines which can run on their own without our continuous monitoring. Automation refers to machines with intelligence and adaptability which reduces our workload and need for nonstop supervision.

AUTOMATION IN CLINICLA LABORATORY There are several individual steps in the analysis process as a whole in a laboratory such as: 1. Identifying the patient 2. Getting the correct sample 3. Identifying and proper labeling of the sample 4. Delivery of sample in proper storage condition and within time BIOCHEMISTRY MODULE Automation in Clinical Laboratory Biochemistry 322 Notes 5. Preparation of sample for test 6. Sample loading/aspirating 7. Analysis 8. Reporting 9. Entering in register Imagine if you are asked to add from no 1 to 100 and write the result throughout the day. How would you feel? Can you assure that after 2 hours of repeating the same task you will not be bored and make mistakes? But an automated machine will never feel tired nor make mistake as often as you will. Automation has a lot of benefits for the laboratory personnel. 1. Reduces the workload 2. Increases turnaround time (Saves time used per analysis) 3. Increases total number of tests done in less time 4. Eliminates repetition and monotony from human life so decreases human error, improves accuracy 5. Improves reproducibility (repeatability) 6. Uses minimum amount of sample and reagent In a clinical laboratory set up automation is useful in routine chemistry, hematology, immunological assay, and daily processing of large number of samples etc. Usefulness of automation in advanced and well equipped clinical laboratory can be also extended to 1. Transport of specimen 2. Processing of specimen 3.

Loading of specimen into auto analyzer 4. Assessment of results of performed tasks However, if above steps are not automated due to lack of finance and infrastructure, still any ordinary laboratory at least go for automation in its analysis step. The routine techniques and procedures that are done manually by technicians are replaced by automated analyzers called AUTOANALYZER.

Sample collection

The use of glucometer is one such example where just by pressing a button on finger tip, the finger is pricked with least pain and analysis is also done then and there. However, not all tests can be done in glucometer. So, automation in sample collection mainly refers to improved, faster and least discomfort causing techniques of collection. Such as: robotic system, vacutainers etc. Blood collected using a vacutainer. Here the phlebotomist need not pull the syringe, blood gets sucked in due to negative pressure filling the vaccum. Different types of vacutainer for serum collection and for plasma collection using different types of anticoagulants. The identification is done with the colour of caps used.

Sample identification by Labeling and bar coding

The laboratory information system comes into take part here. It first generates a unique identity or hospital number for each new patient. A record is maintained thereafter for him/her. All sample collected have to

bear the name and details of the patient along with this unique identity (hospital number). The same is used while entering the details into auto analyzer software and result is also published with this number and other details. Some advanced labs are using computer generated bar coding technology for labeling samples. It has the advantage that it can be scanned and read by bar code reader accurately so transcriptional error (mistake in writing manually) is avoided.

Sample delivery

Most of the laboratories rely on human pick up system or conveyer belt system. Though cheaper, it may lead to human error, delays etc. Pneumatic tube systems (use of pressurized gas to move the tubes containing samples) are used in some laboratories. However, care has to be taken that acceleration and deceleration should not damage any sample. In very advanced laboratory mobile robots are used.

Sample preparation

Most of the labs depend on technicians for sample processing (such as serum separation) as soon as sample arrives. However introduction of automation can reduce the workload on technicians and save their time and expertise for analysis purpose. Therefore, now days many semi automated devices are developed which can analyze whole blood itself. For example, automated ion selective electrode, use of dry chemistry etc. The automated sample processors come in 2 types: z Stand alone

automated sample processors and z Independent automated sample processors. These automated sample processors can do the following tasks: sorting of samples, removing caps, separating samples, bar coding etc. having an automated sample processor solves the task of bar coding and sample delivery via conveyer belt system.

SAMPLE ANALYSIS

Now let us study briefly about each aspect of automation in the analysis process itself which is the minimum essential aspect of automation for any laboratory. For automation in analysis process we have invented auto analyzer

TYPES OF AUTO ANALYZERS

Auto analyzers based on above principle can be divided into two types

1. Open system
2. Closed system

Open system

In this system, the operator has the advantage that he can purchase reagents from any company so he can save money by buying reagents which are cheaper thereby reducing the cost per test. In a modular design: An auto analyzer is designed by assembling pulling together of all parts. This increases the flexibility of machine according to customer's demand. For example: Ion selective electrode. Due to

modular approach, the facility for analysis of sodium, potassium and chloride can be built into the system or can be added later on.

Closed system

In this system the operator has to buy chemicals only from a particular company, because reagents from different companies will simply not be accepted by the machine, so machine will not run. So operator can not reduce the cost per test. Next, reagents have to be provided in unique containers or format as prescribed by its manufacturer. This too adds to cost per test. However, it allows high degree of automation. Laboratory can be managed by just one or two well trained technical assistants. The automated machines are designed to function as either a modular system or an integrated system.

Parts of Auto-analysers:

These instruments are involved in the automation to the routine biochemical analysis of hospital specimens. About 60 to 300 samples of blood or serum per hour for as many as 18 constituents can be analysed by the auto-analysers.

The principal parts of an auto-analyser are the followings:

Simpler.

ii. Proportionating pump.

iii. Dialyzer.

iv. Constant temperature.

v. Flow through colorimeter.

vi. Recorder.

i. Simpler:

(a) This module holds the batch of samples awaiting analysis in separate cups on a circular tray which is rotated at intervals.

(b) A probe connected by plastic tubing to the proportionating pump enters each sample serially.

(c) The volume of sample aspirated is determined by the pumping rate and the adjustable dwell time of the probe in the sample.

(d) As the probe movement into the sample cup was slow, the volume aspirated varied somewhat with the depth to which this was filled.

(e) The transit time between reservoir and sample is short.

ii. Proportionating Pump:

(a) This module determines the relative flow rates of sample and all reagents and replaces the use of different sizes of pipettes in manual methods.

(b) The pumping technique involves the peristaltic action produced by a series of rollers passing along an array of parallel plastic "Pump tubes".

(c) Each roller compresses all tubes so that the rate flow in each tube is proportional to the square of the pump tube diameter.

(d) Colour-coded tubes with a range of nominal diameters and pumping rates are available in three materials.

(e) The normal tygon tubing is suitable for most reagents but Acid-flex tubing is preferred for reagents containing corrosive acid and Salvaflex tubing for certain organic reagents.

iii. Dialyser:

(a) This module achieves the separation of small and large molecules by allowing the former to pass through a semipermeable membrane from the donor (sample) stream of liquid and air bubbles to a recipient , stream of liquid again segmented by air bubbles.

(b) The dialysis rate depends on the temperature but complete passage of small molecules into the recipient stream is rarely achieved and may be only a few percent of the total.

(c) The analytical process then requires that a constant fraction should dialyse and this is not always the case when simple aqueous and protein-containing solutions are compared.

(d) It is important to ensure that the two streams flow in the same direction.

(e) Care must be taken to ensure that the output from the recipient stream is the one which enters the remainder of the analytical system. If the sample stream is greatly diluted, the difference may not be seen easily.

iv. Constant Temperature:

(a) It is to maintain the reaction mixture at a constant temperature for a defined time to bring about the required chemical change under controlled conditions.

(b) The incubator bath consists of a glass delay coil mounted in a thermostatically controlled oil bath. This is sealed and stirred constantly.

(c) Most baths are set at 37°C or 95°C but some have adjustable thermo-regulators which allow operation up to 120°C or even higher.

v. Flew through colorimeter:

(a) The colorimeter is to measure the intensity of colour produced in the reaction and to provide a graphical display of change in colour with time.

(b) The use of double beam spectrophotometer is costly and is rarely justified by analytical requirements. The single beam colorimeters have insufficient stability to operate reliably over the long period required.

(c) The Auto-analyser MKI colorimeter combines double beam operation with interference filters to select the wavelength.

vi. Recorder:

The servo-potentiometer recorder is used to record the ratio of the responses from the two detectors and these responses are proportional to the intensity of light reaching the detectors.

Functioning of Auto-analysers:

i. The flow of the analytical stream is directed through plastic tubing from one module to another.

ii. The samples are then loaded into the cup of the sampler and the channels of the proportionating pump aspirate them as well as dilute them.

iii. The diluted serum samples are led through one of the dialyser unit.

iv. The pump introduces suitable reagents through the other side of the dialyser.

v The two streams run side by side being separated only by dialysing membrane.

vi. A portion of dialyzable constituents of serum passes across the membrane to the reagent stream.

vii. Further treatment like incubation at suitable temperature is given in the constant temperature bath.

viii. The intensity of the colour developed is measured in a colorimeter and recorded in the recorder.

ix. Suitable standards are treated in the same way.

Lately, multiple analysers have been introduced with multiple channels to estimate as many as 18 selected constituents including the non-dialyzable proteins, enzymes like alkaline phosphatase, triacylglycerol's and electrolytes. About 60 to 300 samples can be investigated per hour simultaneously for 18 parameters.

Auto-analysers have gained much popularity for routine biochemical analysis in clinical laboratories for their speed, flexibility of the

methodology, increased quantum of clinical biochemical analysis, easy operation, and accuracy of results.

Disadvantages of Auto-analysers:

i. Prohibited cost.

ii. **"Carry-over"** errors.

iii. The usual hazards of any complicated equipment.

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CERTIFICATE OF MERIT

This is to certify that SUMAN KALYAN SAHOO has actively participated in the Value Added Course on Basic concepts of Auto analyzer in clinical biochemistry laboratory Nov – Dec 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Kajalakshmy
RESOURCE PERSON

Dr. Jansi Rani
COORDINATOR
PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that VIKAASH .M has actively participated in the Value Added Course on **Basic concepts of Auto analyzer in clinical biochemistry laboratory** Nov 2018 – Dec 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Kajalakshmy
RESOURCE PERSON

Dr. Jansi Rani
COORDINATOR

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502

S.NO	Student Name	Reg.NO	Sign
1	TECHI NADAM	U18MB388	Techi Nadam
2	ROHINI V	U18MB355	
3	SHEETAL SHRIVASTAVA	U18MB367	Sheetal
4	SHRI KIRTI RAAJA	U18MB372	Shri Kirti Raaja
5	VIKRANT SINGH	U18MB396	Vikrant Singh
6	PRAKRITI KAR	U18MB342	Prakriti Kar
7	IPSITA SETHY	U18MB303	Ipsita Sethy
8	JAISHREE .S	U18MB306	Jaishree
9	KEISHAM LUXMIRANI	U18MB315	Keisham Luxmi Rani
10	NABAM YAMIN	U18MB327	Nabam
11	NIDHI MADHUSOODANAN	U18MB332	Nidhi
12	PRADEEP V S	U18MB340	Pradeep.
13	S.R.HEENA FEEMISHNEE	U18MB356	Heena
14	SARFARAZ ISLAM	U18MB362	Sarfaraz
15	SWAPNIL	U18MB384	Swapnil
16	VARSHITHA .N	U18MB393	Varshitha
17	VIKAS SHORAN	U18MB395	Vikas
18	YASHWANTH NAIK R	U18MB400	Yashwanth
19	SABARISH K S	U18MB357	Sabarish
20	RACHEL SWARNA MARY B	U18MB346	Rachel Swarna Mary

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

Course feedback form

Course title: Date :

Course code: BIO - 09

Department: Biochemistry

S.no	Design of the course	1	2	3	4	5
1	The objective of the course clear to you	✓				
2	The course contents met with your expectations	✓				
3	The lecture sequence were well planned		✓			
4	The lectures were clear and easy to understand					
5	The audiovisual teaching aids were effectively used		✓			
6	The instructor's encouraged interaction and was it helpful	✓				
7	The contents were illustrated with examples		✓			
8	Overall Rating of the course	✓				

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Excellent

Signature

Course feedback form

Course title: Date :

Course code: BIO - 09

Department: Biochemistry

S.no	Design of the course	1	2	3	4	5
1	The objective of the course clear to you	✓				
2	The course contents met with your expectations		✓			
3	The lecture sequence were well planned	✓				
4	The lectures were clear and easy to understand		✓			
5	The audiovisual teaching aids were effectively used	✓				
6	The instructor's encouraged interaction and was it helpful		✓			
7	The contents were illustrated with examples	✓				
8	Overall Rating of the course	✓				

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Signature

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

DEPARTMENT OF BIOCHEMSITRY

4/10

1. In mass spectrometer, the sample that has to be analysed is bombarded with which of the following?

   a) Protons

   b) Electrons

   c) Neutrons

   d) Alpha particles

2. In mass spectrometer, the ions are sorted out in which of the following ways?

   a) By accelerating them through electric field

   b) By accelerating them through magnetic field

   c) By accelerating them through electric and magnetic field

   d) By applying a high voltage

3. Which of the following statements is not true about mass spectrometry?

   a) Impurities of masses different from the one being analysed interferes with the result

   b) It has great sensitivity

   c) It is suitable for data storage

   d) It is suitable for library retrieval

4. In mass spectrometer, the sample gas is introduced into the highly evacuated spectrometer tube and it is ionised by electron beam.

   a) True

   b) False

5. **Which of the following are electrochemical measurements**

   a. Humidity and density

   b. Turbidity and differential vapor pressure

c. pH and ORP

d. Dew point and boiling point rise

6. Ion-selective measurements

a. Are similar to conductivity in operation but use a different cell

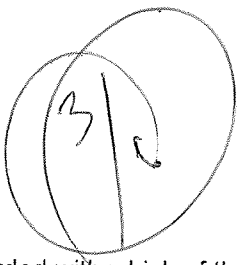
b. Are similar to capacitance measurement but use a different instrument

c. Are similar to pH measurement but use different electrodes

d. Are similar to density but use more exact techniques

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

DEPARTMENT OF BIOCHEMSITRY



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c. Are similar to pH measurement but use different electrodes

d. Are similar to density but use more exact techniques

Date: 09.01.2019

From

Dr. Jansi Rani

Professor and Head,
Department of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course:

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Basic concepts of auto analyzer of clinical Biochemistry.** We solicit your kind action to send certificates for the participants that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. Jansi Rani

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY 605 502

Encl: Certificates

Photographs

Sri Lakshmi Narayana Institute of Medical Sciences

Date-20-11-2018

From
Dr. K. Harsha Vardhan
Professor and Head,
Department of Dermatology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Onychomycosis

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Onychomycosis** on 20-12-2018 . We solicit your kind permission for the same.

Kind Regards

Dr. K. Harsha Vardhan

FOR THE USE OF DEANS OFFICE

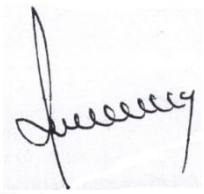
Names of Committee members for evaluating the course:

The Dean: Dr. A. Sugumaran

The HOD: Dr. K. Harsha Vardhan

The Expert: Dr. A. Buvanaratchagan

The committee has discussed about the course and is approved.



DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Dean | Subject Expert | HOD

Sri Lakshmi Narayana Institute of Medical Sciences

Date-20-11-2018

From
Dr. K. Harsha Vardhan
Professor and Head,
Department of Dermatology,
Sri Lakshmi Narayana Institute of Medical Sciences
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DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Dr. A. BUVANARATCHAGAN, MD.,
Reg. No: 37150
Asso. Professor, Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Koodapakkam, Puducherry-605 502

Subject Expert

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

HOD

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OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

27.11.2018

Sub: Organising Value-added Course: Onychomycosis (Nov 2018 – Feb- 2019)

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Onychomycosis"**. The course content is enclosed below."

The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 13-12-2018. Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

DEAN

Encl: Copy of Course content

Course Proposal

Course Title: **Onychomycosis**
Course Objective: **To evaluate predisposing factors and treatment of onychomycosis**
Course Outcome: **Completed**
Course Audience: second year mbbs students
Course Coordinator: Dr. K. Harsha Vardhan
Course Faculties with Qualification and Designation:
1. Dr. K. Harsha Vardhan
Professor , Department of Dermatology
2. Dr. Buvanaratchagan
Associate Professor,Department of Dermatology

Course Curriculum/Topics with schedule (Min of 30 hours)

Sl No	Date	Topic	Time	Hours	Lecture taken by
1	20-12-18	Introduction	5 to 7 pm	2hours	. Dr. K. Harsha Vardhan
2	24-12-18	Etiology	4:30 to 6:30 pm	2hours	Dr. Buvanaratchagan
3	28-12-18	Predisposing factors	4 to 6 pm	2hours	Dr. K. Harsha Vardhan
4	2-1-19	Types	5 to 7 pm	2hours	Dr. Buvanaratchagan
5	4-1-19	Variants	4:30 to 6:30 pm	2hours	Dr. K. Harsha Vardhan
6	9-1-19	Investigation	4 to 6 pm	2hours	Dr. Buvanaratchagan
7	14-1-19	Topical treatment	5 to 7 pm	2hours	Dr. K. Harsha Vardhan
8	17-1-19	Systemic treatment	4:30 to 6:30 pm	2hours	Dr. Buvanaratchagan
9	21-1-19	Complications	4 to 6 pm	2hours	Dr. K. Harsha Vardhan
10	24-1-19	Other treatment methods	4 to 6 pm	2hours	Dr. K. Harsha Vardhan
11	29-1-19	Case discussion	5 to 7 pm	2hours	Dr. Buvanaratchagan
12	4-2-19	Onychomycosis in Immunocompromised	4:30 to 6:30 pm	2hours	Dr. K. Harsha Vardhan
13	8-2-19	Pulse therapy for onychomycosis	4 to 6 pm	2hours	Dr. Buvanaratchagan
14	13-2-19	Guidelines for pulse therapy	5 to 7 pm	2hours	Dr. K. Harsha Vardhan
15	20-2-19	Q&A, mcqs	4:30 to 6:30 pm	2hours	Dr. Buvanaratchagan
			Total Hours	30	

REFERENCE BOOKS:

Rooks Textbook of dermatology 9th edition

Fitzpatrick 's dermatology in general medicine 8th edition

ABSTRACT-VALUE ADDED COURSE

1. Name of the programme & Code

Onychomycosis and DR09

2. Duration & Period

30 hrs & November 2018 to February 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Course Feed Back

Enclosed as Annexure- IV

7. No. of times offered during the same

November 2018 to February 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- November 2018 to February 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	DR09	Onychomycosis	Dr. Buvanaratchagan	2nd yr MBBS	15 (Nov 2018–Feb 19)

10. Certificate model

Enclosed as Annexure- V

Dr. Buvanaratchagan

RESOURCE PERSON

Dr. K. Harsha Vardhan

COORDINATOR

ABSTRACT-VALUE ADDED COURSE

1. Name of the programme & Code

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Dr. Buvanaratchagan

RESOURCE PERSON

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Reg. No: 37150
Asso. Professor, Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Vardhan KH

Dr. K. Harsha Vardhan

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

COORDINATOR

ANNEXURE-1

ONYCHOMYCOSIS



PARTICIPANT HAND BOOK

Course details

PARTICULARS	DESCRIPTION
Course title	Onychomycosis
Course code	DR09
Objective	1. To learn about the clinical features 2. To learn about the diagnosis 3. To learn about the treatment
Further learning opportunities	Recent advances in management
Key competencies	To make the diagnosis and provide adequate treatment
Target student	2nd year mbbs students
Duration	30 hrs Nov 2018 to Feb 2019
Theory session	10 hrs
Practical session	20 hrs
Assessment procedure	Mcqs

Introduction

Onychomycosis is a fungal infection of nails caused by dermatophytes, yeasts or nondermatophyte molds and represents about 30% of mycotic cutaneous infections. Increasingly onychomychosis is being viewed as more than a mere cosmetic problem. In spite of improved personal hygiene and living environment, onychomycosis continues to spread and persist. The prevalence rate of onychomycosis is determined by age, predisposing factor, social class, occupation, climate, living environment and frequency of travel. Onychomycosis in immunocompromised patients can pose a more serious health problem. Dermatophytes are the most frequently implicated causative agents in onychomycosis. Previously regarded as contaminants, yeasts are now increasingly recognised as pathogens in fingernail infections, as are some moulds. Clinical diagnosis of onychomycosis is based on the patients' history; a physical examination, microscopy and culture of nail specimens. The treatment of onychomycosis has been attempted throughout the ages, but only in the last two decades have safe, effective systemic treatments been available for this chronic superficial fungal disease. Oral Griseofulvin and Ketoconazole; once the agents of choice for the treatment of onychomycosis, have been

superseded by newer systemic compounds that have a higher cure and lower relapse rates, cause fewer side effects and are suitable for short-term dosing.

Until the late 1990s onychomycosis was a poorly discussed topic of medical science. Even in financially more advanced Asian countries, onychomycosis has been highlighted only in the last decade. Onychomycosis is a denomination used to describe fungal infection of one or more of the nail units and can be caused by dermatophytes, yeasts or nondermatophyte moulds. [1] Onychomycosis affects approximately 5% of the population worldwide [2] and represents 20-40% of onychopathies and about 30% of mycotic cutaneous infections. [3] Various workers have reported the incidence to vary from 0.5 to 5% in the general population in India. [4],[5] In developing countries, higher priorities in socioeconomic concerns and health issues for other diseases, have resulted in low awareness of onychomycosis by physicians and the general public alike. In spite of improved personal hygiene and living environment, onychomycosis continues to spread and persist. Though there is a clearly diseased appearance associated with this condition, onychomycosis is all too often regarded as merely a cosmetic problem of relatively minor importance that is hardly worth the effort to seek treatment in many cases. This belief may have been supported by the adverse effects and long dosing courses associated with some of the earlier antifungal agents. Only in the last two decades have safe, effective systemic treatment regimens been available for this chronic superficial fungal disease that can have significant negative effects on patients' emotional, social and occupational functioning. Although onychomycosis is rarely life threatening, its high incidence and prevalence and the associated morbidity makes it an important public health problem. In this paper, current knowledge of the pathogenesis, diagnosis and management of onychomycosis is reviewed.

Epidemiology and risk factors

Reports concerning the prevalence of onychomycosis are conflicting with estimates ranging from 2-3% to 13% in the western population. [6],[7] Unlike in western countries where it is the frequent cause of nail disorders, in Southeast Asia the prevalence of onychomycosis is relatively low. This was partially confirmed by a large scale-survey in Asia in the late 1990s in which the prevalence of onychomycosis was lower in tropical countries (3.8%) than in subtropical countries and the countries in the temperate zone (18%). [8] In India, the prevalence of fungal nail infections has been estimated in the different parts of the country and the observations are listed in [Table - 1]. The prevalence rate of onychomycosis is determined by age, predisposing factor, social class, occupation, climate, living environment and frequency of travel. [9] The prevalence is higher (25%) in patients with human immunodeficiency virus infection (HIV). [10] Several studies have shown that prevalence of onychomycosis increases with age, reasons for which may include poor peripheral circulation, diabetes, repeated nail trauma, longer exposure to pathogenic fungi, sub optimal immune function, inactivity or the inability to cut the toe nails or maintain good foot care. [7] As is the case among adults, prevalence rates for onychomycosis among children are quite variable: a recent review of studies of the subject in several countries lists

prevalence rates varying from 0% (United states, Wales and Finland) to 2.6% (Guatemala). The reasons for this 30-fold decrease in the prevalence of onychomycosis in children relative to adults may include reduced exposure to fungus because less time is spent in environments containing pathogens; faster nail growth, smaller nail surface for invasion and lower prevalence of tinea pedis [Figure - 1]. [11] However, the worldwide prevalence of onychomycosis is increasing. In one study that evaluated the prevalence and risk factors of onychomycosis in individuals representing different strata of population in New Delhi the prevalence of onychomycosis was confirmed in 45% of the analysed patients. [12] A number of factors may contribute to this rise. First, as the population ages, there is a corresponding increase in chronic health problems (diabetes) and poor peripheral circulation. Second, the number of persons who are immunocompromised because of infections with human immunodeficiency virus and the use of immunosuppressive therapy, cancer chemotherapy or antibiotics, continue to expand. Third, avid sports participation is increasing the use of health clubs, commercial swimming pools and occlusive foot wears for exercise. [13] In a small percentage of persons, onychomycosis may be caused by a genetic defect that causes an alteration in immune function. [14] Contact with the source of the infection constitutes a risk factor. Other factors that increase the risk of onychomycosis are direct trauma to the nail including nail biting. Onychomycosis in immunocompromised patients can pose a more serious health problem. Not only does the difficult-to-treat infection serve as a constant reminder to the patient of his or her own deteriorated condition, the possibility exists of transfer of fungal pathogens to other individuals. [13]

Definition, etiology and classification

Onychomycosis has been traditionally referred to a non-dermatophytic infection of the nail but is now used as a general term to denote all fungal infections of the nail. Tinea unguium specifically describes a dermatophyte invasion of the nail. The term onychomycosis is derived from the Greek word "onyx", a nail and "mykes" a fungus. Toenails are about 25 times more likely than fingernails to be infected. The longest toe, either the first or the second, which bears the brunt of pressure and trauma from footwear, is particularly susceptible to invasion, although multiple nails are typically infected [Figure - 2].

Dermatophytes are the most frequently implicated causative agents in onychomycosis (nearly 90% in toenail and at least 50% in fingernail infections). Previously regarded as contaminants, yeasts are now increasingly recognized as pathogens in fingernail infections, as are some moulds. [15] The incidence and clinical significance of other than dermatophytic fungi or moulds causing onychomycosis is not well known, because they may be colonising organisms rather than pathogens. The rates of isolation of various fungi in onychomycosis are listed in [Table - 2]. One report, which presented the results of a two-year study, conducted to determine the incidence and aetiology of onychomycosis by nondermatophytic fungi in the population of Spain, described a number of species, such as *Fusarium* spp., *Scytalidium* spp. and *Acremonium* spp. etc. as aetiological agents of onychomycosis. [16] Nondermatophyte moulds cause 1.5-6% of onychomycosis. [17] Onychomycosis secondary to nondermatophyte moulds is seen most frequently in the elderly, in patients with skin diseases that affect the nails and in immunocompromised patients. It is more frequent in toes than in fingers. Many of these fungi

are highly sensitive to cycloheximide and may be missed if the specimen is not also inoculated on a cycloheximide-free medium, such as Sabouraud glucose agar, Littman's Oxgall agar or potato dextrose agar. Clinical clues that a nondermatophyte mould is the causative pathogen may include the absence of tinea pedis, only one or two infected toenails, a history of trauma, a history of nonresponsiveness to systemic antimycotics and association with periungual inflammation.

There are three groups of fungi associated with onychomycosis: dermatophytes, non-dermatophytic moulds and yeasts.

Common fungal agents causing Onychomycosis

1. Dermatophytes:

   Trichophyton rubrum

   Trichophyton mentagrophytes

   Epidermophyton floccosum

2. Nondermatophyte fungi:

   Acremonium species

   Alternaria species

   Aspergillus species

   Botryodiplodia theobromae

   Fusarium species

   Onycochola canadensis

   Scytalidium dimidiatum

   Scytalidium hyalinum

   Geotrichum candidum

Cladosporium carrionii

Scopulariopsis brevicaulis

3. Yeast:

   Candida albicans

CLINICAL FEATURES

Distal subungual onychomycosis

The most common variety of onychomycosis, distal lateral subungual onychomycosis (DLSO), is characterised by invasion of the nail bed and underside of the nail plate. It is best described as "nail bed dermatophytosis". The infecting organism migrates proximally through the underlying nail matrix. Mild inflammation develops, resulting in focal parakeratosis and subungual hyperkeratosis, with two consequences: onycholysis and subungual thickening. The nail bed becomes cornified and normal nail contour is lost. The thickened horny layer raises the free edge of the nail plate with disruption of the nail plate to nail bed attachment. DSO may develop on the fingernails, toenails or both. The dermatophytes predominate as causative agents with occasional involvement of the non-dermatophyte fungi. The commonest species of dermatophytes causing this type of onychomycosis is *T. rubrum* followed by *T. mentagrophytes* , *T. tonsurans* and *E. floccosum* . The ideal site for collection of specimen in DLSO is nail bed underside of the nail plate from the advancing edge, most proximal to the cuticle. DLSO may progress to total dystrophic onychomycosis in which case the entire nail plate and bed are involved.

Proximal subungual onychomycosis

This is also known as proximal white subungual onychomycosis (PWSO) or proximal subungual onychomycosis (PSO). A relatively uncommon subtype, PSO occurs when organisms invade the nail unit via the proximal nail fold through the cuticle area, penetrate the newly formed nail plate and migrate distally resulting in subungual hyperkeratosis, proximal onycholysis, leukonychia and destruction of the proximal nail plate. Fungal invasion of the proximal nail fold is often visible through the cuticle as a whitish yellow discolouration while the distal nail unit remains normal. Periungual inflammation may be quite marked and painful and in some cases associated with purulent discharge. These patients are frequently misdiagnosed as having bacterial infection. It affects the fingernails and toenails equally and is primarily caused by *T. rubrum* ; though *T. mentagrophytes* and other rare causes have also been reported to cause this condition. PSO has been described with increased frequency in patients with acquired immunodeficiency syndrome (AIDS). [18] Toenails involvement is more common and *T. rubrum* is the most common

pathogen. The explanation for the increased prevalence in this patient population remains unclear. The specimen is taken from nail plate and proximal nail bed as close to lunula as possible. Subungual hyperkeratosis, onychomadesis and eventual destruction and shedding of the entire nail plate may occur in advanced disease.

White superficial onychomycosis

White superficial onychomycosis (WSO) **;** a less common variety, is a distinctive pattern in which the nail plate is the primary site of invasion. This is the surface infection of the nail primarily when the fungi invade the superficial layers of the nail plate directly and is caused by *T. mentagrophytes* and sometimes by the nondermatophyte molds like *Acremonium* spp., *Aspergillus terreus* and *Fusarium oxysporum* . It can be recognized by the presence of well-delineated opaque "white islands" on the external nail plate, which coalesce and spread as the disease progresses resulting in a rough, soft and crumbly appearance of the nail. Inflammation is usually minimal in patients with WSO because viable tissue is not involved. WSO occurs primarily in toenails. It may also be found in patients of acquired immunodeficiency syndrome. The surface scrapings of the nail plate are the ideal specimens to demonstrate the fungi.

Candida onychomycosis

Candida nail infections occur in patients with chronic mucocutaneous candidiasis and are caused by *C. albicans* in 70% of cases of onychomycosis caused by the yeast; *C. parapsilosis* , *C. tropicalis* and *C. krusei* account for the remainder of the cases. [19] Both toenails and fingernails may be involved [Figure - 3]. The organism invades the nail plate directly and has three subtypes:

Candida paronychia: This is the most common type and is marked by swelling and erythema of the proximal and lateral nail folds, also called a "whitlow". After infection of the nail matrix occurs, transverse depressions (Beau's lines) may appear in the nail plate, which becomes convex, irregular and rough and ultimately dystrophic.

Candida granuloma: This type is uncommon and is characterised by direct invasion and thickening of the nail plate and associated paronychia. This condition is seen in immunocompromised patients. The organism may affect the entire thickness of the nail, resulting in advanced cases, in swelling of the proximal and lateral nail folds until the digit develops a pseudo clubbing or "chicken drumstick" appearance. It is useful to take sample from both the nail plates as well as the subungual debris of the infected nail.

Candida onycholysis: This occurs when the nail plate separates from the nail bed. Distal subungual hyperkeratosis can be seen as a yellowish grey mass lifting off the nail plate. The lesion resembles that seen in patients with DSO.

Total dystrophic onychomycosis (TDO) **:** In this type there is total destruction of the nail plate, which usually may be the end result of the any of the four main patterns of onychomycosis. The

entire nail unit becomes thick and dystrophic. TDO is used to describe end-stage nail disease, although some clinicians consider it a distinct subtype [Figure - 4].

DIAGNOSIS

Increasingly onychomychosis is being viewed as more than a mere cosmetic problem. Persons with unsightly infected nails may suffer embarrassment. Fungi from the nails may precipitate secondary bacterial infections, cellulitis, idiopathic reactions and chronic urticaria. Infected toenails may act as a reservoir for fungi, facilitating their transmission to other areas of the body and may even to other people.

Clinical diagnosis of onychomycosis is based on the patients' history; a physical examination, microscopy and culture of nail specimens. Predisposing factors like diabetes, old age, hyperhydrosis, onychoglyphores, nail trauma, poor peripheral circulation are likely to be present. Several nail disorders that may mimic fungal nail infections must be differentiated from one another and onychomycosis to initiate the most appropriate therapy. They include psoriasis, lichen planus, bacterial infections, contact dermatitis, traumatic onychodystrophies, paronychia congenital, nail bed tumours, yellow-nail syndrome, idiopathic onycholysis etc.

One should look for cutaneous signs of psoriasis on the scalp, gluteal folds, elbows and knees and nails should be evaluated for other signs of psoriasis, especially for pitting and/or small salmon coloured droplets evident on the plate. Approximately 10% of patients with lichen planus have abnormal nails. [2],[4] A practitioner can differentiate lichen planus by looking for the violaceous purple papules ridged/dystrophic nail indicative of lichen planus on the extremities or by other signs on the mucus membranes. Repeated nail trauma can cause distal onycholysis, leading to colonization of the affected space by microorganisms that produce pigmentation of the area. If the onycholytic nail is clipped to allow examination of the nail bed, the latter will be normal if the symptoms are caused by trauma rather than onychomycosis. A habit tic, often manifestating as a median furrow or depression in the middle of the nail, may also cause abnormalities of the nail. The yellow nail syndrome may also be mistaken for a fungal infection; however, the hardness of the nail plate, its increased longitudinal curvature and the light green/yellow discoloration are all typical and discriminatory.

Specimen collection

A proper specimen collection is essential for accurate diagnosis and initiation of appropriate therapy. The first step of the sample collection process is thorough cleansing of the nail area with alcohol to remove contaminants. Because the sites of invasion and localisation of the infection differ in the different types of onychomycosis, different approaches depending on the presumptive diagnosis are necessary to obtain optimal specimens.

For distal subungual onychomycosis, the abnormal nail is clipped proximally and the nail bed

and underside of the nail plate are scraped with a 1-2 mm serrated curette; the outermost debris should be discarded. Care should be taken to avoid penetration of the nail plate and bleeding. It is important to obtain nail material from the advancing infected edge closest to the cuticle, where the likelihood of viable hyphae is the greatest. For proximal subungual onychomycosis, the normal surface of the nail plate is pared down with a no. 15 surgical blade at the lunula and the white debris is collected with a sharp curette from the deeper portion of the plate and the proximal nail bed. For WSO, the white spots on the nail are scraped and the outermost surface is discarded; the white debris directly underneath is then collected. For *Candida* infection, the material closest to the proximal and lateral nail edges should be obtained.
If *Candida* onycholysis is suspected, the lifted nail bed and, if necessary, the under surface of the nail plate are scraped. For TDO, any abnormal area of the nail plate or bed can be used as a specimen.

The sampled material can be divided into two portions: one for direct microscopy and the remainder for culture. If nail material is to be used, fine shavings or minute clippings are preferred to large pieces. The specimen should be obtained when the patient has been off both topical and systemic antifungal drugs for two to four weeks. If the specimen is shipped to an outside laboratory, a sterile container, a pill packet, a clean sheet of white paper folded and sealed with tape or a specially designed mailer such as a Dermapak ^{TM} can be used. Specimens must not be kept in moist media to avoid rapid multiplication of bacterial and fungal spores. Ideally nail specimens should be processed within a week, although infective fungal elements can remain viable for months after specimen collection.

Specimen analysis

Both direct microscopy and culture of sampled material are necessary to definitive identification of the aetiologic agent. Whereas direct microscopy serves only as a screening test for the presence or absence of fungi; culture can actually help in differentiating among the pathogens and identifying the aetiologic agent. The clinician should be aware of the limitations of direct microscopy in diagnosing the cause of onychomycosis. Direct microscopy is often time-consuming because nail debris is thick and coarse and hyphae are usually sparse and there also exists a possibility of false negative results at a rate of approximately 5 to 15%. [20] The specimen can be mounted in a solution of 10 to 30% KOH or NaOH mixed with 5% glycerol, warmed to emulsify lipids and examined under 40x objective lens. An alternate formulation consists of 20% KOH and 36% DMSO. [20] The specimen may be counterstained with chitin-specific chlorazol black E to accentuate hyphae. Furthermore, it will not stain potential contaminants such as cotton or elastic fibres, which eliminates many false-positive findings. Parker's blue-black ink also can be added to the KOH preparation to improve visualisation, but this stain is not chitin-specific. Calcofluor white, a fluorescent dye that stains chitin in the fungal cell wall, can be used to enhance a standard KOH preparation. However, the use of this stain is not always practical in a clinical setting because a fluorescent microscope is required. The nail is examined for fungal hyphae or arthrospore. In *Candida* infections, yeast forms are also present. In certain nondermatophyte infections conidia may be formed *in situ* . Culture is the only method by which

the causative microorganism can be identified. As nails are non-sterile; care should be taken with culture analysis as contaminants may obscure the actual pathogen.

Two different media are used for culturing nail specimens; primary medium (containing cycloheximide selective against most nondermatophytic molds and bacteria) such as dermatophyte test media (DTM), Mycosel (BBL) and Mycobiotic (DIFCO) and secondary medium (free of cycloheximide that allows isolation of nondermatophytes nail pathogens) such as Sabouraud glucose agar, Littman's oxgall medium and potato dextrose agar. The addition of antibiotics such as chloramphenicol and gentamicin to Sabouraud glucose agar or potato dextrose agar is an additional precaution to eliminate bacterial contamination from non-sterile sites. Ideally the specimen should be incubated at 25-30°C.

The incidence and clinical significance of other than dermatophytic fungi or moulds causing onychomycosis is unknown, because they may be colonising organisms rather than pathogens. Therefore, reference laboratories should provide data on whether the isolated fungus was a likely pathogen or an unlikely one. All dermatophytes should be considered pathogens.

To increase the predictive power of a diagnosis of dermatophytic invasion of a nail, Summerbell [21] suggested that non-filamentous non-dermatophytes identified in nail tissue may be considered as one of the following:

1. Contaminant (species growing in culture from dormant propagules on the nails)
2. Normal mammalian surface commensal organism
3. Transient saprobic coloniser (coloniser of accessible surface molecules but non invasive)
4. Persistent secondary coloniser (coloniser of material infected by a dermatophyte but incapable of remaining after the dermatophyte is eliminated)
5. Successional invader (species that can cause infection after gaining entry into a nail via the disruption caused by a primary pathogen
6. Primary invader (able to infect and cause onychomycosis in a previously uncolonised nail)

As an additional confirmatory technique, definitive identification of non-dermatophytic invasion in nails may require the isolation of the agent from successive specimens from the infected region.

The difficulty in isolating fungi from nail clippings in cases of onychomycosis because of the non-viability of the fungal hyphae in the distal portion of the nail plate from where the scraping is done is well known. In order to improve the isolation rate various methods have been derived. These include the use of a grinder [22] or a dental drill fitted with a suction nozzle, [23] which

collects the nail dust for microscopy and culture. This latter instrument has raised the success rate of culture from microscopically positive nails from the usual reported rates of 50-75% to about 88%, but is not a practical procedure for the routine laboratory. [24]

If neither microscopy nor culture yields a diagnosis, histological analysis of pulverized nail plate clippings will determine whether the pathogen is a fungus. This procedure is helpful when the patient has a dystrophic nail that has repeatedly failed to show a positive response with potassium hydroxide or culture. Nail plate fragment can be sent in a 10% buffered formalin container for histopathologic analysis such as periodic acid-Schiff (PAS) staining. PAS stains glycogen and mucoproteins in the fungal cell wall. In one recent study, PAS was found to be more sensitive than KOH preparation and culture alone (92% versus 80% or 59% respectively) and PAS staining plus culture had the best sensitivity overall. [25] Another advantage of histopathologic evaluation with PAS is the short time required to render a diagnosis compared to culture. Histopathology reliably demonstrates whether a fungus is invasive or merely colonising subungual debris but like KOH this preparation does not identify the particular pathogen. PAS stain is usually sufficient to demonstrate fungi; however, small serum inclusions may be mistaken for fungi, as they are also PAS positive. The methenamine silver stain (Grocott) and calcofluor white are more selective. Nail biopsy is the last resort.

Treatment

As can be imagined, the treatment of onychomycosis has been attempted throughout the ages, but success has been limited until the current decade. In choosing therapy, the physician needs to consider the patient's age and health, the infecting organism, potential side effects and drug interactions of the various agents, the cost of treatment, the dosage schedule and patient compliance. As the rate of growth of toenails is one-third to one-half of fingernails, therapy of the former using the classical systemic drugs such as griseofulvin and ketoconazole must be continued for 12-18 months whereas fingernail infections may be cured in six months.

Oral griseofulvin and ketoconazole; once the agents of choice for the treatment of onychomycosis, have been superseded by newer systemic compounds that have a higher cure and lower relapse rates, cause fewer side effects and are suitable for short-term dosing. [26] Griseofulvin represented a promising advance in antifungal therapy when it first became available for clinical use nearly forty years ago. However, its effectiveness proved a disappointment, since its spectrum of activity is limited to dermatophytes and a prolonged duration of therapy is required for maximal efficacy-a period that may last for more than one year. Poor compliance with long-term therapy as a result of the side effects and the slow and incomplete clearance of dystrophic nails, led to success rates as low as 3-38%, with recurrence of infection often observed. [27]

Ketoconazole, developed in the 1980s, was the first orally active imidazole with a relatively broad spectrum of activity against dermatophytes, some yeast and several moulds. However, the long-term use of oral ketoconazole in onychomycosis, which is necessary to effect improvement or cure, is limited by the occurrence of side effects and significant drug interractions. [28]

The newer antifungal agents (itraconazole, fluconazole, terbenafine) block the ergosterol synthesis pathway at different points, a difference with implications for these drugs' efficacy and side effects.

Fluconazole, a triazole developed in the 1990s, is active against dermatophytes, *Candida* spp. and certain other fungi. Studies of fluconazole in onychomycosis show high cure rates but a need of long treatment time along with demonstration of some potentially significant drug interactions. [29]

Itraconazole, a broad-spectrum synthetic antifungal triazole approved in 1995 for the treatment of onychomycosis, represents an advancement beyond earlier therapies, due to its broad spectrum of activity, its high affinity for keratin and its pharmacokinetic profile. It is highly effective in the treatment of dermatophyte, yeast and some non-dermatophytic mould infections of the nails. Due to its rapid penetration into the nail and prolonged presence in the nail after discontinuation of drugs; Itraconazole has been evaluated in intermittent dosing or "pulse therapy" regimes which consists of dosing for one week (pulse) per month for a set number of months. [30]

The allylamine antifungal agent terbenafine is effective against dermatophytes and some moulds but has less activity in *C. albicans* infections. Results from several studies show that terbenafine has a high mycological cure rate and it significantly reduces treatment time over the older systemic agents. [31]

Regardless of which continuous oral antifungal agents the physician prescribes, a baseline liver profile and a blood chemistry study are recommended; however, this is not indicated for itraconazole pulse therapy.

Topical antifungal agents are of limited efficacy when used alone or with older antifungal agents to treat onychomycosis, but they may result in a more rapid cure when used in conjunction with the newer systemic compounds. They may also help to prevent the recurrence of tinea pedis, which often accompanies fungal toenail infections. Topical therapy has the greatest potential as primary therapy in mild infections, as palliative therapy in those unable to take oral therapy and as a prophylactic agent. Improvement of the conventional formulations led to the development of an alcoholic solution containing 28% tioconazole and undecylenic acid, for instance, which has produced moderate results. [32] A further step forward has been achieved with the development of new vehicles in the form of colourless nail lacquers known from cosmetic formulations. Two compounds, amorolfine and ciclopirox, are currently used in a lacquer base in several countries.

Surgical nail removal is not often used because of the discomfort, cost and possible cosmetic disfigurement. Avulsion of the nail combined with a topical antifungal agent, under occlusion, may be effective in selected patients. However, because of the inherent problems of nail avulsion, this is best limited to those with only one or two dystrophic nails and those intolerant of oral antifungals. Total surgical removal has to be discouraged: the distal nail bed may shrink and become dislocated dorsally. In addition, the loss of counter pressure produced by the removal of the nail plate allows expansion of the distal soft tissue and the distal edge of the regrowing nail

then embeds itself. This can be largely overcome by using partial nail avulsion. Chemical avulsion, done by urea ointment, is a painless method that has superseded partial surgical avulsion.

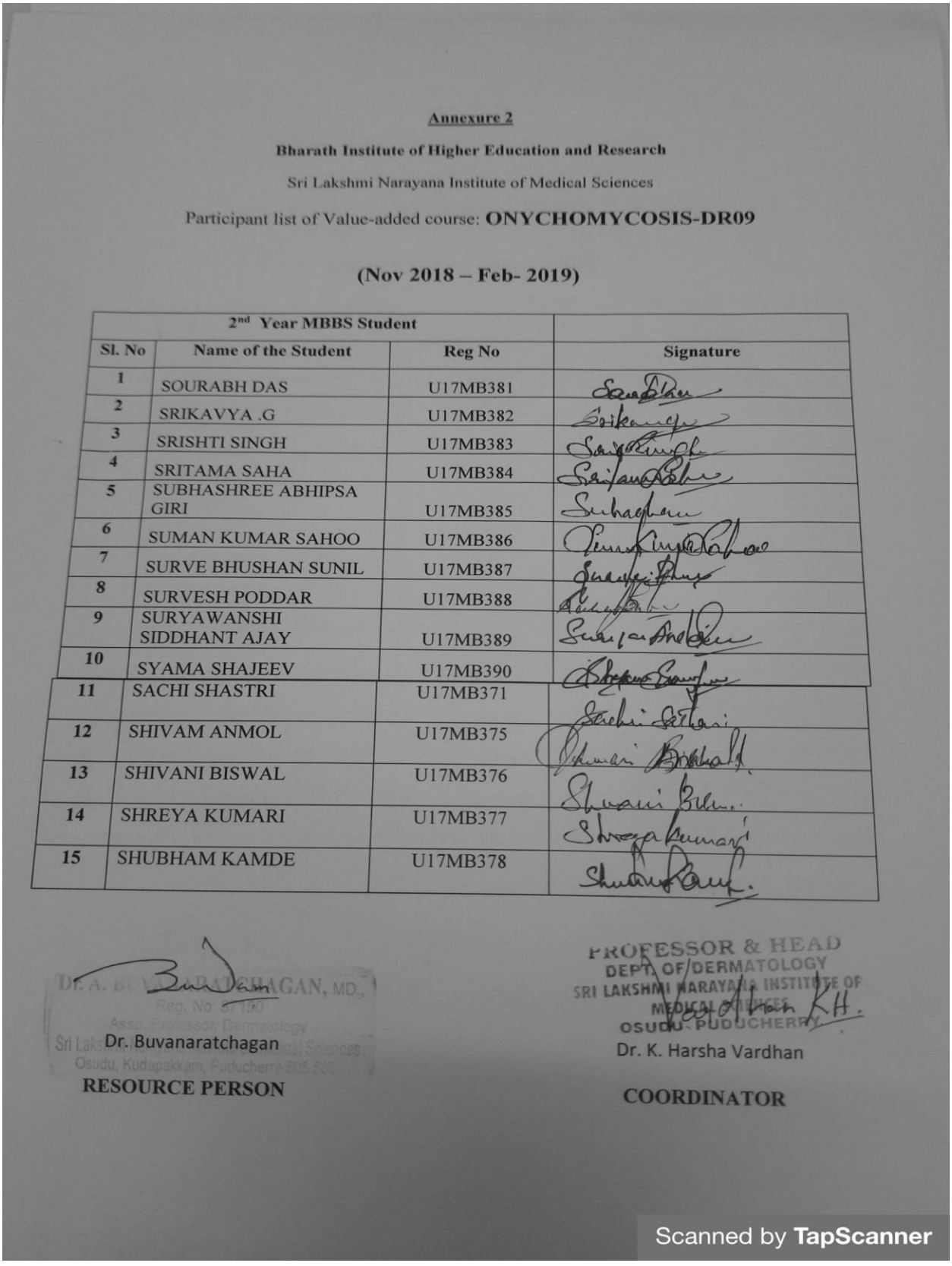
Preventing recurrence and relapse

Even with apparently optimal diagnosis and treatment, one in five onychomycosis patients are not cured by current therapies. The reasons for the 20% failure rate are inaccurate diagnosis, misidentification of the pathogen, presence of a second disorder, characteristics of the nails, presence of a high fungal inoculum and/or drug-resistant microorganisms, compromised immune system of the host, diabetes mellitus or peripheral vascular disease.

Following are some suggested measures:

1. Avoid going barefoot in public places
2. Keep feet cool and dry
3. Apply topical antifungal medication regularly to the feet and toe nails
4. Discard old shoes and "rest" shoes periodically to decrease their exposure to fungi
5. Apply an antifungal powder/spray to the inside of shoes once a week or more
6. Comply with the treatment protocol[50]

Annexure 2



Annexure 2

Bharath Institute of Higher Education and Research

Sri Lakshmi Narayana Institute of Medical Sciences

Participant list of Value-added course: **ONYCHOMYCOSIS-DR09**

(Nov 2018 – Feb- 2019)

2nd Year MBBS Student			
Sl. No	**Name of the Student**	**Reg No**	**Signature**
1	SOURABH DAS	U17MB381	
2	SRIKAVYA .G	U17MB382	
3	SRISHTI SINGH	U17MB383	
4	SRITAMA SAHA	U17MB384	
5	SUBHASHREE ABHIPSA GIRI	U17MB385	
6	SUMAN KUMAR SAHOO	U17MB386	
7	SURVE BHUSHAN SUNIL	U17MB387	
8	SURVESH PODDAR	U17MB388	
9	SURYAWANSHI SIDDHANT AJAY	U17MB389	
10	SYAMA SHAJEEV	U17MB390	
11	SACHI SHASTRI	U17MB371	
12	SHIVAM ANMOL	U17MB375	
13	SHIVANI BISWAL	U17MB376	
14	SHREYA KUMARI	U17MB377	
15	SHUBHAM KAMDE	U17MB378	

Dr. Buvanaratchagan

RESOURCE PERSON

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

Dr. K. Harsha Vardhan

COORDINATOR

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ANNEXURE-3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

ONYCHOMYCOSIS

MULTIPLE CHOICE QUESTIONS Annexure- III

ANSWER ALL QUESTIONS Course code: DR09

MULTIPLE CHOICE QUESTIONS

ANSWER ALL THE QUESTIONS

1. What is the most common pattern of onychomycosis.
a) PSO
b) Endonyx onychomycosis
c) DLSO
d) SO

2. The yeast that causes onychomycosis is:
a) Aspergillus spp
b) Fusarium spp
c) Scopulariopsis brevicaulis
d) Candida albicans

3. The organism that can invade nail plate easily and is the most common cause of onychomycosis is:
a) T. rubrum
b) T. interdigitale
c) Fusarium
d) T. soudanense

4. Two major clinical feature of DLSO are:
a) Subungual hyperkeratosis and nail thickening
b) Paronychia and pitting
c) Nail thickening and pitting
d) Subungual hyperkeratosis and paronychia

5. The 2nd most common clinical pattern of onychomycosis is:
a) DLSO
b) SO
c) TDO
d) PSO

6. What is the definitive diagnostic test to find etiology of onychomycosis?
a) Culture
b) Microscopy
c) Nail unit biopsy
d) PCR

7. What are the indications of oral treatment for onychomycosis?
a) When multiple nails are involved
b) Lunula or matrix is involved
c) More than 75% of nail apparatus is involved
d) All of the above

8. What is the main clinical feature of non-dermatophyte onychomycosis?
a) Subungual hyperkeratosis
b) Pitting
c) Nail thickening
d) Periungual inflammation

9. Which type of onychomycosis is related to AIDS and other immunocompromised conditions?
a) DLSO
b) PSO
c) SO
d) Endonyx onychomycosis

10. A patient with onychomycosis is said to have developed relapse of the disease if he develops onychomycosis within how many months of starting the treatment?
a) 6 months
b) 18 months
c) 12 months
d) 24 months

ANNEXURE-3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

ONYCHOMYCOSIS

SYAMA SHAJEEV

MULTIPLE CHOICE QUESTIONS Annexure- III

ANSWER ALL QUESTIONS Course code: DR09

MULTIPLE CHOICE QUESTIONS

ANSWER ALL THE QUESTIONS

1. What is the most common pattern of onychomycosis.
a) PSO
b) Endonyx onychomycosis
c) DLSO
d) SO

8/10

Vardhan KH. 5/9/17.

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c) Nail thickening and pitting
d) Subungual hyperkeratosis and paronychia

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b) SO
c) TDO
d) PSO

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a) Culture
b) Microscopy
c) Nail unit biopsy
d) PCR

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ANNEXURE-3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

ONYCHOMYCOSIS

SOURABH DAS

MULTIPLE CHOICE QUESTIONS Annexure- III

ANSWER ALL QUESTIONS Course code: DR09

MULTIPLE CHOICE QUESTIONS

ANSWER ALL THE QUESTIONS

9/10

Vardhan KH 5/9/17.

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a) 6 months
b) 18 months
c) 12 months
d) 24 months

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ANNEXURE-4
Student Feedback Form

Course Name: **ONYCHOMYCOSIS**

Subject Code: **DR09**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Signature

Date: 20-02-2019

ANNEXURE-4
Student Feedback Form

Course Name: **ONYCHOMYCOSIS**

Subject Code: **DR09**

Name of Student: SWAMA SHAJEEV Roll No.: U17MB390

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear	✓				
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course			✓	✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 20-02-2019

Signature

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ANNEXURE-4
Student Feedback Form

Course Name: **ONYCHOMYCOSIS**

Subject Code: **DR09**

Name of Student: SOURABH DAS Roll No.: UTMB387

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear	✓				
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned		✓			
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date: 20-02-2019

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Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SYAMA SHAJEEV has actively participated in the Value Added Course on *Onychomycosis- Overview* held during Nov 2018 - Feb 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. A. BUVANARATCHAGAN, MD.,
Reg. No: 37150
Asso. Professor, Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry-605 502.

Dr.Buvanaratchagan
RESOURCE PERSON

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCE

Dr. K. Harsha Vardhan
COORDINATOR

ANNEXURE-5

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SOURABH DAS has actively participated in the Value Added Course on *Onychomycosis- Overview* held during Nov 2018 - Feb 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Buvanaratchagan
RESOURCE PERSON

Dr. K. Harsha Vardhan
COORDINATOR

Course completion letter Date 25-02-19

From
Dr. K. Harsha Vardhan
Department of Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai.

Through Proper Channel

To
The Dean
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Onychomycosis

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **Onychomycosis** on 20-12-2018. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. K. Harsha Vardhan

<HOD Sign and Seal>

Encl: Certificates

Photographs

Course completion letter Date 25-02-19

From
Dr. K. Harsha Vardhan
Department of Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai.

Through Proper Channel

To
The Dean
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Vardhan KH

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
PUDUCHERRY.

<HOD Sign and Seal>

Encl: Certificates

Photographs



OFFICE OF THE DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Date 23.11.2018

From
DR.Vijayaragavan,
Professor and Head,
Department of orthopaedics,
SLIMS,
Bharath Institute of Higher Education and Research,
Pondicherry.

To
The Dean,
SLIMS,
Bharath Institute of Higher Education and Research,
Pondicherry.

Sub: Permission to conduct value-added course: Orthopaedic surgical approaches

Respected Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Orthopaedic surgical approaches** on 05.12.2018. We solicit your kind permission for the same.

Kind Regards

DR.Vijayaragavan

Dr. R. VIJAYA RAGAVAN, DNB.,
Reg. No 68472
Asso Professor Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean:DR.Jayalakshmi.

The HOD:DR.Vijayaragavan

The Expert:Dr.Boblee James

The committee has discussed about the course and is approved.

OFFICE OF THE DEAN

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OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
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[Affliated to Bharath University, Chennai - TN]

Dean

DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

Subject Expert

Department of Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Pondicherry - 605 502.

HOD

Dr. R. VIJAYA RAGAVAN, DNB.,
Reg. No 68472
Asso Professor Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

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Circular

07.06.2020

Sub: Organising Value-added Course: ORTHOPAEDIC SURGICAL APPROACHES

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **ORTHOPAEDIC SURGICAL APPROACHES**.30HRS& DEC18–MAR19

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before DEC18–MAR19. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

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Course Proposal

Course Title: ORTHOPAEDIC SURGICAL APPROACHES

CourseObjective: To learn new and old techniques

Course Outcome: understanding the approach & its necessity

Course Audience: 16

Course Coordinator: DR.Jayalakshmi

Course Faculties with Qualification and Designation:

1.DR.VIJAYARAGAVAN DNB ORTHO

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1	8/12/18	KNOW YOUR PATIENT	4-5pm	1hr
2	10/12/18	CONSENT FOR SURGERY	4-5pm	1hr
3	14/12/18	LIMB MARKING	4-5pm	1hr
4	18/12/18	ANAESTHESIA	4-5pm	1hr
5	21/12/18	TOURNIQUETS	4-5pm	1hr
6	24/12/18	SKIN INCISION	4-5pm	1hr
7	27/12/18	SKIN MARKING	4-5pm	1hr
8	07/01/19	TISSUE HANDLING	4-5pm	1hr
9	11/01/19	EXTERNAL FIXATORS	4-5pm	1hr
10	16/01/19	CLOSURE	4-5pm	1hr
1	16/02/19	PRACTICAL SESSION	3-8	5
2	28/2/19	PRACTICAL SESSION	3-8	5
3	8/3/19	PRACTICAL SESSION	3-8	5
4	21/3/19	PRACTICAL SESSION	3-8	5
			Total Hours	30

REFERENCE BOOKS:

1)SURGICAL EXPOSURES IN ORTHOPAEDICS **STANLEY HOPPENFELD**

2)CAMPBELLS OPERATIVE ORTHOPAEDICS

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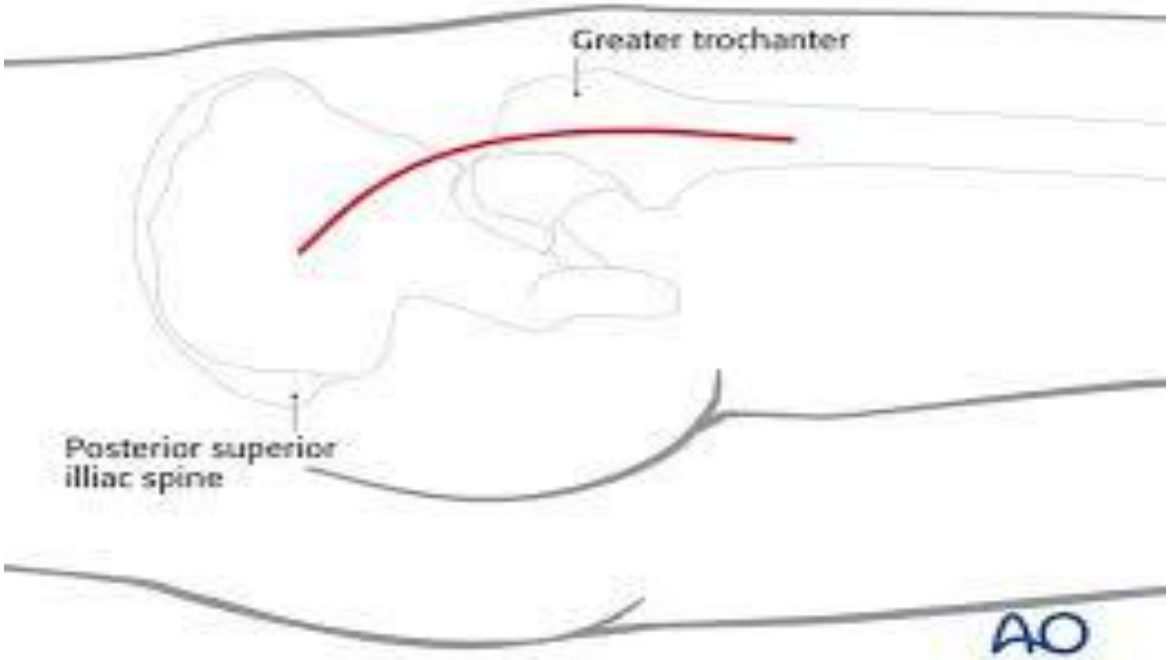

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ORTHOPAEDIC SURGICAL APPROACHES

8/12/2018

ORTHOPAEDIC SURGICAL APPROACHES – GENERAL PRINCIPLES

Particulars	Description
Course Title	Orthopaedic surgical approaches – general principles
Course Code	OR10
Objective	1. Know your patient 2. Consent for surgery 3. Limb marking **4.** Anaesthesia **5.** Tourniquets **6.** Skin incision **7.** Skin marking **8.** Tissue handling **9.** External fixators **10.** Closure
Further learning opportunities	Orthopaedic surgical approaches – general principles
Key Competencies	On successful completion of the course the students will have skill in SURGICAL APPROACHES
Target Student	PRE FINAL YEARS Students
Duration	30hrs Dec2018– March 2019
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	SHORT NOTES

"Surgery is the first and highest division of the healing art, pure in itself, perpetual in it's application and it prolongs the duration of human existence on the earth"-Sushrut, 300 BC

"A surgical procedure starts with an approach, a skin incision"

"To study the phenomenon of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all".-Sir William Osler (1849-1919)

'Key to operative surgery is surgical anatomy'
'Key to surgical anatomy is inter nervous plane'-A K Henry

Key to Successful Orthopaedic procedures

'GET TO THE BONE AND STAY THERE'

BASICS:

11. Know your patient
12. Consent for surgery
13. Limb marking
14. Anaesthesia

POSITION OF THE PATIENT:

1) Supine
2) Prone
3) Lateral
4) Beach chair

Position and draping of the limb (free limb)

Position & Comfort of the surgeon

TOURNIQUETS

Limb Surgeries – Use tourniquet

Blood less field,

Easy identification of structures

Proper application prior to scrubbing and draping should be ensued

SKIN INCISION:

- Skin Marking
- Distribution of cutaneous nerves
- Direction of blood flow
- Natural lines of skin cleavage – Langer's
  - ✓ Across / in line
  - ✓ May influence the size and prominence of the scar
- Site of incision is determined by
    - Safety and effectiveness, not by cosmetic considerations
- Are you an 'angle' person or a 'curvy' artist
- Extensibility / free access to deeper structure
- Dealing with altered anatomy

SKIN MARKING:

-Plan the surgical approach.

-Palpate bony points and anatomical borders and mark with marking pen

-If necessary outline bony prominences.

DEEP TISSUE INCISIONS:

- Follow the planes of fascia, some areas plane between the muscles.
- Always leave enough tissue on each side to facilitate closure
- Certain approaches require incision of fascia & muscle along the direction of muscle fibres
- The yellow cords and red tubes : Nerves & vessels should be protected and retracted

TISSUE HANDLING:

- Respect – crushed tissue is a devitalized tissue
- Sensitive structures- Nerves & blood vessels
- Fine structures – Tendons / Tendon sheaths
- Muscle-

  Split in the direction of fibres

  Muscles with dual nerve supply Eg. Brachialis

APPROACH AT JOINTS:

Skin incision should not cross flexion creases at 90 degrees.

Skin incisions across the flexion creases are usually curved to traverse crease at about 60 degrees.

Skin incisions perpendicular to flexion crease can cause contractures of joints.

PERCUTANEOUS APPROACHES

Un-displaced & minimally displaced fractures mostly in subarticular regions

Skin incision wide enough to get the screw with or without washer into fixation site

Clearance of soft tissue till the bone surface

Use of image intensifier

EXTERNAL FIXATORS:

Pins Passed through stab cuts in the skin to stabilize the bone

Changed the management of open fractures

Useful in limb lengthening

Safe zones : in order to avoid injury to nerves, vessels & tendons.

Different safe zones for extremities

Skin Incision: Should be long enough to avoid tension.

Deeper structures and tissues to be cleared till bony surface.

CLOSURE:

i. It is always courteous to put the things back where they belong
ii. How do you close the deep planes
iii. When not to close the deep layers
iv. Obliterate dead spaces
v. Use of suction drains
vi. Skin closure
vii. Can you always close the skin ?

In Conclusion

A SURGICAL APPROACH

- Position of patient on operating table
- Surgical landmarks and incision
- Inter nervous plane
- Superficial surgical dissection
- Deep surgical dissection
- Dangers – Vessels & Nerves
- Extension of the approach
- Local measures
- Extensile approach
- Closure of the wound

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Annexure- II

VALUE ADDED COURSE

Orthopaedic surgical approaches – general principles

OR10

4. List of Students Enrolled DEC 2018 – MARCH 2019

THIRD Year MBBS Student			
Sl. No	**Name of the Student**	**Roll No**	**sign**
1	BHASKARAN .K.C	U16MB275	
2	BHAVANI . K.M	U16MB276	
3	BLESSY AMALA RISHA .J	U16MB277	
4	CAREENA DANIEL	U16MB278	
5	CHANDRA PRAKASH.M	U16MB279	
6	CHINJU S.R	U16MB280	
7	DASARI VENKATA SAI MOUNISH	U16MB281	
8	DEBARPITA NATH	U16MB282	
9	DEEBAK .I	U16MB283	
10	DEEKSHITH D.R	U16MB284	
11	DEEPIKAA D.V	U16MB285	
12	DELFI MARY .E	U16MB286	
13	DEVIKA.U.M	U16MB287	
14	DHAKSHANA .M	U16MB288	
15	EDA SAI VENKATA TEJA	U16MB289	
16	GAURAV KUMAR	U16MB290	

RESOURCE PERSON
DR.VIJAYARAGAVAN

Dr. R. VIJAYA RAGAVAN, DNB.,
Reg No 68472
Asso Professor Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

COORDINATOR
DR.JAYALAKSHMI

DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villianur Commune Puducherry-605 502.

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Annexure 4

Course/Training Feedback Form

Course: ORTHOPAEDIC SURGICAL APPROACHES
Date: 21/3/19
Name:DEEBAK.I
Reg NO.
Department:ORTHO

Q 1: Please rate your overall satisfaction with the format of the course:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 2: Please rate course notes:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 3: The lecture sequence was well planned

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 4: The lectures were clear and easy to understand

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 5: Please rate the quality of pre-course administration and information:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 6: Any other suggestions:

Comments:

Thank you for taking the time to complete this survey, your comments are much appreciated.

***OPTIONAL Section*:** Name _____
Signature _____ Date _____

dical Sciences
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EXTERNAL FIXATORS:-

External fixation is a surgical treatment wherein rods are screwed into bone and exit the body to be attached to stabilizing structure on outside of the body.

Types:

01. Ilizarov apparatus
02. Taylor spatial frame.

Indications:

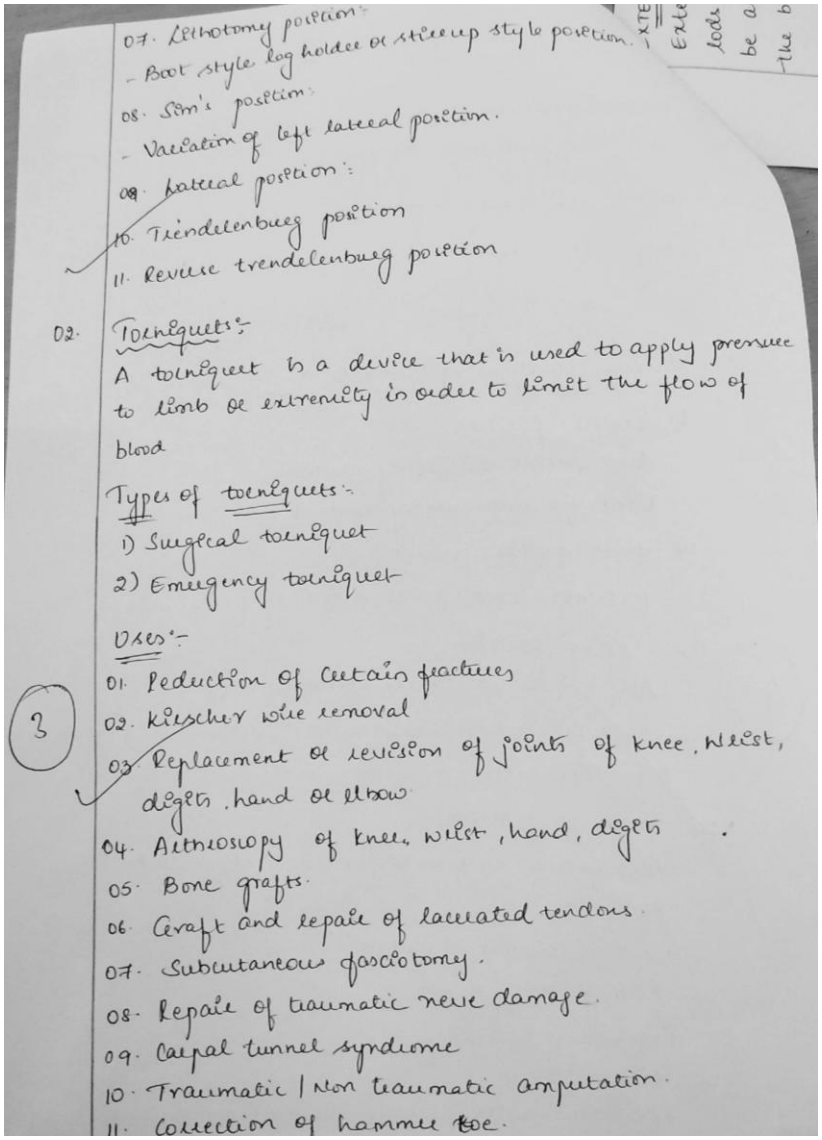
01. Stabilizing of severe open fractures
02. Stabilizing infected nonunions
03. Correction of extremity malignalignments and legth discrepancies.
04. Initial stabilizing of soft tissues
05. Arthrodesis
06. Legamentotaxis

Contra Indications:

01. Pt with compromised immune system
02. Non complaint pt.
03. Pre-existing pt who would not be able to ensure proper wire and pin
04. Bone pathology

04. TYPES OF SUTURES:

01. Natural
02. Synthetic



07. Lithotomy position:
- Boot style leg holder or stirrup style position.

08. Sim's position:
- Variation of left lateral position.

09. Lateral position:

10. Trendelenburg position

11. Reverse trendelenburg position

02. Tourniquets:

A tourniquet is a device that is used to apply pressure to limb or extremity in order to limit the flow of blood

Types of tourniquets:

1) Surgical tourniquet
2) Emergency tourniquet

Uses:

01. Reduction of certain fractures
02. Kirschner wire removal
03. Replacement or revision of joints of knee, Wrist, digits, hand or elbow
04. Arthroscopy of knee, wrist, hand, digits
05. Bone grafts.
06. Graft and repair of lacerated tendons.
07. Subcutaneous fasciotomy.
08. Repair of traumatic nerve damage.
09. Carpal tunnel syndrome
10. Traumatic / Non traumatic amputation.
11. Correction of hammer toe.

3

01. Various positions of patients and physiological (surgical) approach
02. of tourniquets and its uses.
03. What are external fixators.
04. Types of sutures.

14/20

01. Various positions of patients during surgery:-

01. Fowler's position
- Also called as sitting position
- Used for neurosurgery and shoulder surgery.

02. High fowler's position:-
- patient seated at head end of operating table.

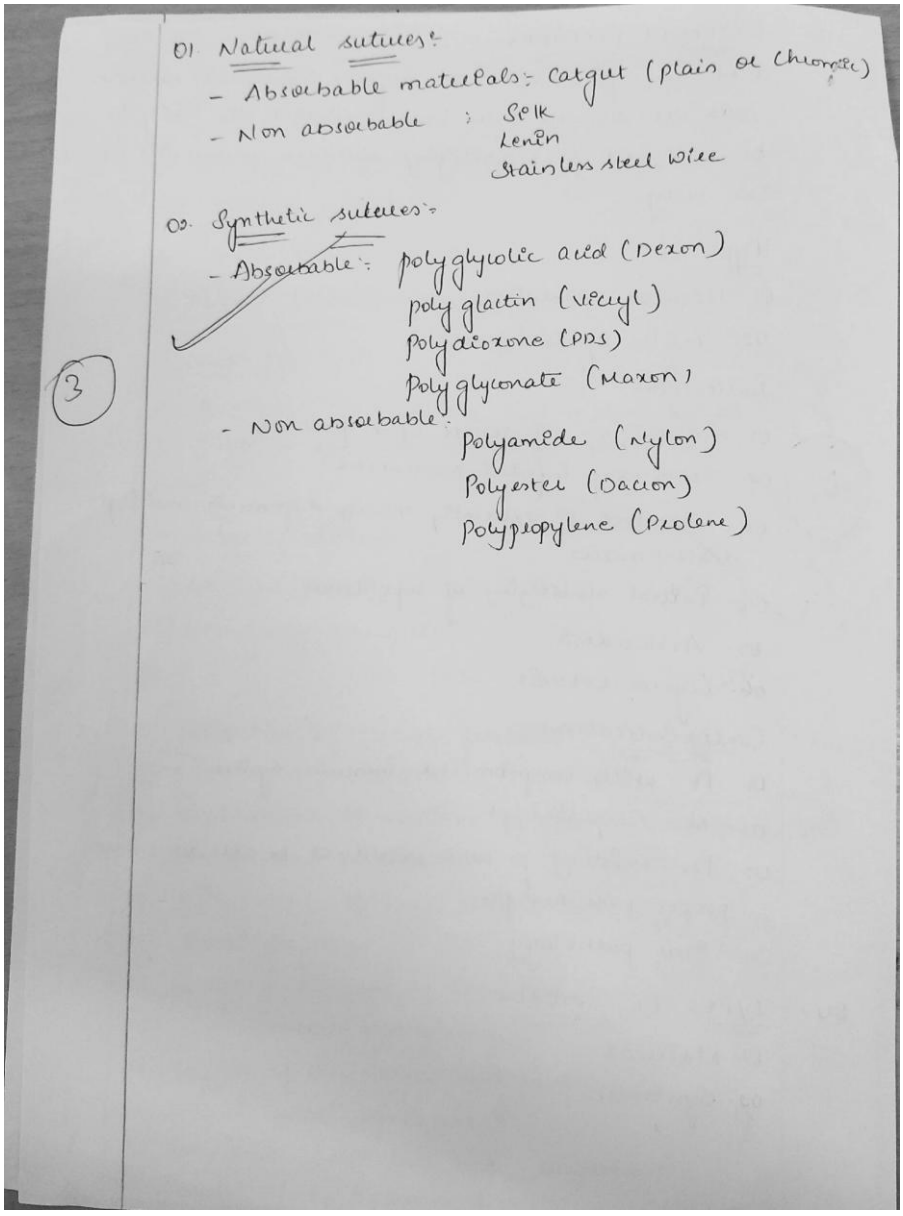
03. Supine position:-
- Also known as Dorsal decubitus
- Used for intracranial, cardiac, abdominal, endovascular laparoscopic etc.

04. Jackknife position:-
- Also known as kraske or knee-chest or kneeling positions
- Used in colorectal surgeries.

05. Kidney position:-
- Resembles lateral position

06. Prone position:-
- Face down with head in neutral position

(4)



01. Natural sutures:
- Absorbable materials: Catgut (plain or Chromic)
- Non absorbable : Silk
  Linen
  Stainless steel wire

02. Synthetic sutures:
- Absorbable: polyglycolic acid (Dexon)
  polyglactin (Vicryl)
  Polydioxone (PDS)
  Polyglyconate (Maxon)
- Non absorbable:
  Polyamide (Nylon)
  Polyester (Dacron)
  Polypropylene (Prolene)

(3)

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Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _DEEBAK.I_ has actively participated in the Value Added Course on *Orthopaedic surgical approaches – general principles* held during DEC 2018 – MARCH 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Vijayaragavan
RESOURCE PERSON

Dr. Jayalakshmi
COORDINATOR

OFFICE OF THE DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
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Student Feedback Form

Course Name: **ORTHOPAEDIC SURGICAL APPROACHES – GENERAL PRINCIPLES**

Subject Code: OR10

Name of Student: Deepikaa D.V Roll No.: U16MB285

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 21/3/19

Signature

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Date:21.3.2019

From
DR.Vijayaragavan,
Department of orthopaedics,
SLIMS,
Bharath Institute of Higher Education and Research,
Pondicherry.

Through Proper Channel

To
The Dean,
SLIMS,
Bharath Institute of Higher Education and Research,
Pondicherry.

Sub: Completion of value-added course: ORTHOPAEDIC SURGICAL APPROACHES

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **Orthopaedic surgical approaches** on 21.03.2019. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr.Vijayargavan

Dr. R. VIJAYA RAGAVAN, DNB.,
Reg. No 68472
Asso Professor Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

Encl: Certificates

Photographs

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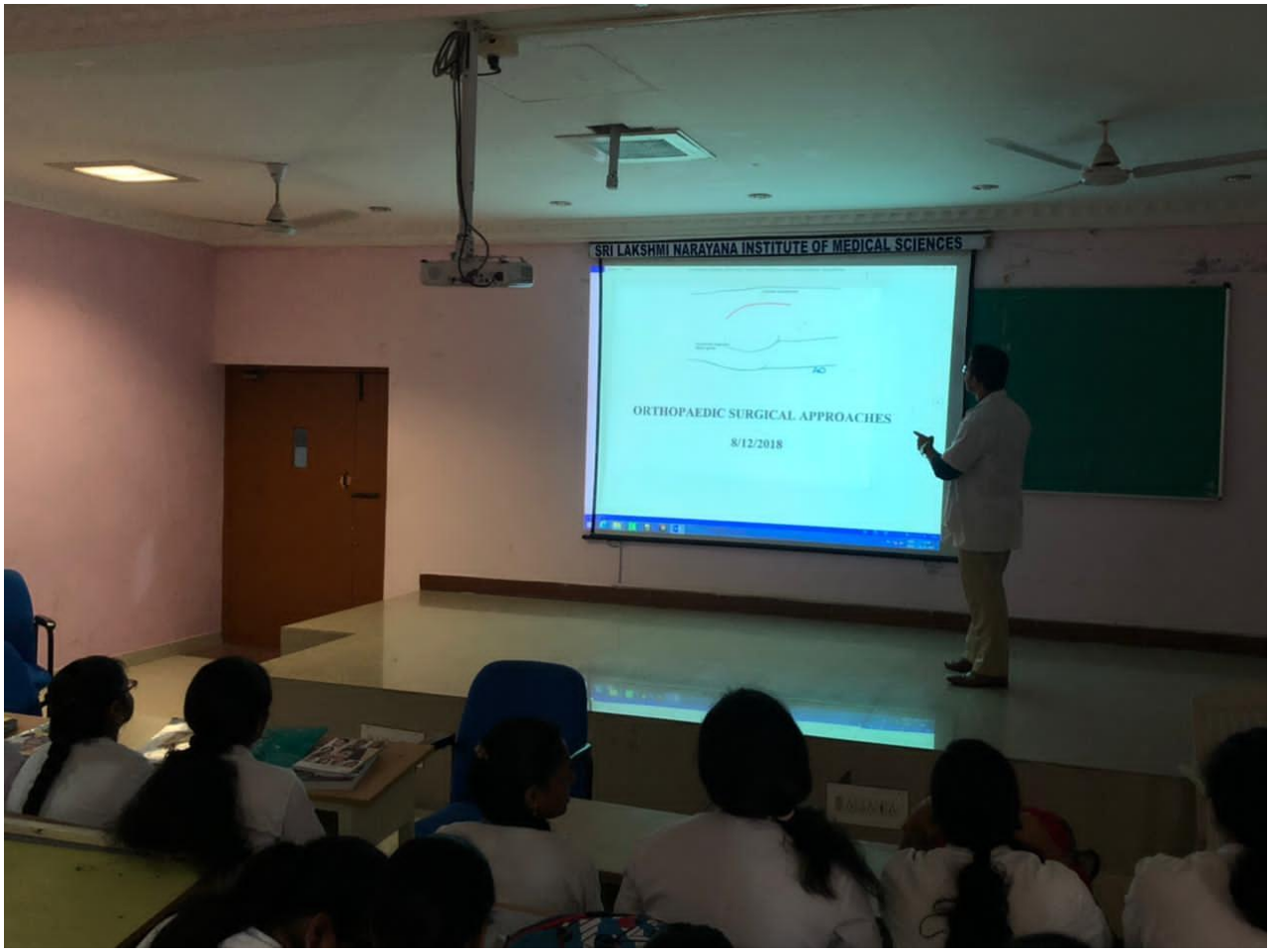

Sri Lakshmi Narayana Institute of Medical Sciences

From

Dr. Vijay Kumar
Assistant Professor and Head,
Department of TB & Chest,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Date: 02.11.2018

To

The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE** for interns December 2018 to January 2019 We solicit your kind permission for the same.

Kind Regards

Dr .Vijay Kumar

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. Jaya lakshmi**

The HOD: **Dr. Vijay Kumar**

The Expert: **Dr. Prakash Rao Balan**

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D., DEAN Sri Lakshmi Narayana Institute of Medical Sciences Osudu, Agaram, Kudapakkam Post, Villianur Commune, Puducherry - 605502.	Dr Prakash Rao Balan	Dr.Vijay Kumar

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Circular

08.11.2018

Sub: Organising Value-added Course: DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE"**. The course content is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30.11.2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean
Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Course Proposal

Course Title: **DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

Course Objective:

1.To diagnose a COPD patient

2.To improve the skill in treating a COPD patient.

Course Outcome: Improvement in the skill of management of COPD patients

Course Audience: Medical Interns of 2018 Batch

Course Coordinator: Dr. Vijay Kumar

Course Faculties with Qualification and Designation:
1.Dr. Vijay Kumar ,Assistant Professor
2.Dr.Prakash Rao Balan, Senior Resident

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Resource faculty	Time	Hours
1.	1/12/2018	DEFINITION AND OVERVIEW	Dr. Vijay Kumar	2-6p..m	4
2.	3/12/2018	BURDEN OF COPD	Dr.Prakash Rao Balan	2-6pm	4
3.	6/12/2018	PATHOLOGY, PATHOGENESIS AND PATHOPHYSIOLOGY	Dr. Vijay Kumar	2-6p.m	4
4.	8/12/2018	DIAGNOSIS AND INITIAL ASSESSMENT	Dr.Prakash Rao Balan	2-6p.m	4
5.	10/12/2018	Classification of severity of airflow limitation	Dr. Vijay Kumar	2-6p.m	4
6.	13/12/2018	Role of spirometry	Dr.Prakash Rao Balan	2-6p m	4
7.	15/12/2018	Differential Diagnosis of COPD	Dr. Vijay Kumar	2-6p.M	4
8.	17/12/2018	EVIDENCE SUPPORTING PREVENTION AND MAINTENANCE THERAPY	Dr.Prakash Rao Balan	2-6p.m	4
9.	20/12/2018	INTERVENTIONAL THERAPY	Dr. Vijay Kumar	4-6p.m	2
		Total			34hrs

REFERENCE BOOKS:

1.. Barnes PJ, Celli BR. Systemic manifestations and comorbidities of COPD. Eur Respir J 2009; 33(5): 1165-85.

2.Soriano JB, Visick GT, Muellerova H, Payvandi N, Hansell AL. Patterns of comorbidities in newly diagnosed COPD and asthma in primary care. Chest 2005; 128(4): 2099-107.

3.Mannino DM, Thorn D, Swensen A, Holguin F. Prevalence and outcomes of diabetes, hypertension and cardiovascular disease in COPD. Eur Respir J 2008; 32(4): 962-9.

4.Sin DD, Anthonisen NR, Soriano JB, Agusti AG. Mortality in COPD: Role of comorbidities. Eur Respir J 2006; 28(6): 124557.

5.Iversen KK, Kjaergaard J, Akkan D, et al. The prognostic importance of lung function in patients admitted with heart failure. Eur J Heart Fail 2010; 12(7): 685-91.

VALUE ADDED COURSE

1. Name of the programme & Code

Diagnosis and Treatment of Chronic obstructive pulmonary disease & CT03

2. Duration & Period

34 hrs & Dec2018 – Jan 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time Dec2018 – Jan 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- December 2018 – January 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	CT 03	**Diagnosis and Treatment of chronic obstructive pulmonary disease**	Dr. Vijay Kumar	CRRI Interns	8 students DEC 2018 – Jan 2019

10. Course Feed Back

Enclosed as Annexure- V



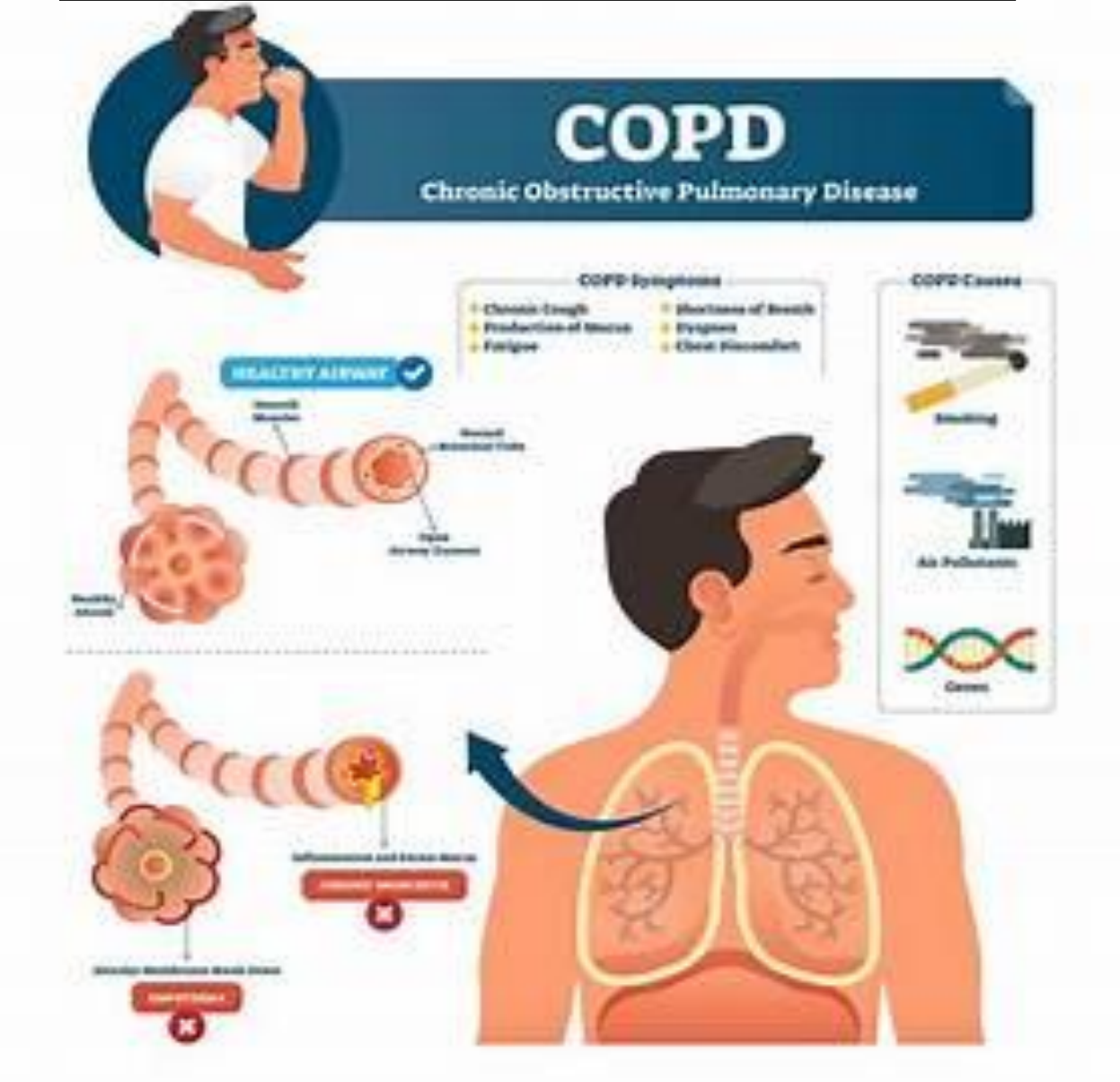
RESOURCE PERSON
Dr. Prakash Rao Balan



COORDINATOR
Dr.Vijay Kumar

Annexure -1

CHRONIC OBSTRUCTIVE PULMONARY DISEASE



PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE
Course Code	CT03
Objective	1.Definition 2.Etiology and pathogenesis 3.Diagnosis 4.Differential diagnosis 5.Management of COPD
Further learning opportunities	Differentiate between asthma and COPD
Key Competencies	On successful completion of the course the students will have skill in handling and manage patients with COPD.
Target Student	CRRI Interns
Duration	32hrs
Theory Session	30 hrs + (2 hours assessment)
Assessment Procedure	Multiple choice questions

1. DEFINITION:

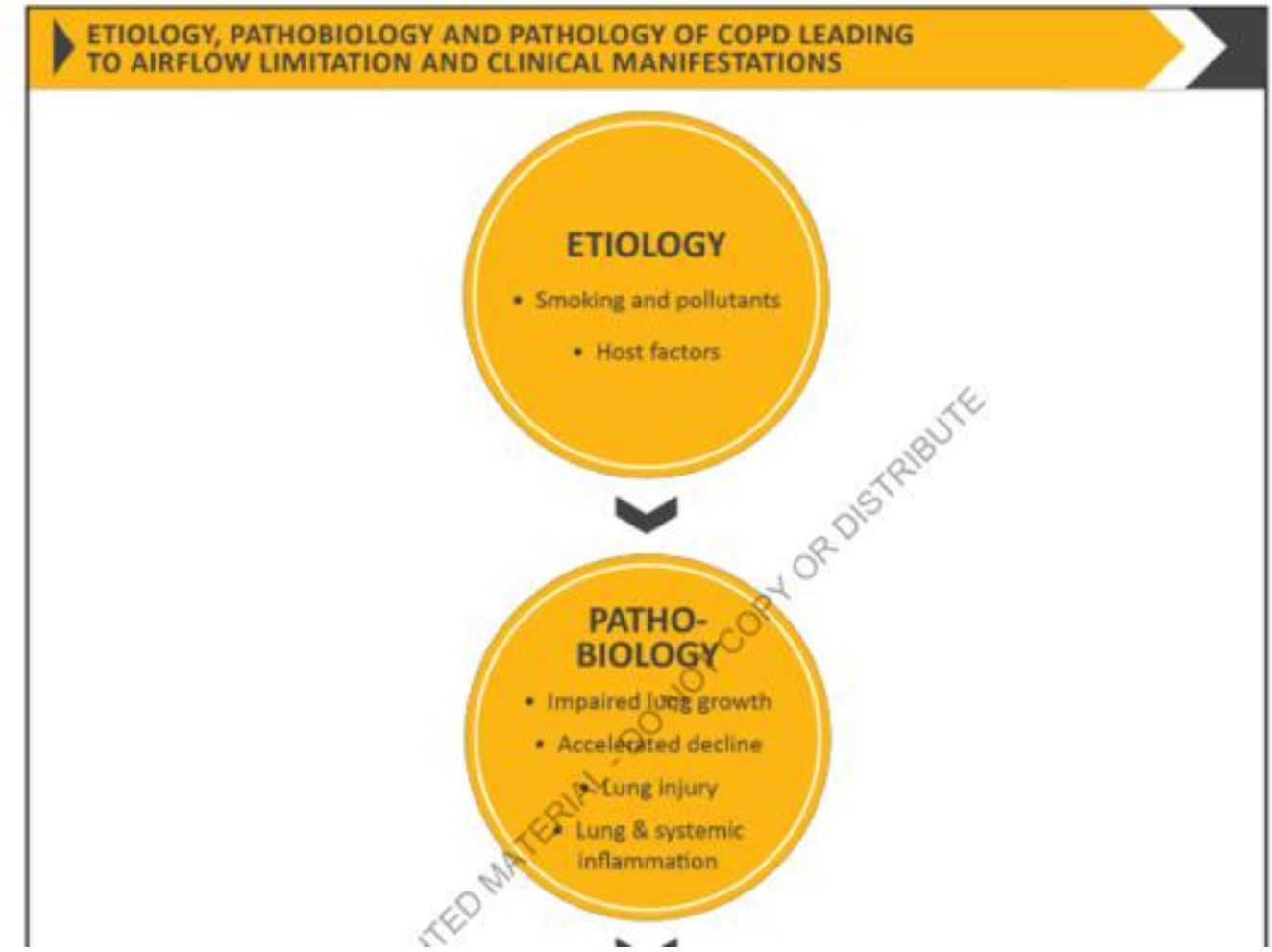
Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.

• The most common respiratory symptoms include dyspnea, cough and/or sputum production. These symptoms may be under-reported by patients.

• The main risk factor for COPD is tobacco smoking but other environmental exposures such as biomass fuel exposure and air pollution may contribute.

Besides exposures, host factors predispose individuals to develop COPD. These include genetic abnormalities, abnormal lung development and accelerated aging.

2.ETIOLOGY AND PATHOGENESIS:



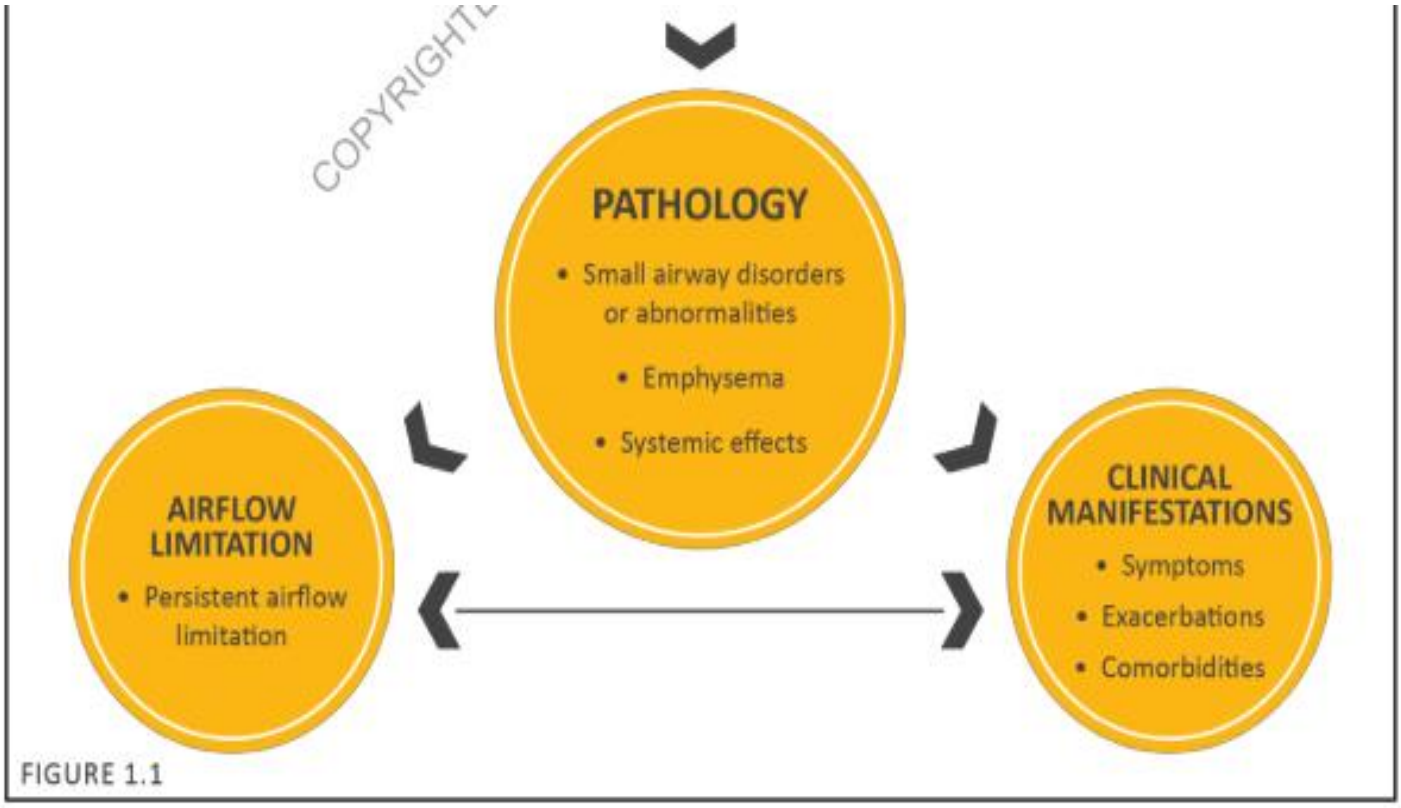


FIGURE 1.1

3.DIAGNOSIS AND INITIAL ASSESSMENT:

KEY INDICATORS FOR CONSIDERING A DIAGNOSIS OF COPD

Consider COPD, and perform spirometry, if any of these indicators are present in an individual over age 40. These indicators are not diagnostic themselves, but the presence of multiple key indicators increases the probability of a diagnosis of COPD. Spirometry is required to establish a diagnosis of COPD.

Dyspnea that is:	Progressive over time. Characteristically worse with exercise. Persistent.
Chronic Cough:	May be intermittent and may be unproductive. Recurrent wheeze.
Chronic Sputum Production:	Any pattern of chronic sputum production may indicate COPD.

Recurrent Lower Respiratory Tract Infections	
History of Risk Factors:	Host factors (such as genetic factors, congenital/developmental abnormalities etc.). Tobacco smoke (including popular local preparations). Smoke from home cooking and heating fuels. Occupational dusts, vapors, fumes, gases and other chemicals.
Family History of COPD and/or Childhood Factors:	For example low birthweight, childhood respiratory infections etc.

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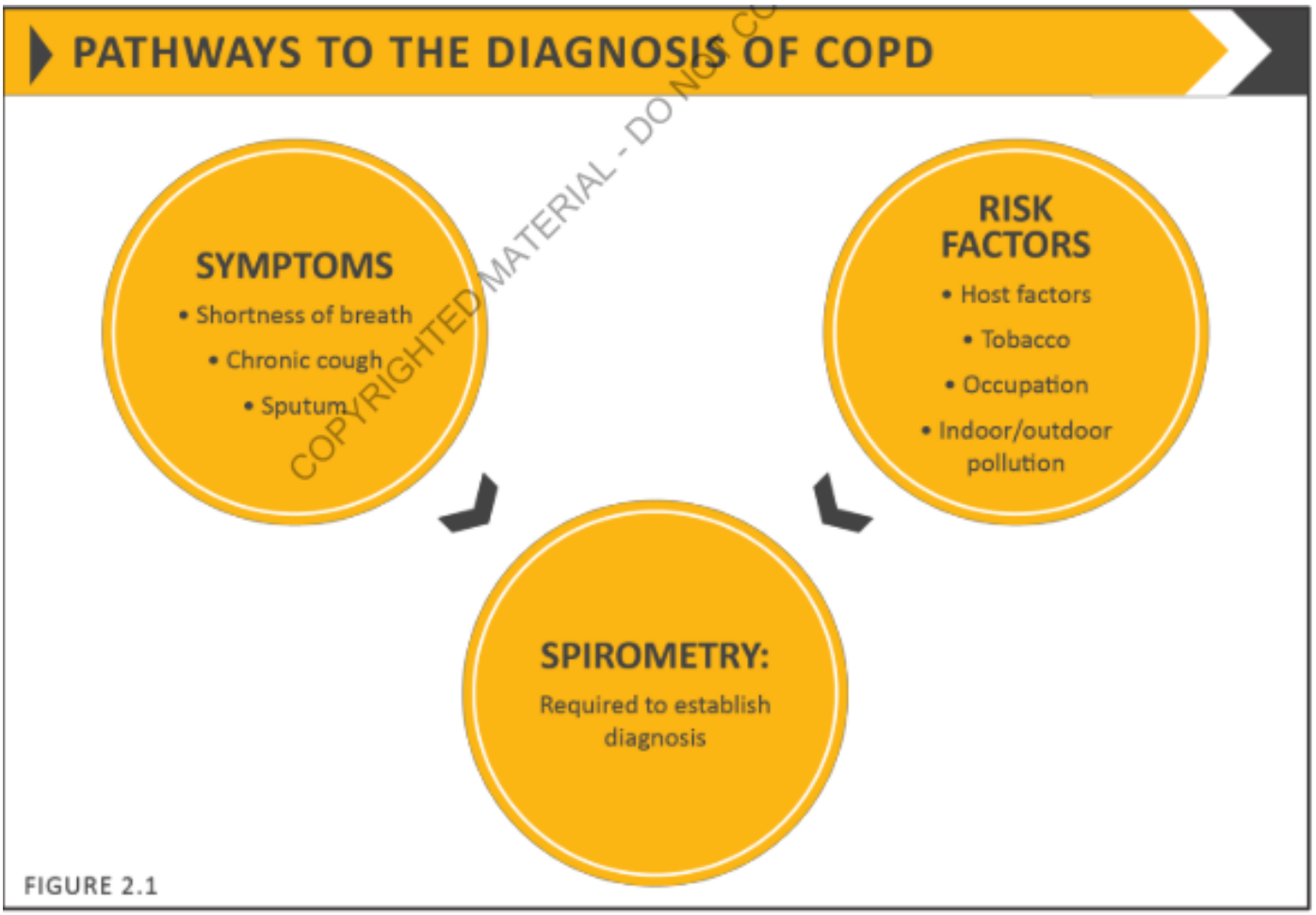

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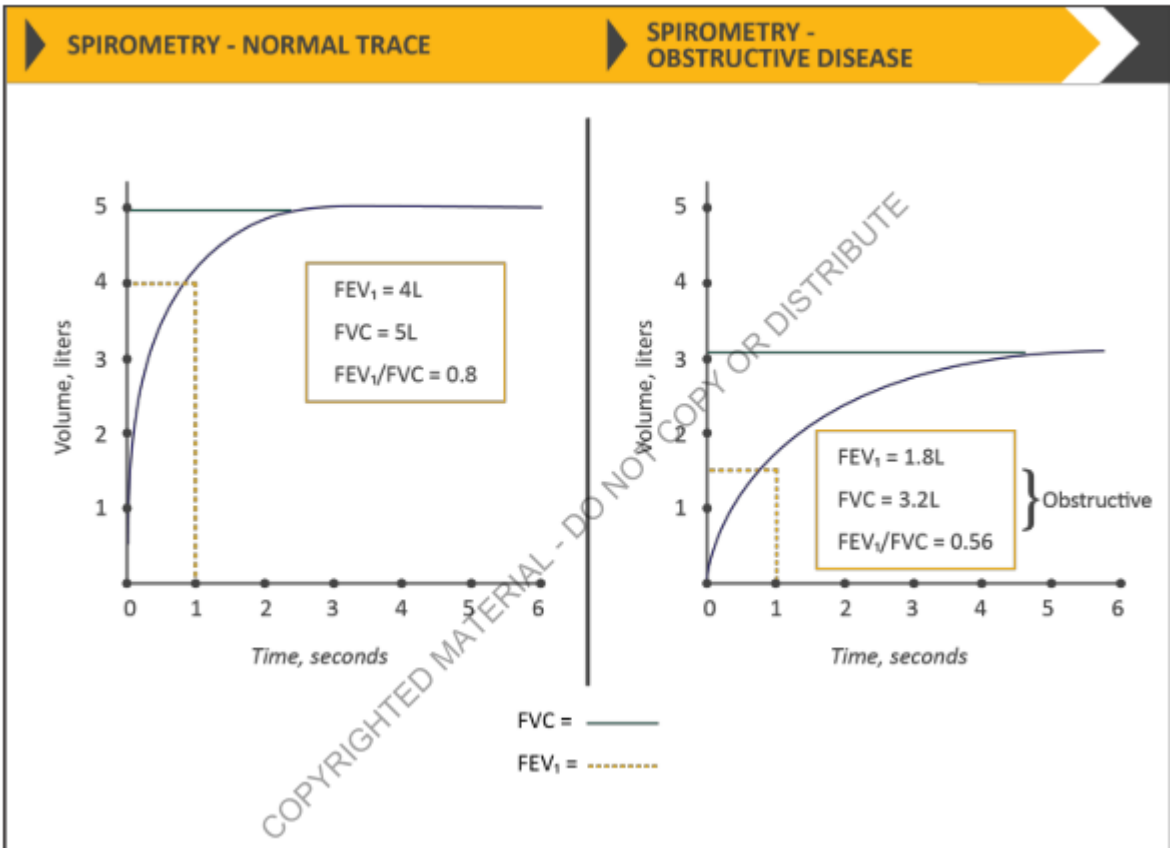
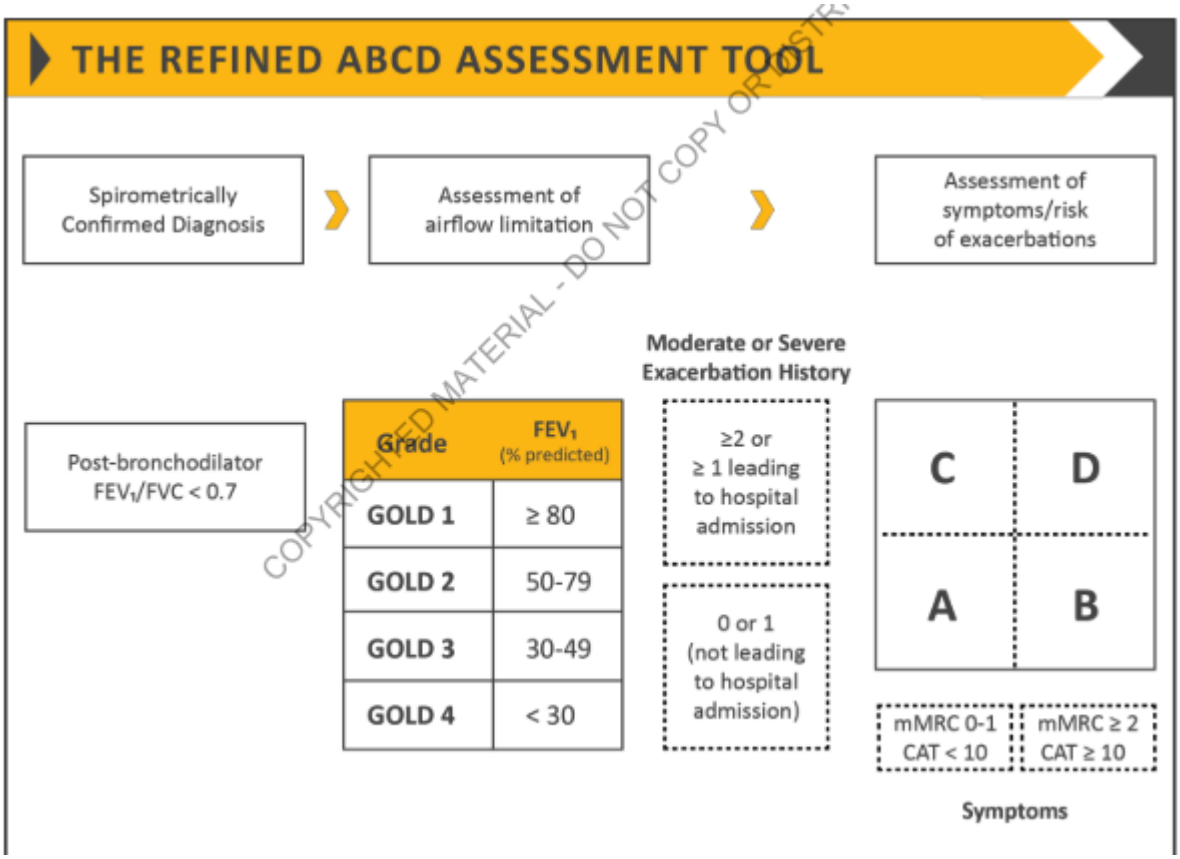
FIGURE 2.1

SPIROMETRY NORMAL AND ABNORMAL GRAPH :



DIAGNOSTIC PATHWAY IN THE DIAGNOSIS OF COPD :



4.DIFFERENTIAL DIAGNOSIS OF COPD :

DIAGNOSIS	SUGGESTIVE FEATURES
COPD	Onset in mid-life. Symptoms slowly progressive. History of tobacco smoking or exposure to other types of smoke.
Asthma	Onset early in life (often childhood). Symptoms vary widely from day to day. Symptoms worse at night/early morning. Allergy, rhinitis, and/or eczema also present. Family history of asthma. Obesity coexistence.
Congestive Heart Failure	Chest X-ray shows dilated heart, pulmonary edema. Pulmonary function tests indicate volume restriction, not airflow limitation.

Bronchiectasis	Large volumes of purulent sputum. Commonly associated with bacterial infection. Chest X-ray/CT shows bronchial dilation, bronchial wall thickening.
Tuberculosis	Onset all ages. Chest X-ray shows lung infiltrate. Microbiological confirmation. High local prevalence of tuberculosis.
Obliterative Bronchiolitis	Onset at younger age, nonsmokers. May have history of rheumatoid arthritis or acute fume exposure. Seen after lung or bone marrow transplantation. CT on expiration shows hypodense areas.
Diffuse Panbronchiolitis	Predominantly seen in patients of Asian descent. Most patients are male and nonsmokers. Almost all have chronic sinusitis. Chest X-ray & HRCT show diffuse small centrilobular nodular opacities & hyperinflation.

These features tend to be characteristic of the respective diseases, but are not mandatory. For example, a person who has never smoked may develop COPD (especially in the developing world where other risk factors may be more important than cigarette smoking); asthma may develop in adult and even in elderly patients.

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5.MANAGEMENT OF COPD :

Smoking cessation is key. Pharmacotherapy and nicotine replacement reliably increase long-term smoking abstinence rates.

Legislative smoking bans and counseling, delivered by healthcare professionals, improve quit rates.

Each pharmacological treatment regimen should be individualized and guided by the severity of symptoms, risk of exacerbations, side-effects, comorbidities, drug availability and cost, and the patient's response, preference and ability to use various drug delivery devices.

• Inhaler technique needs to be assessed regularly.

• Influenza vaccination decreases the incidence of lower respiratory tract infections.

• Pneumococcal vaccination decreases lower respiratory tract infections.

• Pulmonary rehabilitation improves symptoms, quality of life, and physical and emotional participation in everyday activities.

In patients with severe resting chronic hypoxemia, long-term oxygen therapy improves survival.

• In patients with stable COPD and resting or exercise-induced moderate desaturation, long-term oxygen treatment should not be prescribed routinely. However, individual patient factors must be considered when evaluating the patient's need for supplemental oxygen.

• In patients with severe chronic hypercapnia and a history of hospitalization for acute respiratory failure, long-term non-invasive ventilation may decrease mortality and prevent re-hospitalization

NON-PHARMACOLOGIC MANAGEMENT OF COPD*

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PATIENT GROUP	ESSENTIAL	RECOMMENDED	DEPENDING ON LOCAL GUIDELINES
A	Smoking Cessation (can include pharmacologic treatment)	Physical Activity	Flu Vaccination Pneumococcal Vaccination
B, C and D	Smoking Cessation (can include pharmacologic treatment) Pulmonary Rehabilitation	Physical Activity	Flu Vaccination Pneumococcal Vaccination

*Can include pharmacologic treatment.

PHARAMACOLOGICAL MANAGEMENT:

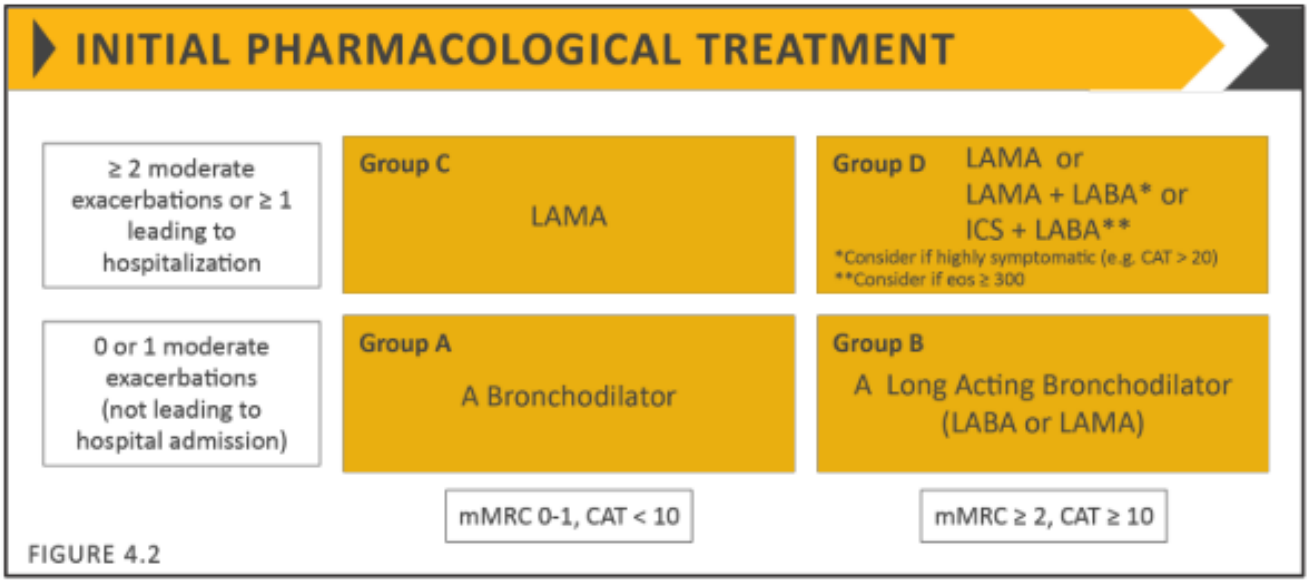
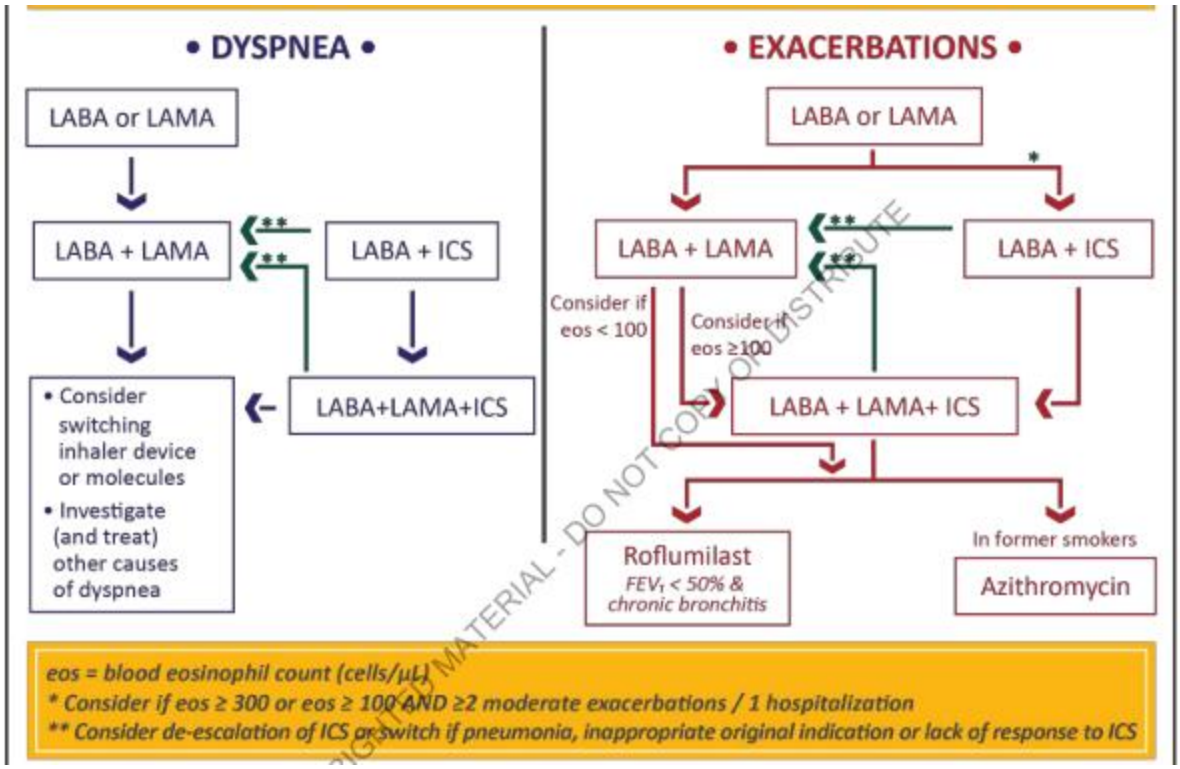


FIGURE 4.2

FOLLOW UP PHARAMACOLOGICAL TREATMENT:





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Annexure- II

VALUE ADDED COURSE

DIAGNOSIS AND TREATMENT OF COPD & CT03

4. List of Students Enrolled DEC 2018 – JAN 2019

S.No	4th Year MBBS Student		SIGNATURE
	Name of the Student	Roll No	
	RAMKATHIR	U14MB297	Ramkathir
	RANGARAJAN. R	U14MB298	Rangarajan.R
	RAVEENDHAREN.V	U14MB299	Raveendharan.V
	RENIL KUMAR. A	U14MB300	Arenilkumar.A
	RENITH. J	U14MB301	Renith.J
	RESHMA. R.L.	U14MB302	Reshma
	RICHARD ROZARIO. C	U14MB303	C.Richardrozario
	RUBINA.S	U14MB304	Sumbria.

RESOURCE PERSON

COORDINATOR

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

MULTIPLE CHOICE QUESTIONS.

11/11

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

CANDIDATE AND ASSESSOR INFORMATION

Course code: CT 03

Candidate Name	RANGARAJAN	Assessor Name	DR. VIJAY KUMAR.
Date of Assessment	20.12.2018	Assessor Position	ASSISTANT PROFESSOR AND HOD

QUESTIONS:

1.Drug treatment for asthma and COPD aim to do all of the following except:

- Cure asthma/COPD
- Relieve/prevent bronchoconstriction
- Inhibit airway inflammation
- Prevent airway remodeling
- Manage asthma/COPD

2. Which of the following statements is not true with regard to COPD?

A. COPD is an internationally recognized term used to indicate chronic bronchitis and emphysema.

B. Key feature of COPD is poor reversibility of airflow limitation even after giving bronchodilators.

C. COPD is more common in young age.

D. COPD originates in the peripheral airways and in the air spaces of the lungs

3. Which of these is not a risk factor for COPD?

A. Homozygous serum alpha-1 antitrypsin deficiency.

B. Thiazide diuretics

C. Potassium sparing diuretics

D. Osmotic diuretics

4. Diagnosis of COPD can be firmly made by:

A. Spirometry

B. X-ray chest

C. Auscultation

D. Blood Test

5. Which of these factors if present suggest the diagnosis COPD?

A. Long history of heavy smoking.

B. Chronic cough with large amount of sputum production.

C. Breathlessness mainly on exertion, which is gradually increasing.

D. All of the above

6.The two diseases grouped together that make up COPD are:

A. Asthma

B. Chronic Bronchitis

C. Emphysema

D. Bronchiolitis

E. Cystic Fibrosis

7 The doctor can tell the patient needs further education about hypoxemia when the patient states:

A. I have too much oxygen in my system

B. I will get fatigued with hard exercise.

C. I have too much CO2 in my system.

D. I should use pursed lip breathing to empty my alveoli.

8. Bifurcation in adults is usually at T6. Where is it normally bifurcated on children?

A. T6

B. T5

C. T4

D. T3

E. T2

9. What is the most common airway disease found in children?

A. Asthma

B. Bronchiolitis

C. Cystic Fibrosis

10.What s/s will most likely be seen by an Asthma pt?

A. Productive cough.

B. Mucus plugs in brochiols.

C. Wheezing.

D. Loss of cilia.

11.. 1% of emphysema pts have centrilobular type of emphysema.

A. True

B. False

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Annexure - III

DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

MULTIPLE CHOICE QUESTIONS



Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

CANDIDATE AND ASSESSOR INFORMATION

Course code: CT 03

Candidate Name	RESHMA . R	Assessor Name	Dr. VIJAY KUMAR
Date of Assessment	20.12.2018	Assessor Position	ASSISTANT PROFESSOR + HOD

QUESTIONS:

1.Drug treatment for asthma and COPD aim to do all of the following except:

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A. T6

B. T5

C. T4

D. T3

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

E. T2

9. What is the most common airway disease found in children?

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B. Bronchiolitis

C. Cystic Fibrosis

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A. Productive cough.

B. Mucus plugs in brochiols.

C. Wheezing.

D. Loss of cilia.

11.. 1% of emphysema pts have centrilobular type of emphysema.

A. True

B. False

Sri Lakshmi Narayana Institute of Medical Sciences

This is to certify that __Reshma.R(U14MB302)_____ has actively participated in the Value Added Course on DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE held during December 2018 - January 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Prakash Rao Balan
RESOURCE PERSON

Dr. Vijay Kumar
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

This is to certify that __Rangarajan.R(U14MB298)_____ has actively participated in the Value Added Course on DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE held during December 2018 - January 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Prakash Rao Balan
RESOURCE PERSON

Dr. Vijay Kumar
COORDINATOR

Student Feedback Form

Course Name: **DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

Subject Code: **CT 03**

Name of Student: RANGARAJAN . R Roll No.: 114HB298

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

SL NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

EXCELLENT

Date: 20.12.2018

Signature

Student Feedback Form

Course Name: DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Subject Code: CT 03

Name of Student: RESHMA · R Roll No.: U14MB302

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Good

Signature

Date: 20·12·2018

COURSE COMPLETION

Date: 10.01.2018

From

Dr. Vijay Kumar
Assistant Professor and Head,
Department of Respiratory medicine,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE & CT03

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: : **DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE** from December 2018 to January 2019 8 interns (Batch 2018) . We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. Vijay Kumar

Encl: Certificates

Photographs



Sri Lakshmi Narayana Institute of Medical Sciences

Date: 06.11.2018

From
Dr.G.Jayalakshmi
Professor of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Portfolios & E-Portfolios&MIC15

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Portfolios & E-Portfolios & CD/ME01** for II MBBS Students 01.12.2018. We solicit your kind permission for the same.

Kind Regards

Dr.G.Jayalakshmi

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean:Dr.G.Jayalakshmi

The HOD:Dr. Abarna

The Expert: Dr.G.Jayalakshmi

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign & Seal)	(Sign & Seal)	(Sign & Seal)

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam Post,
Villanur Commune Puducherry-605 502

PROFESSOR & HOD
DEPARTMENT OF MICROBIOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute Of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,

PUDUCHERRY – 605 502

Circular

15.11.2018

Sub: Organising Value-added Course: Portfolios & E-Portfolios& CD/ME01.reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Portfolios & E-Portfolios& CD/ME01"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 25.11.2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Kudapakkam Post
Villianur Commune Puducherry 605 502.

Encl: Copy of Course content and Registration form.

Course Proposal

Course Title: **Portfolios & E-Portfolios & CD/ME01**

Course Objective:

- Portfolios & E-Portfolios enable their students to record their learning and document their growth over a period of time.
- They provide students with a venue through which they can showcase their learning.
- They can be used as a tool for self-assessment, self-reflection and personal development.
- They help students focus on the process of learning rather than the end product.
- They promote deeper learning as students actively engage in the learning process.
- They empower students' voice.
- They help students develop their writing skills.
- A portfolio presents a concrete evidence of your work and achievements to
- Prospective employers.
- They assist students in locating their strengths and weaknesses and plan for future improvement.

Course Outcome: Reflection, Essay writing, E-portfolio submission, Poster Presentation & Rubric

Course Audience: II MBBS Students of 2017-18 Batch
Course Coordinator: Dr.G.Jayalakshmi
Course Faculties with Qualification and Designation:
1.Dr.G.Jayalakshmi, Professor & HOD
2. Dr.Jyayapradha, Assistant Professor
3.Dr.Naveen kumar, Assistant Professor
Course Curriculum/Topics with schedule (Min of 30 hours)

Sl No	Date	Topic	Time	Hours	Lecture taken by
1.	1.12.2018	Introduction, Main Goals Of Earlier Academic Education	4-5p.m	1	**Dr.G.Jayalakshmi**
2.	3.12.2018	Constructivism Based On Piaget's And Vygotsky's Assuming	4-5p.m	1	**Dr.G.Jayalakshmi**

3.	4.12.2018	1. Individual Or Group Performance Is Portfolio 2. *What Is A Portfolio?*	4-5p.m	1	**Dr.G.Jayalakshmi**
4.	5.12.2018	3. *Definition Of Portfolio* (1) Organization Of Portfolio Content (2) Determining The Purpose Of The Portfolio (3) Determining The Evidence Including In Portfolio (4) Determining Assessment Criteria:	4-6p.m	2	**Dr.G.Jayalakshmi**
5.	6.12.2018	4. Determining Assessment Criteria: (1) Important Points In Portfolio Developing Process (2) In Portfolio Making Process Some Necessary Steps Are;	4-5p.m	1	**Dr.Jayapradha**
6.	7.12.2018	Assessment Of Portfolios	4-5P.M	1	**Dr.Naveen kumar**
7.	8.12.2018	Variety Of Different Approaches To Grade Portfolios.	2-4p.m	2	**Dr.Jayapradha**
8.	9.12.2018	5. Portfolio Types (a) Personal Portfolio (b) :) Working Portfolio (c) Record-Keeping Portfolio: (d) Group Portfolio (e)) Thematic Portfolio: (f)) Integrated Portfolio: (g)) Electronic Portfolio: (h))Multiyear Portfolio:	9-12 am	3	**Dr.G.Jayalakshmi**
9.	10.12.2018	*6. Advantages And Disadvantages Of E-Portfolios* 1. Advantages Of Using Portfolio Assessment Methods	4-5p.m	1	**Dr.Naveen kumar**
10.	11.12.2018	Comparing To Portfolio Assessment	4-5p.m	1	**Dr.G.Jayalakshmi**

		With Standardized Testing			
11.	12.12.2018	Top 10 Types Of Assessment	4-5p.m	1	**Dr.G.Jayalakshmi**
12.	13.12.2018	Advantages In A Nutshell Disadvantage Of Using Portfolio	4-5p.m	1	**Dr.Jyayapradha**
13.	14.12.2018	Problems And Disadvantage Of Portfolio Assessment Methods	4-5p.m	1	**Dr.G.Jayalakshmi**
14.	15.12.2018	The Limitations Of Portfolios, Portfolio Assessment's Inherent Limitations	2-4 pm	2	**Dr.G.Jayalakshmi**
15.	17.12.2018	Lack Of Standardization Not Feasible For Large Scale Learning Assessment Bias	4-5p. m	1	**Dr.G.Jayalakshmi**
16.	18.12.2018	5 Of The Best Tools To Create Digital Portfolios & E-Portfolios In Class -Digital Portfolio Tools	4-5p. m	1	**Dr.G.Jayalakshmi**
13.	19.12.2018	Three Processes Are Involved In Portfolio Creation	4-5p. m	1	**Dr.Naveen kumar**
14.	20.12.2018	Several Web Tools Students Can Use To Create Digital Portfolios	4-5p. m	1	**Dr.Naveen kumar**
15.	21.12.2018	Types of Portfolios: Electronic And Paper	4-5p. m	1	**Dr.G.Jayalakshmi**
16	22.12.2018	Advantages of E-Portfolios & E-Portfolios Disadvantages of E-Portfolios & E-Portfolios Advantages of Paper Portfolios Disadvantages of Paper Portfolios	2.3 p.m	1	**Dr.G.Jayalakshmi**
17	24.12.2018	The What, Why, And How Of Eportfolios What Is An Eportfolio?	4-5 pm	1	**Dr.Naveen kumar**

18	26.12.2018	Types Of E portfolios	4-6 pm	2	**Dr.G.Jayalakshmi**
19	27.12.2018	1. Why Would You Want An Eportfolio? What Can Our Office Do For You? Content: What Goes In A Portfolio? What Do Employers Want To See? Additional Tips For Creating A Portfolio Examples Of Assessment Tools	4-6 pm	2	**Dr.G.Jayalakshmi**
20	28.12.2018	Types Of Assessment Results And Suggestions	**4-6 pm**	2	**Dr.G.Jayalakshmi**
		Total		30 hrs	

REFERENCE BOOKS:

1. *Richard J. Shavelson is a professor of education at Stanford University. Stephen Klein and Roger Benjamin are director of research and development and president/CEO, respectively, at the Council for Aid to Education, which owns the Collegiate Learning Assessment.*
2. A Guide to **Types of Assessment**: Diagnostic, Formative, Interim, and Summative.Aug 16, 2018.
3. Portfolios & E-Portfoliosin Science Education: Issue in Purpose, Structure and Authenticity. Science Education, 76 (4), 451-463. De Fina, A. (1992).
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5. The Portfolio And Its Use: Developmentally Appropriate Assessment of Young Children. Eric Digest. ED351150. Gussie, W.F. (1998).
6. Assessment of the Implementation of Portfolio Assessment in the K8 School Districts in New Jersey. Unpublished Doctoral Dissertation, Widener University. Haladyna, T.M. (1997).
7. The Use of Portfolio to Assess Student's Performance Osman BİRGİN 1 , Adnan BAKİ 2 1 Research Assist. Fırat University, Education Faculty, Dept.of Primary Education, Elazığ 2 Prof. Dr., Karadeniz Technical University, Fatih Education of Faculty, Sec. Dept.of Math. Edu., Trabzon

Date : 28.12.2018

From
Dr.G.Jayalakshmi
Professor of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Portfolios & E-Portfolios &CD/ME01

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Portfolios & E-Portfolios& CD/ME01 on** December 2018 II MBBS Students (batch 01) . We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr.G.Jayalakshmi

Encl: Certificates

Photographs


Evaluation
by
RUBRICS



VALUE ADDED COURSE

1. Name of the programme & Code

Portfolios & E- Portfolios & CD/ME01

2. Duration & Period

30 hrs & Dec 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Reflection, Essay writing, E-portfolio submission, Poster Presentation & Rubric - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time Dec 2018

8. Year of discontinuation: 2018

9. Summary report of each program year-wise

Value Added Course- Dec 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	CD/ME01	*Portfolios & E-Portfolios*	Dr. G.Jayalakshmi Dr. Jayapradha Dr.C.Naveen Kumar	II MBBS Students	15 students DEC- 2018)

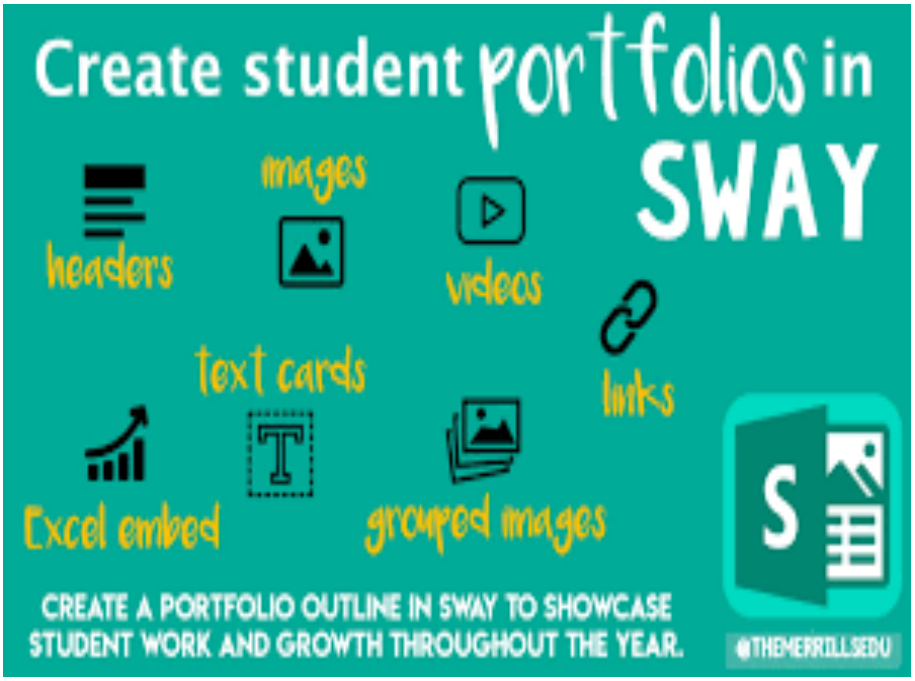
10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON **COORDINATOR**

1. **Dr.G.Jayalakshmi** **Dr.G.Jayalakshmi**
2. **Dr.Jayapradha**
3. **Dr. V. Naveen Kumar**

Portfolios & E-Portfolios



PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	*Portfolios & E-Portfolios*
Course Code	CD/ME01
Topics and content of the course in the Hand book	1. Introduction, Backround 2. Main Goals Of Earlier Academic Education 3. Constructivism Based On Piaget's And Vygotsky's Assuming 4. Individual Or Group Performance Is Portfolio 5. What Is A Portfolio? 6. Definition Of Portfolio (1) Organization Of Portfolio Content (2) Determining The Purpose Of The Portfolio (3) Determining The Evidence Including In Portfolio (4) Determining Assessment Criteria: 7. Determining Assessment Criteria: (1) Important Points In Portfolio Developing Process (2) In Portfolio Making Process Some Necessary Steps Are;

	8. Assessment Of Portfolios 9. Variety Of Different Approaches To Grade Portfolios. 10. Portfolio Types (a) Personal Portfolio (b) :) Working Portfolio (c) Record-Keeping Portfolio: (d) Group Portfolio (e)) Thematic Portfolio: (f)) Integrated Portfolio: (g)) Electronic Portfolio: (h))Multiyear Portfolio: 11. Advantages And Disadvantages Of E-Portfolios (1) Advantages Of Using Portfolio Assessment Methods 12. Comparing To Portfolio Assessment With Standardized Testing 13. Top 10 Types Of Assessment 14. Advantages In A Nutshell 15. Problems And Disadvantage Of Portfolio Assessment Methods 16. Disadvantage Of Using Portfolio 17. The Limitations Of Portfolios 18. Portfolio Assessment's Inherent Limitations 19. Lack Of Standardization Not Feasible For Large Scale Learning Assessment Bias

	20. 5 Of The Best Tools To Create Digital Portfolios & E-PortfoliosIn Class -Digital Portfolio Tools 21. Three Processes Are Involved In Portfolio Creation 22. Several Web Tools Students Can Use To Create Digital Portfolios 23. Types Of Portfolios: Electronic And Paper 24. Advantages Of E-Portfolios & E-Portfolios Disadvantages Of E-Portfolios Advantages Of Paper Portfolios Disadvantages Of Paper Portfolios 25. The What, Why, And How Of Eportfolios 26. What Is An Eportfolio? An Eportfolio May Contain All Or Some Of The Following: 27. Types Of Eportfolios 28. Why Would You Want An Eportfolio? What Can Our Office Do For You? Content: What Goes In A Portfolio? What Do Employers Want To See? Additional Tips For Creating A Portfolio Examples Of Assessment Tools 29. Types Of Assessment

	Results And Suggestions
Interactive discussion with examples	They can be used as a tool for self-assessment, self-reflection and personal development. They develop students metacognitive skills (reflective practices) and help them take control of their learning
Further learning Opportunities	• Portfolios & E-Portfoliosenable their students to record their learning and document their growth over a period of time. • They provide students with a venue through which they can showcase their learning. • They help students focus on the process of learning rather than the end product. • They promote deeper learning as students actively engage in the learning process. • They empower students' voice. • They are a 'method of self-discovery and confidence building'. They help students develop personal and academic identities. They assist students in locating their strengths

	and weaknesses and plan for future improvement. They invite teachers' feedback and peers' input. • They help students develop their writing skills. • They assist students in locating their strengths and weaknesses and plan for future improvement.
Key Competencies	A portfolio presents a concrete evidence of your work and achievements to Prospective employers.
Target Student	II MBBS Students (2018-219)
Duration	30hrs
Theory Session	30hrs
Assessment Procedure	**Reflection, Essay writing, E-portfolio submission,** Poster Presentation & Rubric

Portfolios & E-Portfolios

There are numerous benefits students will gain from incorporating Portfolios & E-Portfolios in their learning. Here is a summarized list of some these benefits based on readings



Background:

- Portfolios & E-Portfolios enable their students to record their learning and document their growth over a period of time.
- They provide students with a venue through which they can showcase their learning.
- They can be used as a tool for self-assessment, self-reflection and personal development.

- They help students focus on the process of learning rather than the end product.
- They promote deeper learning as students actively engage in the learning process.
- They develop students metacognitive skills (reflective practices) and help them take control of their learning.
- They empower students' voice.
- They are a 'method of self-discovery and confidence building'.
  They help students develop personal and academic identities.
  They assist students in locating their strengths and weaknesses and plan for future improvement.
  They invite teachers' feedback and peers' input.
- They help students develop their writing skills.
- A portfolio presents a concrete evidence of your work and achievements to
- Prospective employers.
- They assist students in locating their strengths and weaknesses and plan for future improvement.

INTRODUCTION

Recent developments and demands in science and society have deeply affected education. Especially theories such as constructivism and multiple-intelligence and new social trends such as changing labor market, information-age needs engendered to radical change in traditional approaches of learning, teaching and assessment. Since learning approach is changed, it affects assessment procedures and approaches (Fourie & Van Niekerk, 2001).

For example***, the main goals of earlier academic education enable students to know a certain domain***. Since learning of basic knowledge was very important, behaviorist approach generally uses traditional instruction. In this instructional approach, knowledge is merely abstracted, and "learning" and "teaching" process is viewed as individual process, and "learning" is conceived as the accumulation of stimulus-response association.

Drill and practice play an important role in this process. Also, the assessment practice is mainly based on testing basic knowledge. Because, the proof of learning generally is seen as changing the behaviors and increasing the right answer in test and changing between pre-test

and end-test in this approach, tests such as multiple-choice, true false, matching items for assessment are used.

These tests which provide less useful information about students' understanding and learning are not enough to assess higher order cognitive skills such as problem solving, critical thinking and reasoning (Romberg, 1993), not measure a students' ability to organize relevant information (Shepard, 1989), and assess what is easy to test-memorization of rote skills and procedures (Mumme, 1991).

On the other hand, the constructivism based on Piaget's and Vygotsky's assuming that students are able to acquire and socially construct their knowledge and understanding.

This approach pays more attention to students' prior learning, their problem solving skills and their collaborative learning (Baki, 1994). However, in this new environment students' learning cannot be assessed within a shorter time using multiple choices tests (Mumme, 1991; Romberg, 1993). **Therefore, it is needed a broader range of assessment tools that be able to assess the students' skills such as open-ended problem solving, and critical thinking, analyzing, reasoning, be able to apply theirs knowledge in new problems, and to express oral and writing**. Further, constructivist epistemology requires us to assess students' individual performance and group performance together during their learning experience (Shepard, 2000).

Nowadays, society asks for students who have cognitive skills such as problem solving, critical thinking, analyzing data, and presenting them orally and written format and so on (Dochy, 2001).

Since society request new trends, educational developments have improved towards a more powerful learning environment. For this reason, alternative assessment approaches are needed in assessing both learning process and learning outcomes.

This implies that assessment techniques should focus an assessing what students know as well as what they do not know. These recommendations can be achieved through alternative assessments measuring students' performance and developments in learning process.

One of the alternative methods in education used in the assessment of the students' individual or group performance is portfolio. Necessity of using portfolio is emphasized by many researches .According to them, portfolio gives more reliable and dynamic data about students for teachers, parents and also student himself. Also, using this assessment method in primary schools provides getting clear information about students and fulfilling their weaknesses and helps teachers planning teaching progress.

What is a Portfolio?

It is a brief (approximately 10 pages) collection of your best and most recent work, showcasing your talents, skills, and experience to a potential employer. A portfolio should provide evidence of your abilities, communicate in more depth what you can offer if hired, and be organized and designed so that you can incorporate it smoothly and effectively during the interview to compliment or enhance your responses to questions.

Teachers' attitudes in measurement and assessment applications cause many problems. For instance, up to now, being lack of pedagogical knowledge and limited in-service course prevented teachers from being qualified (İşman, 2005). Besides teachers were not given enough information and resources about how to make assessment or which materials should be used and assessment method is given to teacher's initiative.

Furthermore, common use of traditional measurement and assessment methods prevents finding out students' skills and their developmental potentials (Baki & Birgin, 2002). Teachers usually try to do their assessment activities through Bloom's (1976) theory of school learning which exists in teaching programs. However, disadvantage of this approach is that it ignores the students' different skills and developmental potentials in assessment (Çepni, 2006).

Thus as parallel to recent developments in education contemporary approaches such as constructivism and multiple-intelligences become dominant in new teaching programs in Turkey.Teachers did not have enough knowledge and experience about alternative assessment methods especially about portfolio. It is still a question that how a teacher can apply alternative assessment methods properly without having enough knowledge and experience about it. Because of this reason, portfolio assessment method as an alternative one to traditional assessment approaches becomes quite significant.

The purpose of this course was to introduce portfolio assessment method commonly used in educational contexts recently. To achieve this aim, some information of portfolio such as its definition, its developing process, the types of portfolio to be used, selection of contexts, its advantage and disadvantage were discussed in depth. Also, portfolio assessment method is compared with traditional one in terms of different aspects.

What Is Portfolio?

Although Portfolios & E-Portfoliosare used in the assessment of student's performance in nowadays, they are used as a method by architects, painters, photographers and artists in showing their works. However, as portfolio has been used for different purposes

it may be different from than that of artists. It is not possible to use only one definition for portfolio.

Definition of portfolio may change according to users' purpose and way of usage.

Many researchers defined portfolio in order to explain its features. Some of them are as follows; According to Arter and Spandel (1991), portfolio is a purposeful collection of student work that exhibits to the student, or others, her efforts or achievement in one or more areas.

Paulson, Paulson and Mayer (1991: 60) define that portfolio is a purposeful collections of student's work that exhibits the student's efforts, progress and achievement in one or more areas. The collection must include student participation in selecting contents, the criteria for selection, the criteria for judging merit and evidence of student self-reflection.

Grace (1992, p.1), who stresses the learning process, defines as "portfolio is a record of the child's process of learning: what the child has learned and how she has gone about learning; how she thinks, questions, analyzes, synthesizes, produces, creates; and how she interacts--intellectually, emotionally and socially-with others".

Collins (1992, p. 452) identify portfolio as "a container of collected evidence with a purpose. Evidence is documentations that can be used one person or group of persons to infer another person's knowledge, skill, and/or disposition".

Winsor and Ellefson (1995, p.68), who stress the learning process and learning product, define that "portfolio is a fusion of process and product. It is the process of reflection, selection, rationalization, and evaluation, together with the product of those processes".

Simon and Forgette-Giroux (2000, p.36) define as "portfolio is a cumulative and ongoing collection of entries that are selected and commented on by the student, the teacher and/or peers, to assess the student's progress in the development of a competency".

De Fina (1992, p.13), who emphasizes the characteristic of portfolios, state that Portfolios & E-Portfoliosare systematic, purposeful, and meaningful collections of students' work in one or more subject areas.

On the other hand, Birgin (2003, p.22) defines portfolio as "the assessment of some data about students' skills in one or more areas in a certain time period, regular collection of his studies and performances according to predetermined criteria.

There are some essential characteristics to the development of any type of portfolio used for assessment.

Barton and Collins (1997) state that Portfolios & E-Portfoliosshould be multi sourced, authentic, forms of dynamic assessment, explicit of purpose, establish a correspondence between program activities and life experiences, based on student's ownership, and multi-purposed.

Therefore, Portfolios & E-Portfoliosshould be on going so that they show the students' efforts, progress, and achievement over a period of time.

When the descriptions stated above, portfolio is not either the arbitrary collections or observation of student's works to be filled haphazardly.

It is important that the portfolio collections should be purposeful, systematic, the determined evaluation criteria, and take a period of time.

Thus in this course portfolio is described as a systematic and purposeful collection of the evidence which reflect the success, performance, and efforts of the students in one or more areas over a period of time.

Organization of Portfolio Content

A portfolio is not a collection of a students' work haphazardly over time. Thus, in developing a portfolio it is important to decide its' purpose, evidence consisting of portfolio, and its' assessment criteria (Barton & Collins, 1997). There is a closely related three aspects, and these aspects affect each other directly

What should be considered during the organization of the portfolio contents explained in details as follows?

(a) **Determining the purpose of the portfolio**: The first and most significant acts of portfolio preparation are to determine the purposes for the portfolio. The purpose of the portfolio directly affects the process by which the portfolio is created. Also, the purposes of portfolio determine what kinds of items should be in it. Explicit purposes prevent the portfolio from becoming busy-work. Portfolios & E-Portfolioscan be used for different purposes in education. The purpose of the portfolio can be shaped depending on the users' demands. The aim of teacher using portfolio is to assess the progress of the student over a period of time, to determine the efficiency of the teaching, to have connection with the parents of the students, to evaluate the education program, to enable schools to have contact with the commodity, to help students for self-assessment and to determine the students' weak points in learning process (Mumme, 1991; De Fina, 1992).

As a result, it has been needed to determine the purpose for the portfolio firstly so it will effect directly on the qualifications and the collections stills of items in the portfolio. During determining the purpose of the portfolio, it is very important for teachers to consult his colleagues, students, parents and school administrations. In this concern, it will help to appropriate and carry out the portfolio implementation.

Determining the evidence including in portfolio:

Considering the purpose of the portfolio, it should be determined which evidence should be collected, who will collect the works, how often they will be collected, and how they will be

assessed. Consulting students during the selection of the studies which will be filled in a portfolio is important since it enable students to have responsibility and possession feelings (Kuhs, 1994). It is suggested that there has been a caption that is a statement attached to each piece of portfolio evidence that describes what it is, why it is evidence, and of what it is evidence (Barton and Collins, 1997). The caption helps students become aware of their learning as they share what they can prove they know.

There is not a strict rule for the portfolio content since portfolio has a different purpose in terms of its evidence.This means that content of portfolio can be variable depending on its users or purposes.

For instance, a portfolio organized by a student can contain a lot of visual or activity materials such as individual or group studies, his/her best studies, tests, projects, presentations, control lists, problem solutions, questionnaire, teacher comment, reading list and reviews, self-assessment/peer-assessment checklist, interview notes, course note, cd and disks. However, instead of random selection of evidence in student's portfolio, selecting of evidences which reflect the performance and products of students during learning process have an important role in learning. Because items are collected over time, its selection is important for portfolio process.

According to De Fina (1997) when decided the contents of a portfolio, two compelling factors should be kept in mind: the students' desires and the purpose for collecting each item. Ideally, the portfolio should be as student-centered as possible and the teachers facilitate, guide, and offer choices rather than inform, direct, and predetermine priorities.

It should be remembered in the process of preparing a portfolio that each student has different cognitive, affective, psychomotor skills, different experiences, social environments and socio-economic levels. Thus, items which will be put in the portfolio should be designed to reflect each student's performance as an individual or as a group and to reflect their cognitive, affective and skills properly.

Further, portfolio assessment should be multi-dimensional and in order to make a reliable assessment, data should be collected from different sources such as student himself, teachers, student's friends and parents.

Also, it is important that students have the opportunity to choose work samples for their learning.

Simon and Forgette-Girous (2000) call for the cross-curricular sampling of items that provide evidence of the cognitive, behavioral, affective, meta-cognitive and developmental dimensions of a single but complex competence such as problem solving or effective communications.

For example, in the portfolio designed by Birgin (2003) for mathematics course in primary school 7th graders there have been "problem solving assessment form, observation form related to learning in a unit, group work observation form, parent observation form, assessment form of students' affective dimension, assessment form for students' ideas related to mathematics course and assessment form of students' academic success.

However, the portfolio which was used for mathematics course in 1990 in Vermont State, in USA, consisted of only problem solving activities. In this portfolio application students have been asked to present the solutions of open-ended problems in detail. In addition, such kind of portfolio consists of "best pieces".

Determining assessment criteria:

First, the purpose of portfolio is mentioned explicitly and then, assessment criteria of the each item in portfolio need to be explained.

It is very important to determine the criteria for assessing the portfolio.

Because an assessment criterion allows students to recognize, and select work that is considered high quality. It also allows and encourages discussions among teachers, students, and other concerning the outcomes and quality of outcomes

Assessment criteria which have been used to determine the quality of the student's performance should be clear and easy to understand. This is quite important in terms of student to assess his own works and to be able to fulfill his weaknesses. Rubrics should be used in order to determine quality of the evidence in portfolio and to make a reliable and valid assessment.

Important Points in Portfolio Developing Process

It is a challenging situation for teachers to make Portfolios & E-Portfoliosan integral part of their instruction. We can solve this problem and enable portfolio as an important learning and assessment tool.

Some of them are as follows;

•It should be consulted to teachers, students, parents and school administrations in deciding which items would be placed in it.

•It should be created a shared, clear purpose for using portfolios. Students should clearly understand what purpose of and for whom a portfolio is consisted.

It should reflect the actual day-to-day learning activities of students. Also, items in portfolio should vary and be multi-dimensional.

• It should be ongoing so that they show students' efforts, progress, and achievements over a period of time.

• Items in portfolio should be collected as a systematic, purposeful, and meaningful.

• It should give opportunities for students in selecting pieces they consider most reprehensive of themselves as learners to be placed into their portfolios, and to establish criteria for their selections. Also, it should be make students responsible for keeping their Portfolios & E-Portfoliosup to date.

• It should be viewed as a part of learning process rather than merely as recordkeeping tools, as a way to enhance students' learning.

• Students can access their portfolios.

• Share the criteria that will be used to assess the work in the portfolio as well as in which the result are to be used

. • Teachers should give feedback to students, parents about the use the portfolio.

In portfolio making process some necessary steps are;

- students' ideas should be taken,
- each study should have a purpose,
- assessment of studies should be clearly explained,
- the process should cover a certain time period,
- portfolio should encourage students to learn, and
- items in the portfolio should be multi-dimensional and
- should address different learning areas.
- it is virtually important that the studies in a portfolio should be designed in order to present students' performance and development in a any time period in detail.

Assessment of Portfolios

There has been no exact way or method for the assessment of portfolios. However, some different methods can be used in terms of their aims.

If the purpose of portfolio is to improve the students' learning and to diagnose his/her learning needs, then the works in the portfolio usually are determined by teachers.

Student is given feedback for his/her works by teachers and peers. These kinds of feedbacks are used to improve the students' learning

If the purpose of the portfolio is to assess the student progress over an extended period of time, and to provide evidence for grades, than the portfolio contains some standard work for everyone and the works in the portfolio are selected by students. This portfolio includes the best works of student in a term or year.

They are assessed by teachers in terms of the criteria determined before. The goal of portfolio grading is to strike a balance between product and process. In other words, a student's improvement in learning process is just as important as their ability to produce a well-shaped product which meets standard rubric-like criteria, so portfolio grading focuses on both the learning process as well as the quality of products.

Consequently, Portfolios & E-Portfoliosare graded as a whole, and each item in a portfolio can be used to showcase a student's best works or provide evidence for a student's self- assessment of his or her learning process and growth.

Variety of different approaches to grade portfolios.
that three basic approaches can be used.

The first is to evaluate each piece of work in the portfolio and average those grades to determine the portfolio grade.

The second is to use an analytic scheme where separate grades are given for different performance.

For example, a teacher might review the portfolio and given one grade each for the problem solving ability to communicate mathematical ideas, to carry out procedures accurately, to demonstrate insight and understanding of ideas, and to apply mathematics in problem solving situations. Unlike in the first approach, this approach is based on reviewing several pieces of work in the portfolio.

This assessment strategy was used in 1992 Vermont became the first state to use Portfolios & E-Portfolios as the centerpiece of a statewide assessment of students achievement in mathematics courses. Each piece in this mathematics portfolio was rated on seven dimensions and each dimension was scored on a different 4-point scale.

The third approach to scoring students' work, when a single score is determined focusing on several dimension of performance, is termed the focused-holistic approach. This approach allows the teachers to give a single grade for all pieces contained in the portfolio such performance attributes as the student's ability to interpreted the problem and information in the problem, select and use appropriate solutions strategies, and evaluate and connect the answer to the given problem situation.

Portfolio Types

There is no an absolute description and content for portfolios. The types of Portfolios & E-Portfolios are varied according to their purpose and collected items in it. Therefore, many

researchers define different types of portfolio. For example, according to Haladyn (1997), there are five types of Portfolios & E-Portfolios that named ideal, showcase, documentation, evaluation, and class portfolio. The ideal portfolio contains students' all works. It is not given to students a grade. Thus, it is important for students to assess their own portfolio. The showcase portfolio is included only of the students' best works. It is important for students to select own works and to reflect their works.

These types of portfolio are not suitable to be assessed and graded. The documentation portfolio involves a collection of work over time showing growth and improvement reflecting students' learning of identified outcomes. This portfolio contains quality and quantity data.

The evaluation portfolio includes a standardized collection of students' work and could be determined by the teacher or, in some cases, by the student. This portfolio is suitable for grading students.

The class portfolio contains student's grade, teacher's view and knowledge about students in the classroom. This portfolio can be defined a classroom portfolio. Slater (1996) describes there types of portfolio as showcase, open-format and checklist portfolio.

A showcase portfolio is a limited portfolio where a student is only allowed to present a few pieces of evidence to demonstrate mastery of learning objectives an open-format portfolio, students are allowed to submit anything they wish to be considered as evidence for mastery of a given list of learning objectives. A checklist portfolio is composed of a predetermined number of items. Often, a course syllabus will have a predetermined number of assignments for students to complete Melograno (2000, p.101), who made more detailed descriptions, defines nine types of portfolios. These types of Portfolios & E-Portfoliosare not exhaustive and can be used separately or in combination. These classifications are given below appropriately;

(i) Personal portfolio:

For other students and teachers to form a more holistic view about students and to celebrate their interests, items may be included from within and outside school. The port folio could contain pictures, awards, videos, or other memorabilia. The personal portfolio serves as a catalyst for self-reflection and sharing.

(b**) Working portfolio**: The ongoing, systematic collection of student work samples and exhibits can be maintained in a working portfolio. This collection of daily, weekly, monthly, or unit work products forms.

(c) Record-keeping portfolio: This type of portfolio is usually kept by teachers. It contains necessary assessment samples and records that may be required (e.g., written exams, proficiency tests). It could also include observational information

(e.g., anecdotal notes, frequency index scales, narrative descriptors, behavior checklists) and progress reports that supplement traditional report cards.

(d) **Group portfolio**: Each member of a cooperative learning group contributes individual items along with group items (e.g., samples, pictures, community project) to demonstrate the effectiveness of the entire group.

(e) **Thematic portfolio**: This portfolio would relate to a unit of study with a particular focus, normally lasting from 2 to 6 weeks. For example, if a portfolio is constructed related to "Rational Numbers", “Force” unit, this portfolio could reflect cognitive and affective skills and their views about these units.

(f**) Integrated portfolio:**

To view the whole student, works from all disciplines showing connections between or among subjects would be included. Selected items, either required or optional, could be drawn from several or all subjects. For example, this portfolio can be prepared in math and science courses.

(g) **Showcase portfolio:**

A limited number of items are selected to exhibit growth over time and to serve a particular purpose. Usually, only the student's best works are included. For instance, in Vermont and Kentucky, at the beginning of the 1990 years, this type of portfolio was implemented for mathematics and writing in grades 4 and 8. In both states, Portfolios & E-Portfoliosare supposed to contain five to seven examples of the students’ best work during the school year and scored are supposed to reflect optimum performance. Writing portfolio must contain work in number of pre-specified genres of writing.

(h**) Electronic portfolio:**

Technological advances have made electronic portfolios. However, if they are simply software databases (storage for pictures, sound, or words) they are really no different from a hanging file or milk crate. Since current technology allows for the capture and storage of information in the form of text, graphics, sound, and video, students can save writing samples, solutions to mathematics problems, samples of art work, science projects and multimedia presentations in one coherent document (Lankes, 1995). Electronic Portfolios & E-Portfoliosoffer many advantages such as to collect, and store, and manage the information electronically according to traditional portfolios. In recent years, because of the educational opportunities supported with the technological development, electronic Portfolios & E-Portfoliosare used much more. For instance, computer-based Portfolios & E-Portfoliosintroduced by Baki and Birgin (2004) and Korkmaz and Kaptan (2005) in their studies can be shown as examples.

(i)**Multiyear portfolio:**

Students would collect items from a cluster of grade levels over 2-, 3-, or 4-year intervals. The multiyear portfolio would be stored at the school. For example, this portfolio can be used to follow students' progress periodically during primary and secondary school and university education.

In sum, it is clear that different types of Portfolios & E-Portfolios are described by researchers in terms of their purposes and contents. Besides the Portfolios & E-Portfolios described above, it is possible to mention different types of portfolios. However, it is very difficult to make a clear distinction between these ones. On the other hand, the Portfolios & E-Portfolios mentioned above can be used separately or different Portfolios & E-Portfolios can be used together. So teachers should select proper ones and should apply them.

Advantages and disadvantages of e-portfolios

Due to the fact that e-Portfolios & E-Portfoliosoffer great opportunities, many advantages of e-Portfolios & E-Portfolioscan be mentioned. To begin with, the creation of e-Portfolios & E-Portfoliosdemands a high degree of self-organisation and self-responsibility. Therefore, pupils and also students at university increase these skills.In addition to that, computer skills are trained in the course of creating an e-portfolio. Moreover, pupils learn to be creative and they also learn how to deal with information from the web.Apart from that, audio material, videos and images can easily be included. What is also important is the benefit that e-Portfolios & E-Portfoliosare accessible everywhere and they can be easily extended. Due to the fact that the pupils have to reflect their work, they probably learn more efficiently.

The disadvantages are that some pupils might not have the technical know-how and consequently feel over challenged. Moreover, pupils might have a lack of motivation, when the teacher does not give enough information about the topic and the task.

However, the e-portfolio is also not expressive when the teacher makes to many restrictions concerning the layout and the tasks of the e-portfolio, since then the e-portfolio cannot be regarded as the pupil's individual and self-organized piece of work. This problem is called 'over-scripting'. In addition to that, another problem, which is called 'over-acting', might occur. This means that the pupils just collect a vast number of pieces of work without any concept, which is not meaningful.
Furthermore, the pupil's intensive reflection of their learning process can lead to a problem called 'over-reflecting', which implies that pupils only reflect their work only for the sake of their teachers.

All in all, one can say that the advantages of e-Portfolios & E-Portfoliosprevail. However, it

should be noted that the teachers need to inform their pupils clearly about how to create an e-portfolio and also about the expectations they have.

Advantages Of Using Portfolio Assessment Methods

Portfolio can present a wide perspective of learning process for students and enables a continuous feedback for them (Adams, 1998). Besides this, it enables students to have a self-assessment for their studies and learning, and to review their progress (De fina, 1992). Since it provides visual and dynamic proofs about students' interests, their skills, strong sides, successes and development in a certain time period, portfolio which is the systematic collection of the student's studies helps assessing students as a whole (Baki & Birgin, 2004).

Portfolio is strong devices that help students to gain the important abilities such as self-assessment, critical thinking and monitoring one's own learning (Asturias, 1994; Micklo, 1997). Furthermore, portfolio provide pre-service teacher assessing their own learning and growth, and help them become self-directed and reflective practitioners, and contribute them the individual and professional developments (Birgin, 2007; Mokhtari et al., 1996). Mullin (1998) stresses that portfolio provides teachers to have new perspective in education. For instance, portfolio can answer these questions:

What kind of troubles do students have?

Which activities are more effective or ineffective?

What subjects are understood and not understood?

How efficient is the teaching process?.

On the other hand, portfolio assessment has many advantages comparing with standardized testing. It is shown in the Table 1 (De Fina, 1992, p. 39).

Table 1. Comparing to Portfolio Assessment with Standardized Testing

Portfolio Assessment Standardized Testing	**Portfolio Assessment Standardized Testing**
occurs in the child's natural environment ™ is an unnatural eve	™ occurs in the child's natural environment ™ is an unnatural eve
provides an opportunity for student to demonstrate his/her strengths as well as weaknesses ™ provides a summary of child's filatures on certain tasks ™ gives hands	on information to the teacher on the spot ™ provides little diagnostic information
provides an opportunity for student to demonstrate his/her strengths as well as weaknesses ™ provides a summary of child's filatures on certain tasks ™ gives hands	on information to the teacher on the spot ™ provides little diagnostic information
provides an opportunity for student to	on information to the teacher on the spot ™

demonstrate his/her strengths as well as weaknesses ™ provides a summary of child's filatures on certain tasks ™ gives hands	provides little diagnostic information
provides an opportunity for student to demonstrate his/her strengths as well as weaknesses ™ provides a summary of child's filatures on certain tasks ™ gives hands	on information to the teacher on the spot ™ provides little diagnostic information
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provides an opportunity for student to demonstrate his/her strengths as well as weaknesses ™ provides a summary of child's filatures on certain tasks ™ gives hands	on information to the teacher on the spot ™ provides little diagnostic information
invites the parents to be reflective of child's work and knowledge ™ provide parents with essentially meaningless and often frightening numerical data ™ encourages teacher	student conferencing ™ forces teacher
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portfolio assessment enables measuring high-level skills with meaningful and realistic activities for students instead of measuring low-level skills in a limited-time, using multi assessment methods instead of using only one measurement method, making assessment not sometimes but continuously, and determining the student's weaknesses and strengths.
Besides, it also encourages students to participate in the assessment process actively and to make an effective communication with his teacher and parents.
As portfolio assessment places student at the center of the teaching process, it enables students to direct teaching. Portfolio assessment method also has many benefits for teacher, parents and students.
Making use of Portfolios & E-Portfoliosaffectively largely depends on using their purpose properly.

Some of the assessment methods are presented as follows.

Top 10 Types of Assessment

- **Summative Assessment**.
- **Formative Assessment**.
- Evaluative assessment.
- Diagnostic Assessment.
- **Norm**-referenced tests (NRT)
- **Performance**-based assessments.
- Selective response assessment.
- Authentic assessment.

Advantages in a nutshell

• Portfolio provides multiple ways of assessing students' learning over time
• It provides for a more realistic evaluation of academic content than pencil-and paper tests.
• It allows students, parent, teacher and staff to evaluate the students' strength and weakness.
• It provides multiple opportunities for observation and assessment
• It provides an opportunity for students to demonstrate his/her strengths as well as weakness.
• It encourages students to develop some abilities needed to become independent, self-directed learners
• It also helps parents see themselves as partners in the learning process
. • It allows students to express themselves in a comfortable way and to assess their own learning and growth as learners.
• It encourages students to think of creative ways to share what they are learning
• It increases support to students from their parents and enhances communication among teachers, students and parents.

• It encourage teachers to change their instructional practice and it is a powerful way to link curriculum and instruction with assessment

In sum, portfolio assessment provides more authentic and valid assessment of students' achievement and comprehensive views of students' performances in contexts, and encourages students to develop independent and self-directed learners, and enhances communication among teacher, student and parents. It can provide opportunities for learners to demonstrate his/her weakness and strengths and for teachers to direct their teaching.

It also can encourage students to take responsibility for their own learning, and enhance student-teacher communication. In addition, portfolio assessment has a potential to demonstrate students' learning process and leaning product over time. As a result, portfolio gives detailed information about students' development in learning process to teacher, parents and students themselves.

Problems and Disadvantage of Portfolio Assessment Methods

Although using of Portfolios & E-Portfolioshas some advantages and benefits in education, it has some disadvantages and burdensome. Thus, when it is developed and used, these disadvantages and burdens should be considered.

Beside the disadvantages and burdensome of portfolios, the precautions which should be taken for overcoming these disadvantages and burdens of Portfolios & E-Portfoliosare explained below.

Scoring a portfolio may be seen as less reliable or fair than multiple choices test scores (Cicmanec & Viecknicki, 1994).

Why the purpose and assessment criteria of Portfolios & E-Portfoliosshould be explained detailed and clearly

When the specific, clear, and measurable criteria for each item are used in portfolios, the reliability of Portfolios & E-Portfolioscan increase. If the purpose and assessment criteria of portfolio are not clear, the portfolio can be just a miscellaneous collection of works that can't reflect students' growth or achievement accurately. Thus, the purpose and assessment criteria of Portfolios & E-Portfoliosshould be explained detailed and clearly

Another ***disadvantage of using portfolio*** is very time consuming for teachers to score students' works and to assess students' performance over time in the crowded classroom (Birgin, 2006b). Therefore, it is suggested to use checklists, rubrics and digital portfolio form to reduce time for the assessment of it (Birgin, 2006b; De Fina, 1992; Lustig, 1996).

Like any other form of qualitative data, data from portfolio assessments can be difficult to analyze. To use checklists and observation lists can be facilitate to analyze process. If it is possible, designing the computer-based portfolio and electronic Portfolios & E-Portfoliosfor students make easier to examine the Portfolios & E-Portfoliosand to give feedback to students .

When comparing students' performance and schools by considering the portfolio scores, the questions "whom did the study belong to?", "Did the student do this work with someone else or alone?" are sometimes discussed. This statement may cause anxiety about the validity and reliability of the portfolio assessment.. In this case, students' scores in Portfolios & E-Portfoliosmay not show their real performance.

To overcome this problem, students' performance should be followed by teachers continuously and they should be required to present their works Developing portfolio assessment criteria, rubrics, and determining the works in portfolio can be difficult for teachers at first. Moreover, organizing and assessing the portfolio and giving feedback to students can be time consuming (Stecher, 1998). Therefore, both in-service and pre-service teachers should be informed about the portfolio assessment.

One of the problems of using portfolio is to store, to handle and to control the Portfolios & E-Portfoliosin the crowded classroom. Also, asking students to bring their portfolio materials to each class can be burdensome.

To overcome this problem, electronic Portfolios & E-Portfolios(e-portfolios) which easily stored, handled and controlled can be used (Baki et al., 2004; Chen et al., 2000).

Another problem of portfolio assessment is parental or community support for such a new and unfamiliar system of assessment.

Most parents is accustomed to their child receiving a letter grade on a report card at the end of a designated grading period. Such a change could be difficult for parents to accept or adjust to without considerable effort to educate them as to the nature and advantages of the new system (Thomas et al., 2005). Therefore, parents initially should be made aware of what is going to transpire with the new assessment method at the beginning of the school year. Also, at least once a month, parents should be invited in to discuss and view their child's portfolio with the teacher. Parents should be an essential part of this assessment process, and include as equal partners and stakeholders.

Consequently, the most important disadvantage of Portfolios & E-Portfoliosis that its low reliability of scores. To overcome this problem, rubrics should be used in the assessments of the students' works. Moreover, portfolio assessment place new demands on teachers such as professional development time to learn portfolio, preparation time to create new materials and lessons, to produce and refine portfolio pieces.

Teachers also need additional time for reviewing and commenting on students work. Such kinds of requirements force teachers to develop themselves in their fields. However, researches show that some teachers see Portfolios & E-Portfoliosas a worthwhile burden with tangible results in instruction and student motivation .

This fact is very important in terms of the application of portfolio. To cope with the possible limitations or disadvantages of portfolios, teachers who tend to use Portfolios & E-Portfoliosshould be educated before, assisted and supported in the portfolio application process by experts.

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The Limitations of Portfolios

Electronic collections help show the range of students' work, but are not standardized or scalable enough to be used for broad assessment purposes, write Richard Shavelson, Stephen Klein and Roger Benjamin.

The Limitations of Portfolios

Colleges have come to realize the need to assess and improve student learning and to report their efforts to students, faculty, administrators, and the public; including policy makers and prospective students and their parents.

The question is how to accomplish this. The roar of yesterday's Spellings Commission and its vision of accountability is background noise to today's cacophony of calls for more transparency and campus-based, authentic assessment of student learning. Some of the advocates for more authentic measures, such as Carol Schneider, president of the Association of American Colleges and Universities, have suggested using electronic Portfolios & E-Portfolios-- collections of a student's work products, such as term papers, research papers or descriptions, and the student's written thoughts ("reflections") about these work products and curricular experiences that are bundled together on an electronic platform. The presumed merits of portfolios, such as their supposed ability to drill down into the local curriculum, have been extolled elsewhere.

Portfolios & E-Portfolios are simply not up to the task of providing the necessary data for making a sound assessment of student learning. They do not and cannot yield the

trustworthy information that is needed for this purpose. However, there are approaches that can provide some of the information that is required.

Portfolio Assessment's Inherent Limitations

There are three major reasons Portfolios & E-Portfolios are not appropriate for higher education assessment programs: They are (a) not standardized, (b) not feasible for large-scale assessment due to administration and scoring problems, and (c) potentially biased. Indeed, course grades, aggregated across an academic major or program, provide more reliable and better evidence of student learning than do portfolios.

Here's why.

Lack of Standardization

Standardization refers to assessments in which

(a) all students take the same or conceptually and statistically parallel measures;

(b) all students take the measures under the same administrative conditions (such as on-site proctors and time limits);

(c) the same evaluation methods, graders, and scoring criteria are applied consistently to all of the students' work; and

(d) the score assigned to a student most likely reflects the quality of the work done by that student and that student alone (without assistance from others).

Portfolios & E-Portfolios do not and cannot meet the requirements for standardization because by their very nature, they are tailored to each student. AAC&U's attempts at "metarubrics" are not even close to being an adequate solution to address this problem. Portfolio advocates simply ignore the evidence that valid comparisons in the level of learning achieved can only be made when students take the same or statistically "equated" measures (such as different versions of the SAT).

Without standardization, faculty and administrators at individual campuses cannot answer the fundamental questions: Is the amount of student learning and level of achievement attained by the students at our campus good enough? Could they do better, and if so, how much better? For example, are the critical writing skills of our students on a par with those of students at comparable institutions and if below, what might be done to improve their performance?

The reason that campuses using portfolio assessment cannot answer these types of questions is that determining how much learning has occurred has to be measured by comparison to some type of standardized benchmarks. For example, to assess whether seniors write better than freshmen, both groups need to respond to the same essay questions within the same time limits and have their answers mixed together before being graded by readers who do not know whether an answer was written by a freshman or senior.

The same standardization is needed to assess whether the students at one school (or in one program within a school) are more proficient (or learned more) than students at similar schools. In short, learning has to be measured by some type of standardized, controlled, and

unbiased comparison. There is no absolute scale (like weight and height) that is interpretable in and of itself.

Descriptions of scoring criteria are not sufficient to ensure comparable grading standards even when benchmark answers are used to train raters. In order to answer the good enough question, performance comparisons -- "benchmarking" -- is necessary. But benchmarking cannot occur without standardization and benchmarking is necessary to interpret differences in scores between programs within a campus and between peer campuses. Without standardization, differences might be due to variation in portfolio content, rater background and training, assistance provided to students for building their portfolios, bias (see below), and a host of other factors.

Valid interpretations of differences in scores between students, programs, and schools can only occur when the assessment is standardized. Only then can institutions monitor their students' progress toward improving their skills and abilities relative to (a) their school's academic standards, (b) the progress made by their classmates, and (c) the improvements in performance made by students in other programs and similar institutions. Ironically then, by eliminating the standardization that is necessary for benchmarking learning, the portfolio method prevents making the kinds of comparisons that are essential for assessing improvement.

We recognize that there are roles for portfolios. For example, they might be used to provide information about the range of tasks and activities students engage in and their views about the importance of different aspects of their education and campus experiences. This information may have heuristic value in providing possible insights into areas for improvement.

Not Feasible for Large Scale Learning Assessment

By their un-standardized nature, Portfolios & E-Portfolios(even electronic ones) are not practically feasible on a large scale. A moment's reflection reveals why this is true. Because of their length, a single grader will typically need an hour or so to grade a single portfolio. To assure adequate score reliability, each portfolio needs at least two independent graders (and major differences between them should be resolved by a third). In addition, due to the potential interdisciplinary nature of a portfolio's contents, raters with different areas of expertise might be needed which could lead to even more scoring time and feasibility problems.

For Portfolios & E-Portfoliosto be truly authentic, they have to relate to each student's academic major or combination of majors. Hence, different teams of graders (and most likely different scoring rubrics) are needed for students with different majors. These and related concerns preclude combining results across students with different and perhaps unique combinations of majors.

Computer technology cannot solve portfolio feasibility and reliability problems. For example, computers with natural language processing software have been shown to provide a cost-effective and accurate way to grade large numbers of student responses to essay questions and other open-ended tasks. However, these machine grading methods require

standardized prompts. They require that thousands of students respond to the same prompt and thus they are not applicable to portfolios.

Simply put, the time, content expertise, and other challenges -- and hence feasibility -- of grading Portfolios & E-Portfolios substantially exceeds that of grading constructed responses (e.g., essays) that are administered and scored under standardized conditions. Incidentally, the solution to this problem does not lie in having local faculty grade portfolios, even when justified as a professor's instructional and professional development responsibilities. The evidence is clear: in large-scale programs, portfolio assessment overwhelms faculty, and is a source of faculty resistance and low morale. Portfolio assessment, then, is simply not a feasible or practical tool for large-scale assessment programs.

Bias

A portfolio may include a photograph, videoclip, or other information about student identities. Their gender, race, ethnicity, and other characteristics also may be known by those evaluating the portfolio. This lack of anonymity may bias results.

Performance assessment, then, represents an authentic, standardized testing paradigm in which students craft original responses to real-life (criterion-sampled) tasks. For example, most state bar examinations now include tasks in which candidates are given a realistic case situation and asked to use a library to perform a typical task, such as prepare deposition questions or a points-and-authorities brief, draft instructions for an investigator, or write a letter to opposing counsel. Candidates are given a "library" of documents and told to base their answers on the information in these documents. The library might include the opposing counsel's brief, excerpts of relevant and irrelevant case law, letters, investigator reports, and other documents… just like they would review in practice. Performance tasks also have been used in credentialing teachers.

We are concerned about the suggestion to replace standardized higher education measures with electronic Portfolios & E-Portfolios as a means for assessing the effects of campus' programs and as a response to the demand for external accountability. Because of the inherent problems with portfolios, they do not and cannot provide trustworthy, unbiased, or cost effective information about student learning. This is just not in their DNA.

Gathering valid data about student performance levels and performance improvement requires making comparisons relative to fixed benchmarks and that can only be done when the assessments are standardized. Consequently, we urge the higher education community to embrace authentic, standardized performance-assessment approaches so as to gather valid data that can be used to improve teaching and learning as well as meet its obligations to external audiences to account for its actions and outcomes regarding student learning.

Read more by

5 of The Best Tools to Create Digital Portfolios & E-Portfoliosin Class -**Digital portfolio tools**

Digital Portfolios & E-Portfoliosare great teaching, learning, and assessment tools. In today's post we are focusing on the learning part and are looking at e-Portfolios & E-Portfoliosfrom a student-centric perspective.

By definition, a portfolio, according to Arter and Spandel, 'is a purposeful collection of student work that exhibits to the student, or others, her efforts or achievement in one or more areas'). The key word here is 'purposeful', a portfolio is different from a folder in that it has a purpose and is guided by a number of learning objectives and expected outcomes. Without intentional planning, a portfolio becomes a mere receptacles of one"s own work.

Three processes are involved in portfolio creation: collection, selection, and reflection. Each of these processes trains students in a number of skills. Together they provide students with the appropriate mindset to help them take responsibility of their learning and thrive as budding life-long learners.

There are several web tools students can use to create digital portfolios. We have already reviewed a number of them over the last few years. But if you are to ask us about the ones we recommend the most, we would direct you to the following:

1- GoogleSite
This is one of the best platforms we have been recommending for teachers over the last few years. Students can use it to create and host their own digital portfolios. The site is simple and easy to use and they can set up their new website within minutes. They can create as many pages as they want, then upload their content, and share with others. Site Help has everything students need to effectively use Google Sites.

2- Weebly
This is another good website students can use to create digital portfolios. Like Google Sites, Weebly provides users with a simple drag and drop editor that allows you to design your website the way you want. No HTML or coding knowledge acquired. You simply select a template, customize it with your own content and publish it to the web.

3- GoogleSlides
Google Slides can be used to create digital portolios in the form of a presentation. There is actually a pre-made template for that. This Portfolio template provides students with a tentative layout and structure to build their own portfolio.

4- Seesaw
Seesaw is a powerful tool to help students create and share digital portfolios. It allows them

to capture and showcase their learning in multiple formats. They can include videos, drawings, text notes, links, and several other materials to their portfolios. Teachers and parents can easily access and check students work.

5- Evernote

This is another practical option for creating digital portfolios. Students record their thoughts using notes then enhance these notes using things such as photos, audio files, links, and attachments. Evernote provides various organizational features that enable users to effectively organize their work so it can be easily searched and accessed across different devices.

Types of Portfolios: Electronic and Paper

You may want to create an electronic portfolio, also called an "e-portfolio," on the web or on a CD. Or, you may choose a more traditional, paper portfolio route of printing materials and binding your work together. Always use copies, not originals, and plan on leaving it with the potential employer.

Advantages of E-Portfolios

A major advantage is that you can share a large amount of information with many people, for example, if you are participating in a group interview. If your portfolio is online, then the website address can also be included in your resume/cover letter so potential employers can view it before the interview. An additional advantage is that this type of portfolio highlights your technical skills.

Disadvantages of E-Portfolios

A disadvantage of using e-Portfolios & E-Portfoliosis the type of software used and available. Making arrangements to ensure compatible software will be available during your interview is important. In case technical difficulties do arise, bring copies of your originals to distribute.

Advantages of Paper Portfolios

Traditional paper Portfolios & E-Portfolioscan be assembled to look professional and allow you to have a visual representation of your work on hand. This is crucial, as it makes viewing your portfolio accessible to anyone wishing to see it. This also allows you to appear prepared for your interview. Moreover, they are easy to update.

Disadvantages of Paper Portfolios

A disadvantage of a paper portfolio is that you don't necessarily know how many copies to bring to the interview.

It is appropriate to ask beforehand, however, how many people will be participating in the interview but make sure you explain that you want to know so that you can bring copies of your portfolio for everyone.

The What, Why, and How of ePortfolios

What is an ePortfolio?

An ePortfolio is a collection of work (evidence) in an electronic format that showcases learning over time. When you think about your ePortfolio and the types of evidence that it contains, it is important to think carefully about its purpose and intended audience.

An ePortfolio may contain all or some of the following:

- Files of various formats (text, pictures, video, etc.)
- Evidence related to courses taken, programs of study, etc.
- Writing samples (which might include several drafts to show development and improvement)
- Projects prepared for class or extracurricular activities
- Evidence of creativity and performance
- Evidence of extracurricular or co-curricular activities, including examples of leadership
- Evaluations, analysis and recommendations

Types of ePortfolios

Showcase/Professional ePortfolios & E-Portfolios— These ePortfolios & E-Portfoliosare primarily a way to demonstrate (showcase) the highlights of a student's academic career. Great examples of showcase ePortfolios & E-Portfolioson Clemson's campus come from Health Sciences, Architecture and

Learning ePortfolios & E-Portfolios— These Portfolios & E-Portfoliosare typically created by a student as part of a course as a way to demonstrate learning and the learning process. These Portfolios & E-Portfoliosare often shared with other students to elicit peer feedback. Learning Portfolios & E-Portfoliossupport the idea of formative feedback as an essential part of the learning process.

Assessment/General Education ePortfolios & E-Portfolios— At Clemson the use of Portfolios & E-Portfoliosplayed a substantive role in the assessment of our general education competencies. Using both formative and summative assessments feedback was provided to colleges, departments and instructors on the quality of evidence students used in their Portfolios & E-Portfoliosto demonstrate our general education competencies.

Faculty

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Why would you want an ePortfolio?

The American Association of Colleges and Universities recent paper titled: It Takes More than a Major: Employer Priorities for College Learning and Student Success states that "more than 4 in 5 employers say an electronic portfolio would be useful to them in ensuring that job applicants have the knowledge and skills they need to succeed in their company or organization." (**Read the entire report online**.) You can also **view the highlights from 2011 Clemson University President's Advisory Board Meeting** where one group of corporate, industry, community and academic leaders felt that an ePortfolio provided all the right opportunities for students to develop soft skills and market themselves to any industry.

Many Graduate School programs now require a portfolio, as well. For example, the MFA Degree Program in Digital Production Arts in the Clemson School of Computing requires a digital portfolio as part of their application

What can our office do for you?

The goal of Clemson's ePortfolio office is to assist in creating and promoting your own Digital Identity or Digital Brand. Whether you are headed to Grad School, applying for jobs, starting your own business, or looking to become an independent artist, these are powerful tools. Our goal is to assist Clemson students in generating a narrative that sets them apart from their peers at other universities, using the cutting edge tools available to them, such as the Adobe Creative Cloud Suite.

Content: What goes in a Portfolio? What do employers want to see?

Things to consider: Who will view your portfolio? What skills do you want to market? What is your purpose? Does your portfolio reflect your accomplishments? Your career field? You may include:

- Projects you have worked on as a class assignment or in a job
- Reports or research summaries; relevant published articles
- Graphics/technical project print outs

- College transcript
- Awards or certificates
- Professional licenses
- Contact information for references
- Your contact information (in case the portfolio is separated from your resume/cover letter)
- NOTE: Items written or created for an employer are usually considered property of the employer; ask for permission to use these items in your portfolio

Additional Tips for Creating a Portfolio

- Quality is more important than quantity.
- Be ethical - take credit only for what you did in a project.
- Prepare when and how to introduce and discuss the portfolio in the interview.
- The first page should be sturdy - a cover is recommended.
- Proofread! Proofread! Proofread!
- Ask for feedback from professors, career services staff, professionals in your field, friends, family, etc.

Examples of assessment tools

- Research Paper Rubric.
- Checklist.
- Search Report Process Guide.
- **Evaluation** of Instruction.
- **Evaluation** of Critiques of Scientific Articles.
- **Evaluation** of Lab Reports.
- Grading Guide.
- Poster Presentation Rubric

RESULTS AND SUGGESTIONS

It is necessary to assess the students' performances as an individual or in a group during the learning process rather than assessment with traditional methods or multiple choice methods.

Portfolios & E-Portfoliosare alternative assessment methods to observe students' developments and assess their performances during learning process.

Moreover, Portfolios & E-Portfoliosare assessment tool based on contemporary learning approach such as constructivist learning theory, multiple-intelligences theory and brain-based learning theory

Portfolio assessment enables students to reflect their real performance, to show their weak and strong domain and to observe student's progress during the learning process and encourages students to take responsibilities for their own learning.

Since portfolio enable collecting information from different source such as students' parents, friends, teachers, and himself, it provides teachers to have reliable information about student.

They are important tools for assessment of students' learning products and process.

Different theoretical and applicable researches show that portfolio can be used both as learning and assessment tools (Birgin, 2007; Ersoy, 2006; Klenowski, 2000; Kuhs, 1994;Norman, 1998).

Thus, portfolio has a potential which enables students to learn during assessment and to be assessed during learning (to assess for learning and to assess of learning).

Therefore, it should be exactly applied in primary education for different courses such as Science and Technology, Mathematics, Social Science to observe thestudents' progress during the learning process and to provide the required assistance depending on their performances.

During the preparation of a portfolio, first of all, it is necessary to determine a purpose of the portfolio, to plan its items by covering the students' different skills and learning dimensions (cognitive, emotional, and psychomotor) and to explain its assessment criteria clearly.

In addition, it should be considered that there are different extents which portfolio has a restricted usage. It should be use computer-based portfolio and electronic portfolio to decrease the problems such as carrying, reaching, and savingportfolios.

Considering this situation, it decreases the burden in crowded classes in Turkey.

Effective use of the portfolio as a learning and assessment tools

depends on the knowledgeable and experienced teachers who apply them on a large scale. However, some researches (Birgin, 2003; Çakan, 2004; Özsevgeç et al., 2004; Yiğit et al., 1998) emphasized that teachers don't have enough knowledge and experience about portfolio assessment methods and other alternative assessment methods.

Thus, it is very important to teach pre-service teachers about using an assessment tool of the portfolio which has a great potential in Turkish education system during their education and to introduce it for teachers with the help of in service courses.

In this context, pre-service teachers, who will be the runners of the new education program and is a teacher of future, should have experiences about contemporary

assessment methods such as portfolio during their education so they will be apply it theirs courses in future.

It should be sent to teachers the materials explained in details with examples for the portfolio assessment methods which are to be used in the new primary curriculum, and comprehensive in-service courses should be held supported with professional staff.

Ministry of National Education should serve an electronic online service through which teachers can make examine and share different materials and examples about portfolio

The school masters should arrange different occupational development activities with the new education program so that teachers can be master themselves in terms of professional development and be apply the contemporary methods in their courses and,should take some measures to encourage implementation of the new program.

Besides, the school masters should inform parents and students during the process of applying portfolio and organize the meetings for parents regularly. In these meetings, parents should be wellinformed about the portfolio assessment and importance of it for both teachers and students.

In sum, although portfolio is an important tool for the assessment of the students'performance, it is not intensity cure for removing the measurement and assessment problems in Turkish education system. So it is not completely true to leave the traditional assessment methods aside, and accepts the new assessment ones. Besides using portfolio assessment method, using the other assessment methods will enable more reliable information about students.

As a result, it should not be forgotten that using both alternative and traditional assessment methods in proper time may be very useful.

Annexure- II

VALUE ADDED COURSE

Portfolios & E-Portfolios &CD/ME01

4. List of Students Enrolled December- 2018

II MBBS (BATCH 2017-18)		
Sl. No	**Name of the Student**	**Roll No**
1	KEVIN RAHUL.S	U17MB315
2	KURRI BHARGAV REDDY	U17MB316
3	LALITHA PRIYA.G	U17MB317
4	MAGESHWAR.G.V	U17MB318
5	MALLI SOHAN	U17MB319
6	MANVITHA GOTTUMUKKALA	U17MB320
7	MEDEMPUDI REETHIKA JYOTHI	U17MB321
8	MINGAM RUMI	U17MB322
9	PRASANNA.B	U17MB346
10	PRAVEEN.V	U17MB347
11	SHABAN OS	U17MB370
12	RAHUL RAI	U17MB355
13	RICHI SWARN	U17MB356
14	RINI DAS	U17MB357
15	RISHABH SUMAN	U17MB358

RESOURCE PERSON **COORDINATOR**

SRI LAKSHMI NARAYANA INSITUTE OF MEDICAL SCIENCES

Attendance List **Date:01.12.2018**

S.no.	Roll. No.	Students Name	Signature
1	U17MB315	KEVIN RAHUL.S	
2	U17MB316	KURRI BHARGAV REDDY	
3	U17MB317	LALITHA PRIYA.G	
4	U17MB318	MAGESHWAR.G.V	
5	U17MB319	MALLI SOHAN	
6	U17MB320	MANVITHA GOTTUMUKKALA	
7	U17MB321	MEDEMPUDI REETHIKA JYOTHI	
8	U17MB322	MINGAM RUMI	
9	U17MB346	PRASANNA.B	
10	U17MB347	PRAVEEN.V	
11	U17MB370	SHABAN OS	
12	U17MB355	RAHUL RAI	
13	U17MB356	RICHI SWARN	
14	U17MB357	RINI DAS	
15	U17MB358	RISHABH SUMAN	

RESOURCE PERSON

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam Post,
Villanur Commune Puducherry-605 502

COORDINATOR

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam Post,
Villanur Commune Puducherry-605 502.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Assessment and Evaluation

Annexure – III

1. Essay Writing
2. Rubric
3. Self Reflection
4. Submission of E- portfolio Dec-2018 & Feb 2019

Assessment and Evaluation

Short Essay Question:

1. Classify different types of Portfolios
2. Highlights of advantages and disadvantages of portfolios
3. Limitations of portfolios and e-portfolios
4. E-portfolios of advantages and disadvantages

Rubric

Self Reflection

Submit a reflection, how you are going to submit for 2 months course program.

Submission of E- portfolio for the month of Dec-2018

All of you prepare a poster incorporating all Aspects of portfolios & E-portfolios for poster presentation

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

EVALUATION

Name of the II MBBS Student: CHARAN VARMA C.A ROLL NUMBER: U18MB275

WRITE A RUBRIC OF THE PROGRAM ON PORTFOLIO AND E PORTFOLIO.

I am a second MBBS student who attended the value added course on Portfolios & E portfolios. The session was contacted nearly two months with four faculties involved.

The session covered all the objectives like need of the portfolios, types, advantages and disadvantages, how to write and ended with evaluation also

I found the session was very interesting with many inputs and the necessity to write E - Portfolios which is one of the most expected out of the students.

This will help us in documenting all the fax day by day, understanding the concepts and the necessity to create Portfolios and E portfolios in every one's life time. The session was very interesting with practical methodology of teaching.

The lectures were taken by using the following TLM like Didactic lectures, power point presentation, discussions in small groups, and creations of records in E portfolio form with all the events contacted as day to day basics.

I expect such a VAC to be conducted in future for as to learn all the techniques involved and which will be very useful to us.

C.A. Charan

Signature of the Student

Evaluation done by:

Dr G. JAYALAKSHMI

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Kudapakkam, Post,
Puducherry-605 502.

8/10

Annexure- V

Student Feedback Form- ANNEXURE V

Course Name: *Portfolios & E- Portfolios*

Subject Code: **CD/ME01**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Signature

Date:

Student Feedback Form- ANNEXURE V

Course Name: *Portfolios & E- Portfolios*

Subject Code: **MIC15**

Name of Student: Nageshwar. G. V Roll No.: U17MB318

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5 ✓

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

No suggestions.

Signature

Date: 28.12.2018

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that LALITHA PRIYA. G has actively participated in the Value Added Course on **Portfolios & E-Portfolios** held during December 2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.G. Jayalakshmi

RESOURCE PERSON

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
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Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudipalayam, Post,
Villianur Commune Puducherry-605 502

Dr.G. Jayalakshmi

COORDINATOR

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudipalayam, Post,
Villianur Commune Puducherry-605 502

Sri Lakshmi Narayana Institute of Medical Sciences

Date: 02.05.2018

From
Dr. Nithianandam
Professor and Head,
Department of Anaesthesia
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Puducherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry

Sub: Request for Permission to conduct value-added course: Mechanical Ventilation

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Mechanical Ventilation for undergraduates from Jan -June 2019. We solicit your kind permission for the same.

Kind Regards

Dr. NITHIANANDAM. S

Head of Dept. Anaesthesiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502.

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr A.SUGUMARAN

The HOD: Dr.NITHIANANDAM. S

The Expert: Dr KALASREE M

The committee has discussed about the course and is approved.

Dean Subject Expert HOD

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605502

Head of Dept. Anaesthesiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

08.06.2018

Sub: Organizing Value-added Courses: Mechanical Ventilation - reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Mechanical Ventilation"** course in Jan-June 2019. The course content is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 15/06/2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KUDAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content

COURSE PROPOSAL

Course Title: Mechanical Ventilation

Course Objective:

1. To enable the students to learn about mechanical ventilation- its definition, understanding its principles, indications and contraindications and monitoring a patient on mechanical ventilation.

2. To be acquainted with the newer modes of ventilation

Course Outcome:

On successful completion of the course the students will have skill in identifying patients who require mechanical ventilation and have basic knowledge about the common modes of ventilation

Course Audience: II year MBBS students

Course Coordinator: Dr.NITHIANANDAM. S

Course Faculties with Qualification and Designation:

1. Dr. M Kalasree-Associate Professor

2. Dr Chandrasekar - Assistant Professor

Course Curriculum/Topics with schedule (Min of 30 hours)

S.No	Date	Topics	Time	Hours	Faculty
1	05.01.2019	Introduction	2-4PM	2	Dr Chandrasekar
2	19.01.2019	Anatomy and physiology of respiration	2-4PM	2	Dr. Kalasree
3	02.02.2019	Respiratory failure	2-4PM	2	Dr Chandrasekar
4	09.02.2019	indications	2-4PM	2	Dr. Kalasree
5	16.02.2019	Types of mechanical ventilation	2-4PM	2	Dr Chandrasekar
6	23.02.2019	Negative pressure ventilation	2-4PM	2	Dr. Kalasree
7	02.03.2019	Positive pressure ventilation	2-4PM	2	Dr Chandrasekar
8	09.03.2019	Modes of ventilation	2-4PM	2	Dr. Kalasree
9	16.03.2019	Group discussion	2-4PM	2	Dr Chandrasekar
10	23.03.2019	Triggering mechanism	2-4PM	2	Dr. Kalasree
11	30.03.2019	Monitoring a patient with mechanical ventilation	2-4PM	2	Dr. Kalasree
12	06.04.2019	complications	2-4PM	2	Dr Chandrasekar
13	20.04.2019	Skill station and demonstration	2-4PM	2	Dr. Kalasree
14	27.04.2019	Prone ventilation	2-4PM	2	Dr Chandrasekar
15	04.05.2019	Final assessment	2-4PM	2	Dr. Kalasree

REFERENCES

1) Mason R.J, Braaddus V.C.Murray and Nadel`s :Textbook of Respiratory Medicine. 5th edn. Philadelphia:Saunders;2010

2) George R.B,Light R.W. Chestmedicine:Essentials of Pulmonary and Critical Care Medicine. 4th edn . Philadelphia:Lippincott;2000.

3) Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, et al., editors,Harrison’s principles of internal medicine. 17th ed. New York: McGraw Hill; 2008.

VALUE ADDED COURSE

1. Name of the program & Code

MECHANICAL VENTILATION, ANAES 08

2. Duration & Period

30 hrs: Jan 2019-June 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled:

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate of Participation:

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 Time JAN 2019-JUNE 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course Jan 2019-June 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	ANAES 08	MECHANICAL VENTILATION	DR. KALASREE	II MBBS	20

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

DR. KALASREE

COORDINATOR

Dr S NITHIANANDAM

Head of Dept. Anaesthesiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502.

Annexure

MECHANICAL VENTILATION

TOPICS:

Anatomy and physiology of respiration

Modes of ventilation

complications

Respiratory failure

indications

Types of ventilation

Modes of ventilation and triggering mechanism

PEEP and NEEP

Triggering mechanism

Monitoring a patient with mechanical ventilation

Prone ventilation

Skill station and demonstration

Group discussion

Final assessment

Introduction

Mechanical ventilation is a procedure often performed in patients in respiratory failure, which is defined broadly as the inability to meet the body's needs for oxygen delivery or carbon dioxide removal. A ventilator delivers air, usually with an elevated oxygen content, to a patient's lungs via an endotracheal tube to facilitate the exchange of oxygen and carbon dioxide.

The indications for mechanical ventilation include airway protection, treatment of hypoxemic respiratory failure (low blood oxygen), treatment of hypercapnic respiratory failure (elevated carbon dioxide in the blood), or treatment of a combined hypoxic and hypercapnic respiratory failure. On some occasions, patients are also intubated and placed on mechanical ventilation for procedures. However, intubation and initiation of mechanical ventilation require a great degree of vigilance, as committing to this therapy can affect the patient's overall course of treatment.

mechanical ventilation is managed by Respiratory Therapists (RTs), highly-trained medical professionals who specialize in the care of respiratory illnesses. In addition to managing ventilators, RTs have expertise in other forms of oxygen administration and respiratory support, provide medications for respiratory disorders, and assess patients for extubation readiness. RTs are essential for the appropriate care of mechanically ventilated patients. Conversely, mechanical ventilation traditionally has not been taught as a core component of many medical and nursing practices outside of Critical Care and Anesthesiology. As such, to collaborate effectively with RTs in the care of ventilated patients, additional education is warranted. Ventilator management can seem intimidating due to varied and confusing terminology (with many clinicians using synonyms for the same modes or settings), slight variation among brands of ventilators, unfamiliarity, or ceding management to others.

For COVID-19 patients, ventilators are often crucial, given the nature of the illness. But note that intubation and initiation of mechanical ventilation require a great degree of vigilance. The data supporting the importance of good ventilator management continues to increase, and appreciating the fundamental principles of ventilation is essential for all clinicians involved in the care of these patients.

VENTILATOR BASICS Control (target) variables are the targets that are set, based on the mode of mechanical ventilation chosen. For example, there are pressure-controlled and volume-

controlled modes of ventilation. In pressure-control, the clinician sets a designated pressure that is delivered with every breatn. In volume-control, they set a designated tidal volume instead. Conditional variables are the dependent variables in mechanical ventilation. For example, in volume controlled modes of ventilation, the tidal volume is a set parameter, while the pressure is a conditional variable, and can vary from breath to breath. Trigger - the factor that initiates inspiration. A breath can be pressure-triggered, flow-triggered, or time-triggered. Cycle – the determination of the end of inspiration, and the beginning of exhalation. For example, the mechanical ventilator can be volume, pressure, or time cycled.

PHYSIOLOGY TERMS

Airway resistance refers to the resistive forces encountered during the mechanical respiratory cycle. The normal airway resistance is ≤ 5 cm H2O. Lung compliance refers to the elasticity of the lungs, or the ease with which they stretch and expand to accommodate a change in volume or pressure. Lungs with a low 2 compliance, or high elastic recoil, tend to have difficulty with the inhalation process, and are colloquially referred to as “stiff” lungs. An example of poor compliance would be a patient with a restrictive lung disease, such as pulmonary fibrosis. In contrast, highly compliant lungs, or lungs with a low elastic recoil, tend to have more difficulty the exhalation process, as seen in obstructive lung diseases. Atelectasis is a complete or partial collapse of the entire lung or area (lobe) of the lung. It occurs when the tiny air sacs (alveoli) within the lung become deflated or possibly filled with alveolar fluid. Derecruitment is the loss of gas exchange surface area due to atelectasis. Derecruitment is one of the most common causes of gradual hypoxemia in intubated patients and can be minimized by increasing PEEP. Recruitment is the restoration of gas exchange surface area by applying pressure to reopen collapsed or atelectatic areas of the lung. Predicted Body Weight is the weight that should be used in determining ventilator settings, (never use actual body weight). Lung volumes are determined largely by sex and height, and therefore, these two factors are used to determine predicted body weight. The formula for men is: PBW (kg) = 50 + 2.3 (height (in) – 60) The formula for women is: PBW (kg) = 45.5 + 2.3 (height (in) – 60)

PHASES of MECHANICAL BREATHING Initiation phase is the start of the mechanical breath, whether triggered by the patient or the machine. With a patient initiated breath, you will notice a slight negative deflection (negative pressure, or sucking). Inspiratory phase is the portion of mechanical breathing during which there is a flow of air into the patient’s lungs to achieve a maximal pressure, the peak airway pressure (PIP or Ppeak), and a tidal volume (TV or VT). Plateau phase does not routinely occur in mechanically ventilated breaths, but may be checked as an important diagnostic maneuver to assess the plateau pressure (Pplat). With cessation of air flow, the plateau pressure and the tidal volume (TV or VT) are briefly held constant. Exhalation is a passive process in mechanical breathing. The start of the exhalation process can be either volume cycled (when a maximum tidal volume is achieved), time cycled (after a set number of seconds), or flow cycled (after achieving a certain flow rate).

Peak Inspiratory Pressure (PIP or Ppeak) is the maximum pressure in the airways at the end of the inspiratory phase. This valve is often displayed on the ventilator screen. Since this value is generated during a time of airflow, the PIP is determined by both airway resistance and compliance. By convention, all pressures in mechanical ventilation are reported in "cm H2O." It is best to target a PIP < 35 cm H2O. Plateau Pressure (Pplat) is the pressure that remains in the alveoli during the plateau phase, during which there is a cessation of air flow, or with a breath-hold. To calculate this value, the clinician can push the "inspiratory hold" button on the ventilator. The plateau pressure is effectively the pressure at the alveoli with each mechanical breath, and reflects the compliance in the airways. To prevent lung injury, the Pplat should be maintained at < 30 cm H2O.

Positive End Expiratory Pressure (PEEP) is the positive pressure that remains at the end of exhalation. This additional applied positive pressure helps prevent atelectasis by preventing the end-expiratory alveolar collapse. PEEP is usually set at 5 cm H2O or greater, as part of the initial ventilator settings. PEEP set by the clinician is also known as extrinsic PEEP, or ePEEP, to distinguish it from the pressure than can arise with air trapping. By convention, if not otherwise specified, "PEEP" refers to ePEEP. Intrinsic PEEP (iPEEP), or auto-PEEP, is the pressure that remains in the lungs due to incomplete exhalation, as can occur in patients with obstructive lung diseases. This value can be measured by holding the "expiratory pause" or "expiratory hold" button on the mechanical ventilator. Driving pressure (ΔP) is the term that describes the pressure change that occurs during inspiration, and is equal to the difference between the plateau pressure and PEEP (Pplat – PEEP). For example, a patient with a Pplat of 30 cm H2O and a PEEP of 10 cm H2O would have a driving pressure of 20 cm H2O. In other words, 20 cm H2O would be the pressure exerted to expand the lungs. Inspiratory time (iTime) is the time allotted to deliver the set tidal volume (in volume control settings) or set pressure (in pressure control settings).

Expiratory Time (eTime) is the time allotted to fully exhale the delivered mechanical breath. I:E ratio, or the inspiratory to expiratory ratio, is usually expressed as 1:2, 1:3, etc. The I:E ratio can be set directly, or indirectly on the ventilator by changing the inspiratory time, the inspiratory flow rate, or the respiratory rate. By convention, decreasing the ratio means increasing the expiratory time. For example, 1:3 is a decrease from 1:2, just like 1/3 is less than 1/2. 4 Peak inspiratory flow is the rate at which the breath is delivered, expressed in L/min. A common rate is 60 L/min. Increasing and decreasing the inspiratory flow is a means of indirectly affecting the I:E ratio. Fraction of inspired oxygen (FiO2) is a measure of the oxygen delivered by the ventilator during inspiration, expressed at a percentage. Room air contains 21% oxygen. A mechanical ventilator can deliver varying amounts of oxygen, up to 100%.

VENTILATOR MODES Assist Control (AC) is a commonly used mode of ventilation, and one of the safest modes of ventilation in the Emergency Department. Patients receive the same breath, with the same parameters as set by the clinician, with every breath. They may take

additional breaths, or over-breathe, but every breath will deliver the same set parameters. Assist control can be volume-targeted (volume control, AC/VC) where the clinician sets a desired volume, or pressure-targeted (pressure control, AC/PC) where the clinician selects a desired pressure.

Synchronized Intermittent Mandatory Ventilation (SIMV) is a type of intermittent mandatory ventilation, or IMV. The set parameters are similar to those in AC, and the settings can be volume controlled (SIMV-VC) or pressure controlled (SIMV-PC). Similar to AC, each mandatory breath in SIMV will deliver the identical set parameters. However, with additional spontaneous breaths, the patient will only receive pressure support or CPAP. For example, in SIMV-VC we can set a TV, and as long as the patient is not breathing spontaneously, each delivered mechanical breath will achieve this tidal volume. However, spontaneous breaths in this mode of ventilation will have more variable tidal volumes, based on patient and airway factors. Pressure Regulated

Volume Control (PRVC) is a type of assist-control thatcombinesthbestattributes of volume control and pressure control. The clinician selects a desired tidal volume, and the ventilator gives that tidal volume with each breath, at the lowest possible pressure. If the pressure gets too high and reaches a predefined maximum level, the ventilator will stop the air flow and cycle into the exhalation phase to prevent excessive airway pressure and resulting lung injury. In this mode of ventilation, thepressure target

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Anatomy and physiology of respiration

Introduction to mechanical ventilation for junior ICU trainees and nurses.

This page is written with the assumption that the reader has a basic understanding of respiratory physiology and respiratory failure

The problem

Getting oxygen in

Oxygen uptake via the lungs is dependent on a number of factors. Some can be manipulated to a large extent by mechanical ventilation:

- PAO2, which in turn can be manipulated by altering:

    - inspired oxygen concentration (FIO2)
    - alveolar pressure
    - ventilation
- ventilation-perfusion matching - by re-opening collapsed alveoli, thereby reducing intra-pulmonary shunting
    - positive end-expiratory pressure (PEEP) helps re-open alveoli and splint open alveoli

Getting carbon dioxide out

- Carbon dioxide elimination via the lungs is largely dependent on alveolar ventilation.
- Alveolar ventilation = Respiratory rate x (tidal volume - dead space)

Main controls

To improve oxygenation:

- increase FIO2
- increase mean alveolar pressure
    - increase mean airway pressure
        - increase PEEP
        - increase I:E ratio
- re-open alveoli with PEEP

To improve CO2 elimination:

- increase respiratory rate
- increase tidal volume

Other controls

Inspiratory time, inspiratory pause and I:E ratio

- inspiratory time is the time over which the tidal volume is delivered or the pressure is maintained (depending on the mode)
    - in time-cycled modes either inspiratory time or I;E ratio are set (flow is adjusted to ensure that the set tidal volume is delivered in that time). These modes include:
        - pressure control
        - volume control (Siemens and Drager ventilators)
        - pressure regulated volume control
    - in volume-cycled modes the flow is set and inspiration ends when the set tidal volume has been delivered. These modes include:
        - volume control (Puritan-Bennett and Bear ventilators)
    - in pressure support mode the patient determines the duration of inspiration
- inspiratory pause time is only set in modes where a fixed tidal volume is set and delivered (volume control and volume preset SIMV modes)

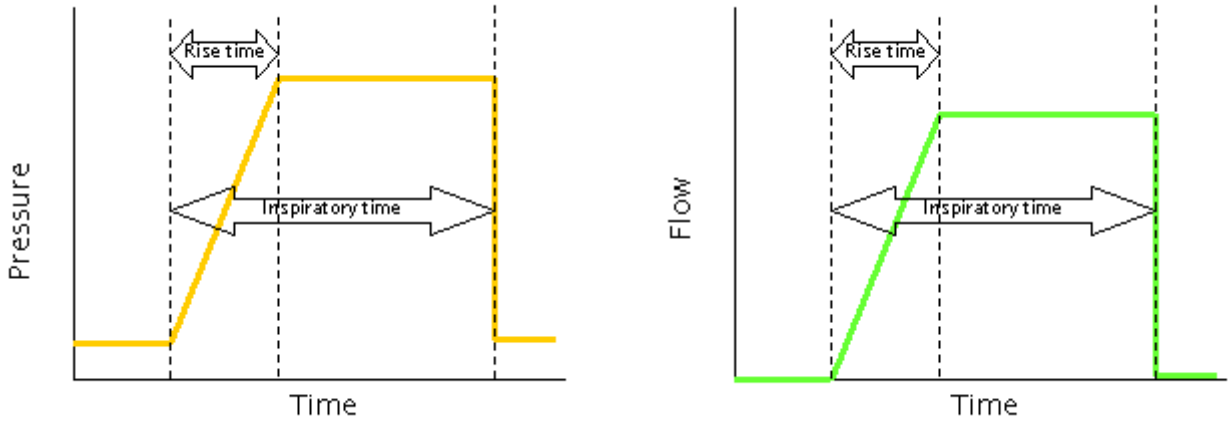
- expiratory time is whatever time is left over before the next breath
- I:E ratio
    - =(inspiratory time + inspiratory pause time):expiration
    - usually set to 1:2 to mimic usual pattern of breathing
- in general longer inspiratory times:
    - improve oxygenation by:
        - increasing the mean airway pressure (longer period of high pressure increases mean airway pressure over the entire respiratory cycle)
        - allowing re-distribution of gas from more compliant alveoli to less compliant alveoli
    - increase risk of gas trapping, intrinsic PEEP and barotrauma by reducing expiratory time
    - are less well tolerated by the patient, necessitating a deeper level of sedation
    - decrease peak pressure by decreasing inspiratory flow

Trigger sensitivity

- this determines how easy it is for the patient to trigger the ventilator to deliver a breath
- in general increased sensitivity is preferable in order to improve patient-ventilator synchrony (ie to stop the patient "fighting" the ventilator) but excessively high sensitivity may result in false or auto-triggering (ie ventilator detects what it "thinks" is an attempt by the patient to breath although the patient is apnoeic)
- triggering may be flow-triggered or pressure triggered. Flow triggering is generally more sensitive.
- the smaller the flow or the smaller the negative pressure the more sensitive the trigger

Rise time

- determines speed of rise of flow (volume control mode) or pressure (pressure control and pressure regulated volume control modes)
- very short rise times may be more uncomfortable for the patient
- long rise times may result in a lower tidal volume being delivered (pressure control mode) or higher pressure being required (volume control and pressure regulated volume control modes)



Modes of ventilation

In general a ventilator can be set to deliver:

- a certain volume of gas in a set period of time
    - the pressure generated in the lung will then be dependent on the resistance and compliance of the respiratory system
    - known as volume control mode

- a certain level of pressure for a set period of time
    - the tidal volume delivered will then be dependent on the resistance and compliance of the respiratory system
    - pressure control and pressure regulated volume control modes
- in assist-control modes (volume control, pressure control, pressure regulated volume control) the ventilator guarantees that the patient will receive the set minimum number of breaths, although he/she is able to demand (trigger) more
- in pressure support modes the patient only receives breaths when he/she triggers the ventilator

Complications

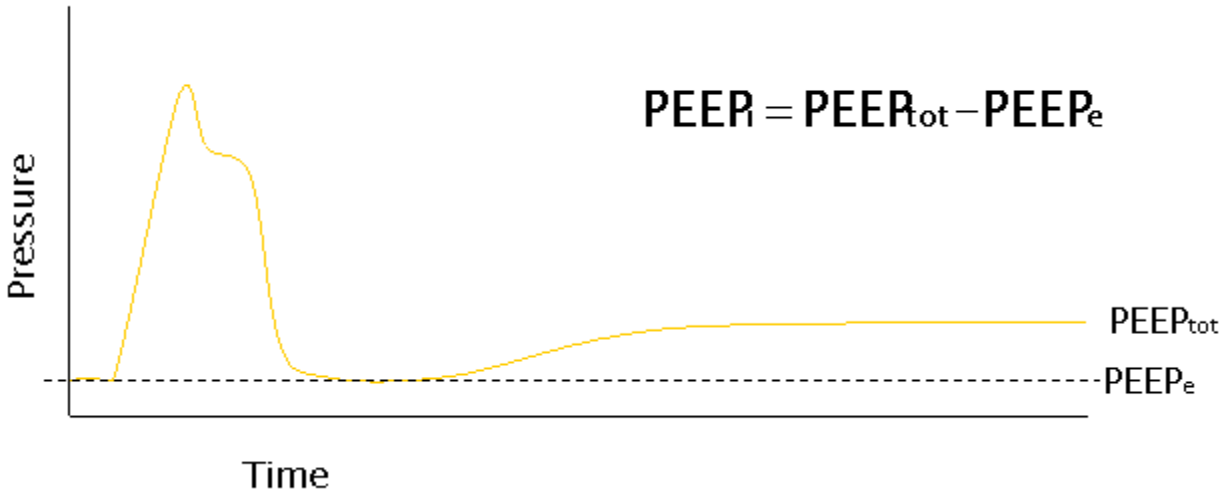
Respiratory

- nosocomial pneumonia
- barotrauma
    - not only due to high pressures also due to high volumes and shear injury (due to repetitive collapse and re-expansion of alveoli and due to tension at the interface between open and collapsed alveoli
    - causes:
        - pneumothorax
        - pneumomediastinum
        - pneumopericardium
        - surgical emphysema
        - acute lung injury
- gas trapping
    - occurs if there is insufficient time for alveoli to empty before the next breath
    - more likely to occur:
        - in patients with asthma or COPD
        - when inspiratory time is long (and therefore expiratory time short)

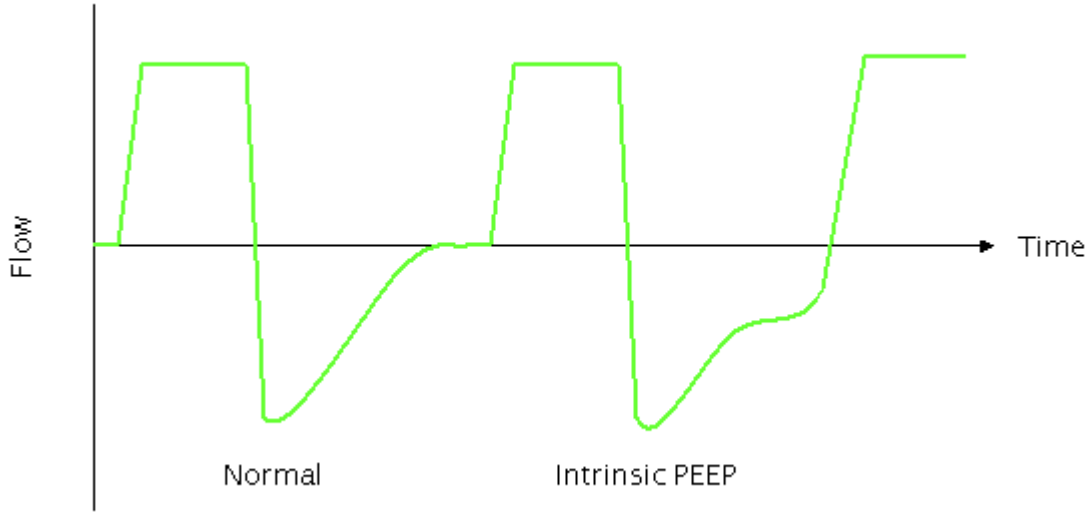
        - when respiratory rate is high (absolute expiratory time is short)
    - results in progressive hyperinflation of alveoli and progressive rise in end-expiratory pressure (known as intrinsic PEEP)
    - may result in:
        - barotrauma
        - cardiovascular compromise due to high intrathoracic pressure. In an extreme case can lead to cardiac arrest with pulseless electrical activity.

Measuring intrinsic PEEP

- quantitative measurement of intrinsic PEEP can be obtained in an apnoeic patient by using the expiratory pause hold control on the ventilator. This allows equilibration of pressures between the alveoli an the ventilator allowing the total PEEP to be measured. The value for total PEEP can be read from the airway pressure dial or the PEEP display
- Intrinsic PEEP=Total PEEP-Set PEEP



- Examination of the flow-time curve from the ventilator gives an indication that there is intrinsic PEEP but does not give an indication of the magnitude. The patient does not need to be apnoeic.



Cardiovascular effects

Preload

- positive intrathoracic pressure reduces venous return
- exacerbated by
  - high inspiratory pressure
  - prolonged inspiratory time
  - PEEP

Afterload

= ventricular wall tension (T) during contraction

$$T = \frac{P_{tm} \times R}{2H}$$

wherePtm=transmural pressure, R=radius and H=wall thickness

Ptm=intracavity pressure-pleural pressure

By increasing pleural pressure positive pressure ventilation decreases transmural pressure and hence afterload

Cardiac output

- reduced preload will tend to decrease cardiac output
- reduced afterload will tend to increase cardiac output

- net effect depends on LV contractility. In patients with normal contractility positive pressure ventilation tends to decrease cardiac output while in patients with decreased contractility it tends to increase cardiac output
- effect on cardiac function also important to remember when weaning patients. Failure to wean may be due to failure to cope with increased preload and afterload

Myocardial oxygen consumption

- reduced by positive pressure ventilation

Respiratory failure

We breathe oxygen from the air into our lungs, and we breathe out carbon dioxide, which is formed in our body as a waste gas. Breathing is essential to life itself. Oxygen must pass from our lungs into our blood for our tissues and organs to work properly.

Respiratory failure is a serious condition that develops when the lungs can't get enough oxygen into the blood. Buildup of carbon dioxide can also damage the tissues and organs and further impair oxygenation of blood and, as a result, slow oxygen delivery to the tissues.

During a physical exam your doctor may do the following:

- **Check for a bluish color** on your lips, fingers, or toes.
- **Listen to your heart** with a stethoscope to check for a fast or irregular heartbeat.

- **Listen to your lungs** with a stethoscope for rapid breathing or any unusual sounds when you breathe. He or she will also see if your chest moves unevenly while you breathe.
- **Measure your blood oxygen level** with a clip on a finger, called pulse oximetry.
- **Measure your blood pressure** to check if it is too high or low.
- **Measure your temperature** to check for a fever and ask if you have recently had a fever.

Diagnostic tests and procedures

To diagnose respiratory failure, your doctor may order some of the following tests and procedures.

- **Arterial blood gas tests** to measure levels of oxygen, carbon dioxide, pH, and bicarbonate. A sample of your blood will be taken from your arteries. These tests help determine whether you have respiratory failure and what type it is.
- **Blood tests** to help find the cause of your respiratory failure. Blood tests can also help your doctor see how well your other organs are working.
- **Bacterial cultures** using samples of your blood, urine, or phlegm (a slimy substance that you cough out) to check for a bacterial infection.
- **Bronchoscopy** to check for blockages, tumors, or other possible causes of respiratory failure.
- **Chest X-ray** to identify any lung or heart conditions that may be causing respiratory failure.
- **Chest computed tomography (CT) scan** to image the lungs and look for inflammation or damage.
- **Electrocardiogram (EKG or ECG)** to check your heart rhythm and how well your heart is working.
- **Echocardiography** to check how well your heart is working.
- **Lung ultrasound** to check for lung conditions such as pleural effusion.
- **Lung biopsy** to collect samples of your lung tissue.
- **Pulmonary function tests** to measure how well your lungs are working

Any condition or injury that affects breathing can cause respiratory failure. The condition or injury may affect your airways or lungs. Or it may affect the muscles, nerves, and bones that help you breathe.

When you can't breathe well, your lungs can’t easily move oxygen into your blood or remove carbon dioxide. This causes a low oxygen or high carbon dioxide level in your blood. Learn more about how your lungs normally exchange oxygen and carbon dioxide

Respiratory failure can be caused by:

- **Conditions that make it difficult to breathe in and get air into your lungs.** Examples include weakness following a stroke, collapsed airways, and food getting stuck in and blocking your windpipe.
- **Conditions that make it difficult for you to breathe out.** Asthma causes your airways to narrow, while COPD can cause mucus to buildup and narrow your airways, which can make it hard for you to breathe out.

- **Lung collapse.** When no air is able to enter your lungs, one or both lobes may collapse and cause a condition called atelectasis. This collapsing of the lung can happen in certain situations, such as when the lungs become extremely weak, mucus blocks one of the large airways, a rib is broken or fractured, or severe pain in the lung makes it difficult to take a deep breath. Chest trauma or lung injury can also cause air to leak from the lung, filling the space around the lung within the chest. This air could cause the lung to collapse, called a pneumothorax.
- **Fluid in your lungs.** This makes it harder for oxygen to pass from the air sacs into your blood and for carbon dioxide in your blood to pass into the air sacs to be breathed out. Pneumonia, acute respiratory distress syndrome (ARDS), drowning, and other lung diseases can cause this fluid buildup. It can also be caused by the inability of the heart to pump enough blood to the lungs (called heart failure). Severe head injury or trauma can also cause sudden fluid buildup in the lungs.
- **A problem with your breathing muscles.** Such problems can occur after a spinal cord injury or when you have a nerve and muscle condition such as muscular dystrophy. It can also happen when your diaphragm and other breathing muscles do not get enough oxygen-rich blood, when the heart is not pumping well enough (cardiogenic shock), or when you get a severe infection called sepsis.
- **Conditions that affect the brain's control over breathing.** In opioid overdose, for example, the brain may not detect high levels of carbon dioxide in the blood. Normally, the brain would signal to you to deepen your breathing so that you breathe out the carbon dioxide. Instead carbon dioxide builds up in the body, while oxygen levels fall, leading to respiratory failure.

Indications for mechanical ventilation

- **Nerve and muscle disorders** such as amyotrophic lateral sclerosis, Guillain-Barre syndrome, and myasthenia gravis. A stroke can also affect the area of the brain that controls breathing.
- **Lung and airways diseases,** such as asthma, cystic fibrosis, COPD, and interstitial lung diseases. Fluid buildup in the lungs or pulmonary embolism (a blood clot in your lungs) can also lead to respiratory failure.
- **Infections** in your brain or spinal cord (such as meningitisexternal link), lungs (such as pneumonia), or airways (such as bronchiolitis). Watch this video to learn how infection with SARS-CoV-2, the virus responsible for COVID-19, can affect the lungsexternal link.
- **Airway blockages,** such as when food or another object gets stuck in your airways or your epiglottis swells. Your epiglottis is the flap at the back of your throat that prevents food or drink from getting into your airways when you swallow. During obstructive sleep apnea, your upper airway becomes blocked repeatedly during sleep, reducing or completely stopping airflow.
- **Chest or back injuries** that damage your ribs or lungs.
- **Severe scoliosis,** a condition in which the spine is curved from side-to-side.
- **Severe allergies to food or medicine** can cause your throat to swell up.

Phases of mechanical ventilation and Types of mechanical ventilation

Bag mask ventilation. You may wear a mask attached to a bag to get more air into your lungs. This is often done while you are waiting for a complex procedure to treat the cause of your respiratory failure.

Noninvasive positive pressure ventilation (NPPV). This treatment uses mild air pressure to keep your airways open while you sleep. You wear a mask or another device that fits over your nose or your nose and mouth. A tube connects the mask to a machine that blows air into the tube. Continuous positive airway pressure (CPAP) is one type of NPPV. For more information, visit the CPAP Health Topic. Although it focuses on CPAP treatment for sleep apnea, it explains how CPAP works.

A mechanical ventilator, if the oxygen level in your blood doesn't increase, or if you're still having trouble breathing. A ventilator is a machine that supports breathing. It blows air—or air with increased amounts of oxygen—into your airways and then your lungs. Using a ventilator, especially for a long time, can damage your lungs and airways and cause infections such as pneumonia.

A tracheostomy to deliver oxy

Modes of ventilation and Triggering

Although mechanical ventilation can be a complex and seemingly elusive topic, expectations are that physicians and healthcare professionals who deal with critically ill patients have a basic familiarity with the management of a patient on a ventilator. Additionally, providers must also understand how applying mechanical ventilation affects patient physiology and response to disease states. The focus of this article will be on the management of the intubated patient in the

first few hours of care on mechanical ventilation and will review the basics of mechanical ventilation.

The primary indications for mechanical ventilation are:

1. Airway protection in a patient who is obtunded or has a dynamic airway, e.g., from trauma or oropharyngeal infection
2. Hypercapnic respiratory failure due to a decrease in minute ventilation
3. Hypoxemic respiratory failure due to a failure of oxygenation
4. Cardiovascular distress whereby mechanical ventilation can offload the energy requirements of breathing
5. Expectant course, e.g., anticipated patient decline or impending transfer

Function

Mechanical ventilation works by applying a positive pressure breath and is dependent on the compliance and resistance of the airway system, which is affected by how much pressure must be generated by the ventilator to provide a given tidal volume (TV). The TV is the volume of air entering the lung during inhalation.[1] Compliance and resistance are dynamic and can be affected by the disease state(s) that led to the intubation. Understanding the changes in compliance and resistance will allow you to pick the proper ventilator strategies.

There are four stages of mechanical ventilation.

] There is the trigger phase,

the inspiratory phase,

the cycling phase

, and the expiratory phase

. The trigger phase is the initiation of an inhalation which is triggered by an effort from the patient or by set parameters by the mechanical ventilator. The inhalation of air into the patient defines the inspiratory phase. The cycling phase is the brief moment when inhalation has ceased but before exhalation has begun. The expiratory phase is the passive exhalation of air from the patient.

Once the decision is made to place a patient on mechanical ventilation, the clinician may be presented with multiple different options on how to set up the ventilator. There are many kinds of modes of ventilation, such as assist-control (AC), synchronized intermittent mechanical ventilation (SIMV), and pressure support ventilation (PSV). [2] The ventilator can then be set to provide a given volume or pressure. Several leading voices in emergency medicine and critical care recommend utilizing volume assist control (VAC) as it is simple to use, safe, and available on all ventilators. [3] Further, it provides complete ventilator support which offsets fatigue in patients who are critically ill.

After choosing the mode, the rest of the parameters have to be set on the ventilator. These parameters are the respiratory rate (RR), inspiratory flow rate (IFR), the fraction of inspired oxygen (FI02), and positive end-expiratory pressure (PEEP). Respiratory rate is generally adjusted to move towards normocapnia, or to offset severe acidosis. The inspiratory flow rate is how fast the inspiration is provided, generally expressed in liters/minute. [2] FI02 is the fraction of inspired air and should be set to the lowest level to achieve an SP02 of 92-96%, as hyperoxemia has been shown to increase mortality in critically ill patients. [4] PEEP is used to increase the functional residual capacity, and to stent open collapsable alveoli thus reducing atelectatic-trauma. [1] Finally, all patients on mechanical ventilation should have the head of the bed elevated to at least 30 degrees and have continuous waveform end-tidal carbon dioxide (CO2) (ETCO2) monitoring. According to a 2016 Cochrane review on ventilator-associated pneumonia (VAP), "a semi-recumbent (30º to 60º) position reduced clinically suspected VAP by 25.7% when compared to a 0° to 10° supine position", however, they acknowledge that the data is severely limited. [5]

Clinical Significance

Three clinical strategies may be chosen to assist in ventilator management.

Lung Protective Strategy:

This strategy should be used for any patient with the potential to develop acute lung injury (ALI) or whose disease state risks progression to acute respiratory distress syndrome (ARDS). This low tidal volume (LTV) strategy developed after the landmark ARDSnet trials, specifically the ARMA study, which showed that low tidal volume ventilation in patients with ARDS improved mortality. [7] This method is used to avoid barotrauma, volume trauma, and atelectatic trauma. Pneumonia, severe aspiration, pancreatitis, and sepsis are examples of patients with the acute potential to develop ALI and should be managed with the LTV strategy.

Tidal volume (TV) should be initially set at 6 ml/kg based upon ideal body weight.[8][7][9][10] As patients develop ALI and progress into ARDS, their lungs become progressively recruited and develop shunts, which leads to decreased functional lung volume. [3] A low tidal volume strategy offsets the decreased functional lung volume. Tidal volume should not be adjusted based on minute ventilation goals. Respiratory rate is adjusted based upon minute ventilation goals and the acid-base status of the patient. An initial rate of 16 breaths/minute is appropriate for most patients to achieve normocapnia. [11] A blood gas should be sent approximately 30 minutes after initiation of mechanical ventilation and RR adjusted based upon the acid-base status and PaCO2 of the patient. Normocapnia is a PaCO2 of 40 mmHg. If the PaCO2 is significantly greater than 40, then the RR should be increased. If the PaCO2 is significantly lower than 40, then the RR should be decreased. It is important to remember that the ETCO2 is not a reliable indicator of PaCO2 as the ETCO2 can be affected by the physiological shunt, dead space and decreased cardiac output. [3] Inspiratory flow rate should be set at 60L/minute. If the patient appears to be trying to inhale more during the initiation of inspiration, then it can be increased. [3]

Immediately after intubation, an attempt should be made to reduce the FI02 to 40% to avoid hyperoxemia. [4] From there, adjustments of the FI02 and PEEP are simultaneously controlled in the lung-protective strategy. Difficulty in oxygenation in ALI is due to de-recruited alveoli and

physiological shunt. To counteract this, you should increase the FIO2 and PEEP together. The oxygenation goal of 88%-95% should follow the ARDSnet protocol. [9]

Table 1.ARDSnet PEEP/FIO2 Protocol [9]

Upon connecting a patient to mechanical ventilation, it is essential to frequently reassess its effects on the patient, especially the alveoli. This assessment is by examining the plateau pressure and driving pressure. The plateau pressure is the pressure applied to small airways and alveoli. The plateau pressure should be under 30, to prevent volume trauma, which is an injury to the lung secondary to overdistension of the alveoli. To obtain the plateau pressure, one must perform an inspiratory pause. Most ventilators have a button to calculate it. The driving pressure is the ratio of the tidal volume to the compliance of the lung, providing an approximation of the "functional" amount of lung that hasn't been de-recruited or shunted. [12] The driving pressure can be calculated simply by subtracting the amount of PEEP from the plateau pressure. [12] The driving pressure should remain below 14. If plateau and driving pressures start to exceed these limits, then decrease TV to 4ml/kg. Respiratory rate can be increased to compensate for the decrease in minute ventilation, though permissive hypercapnia might be necessary. Permissive hypercapnia is a "ventilation strategy to allow for an unphysiologically high partial pressure of carbon dioxide (PCO) to permit lung-protective ventilation with low tidal volumes." [13] Recruitment maneuvers have been found to increase mortality in moderate to severe ARDS and should not be routinely used. [14]

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Airway Pressure Release Ventilation:

APRV is a form of continuous positive airway pressure (CPAP) that is characterized by a timed pressure release while allowing for spontaneous breathing. [16](See Figure 1) While previously considered a rescue strategy, APRV has recently gained acceptance as a primary ventilatory mode. Its indications for Acute Lung Injury (ALI)/Acute Respiratory distress syndrome (ARDS), multifocal pneumonia, and severe atelectasis make it a very attractive ventilatory option.

APRV functions by providing a continuous pressure to keep the lungs open with a timed-release to a lower set pressure.[17][18] The continuous pressure phase of APRV transmits pressure to the chest wall which allows for the recruitment of both proximal and distal alveoli. The prolonged continuous pressure phase with the short release phase avoids the continuous cycles of recruitment-derecruitment that occur in pressure/volume control vent settings.[19] This helps to avoid atelectrauma, barotrauma and resulting ventilator induced lung injury. [19](See Figure 2) The timed release allows for a passive exhalation and improved clearance of CO2. Since APRV relies upon spontaneous ventilation it requires less sedation compared to conventional modalities thus mitigating adverse events due to sedation. Spontaneous breathing has the benefit of increasing end-expiratory lung volume, decreasing atelectasis, and improves ventilation to dependent lung regions. [19] Spontaneous breathing, further, improves the hemodynamic profile by decreasing intrathoracic pressure, thus

.

Enhancing Healthcare Team Outcomes

The management for a patient on mechanical ventilation requires an interprofessional team involving physicians, nurses, and respiratory therapists. Good communication among the team is paramount. Respiratory therapists provide a crucial role in managing the ventilated patient, and their expertise should be utilized extensively. [22] Finally, only one dedicated professional should be in charge of the ventilator and vent changes should not be made without communication with others in charge of the patient. [Level III]

Types oPhase variables: triggering, limits, cycling and PEEP

Phase variables in mechanical ventilation are parameters which control the phases of a mechanical breath. Triggering controls the initiation of inspiration, cycling controls the initiation of expiration, and limits are set to maintain control over the three main parameters while inspiration is taking place. PEEP is also viewed as a phase variable, for lack of a better classification, and is the variable which reigns over the otherwise very boring expiratory phase. CICM have shown some interest in these matters over the years, and the

In short:

- The trigger variable determines how and when the ventilator ends exhalation and commenced inhalation.
  - The trigger setting can be time, flow, pressure or volume
  - This variable determines whether a mode of ventilation is “mandatory” (machine triggered) or “spontaneous” (patient-triggered)
- The limit variable restrict the maximum value which the parameters can achieve during inspiration.
  - Reaching the limit variable during inspiration does not abort the inspiratory phase
  - This is distinct from the alarm variables, which are activated whenever their values are breached, and which abort inspiratory flow or open the expiratory valve
  - Several limit variables can be selected simultaneously.
- The cycling variable is measured during the inspiratory phase; it is the mechanism used to end inspiration and commence expiration
  - Time and flow are the most common settings for this varible, though volume-cycled and pressure-cycled ventilation is also possible
  - Only one cycling variable can be set at any given time
- The PEEP variable is the pressure setting which determines the pressure maintained by the circuit bias flow during expiration.

Trigger variable

The trigger variable determines when a breath is delivered. This variable distinguishes “mandatory” from “spontaneous” modes of ventilation; where “mandatory” refers to the fact that the ventilator decides when you take a breath, usually according to a timer. In the dark ages of critical care, this was the only sort of ventilation available to the slightly comatose patient.

Limit, or “target” variables

The limit variable is the unimaginative name given to the limits of the mechanical breath. One usually has only minimal control over these, as they are integral parts of the selected mode of ventilation. In short, a limit variable is the maximum value a variable can attain during inspiration; and this is something distinct from the alarm settings, which can also be viewed as “limits”. Alarm settings tend to terminate the inspiration by opening the expiratory valve, whereas the main characteristic of the limit variable is that the inspiratory phase continues even after the limit has been reached.

Specifically, the term “limit variable” refers to the inspiratory phase: during inspiration, the ventilator won’t let that parameter (flow, volume, pressure, etc) get beyond its limit value. That is not to say that those parameters are completely ignored during the other phases: there are still limits in place but they fall into the territory of safety parameters. For example, let us take this pressure control mode of ventilation as depicted below.

The PEEP is set as 10 cm H_2O, and the pressure control variable is 20 cm H_2O. Thus, the pressure limit during inspiration is 30 cm H_2O. The pressure will get no higher than this during inspiration. In addition to this limit, there is also as safety limit which is set as one of the ventilator alarms, which is (conventionally) set as 40 cm H_2O. This is not unique to the inspiratory phase- breaching this limit during any phase of ventilation will abort the delivery of flow to prevent injury. This is clearly a confusing distinction: both values can be referred to as “limits”. Because of this, the ISO has moved away from referring to this phase variable as “limit” – they would prefer us to call it a “target” variable, whereas the term “limit” should be restricted to the abovementioned safety alarms.
Limit variables can include flow, volume and pressure. Time is obviously not a limit variable because it would defy logic. All limit variables can be active simultaneously, i.e. one can have a mechanical breath which is pressure-limited flow-limited and volume-limited.

Cycling variable

The cycling variable determines how and when the ventilator transitions from inspiration to expiration. The ventilator measures this variable during the inspiration phase. The cycling variable is distinct from the limit variable, in that it ends the inspiratory phase when it is reached. When the set parameter for this variable is achieved, the ventilator opens the expiratory valve, and expiration may begin. Typical methods of ventilator breath cycling include:

- Time-cycled ventilation (mandatory modes)
- Flow-cycled ventilation (spontaneous modes, eg. pressure support)
- Volume-cycled ventilation
- Pressure-cycled ventilation

Unlike the limit variable (of which several can be active simultaneously), there can only be one cycling variable. In general, time and flow are the most popular settings. Volume and pressure cycled ventilation is something of a historicalfootnote.

PEEP – the expiratory phase variable

The expiratory phase in modern ventilators is generally a fairly passive and unexciting time, where the only thing happening is a slow bias gas flow seeping out of the circuit via the expiratory solenoid valve. This phase generally only has one variable applied to it, which is PEEP. In the absence of any pressure, one should probably refer to it as ZEEP (zero end-expiratory pressure). Historically, during the Dark Age of critical care many physicians held heretical beliefs regarding the need to actively assist patients with expiration, and s

NEEP (negative end-expiratory pressure)

was used as a means of promoting expiratory airflow. A representative example from that era is this article by Hill et al (1965), instructing people on the correct use of a -4 cm H2O NEEP for post-operative cardiac surgery patients via the Engstrom respirator. Around the 1960s-1970s people finally realised that this practice was insane, and ventilator manufacturers stopped incorporating sub-ambient pressure into their equipment.

Control variables, or “target” variables

The control variables are the independent limit variables in a mode of ventilation. In essence, the control variable is the constant to which all other variables are enslaved. There are only two possible control variables: pressure and flow. These are discussed in another chapter because they seemed like something fundamentally important and therefore deserving of a separate page.

Monitoring a patient under mechanical ventilation

- **espiratory rate**—To detect apnea, set or measured respiratory rate can be measured by airflow sampling, capnography, inductive plethysmography, oscillometry frequency-based changes, ECG, or ventilation acoustics.
- **Physical examination**—Vigilant physical assessment of chest excursion is a necessity for accurate monitoring of mechanical ventilation. Asymmetric chest motion or unilateral breath sounds may indicate pneumothorax, endobronchial intubation, or atelectasis. Paradoxical chest motion can signify flail chest or respiratory muscle dysfunction. Poor synchrony of a patient's breathing pattern with the ventilator's drive may indicate that the ventilator settings are inappropriate or that the patient's depth of anesthesia is too light. Tympanic percussion or tracheal deviation could help diagnose a pneumothorax. Audible endotracheal leaks around the airway cuff indicate insufficient air or a potential cuff rupture.
- **Movement of reservoir bag**—Free and unencumbered movement of reservoir bag during spontaneous ventilation assures a patent airway or early detection of circuit obstruction.
- **Breath sounds**—Continuous auscultation with a precordial or esophageal stethoscope is extremely valuable in detecting disconnects, leaks, airway obstruction by secretions or bronchospasm, and apnea.

MONITORING GAS EXCHANGE

Adequacy of mechanical ventilation can be determined by the ability of the patient to maintain ventilation and oxygenation. Pulse oximetry and capnography are two standard American Society of Anesthesiologists (ASA) monitors that are utilized for this purpose. Furthermore, arterial blood gas analysis provides significant insight into ventilatory status. A low Pao_2 on an arterial blood gas (ABG) indicates hypoxemia—a dysfunction of the ability to oxygenate arterial

blood. A number of ventilator factors can directly affect the Pao_2: chiefly, the Fio_2, positive end-expiratory pressure (PEEP) level, and the patient's lung function. It is important to interpret the Pao_2 as a function of these dependent variables, as a "normal" Pao_2 does not necessarily indicate ideal physiologic pulmonary function.

MONITORING VENTILATORY DRIVE AND BREATHING PATTERN

Partial ventilator support can also be utilized through pressure support and synchronized ...

Caring for the Mechanically Ventilated Patient Mechanical ventilation is utilized in intensive care and long-term care settings to assist patients who require additional respiratory support. This handy reference guide provides critical patient care essentials, tips for trouble-shooting ventilator alarms, and potential complications. Care Essentials for Patients on Mechanical Ventilation

• Maintain a patent airway. Per policy, note endotracheal (ET) tube position (centimeters) and confirm that it is secure.

• Assess oxygen saturation, bilateral breath sounds for adequate air movement, and respiratory rate per policy

. • Check vital signs per policy, particularly blood pressure after a ventilator setting is changed. Mechanical ventilation increases intrathoracic pressure, which couldaffect blood pressure and cardiac output.

• Assess patient's pain, anxiety and sedation needs and medicate as ordered.

• Complete bedside check: ensure suction equipment, bag-valve mask and artificial airway are functional and present at bedside. Verify ventilator settings with the prescribed orders

. • Suction patient only as needed, per facility policy; hyperoxygenate the patient before and after suctioning and do not instill normal saline in the ET tube; suction for the shortest time possible and use the lowest pressure required to remove secretions. Monitor for upper airway trauma as evidenced by new blood in secretions.

• Monitor arterial blood gas (ABG) after adjustments are made to ventilator settings and during weaning to ensure adequate oxygenation and acid-base balance.

• To minimize the risk for ventilator-associated pneumonia (VAP), implement best practices such as strict handwashing; aseptic technique with suctioning; elevating head of bed 30-45 degrees (unless contraindicated); providing sedation vacations and assessing patient's readiness to extubate; providing peptic ulcer disease prophylaxis; providing deep vein thrombosis prophylaxis; and performing oral care with chlorhexidine, per your facility policy.

VENTILATOR ALARMS Alarm Potential Causes Interventions High peak inspiratory pressure (PIP)

• Blockage of ET tube (secretions, food, kinked tubing, patient biting on ET tube)

• Coughin

• Bronchospasm

• Lower airway obstruction

• Pulmonary edema

• Pneumothorax

• Assess lung sounds.

• Suction airway for secretions

Ventilator/patient dyssynchrony • Assess breath sounds for increased consolidation, wheezing, and bronchospasm; treat as ordered. Low pressure alarm

• Air leak in ventilator circuit or in the ET tube cuff • Locate leak in ventilatorsystem.

• Check pilot balloon as an indicator of ET tube cuff failure

. • Replace tubing as needed, per policy. Low minute ventilation (VE)

• Low air exchange due to shallow breathing or too few respirations • Check for disconnection or leak in the system.

• Assess patient for decreased respiratory effort. Low O2 saturation (SpO2)

COMPLICATIONS RELATED TO MECHANICAL VENTILATION Patient Complication Potential Causes Interventions Cardiovascular issues • Decrease in venous return to the heart due to positive pressure applied to the lungs. • Assess for adequate volume status by checking heart rate, blood pressure, central venous pressure and urine output. • Assess patient for increasing autopeep, which can increase risk for cardiac tamponade. Barotrauma/pneumothorax • Positive pressure applied to lungs. • Elevated mean airway pressures may rupture alveoli. • Notify healthcare provider. • Prepare patient for possible chest tube insertion. • Avoid high pressure settings for patients with chronic obstructive pulmonary disease (COPD), acute respiratory distress syndrome (ARDS), or history of pneumothorax. Infection • Breaks in ventilator circuit. • Decreased mobility. • Impaired cough reflex. • Use aseptic technique. • Provide frequent mouth care. • Support proper nutritional statuS

1. Care of a patient under mechanical ventilation

Fluids. You may be given fluids to improve blood flow throughout your body. Fluids are usually given through an intravenous (IV) line inserted in one of your blood vessels.

Nutritional support. You may need a feeding tube to make sure you get enough of the right nutrients while you are on a ventilator.

Physical therapy. This can help maintain muscle strength and prevent sores from forming. Movement may also help shorten the time you are on a ventilator and improve recovery after you leave the hospital.

Positioning your body. For severe respiratory failure, your doctor may recommend that you spend most of the time lying facedown, which helps oxygen get to more of your lungs.

Pulmonary rehabilitation. This program of education and exercise teaches you breathing techniques that can improve your oxygen levels.

Blood-thinning medicine. If you are very sick or got sick very quickly, this medicine can prevent blood clots from forming. If you cannot use a blood thinner for some reason, your doctor may order special stockings or devices to increase the pressure on your legs.

Prone ventilation

it took almost 40 years from the early recommendation by BRYAN [1] to use prone positioning in patients with acute respiratory distress syndrome (ARDS) to the demonstration of its beneficial effect on patient survival Meanwhile, research has explored the mechanisms by which prone positioning could improve oxygenation and reduce ventilator-induced lung injury (VILI). Furthermore, several randomised controlled trials (RCTs) have been performed to test the effect of prone positioning on patient outcome. Of interest over these 40 years was the continuous interaction between pathophysiological advances and the search for clinical evidence of efficiency, and the continuous refinement in trial design. The aims of this article are to summarise the rationale for prone positioning, the level of evidence supporting its use, its limitations and its place in the current management of ARDS.“Acute Respiratory Distress Syndrome”Edited by S. John Wort and Stefano NavaNumber 1 in the Series



Figure 1.
A patient with acute respiratory distress syndrome receiving mechanical ventilation in the intensive care unit while in the prone position.

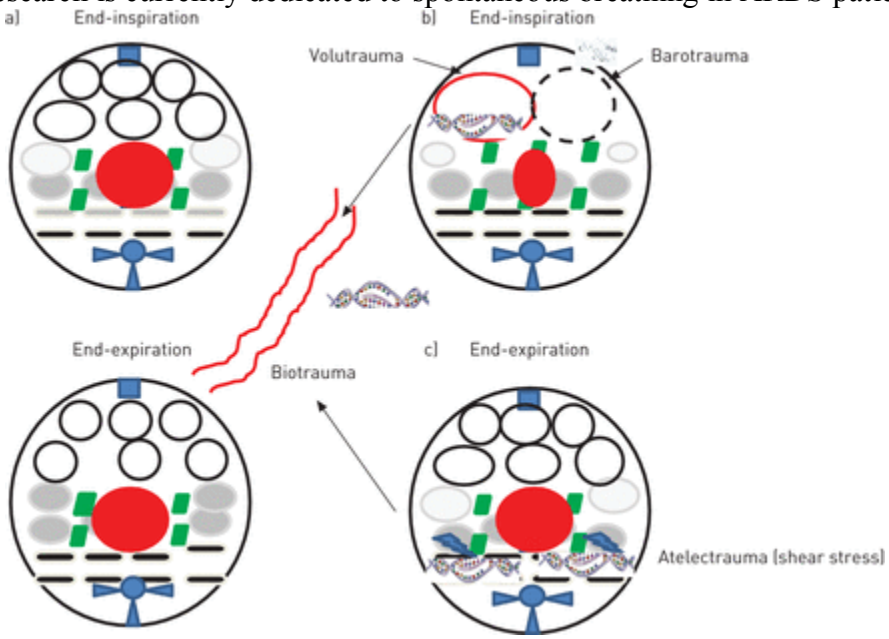
Rationale

Oxygenation

From an historical point of view, the first rationale for using prone positioning in ARDS patients is improvement in oxygenation. We now know that this goal is less important than other rationale that will be discussed later. A large number of reports have shown that the improvement in oxygenation in ARDS was frequent, observed in ~75% of the cases, and sometimes dramatic, *i.e.* during a prone session. The oxygenation response is commonly defined as an increase in the arterial oxygen tension (P_{aO2}) by 20% or an increase in the P_{aO2}/inspiratory oxygen fraction (F_{IO2}) ratio by ≥20 mmHg from the supine position. Therefore, from the onset prone positioning has mainly been thought of and used as a rescue therapy to relieve life-threatening hypoxaemia. For instance, in 1997 MURE *et al.* [3] reported on 13 ARDS patients, mostly secondary lung injury (indirect lung injury stemming from nonrespiratory severe sepsis/septic shock), who received low positive end-expiratory pressure (PEEP) and high F_{IO2}. 11 of the patients had a P_{aO2}/F_{IO2} ratio of <100 mmHg in the supine position and in four patients this ratio was <50 mmHg. In six patients, the P_{aO2}/F_{IO2} ratio increased by a factor of at least four in the prone position. From their results, the authors concluded that prone positioning should be used as a first-line therapy before the use of nitric oxide and extracorporeal membrane oxygenation (ECMO). Moving forward into the RCT era, the effects on oxygenation were then assessed for prone positioning using a group, not just as a single session. Therefore, the effects on oxygenation in the prone position group were compared to the supine position group. Meta-analyses showed a significantly greater risk, ~30–40%, for better oxygenation in the prone position group [4, 5].

Ventilator-induced lung injury

The second rationale to use prone positioning is in the prevention of VILI [9]. Preventing VILI has been established as the primary goal of mechanical ventilation after the ARDS network demonstrated that lower V_T improved survival compared to higher V_T in ARDS patients [10]. This trial was the ultimate demonstration, after decades of research [11, 12], that lung overdistension was detrimental not only to lung healing but also to patient outcome. Lung overdistension is the first component of VILI and, thus, preventing lung overdistension is the main concern of intensivists when setting mechanical ventilation. As it has become clear that lung overdistension pertains to volutrauma [13], not barotrauma (fig. 2), the relevant measurement should not be airway pressure but transpulmonary pressure determination. Transpulmonary pressure is the difference between alveolar pressure (airway pressure at zero airflow when the alveoli and conducting airways are communicating) and pleural pressure. Transpulmonary pressure can even be high if airway pressure is low. The typical example is pressure support ventilation when mechanical breaths are synchronised with a patient's inspiratory effort, a combination that may promote very high V_T, causing a risk for volutrauma [14]. Active research is currently dedicated to spontaneous breathing in ARDS patients.



a) The distribution of normally aerated (white circles), poorly aerated (grey circles), non-aerated (black rectangle) and consolidated (green rectangle) lung areas during acute respiratory distress syndrome while in the supine position during end-inspiration and end-expiration. b) Barotrauma (alveolar rupture with air leaks) and volutrauma (overdistension in the normally aerated lung areas). c) Atelectrauma, *i.e.* shear stress in the poorly aerated lung areas close to the consolidated non-recruitable lung areas. Biotrauma (biochemical and biological response) results from volutrauma and/or atelectrauma with activation of pro-inflammatory mediators within the lungs and distant end organs. The red circle represents the heart.

The second component of VILI is called atelectrauma (fig. 2), which results from the repeated opening and closing of the small airways [15]. When V_T is reduced, atelectrauma may be less important than overdistension as three large RCTs failed to demonstrate a beneficial effect on

patient outcome of higher PEEP compared to lower PEEP [16–18]. However, individual meta-analysis found a statistically significant lower mortality rate in the higher PEEP group in the subgroup of patients with a P_{aO2}/F_{IO2} ratio ≤200 mmHg [19].

A clear and direct demonstration that prone positioning can prevent VILI was reported by BROCCARD *et al.* [20] who ventilated normal dogs with 77 $mL \cdot kg^{-1}$ measured body weight V_T to reach a transpulmonary plateau pressure of 35 cmH_2O. During 6 h of such mechanical ventilation in the supine position the lungs were macroscopically and microscopically severely injured. When the dogs received the same ventilator settings for 6 h in the prone position the lung injury was markedly reduced. Furthermore, the histological lung injury due to high V_T was more homogeneously distributed throughout the lungs in the prone position.

Further findings pertaining to VILI prevention using prone positioning have increased over time in the literature. Prone positioning makes the following more homogeneously distributed in the anterior-to-posterior direction throughout the lungs: lung densities (**fig. 3**) [7, 21], as previously discussed; intrapulmonary shunt [22]; lung ventilation [23]; and transpulmonary pressure [24]. By favouring such a homogenisation, prone positioning prepares the lung to receive the strain imposed by mechanical ventilation [25], and hence makes the distribution of the resulting stress more homogeneous across the lung. Stress/strain homogenisation is associated with less risk for VILI. Furthermore, the global lung stress and strain is reduced in the prone position. MENTZELOPOULOS *et al.* [26] found that transpulmonary pressure, *i.e.* lung stress, and V_T to end-expiratory lung volume ratio, *i.e.* lung strain, were lower in the prone position than in the supine position. GALIATSOU *et al.* [27] performed a lung CT scan in ARDS patients in the supine position and then in the prone position, same patient restricted to different interventions. The authors found that the prone position was associated with significant alveolar recruitment and less hyperinflation compared to the supine position, and that these effects were more important in lobar than diffuse ARDS anatomical pattern. These findings were confirmed and even expanded on by CORNEJO *et al.* [28], who assessed the lung recruitability in the supine position. The prone position promoted lung recruitment and reduced overdistension in patients in both categories of low and high recruitability at either low or high PEEP in the prone position. However, tidal recruitment and derecruitment, *i.e.* cyclic opening and closing of the small airways (atelectrauma), and tidal hyperinflation were significantly reduced in the prone position in only the subgroup of ARDS patients who had high recruitability in the supine position and who were receiving higher PEEP in the prone position.

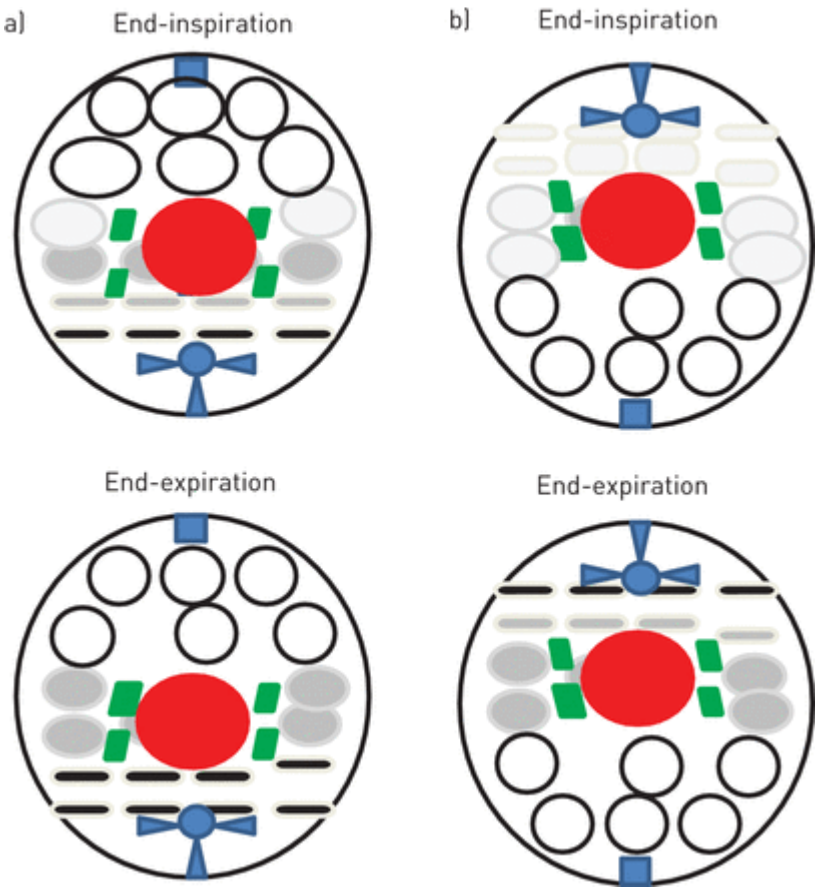


Figure 3.
Homogenisation of the distribution of lung aeration as a result of moving from a) the supine to b) the prone position during acute respiratory distress syndrome. The red circle represents the heart. White circles: normally aerated lung areas; grey circles: poorly aerated lung areas; black rectangle: non-aerated lung areas; green rectangle: consolidated lung areas.

VILI is subtended by biochemical and biological events implicated in the regulation of lung inflammation, a process termed biotrauma (fig. 2). PAPAZIAN *et al.* [29] found that the prone position was associated with lower lung concentration of interleukin (IL)-8, IL-6 and IL-1β compared to the supine position in ARDS patients ventilated with 6 $mL \cdot kg^{-1}$ predicted body weight V_T and higher PEEP. In rodents subjected to injurious mechanical ventilation (V_T 18 $mL \cdot kg^{-1}$ and PEEP 0 cmH_2O), prone ventilation has been shown to maintain the expression of mitogen-activated protein kinase (MAPK)-phosphatase 1, a pivotal regulator in VILI, while the supine position was associated with a significant downregulation [30]. Mice deficient in MAPK-phosphatase 1 were more susceptible to VILI [30].
So, there is large body of evidence supporting the fact that prone position ventilation has relevant beneficial physiological effects in ARDS. These benefits were progressively discovered together with major advances in mechanical ventilation. Whether these physiological benefits can translate into improvement in patient outcome will be discussed in the next section.

Limitations

Our trial has some limitations as the two groups were not completely balanced (by chance) at the time of randomisation. In particular, the Sequential Organ Function Assessment score was lower in the prone group. This was observed even though in order to be included the patients had to have a mean arterial blood pressure ≥65 mmHg. Even though this criterion was met by every patient in both groups, the rate of patients receiving vasopressors was greater in the supine group. However, in the multivariate analysis the effect of the prone position was still highly significant.

From the onset it was pointed out that the procedure of prone positioning exposes serious complications, in particular those related to airways, such as endotracheal tube displacement (main stem intubation or non-scheduled extubation), endotracheal tube obstruction or kinking, and vascular access kinking or removal. In our trial [32], as in others [31, 33], the rate of complications was significantly greater in the prone group compared to the supine group [4]. However, the mortality was not higher in the prone group. The same was true in the PSII RCT, in which the use of rotoprone was implicated in the observed higher rate of complications in the prone group. Therefore, the caregivers were very reluctant to expand the use of prone positioning in their intensive care unit given the lack of a clear significant benefit. The benefit/risk ratio was judged to not be in favour of extensive use of prone positioning. In the PROSEVA trial, for the first time, the rate of serious complications was similar between the two groups. This finding is probably the result of the expertise and skills of the centres involved in the trial that performed the procedure safely. Following the PROSEVA trial the benefit/risk ratio has greatly improved due to the significant increase in survival.
However, there is another side-effect of prone positioning that may cause some concern to the patients, their family and the caregivers, namely pressure ulcers. Previous trials and meta-analyses, also reported a greater incidence of pressure ulcers with the use of prone positioning. Furthermore, the facial location of pressure ulcers may have a psychological impact on the patients and their family. In the PROSEVA trial, as an ancillary study, the location and stage of pressure ulcers at time of inclusion, 7 days after inclusion and at intensive care unit discharge was prospectively reported in both groups.

Place of prone positioning in the management of ARDS patients

Three interventions have proven beneficial in ARDS: lower V_T [10], neuromuscular blocking agents (ACURASYS (ARDS etCurarisationSystématique) trial) [38], and prone positioning [2]. Lower V_T is the common strategy that must be applied to any ARDS patient regardless of the level of hypoxaemia [39]. Two recent meta-analyses have been published, which included PROSEVA in addition to the previous RCTs. Both found that prone positioning improves survival irrespective of the level of hypoxaemia provided a lower V_T is set [40, 41]. Neuromuscular blocking agents and prone positioning were investigated in ARDS patients with a P_{aO2}/F_{IO2} ratio <150 mmHg at PEEP ≥5 cmH_2O. An F_{IO2} of at least 0.60 and a 12–24-h stabilisation period were added to the inclusion criteria. Clearly, these two interventions are tightly linked and should be used together as first-line therapy in patients exhibiting the criteria mentioned above. The recent Berlin proposal split ARDS patients into mild, moderate and severe categories at 300, 200 and 100 mmHg P_{aO2}/F_{IO2} ratio thresholds, respectively. It is unclear

whether mortality does regularly increase from the mild to the severe ARDS category in the Berlin definition [42].

In conclusion, there is now a large body of evidence supporting the fact that prone positioning improves mortality in patients with severe ARDS. Accordingly, prone positioning should be used as a first-line therapy in this setting.

VALUE ADDED COURSE

MECHANICAL VENTILATION

Annexure II

STUDENT ENROLLMENT LIST (JAN-JUNE 2019)

S.No.	University no	Name of the student	Year / CRRI	Signature
1.	U17MB352	PRIYANKA KUMARI	II nd	Priyanka Kumari
2.	U17MB353	PRIYANKA SINGH	II nd	Priyanka Singh
3.	U17MB354	RAAGAVI .S	II nd	Raagavi
4.	U17MB355	RAHUL RAI	II nd	Rahul Rai
5.	U17MB356	RICHI SWARN	II nd	Richi Swarn
6.	U17MB357	RINI DAS	II nd	Rini Das
7.	U17MB358	RISHABH SUMAN	II nd	Rishab Suman
8.	U17MB359	RISHIKA	II nd	Rishika
9.	U17MB360	RISHIRAAJ KAR	II nd	Rishiraaj Kar
10.	U17MB361	RIYA M.A	II nd	Riya
11.	U17MB362	ROFIQUL ISLAM	II nd	Rofiqul Islam
12.	U17MB363	ROHAN DAS	II nd	Rohan Das
13.	U17MB364	SAKSHI SHARMA	II nd	Sakshi Sharma
14.	U17MB365	SAMYUKTHA	II nd	Samyuktha
15.	U17MB366	SANORITA	II nd	Sanorita
16.	U17MB367	SANTOSHKUMAR NK	II nd	Santoshkumar NK
17.	U17MB368	SAPTARSHI CHATTOPADHYAY	II nd	Saptarshi Chattopadhyay
18.	U17MB369	SATHIYA JAINAUB T.S.	II nd	Sathiya Jainaub
19.	U17MB370	SHABAN OS	II nd	Shaban OS
20.	U17MB352	PRIYANKA KUMARI	II nd	Priyanka Kumari

RESOURCE PERSON

DR. KALASREE

COORDINATOR

Head of Dept. Anaesthesiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Oduvil, Kudapakkam, Puducherry - 605 502

Dr S NITHIANANDAM

ANNEXURE III

MCQ: MECHANICAL VENTILATION

1. An artificial airway , like an endotracheal tube is used in the following type of ventilation
    a. Positive pressure
    b. Negative pressure
    c. Both A&B
    d. None of the above
2. Iron lung ventilators used after the polio epidemics in the first half of 20th century belong to
    a. Positive pressure ventilation
    b. Negative pressure ventilation
    c. CPAP
    d. None of the above
3. One of the following is a risk of keeping high PEEP
    a. Hypotension
    b. Hypertension
    c. Hyperthermia
    d. Hypothermia
4. What are the ventilators parameters adjusted to maintain the optimum minute ventilation
    a. FiO2 & PEEP
    b. Tidal volume
    c. Respiratory rate
    d. Both B&C

5. Minute ventilation is equal to

a. FiO2 * PEEP

b. FiO2 \ PEEP

c. Tidal volume* Respiratory rate

d. Tidal volume\ Respiratory rate

6. One of the following modes of ventilation code out the patient efforts to breathe

a. Assist control mode

b. Pressure control mode

c. SIMV

d. CMV

7. CPAP & BIPAP modes are usually used

a. As a weaning protocol

b. To delay inhibition

c. In conjunction with bronchodilators & steroids

d. All the above

8. Pressure is applied to abdomen and thorax to draw air into lungs through upper airway in following type of ventilation

a. Positive pressure

b. Negative pressure

c. Both A&B

d. None of the above

9. Respiratory alkalosis is possible in

a.CMV

b. SIMV

c. Assist control mode

d. Pressure control mode

10. Ventilator parameters adjusted to maintain optimum oxygenation

a. FiO2

b. PEEP

c. Tidal volume

d. Both A &B

Priyanka singh.

7/10

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Shaban OS.

8/10

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Annexure V
Student Feedback Form

Course Name: **MECHANICAL VENTILATION**
Subject Code: **ANAES 08**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

`

Annexure V
Student Feedback Form

Course Name: **MECHANICAL VENTILATION**
Subject Code: **ANAES 08**

Name of Student: Raagavi - S Roll No.: U17MB354

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Riya M.A

Annexure V
Student Feedback Form

Course Name: **MECHANICAL VENTILATION**
Subject Code: **ANAES 08**

Name of Student: Riya M.A Roll No.:
VMMB361

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Satisfactory

Date: 05.12.2018

From
Dr M Kalasree
Head Of Department Incharge
Department of Anaesthesia
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry

Sub: Completion of value-added course: MECHANICAL VENTILATION

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Mechanical Ventilation in Jan- June 2019 for 20 students. We solicit your kind action to send certificates for all the participants, whose name list is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. M Kalasree

Head of Dept. Anaesthesiology
Sri Lakshmi Narayana Institute of Medical Sciences
Gauthu, Kuttapakkam, Puducherry - 605 502

Encl: Certificates

Photographs

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _SANORITA_____ has actively participated in the Value Added Course on Mechanical Ventilation held during January - June 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.KALASREE M

RESOURCE PERSON

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE
OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605 502

Dr. KALASREE M

COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that __RIYA M A_____ has actively participated in the Value Added Course on Mechanical Ventilation held during January - June 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.KALASREE M
RESOURCE PERSON

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE
OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605 502

Dr.KALASREE M
COORDINATOR

Head of Department of Anaesthesiology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502.


MECHANICAL
VENTILATION

Sri Lakshmi Narayana Institute of Medical Sciences

Date: 02.05.2018

From
Dr. Nithianandam
Professor and Head,
Department of Anaesthesia
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Puducherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry

Sub: Request for Permission to conduct value-added course: Day Care Surgery

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Day Care Surgery for undergraduates from Jan -June 2019. We solicit your kind permission for the same.

Kind Regards

Dr. NITHIANANDAM. S

Head of Dept Anaesthesiology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr A.SUGUMARAN

The HOD: Dr. NITHIANANDAM. S

The Expert: Dr M KALASREE

The committee has discussed about the course and is approved.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Subject Expert

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605 502

HOD

Head of Dept Anaesthesiology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

08.06.2018

Sub: Organizing Value-added Courses: Day Care Surgery - reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research**, is organizing **"Day Care Surgery"** course in Jan -June 2019. The course content is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 15/06/2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content

COURSE PROPOSAL

Course Title: **DAY CARE SURGERY**

Course Objective:

.

1. To enable the students to learn about definition, indications and patient preparation for day care surgery

2. To acquaint themselves with newer surgical and anesthetic techniques for patients undergoing ambulatory day care surgery

Course Outcome:

On successful completion of the course the students will be able to identify the patients who can undergo day care procedures. They will also have knowledge of which procedures can be done in a day care set up.

Course Audience: CRRI

Course Coordinator: Dr.NITHIANANDAM. S

Course Faculties with Qualification and Designation:

1. Dr. M Kalasree- Associate Professor
2. Dr S. Yogeshwaran- Assistant Professor

Course Curriculum/Topics with schedule (Min of 30 hours)

S.No	Date	Topic	Time	Hours	Faculty
1	06.01.2019	History and terminology	2-3PM	2	Dr. Kalasree
2	13.01.2019	Definition and patient selection	2-3PM	2	Dr S. Yogeshwaran
3	20.01.2019	indications	2-3pm	2	Dr. Kalasree
4	27.01.2019	Group discussion	2-3PM	2	Dr S. Yogeshwaran
5	03.02.2019	Algorithm and group discussion	2-3PM	2	Dr. Kalasree
6	10.02.2019	Objectives and functions	2-3PM	2	Dr S. Yogeshwaran
7	17.02.2019	Pre op assessment	2-3PM	2	Dr. Kalasree
8	24.02.2019	Pre op fasting guidelines	2-3PM	2	Dr S. Yogeshwaran
9	03.03.2019	Day care anaesthesia	2-3PM	2	Dr. Kalasree
10	10.03.2019	Monitored anaesthesia care	2-3PM	2	Dr S. Yogeshwaran
11	17.03.2019	Recovery and post op care	2-3PM	2	Dr. Kalasree
12	24.03.2019	Discharge criteria	2-3PM	2	Dr S. Yogeshwaran
13	31.03.2019	Fast tracking in DCS	2-3PM	2	Dr. Kalasree
14	07.04.2019	advantages and disadvantages	2-3PM	2	Dr S. Yogeshwaran
15	14.04.2019	final assessment	2-3PM	2	Dr. Kalasree

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VALUE ADDED COURSE

1. Name of the program & Code

DAY CARE SURGERY, ANAES 09

2. Duration & Period

30 hrs: Jan 2019- June 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled:

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate of Participation:

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 Time JAN 2019-JUNE 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- January 2019- June 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	ANAES 09	DAY CARE SURGERY	DR. M KALASREE	CRRI	20

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

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ANNEXURE I

DAY CARE SURGERY

TOPICS:

- Introduction
- Design of ambulatory surgery facilities
- Organizational aspects
- Pre-operative assessment
- Patient information Procedures suitable for ambulatory surgery
- Day of admission
- Recovery Process
- Patient discharge and support
- Discharge analgesia
- Monitoring Quality

INTRODUCTION:

Day surgery or Ambulatory Surgery has many definitions across the world, the IAAS recommend the descriptor Ambulatory Surgery defined as 'an operation/procedure, excluding an office or outpatient operation/procedure, where the patient is discharged on the same working day'. Another important group are those patients who can be managed with an overnight stay which we suggest should be known as 'Ambulatory Surgery – Extended Recovery Patient' defined as 'a patient treated in ambulatory surgery / procedure center/unit, free standing or hospital based, who requires extended recovery including overnight stay, before discharge the following day'.

When comparing international ambulatory surgery rates for a particular operation it is important to realize that despite our recommendations definitions can still be different around the world. Some countries consider a stay of less than 24 hours as Ambulatory Surgery. Given the international contributions to this handbook the terms day surgery and ambulatory surgery will be used interchangeably throughout this handbook.

Day surgery is not new and indeed in 1909 James Nicoll reported his work on nearly 9,000 children who underwent day surgery for such conditions as harelip, hernia, talipes and mastoid disease at the Royal Hospital for Sick Children in Glasgow. This was the work of a gifted enthusiast who was quite simply years ahead of his time, even in those early days he stressed the importance of suitable home conditions and co-operation with General Practitioners.

Three main factors are driving the increase in day surgery 1. Changes in clinical practice – length of stay following surgery have been steadily reducing over the past decade and this has been accelerated with enhanced recovery programmers that encourage early mobilization. 2. Advances in both anesthesia and surgical techniques have made an expanding number of procedures suitable for day surgery. These advances have also allowed us to offer day surgery to patients who were previously deemed unsuitable due to various co-morbidities. Many hospitals are now moving towards a default option for day surgery for many operations. Instead of the surgeon asking 'Is this patient suitable for day surgery?' they are now assumed to be suitable and the question is 'Is there any justification for admitting this case as an inpatient?' 3. Countries are struggling to control costs in their health services and the escalation in emergency admissions linked to their aging populations. The ability to treat more surgical patients through less beds means the cost effectiveness of day case surgery has put this mode of care at the top of political agenda. However it has taken considerable time in many countries to increase day surgery rates. The reasons for this are complex but it is important that these are considered as those wishing to introduce day surgery will experience these issues.

Lack of day surgery facilities Day surgery is possible without the provision of dedicated day surgery facilities but hospitals that achieve high performance in day surgery have dedicated units – this will be discussed further later in the handbook.

Clinical preference It is important to acknowledge that many surgeons, anesthetists and nursing staff have a strong preference for inpatient surgery. Many see day surgery as ‘minor’ and less of a challenge or in some countries surgeons fear the loss of control over hospital beds or ‘their ward’.

Patient preference: Staff often say that the patients don’t want day surgery and it is true that in cultures where day surgery is new that it is important to educate patients on the advantages. When day surgery is explained to patients then it does not matter which country you are working in the universal finding is that most would prefer to recover in their home surroundings. The expansion of day surgery entails a change in mindset in clinicians, nursing staff, managers and the patient. It might be that changes in national policies and regulations will be necessary, such as the removal of incentives that promote unnecessary hospital stays. However day surgery can be successfully introduced by those who have the drive to achieve change for their patients. In the beginning most hospitals will have to start performing day surgery through their existing facilities. The crucial change in this situation is the patient pathway and that it is clear from the start of the pathway to the patient and all staff that the patient will be going home the same day as the procedure is performed. Once a service has been started in a hospital you can start to look at how your facilities can be adapted to further support the day case pathway for more and more patients. This handbook will hopefully help through all stages of development of your day surgery service. At the end of the handbook we have included an Appendix of essays completed by colleagues on the Executive Committee of the IAAS. These are personal views on the management of various aspects of day surgery and contain a large number of useful ideas and information. Each deals with a different part of the patient pathway and we hope you find them useful – we include contact details for those involved so that you can contact them with any questions you may have.

Design of ambulatory surgery facilities

There are several ways of providing ambulatory surgery services.

- Self contained ambulatory surgery unit - free-standing
- Office based surgery
- Self contained ambulatory surgery unit - integrated with main hospital
- Self contained ambulatory ward - using dedicated theatres in main theatre complex
- Self contained ambulatory ward - patients incorporated on in-patient theatre lists

Publications promoting ambulatory surgery often concentrate on the efficiency of self contained units and those with their own theatres in particular. Self contained units integrated with the main hospital and self contained day wards using dedicated theatres are the most common types of unit in Europe while in the USA there are a higher

proportion of free-standing units. There are advantages and disadvantages with each type of service, however it is important to remember that all variations can be made to work if the patient pathway is clear and the local team are well organized.

Self contained - Free-standing

This type of unit brings advantages of reduced overheads in the USA and this can also be seen with the Independent Treatment Centers in the UK. However there are fewer freestanding units in Europe that are not owned by a main hospital and therefore they have to take a share of all the Trusts overheads. Parking, a major problem for many European hospitals is usually not an issue. However free standing units bring problems that increase with the distance from their main supplier of medical and paramedical manpower. Support services from physiotherapy and laboratory services to Intensive Care and radiology are remote from the unit. Do outpatient clinics take place on site? If not, it means further trips for patients if pre-admission assessment is used. Travelling time of medical staff to and from the unit can be inefficient use of a valuable resource. Patient selection has to be more rigorous and the range of procedures that can be performed is more limited. This can be mitigated if the unit has an overnight stay facility that has medical cover – this will reduce the need to transfer failed day cases to a majorfacility and so allow more challenging cases to be managed.

Office based surgery

The provision of surgery in a suitable area within the 'surgeon's office' is popular in some countries. For the surgeon it offers maximal return on investment for their facilities. However the procedures that can be performed and the types of patient that can be selected arelimiting factors. There are real concerns about regulation of these facilities and for patient safety.

Integrated

This type of unit is seen by many as being ideal. Full support services are available and it is easy for patients to visit the unit on the same day as their outpatient clinic visit for preoperative assessment. There is no loss of medical time due to travelling and if the unexpected happens e.g. the patient requiring a laparotomy following uncontrolled hemorrhage during a laparoscopic procedure, then it is easy perform the procedure and admit the patient to an appropriate facility as needed e.g. ward, HDU or even ITU.

Day ward-dedicated theatre(s) in main theatre complex

The distance between the ward area and the main theatre complex is important in this situation. The efficiency of ambulatory surgery depends on the rapid changeover of patients in theatre so that valuable theatre time is not lost. Therefore efficient transfer of patients is important and becomes increasingly difficult with separation of the theatre and ward areas. However the use of patient holding areas close to theatre can address this issue. One consideration often forgotten is

the Recovery Room or Post Operative Care Unit experience. The management of first stage recovery of patients is an important aspect of successful ambulatory surgery - staff using their inpatient surgical practice can delay or even prevent day case patient discharge.

Ambulatory ward-no dedicated theatres

Let us be clear this is a very unsatisfactory way of providing day surgery and is not recommended by the IAAS. This setup begins to not only reduce the efficiency of ambulatory surgery but can have serious effects on the quality of service for day patients. Patients admitted to the ambulatory surgery ward may have to wait a long period for their operation if they appear at the end of a list after the major cases. It is inappropriate to fill up the occasional half hour on the end of a list to perform ambulatory surgery as they should be done early on the list to ensure maximal time for recovery. The risk of cancellation is also high if they are following a large case. Putting them on the beginning of the list is more satisfactory but can also lead to the problem of lists over running their allotted time - a problem all too familiar to those with theatre experience. However they are managed the tendency is for the day cases not to receive the degree of attention they require and so the ambulatory surgery success rate is reduced. We recognize that the above situation may well be unavoidable especially in the beginning. The issues raised canbe helped by careful organization. Having a clear patient pathway sothat the patient, the ward nursing staff and the theatre staff all understand that the patient is a day case can help. Having nurses in the Recovery Room in theatres who are educated in ambulatory surgery and form part of a team introducing the service can make a large difference.

ORGANISATIONAL ASPECTS

Clinical Lead

Each DSU should have a Clinical Lead or Director who has a specific interest in daycare surgery and who will lead the development of local policies, guidelines and Clinical Governance in this area. A consultant anesthetist or surgeon with management experience is ideally suited to such a post. This individual should have adequate time allocated in their contract for this responsibility. In the accompanying essays you will find a section exploring further the role of the Anesthetist as the Clinical Lead but remember this can also apply to surgical colleagues with an interest in ambulatory surgery.

Nursing Lead

Each unit also requires adequate staffing led by a senior nurse who provides the day-to-day administration of the unit in liaison with the Director. The senior nurse in charge of the ambulatory surgery unit should be expected to spend the majority of his/her time within that unit. Hands on activity by senior staff members ensures a valid understanding of any problems that can emerge in day to day practice and will enable these to be more speedily rectified. The staffing levels will depend on the design of the facility and the work undertaken, as well as local

preferences. The DSU should have reception staff of high quality as well as its own nursing personnel. We recommend that each DSU formulates its own staffing structure which takes into consideration their local needs.

Operational Group

Each unit should have an operational group which should oversee the day to day running operation of the unit. This may include representatives from anesthesia, surgery, hospital nursing, community nursing, general practice, pharmacy, management, finance, audit, and ancillary care. This group should agree an operational policy, define a timetable, review any operational problems and organize audit strategies. They should meet on a regular basis and any concerns raised must be acted on by hospital management.

Pre-operative assessment

Successful ambulatory surgery requires careful selection of patients and consideration of the experience of the team involved. Therefore, what may be appropriate for one specialty (and indeed one particular operation) in one setting may not be appropriate for another. For example, a cataract extraction performed under topical local anesthesia can be performed on a much older and more frail population when compared to a shoulder arthroscopy. As an additional example, settings that are not prepared to handle young children as outpatients might not be appropriate for such patients in spite of a preoperative assessment showing clinical stability and low risk for surgery. Proper pre-operative assessments are essential for smooth-running ambulatory surgery schedules. The goals of effective pre-operative assessments are to be organized, efficient, informative, and relatively simple (yet comprehensive). Having such adequate assessments will lead to no surprises on the day of surgery, and ideally no delays or cancellations. Pre-operative assessments can be primarily performed in two different ways. Patients can be seen and evaluated in an assessment clinic or they can be contacted via telephone to gather their medical history. Each system has advantages and disadvantages, and a combination of the two has also been used successfully in several countries. Seeing patients in an assessment clinic has the advantage of having personal interactions, being able to do a physical exam, and performing pre-operative testing if needed. A disadvantage is that it might not be convenient for patients to attend the session. The assessment clinic can be run by suitably trained nursing staff with all patients being seen in advance of their surgery – this is typically the model in the UK whereas other countries run these clinics with anesthetists. Pre-operative telephone interviews is the most common system used in the US. Such a system has proven to be easy and convenient, but it relies on patients having adequate knowledge of their medical histories. It also hinges on a physical exam and pre-operative testing being done at outside facilities and results being delivered in. Whichever model is used leadership of this service is best provided by a clinical lead from the Anesthetic Department. It is important that they develop guidelines for screening of patients that are accepted by their anesthetic colleagues. It is also necessary to have a system for dealing with problems identified by the staff during this screening process. In general, pre-

operative testing should be limited to circumstances in which the results affect the patient treatment and outcomes. Each country may well have their own guidelines but those produced by NICE (UK), the American Society of Anesthesiologists (US) and the Society for Ambulatory Anesthesia (US) have been used by many other countries. Arrangements should be put in place for all appropriate tests to be carried out at the time ofassessment (or close to the time of assessment if telephone interviews are being performed) and there must also be a mechanism in place to review all investigations undertaken. It should be remembered that the preoperative assessment is also an important time to start educating the patient and their care givers about the operation and postoperative care. Assessment falls into two main categories.

1) Social

2) Medical

Social

The patient must be willing to undergo surgery in a day case setting and in most cases there should be a responsible adult able and willing to care for the patient for at least the first twenty four hours. Patients and/or their care givers should have easy access to a telephone and the patients' home situation should be compatible with postoperative care. Travel time from where surgery is being performed is procedure dependent, but generally 1 hour is considered as a reasonable limit.

Medical

The patient and their care should be able to understand the planned procedure and subsequent postoperative care. The patient should be either fully fit or chronic diseases such as asthma, diabetes, hypertension or epilepsy should be well controlled. Patients should be selected according to their physiological status as found at assessment. Routine laboratory testing has been shown in multiple studies to NOT reduce the incidence of perioperative events in ambulatory surgery patients. Such testing should be focused on items that would alter the perioperative management of patients. As previously mentioned it is important for the clinical lead to establish agreement with anesthetic colleagues about the medical screening.

Age

Physiological status and fitness should be considered rather than arbitrary age limits. One exception to this would be infants who were born prematurely and are within 60 weeks post-gestational age. It is routinely accepted that such patient should be admitted post-operatively for observation due to risk of apnea of prematurity.

Blood Pressure

Much has been written in the past about the importance of blood pressure control and anesthesia. However more recent publications have separated out the need for long-term control of hypertension as part of general health of the patient from the risks associated with anesthesia and surgery. There is no evidence to support the cancellation of patients with mild to moderate hypertension from having elective surgery. They must however be highlighted to their primary care physician so that assessment of their hypertension can be undertaken.

Body Mass Index (BMI)

BMI is used as part of selection criteria by most ambulatory surgery units. It is one measure of obesity and is calculated by dividing the patient's weight (measured in kilograms) by the square of their height (measured in meters). This is an area that has seen major change – a few years ago patients with a BMI of more than 30 were deemed unsuitable for ambulatory surgery. Advances in surgical and anesthetic techniques have meant that patients with a much higher BMI, who are otherwise fit, are now accepted. Though some units now accept a BMI of 40 or more it is prudent to start with a lower limit and increase this as you gain experience and confidence in management of these patients.

Sleep Apnea

Patients with sleep apnea undergoing ambulatory surgery has been a major topic of debate in many countries, particularly since many of these patients do not have a formal diagnosis of such at the time of surgery. Interestingly, several studies have shown that there is no difference in complications between OSA and non-OSA patients undergoing ambulatory surgery. However there are several categories of sleep apnea patient for which ambulatory surgery is not recommended: Patients with central sleep apnea Patients with severe OSA without optimized comorbid conditions Patients' inability to follow post-discharge instructions including compliance with Continuous Positive Airway Pressure (CPAP) Patients who adamantly refuse to use night time CPAP after discharge Patients where long acting opioids are required Management of such patients can be complicated and there needs to be proper coordination of availability of equipment (such as CPAP machines) to patients postoperatively.

Diabetes Mellitus

Diabetes affects 2-3% of the population and should not be a contraindication to ambulatory surgery. However when considering diabetic patients for ambulatorysurgery it is important to assess the stability of the disease and the patients understanding of their diabetic control. The British Association of Day Surgery has produced a useful handbook on the management of these patients.

Finally it is important to re-emphasize that this section has been about the assessment of the patient. Patient selection in your ambulatory surgery unit will also be influenced by The experience of the team involved

The type of unit – free standing, with or without availability of overnight beds etc and

The type of surgery to be undertaken Experience has shown that it is easier to start with restrictive criteria which selects those patients you are most likely to succeed with and to gradual extend these as your unit gains experience. Preoperative assessment is an excellent opportunity to educate the patient about their surgery, about what will happen during their visit to the day unit and what they should expect postoperatively. This can be reinforced by the use of written information which we will cover in the next section.

Patient information

Compared to those undergoing traditional surgery, patients undergoing ambulatory surgery have an increased responsibility for their preoperative preparation and their recovery from surgery at home. The time spent preparing a patient for ambulatory surgery in a surgical facility is less than that for inpatient surgery. Therefore, provision of appropriate information about all phases of the surgical process is important, not only to ensure the success of the procedure, but also for patient safety. An effective policy for information provision aims to:

- prepare a patient psychologically for surgery;
- educate the patient about the particular procedure and pre- and postoperative care;
- minimize risks in the postoperative period;
- improve patient satisfaction with the overall day-surgery experience and aid anxiety reduction;
- obtain informed consent for surgery.

An informed patient is able to better adjust to surgery and is less likely to cause cancellations or delays or return for emergency room visits or hospital re-admission. Information about medical and organizational aspects should be provided to the patient in a structured manner. The use of both oral and written information is essential; one informs, while the other reinforces and vice versa. Other media forms, such as video clips or the internet, may also be considered. The information must be consistent across the entire process of care, from the referring physician to the staff of the facility and those involved in aftercare. It should empower patients to take charge of their own care as far as possible. Finally, the role of each staff member in information provision should be identified and the timing of information provision coordinated since patients will come in contact with and receive information, at different stages, from administrative, nursing and surgical staff.

Procedures suitable for ambulatory surgery

Procedures can be performed as a daycare provided there is satisfactory control of symptoms postoperatively and patients regain the ability to drink and eat within a reasonable time after the

completion of surgery. Pain, nausea and vomiting must be controlled and preferably the patient should be able to mobilize to some extent. Enthusiasts are pushing the boundaries of what is possible around the world – radical prostatectomy, laparoscopic nephrectomy and even hip replacement have been managed as day cases. New operative techniques such as endoscopic surgery and other types of minimal access surgery have been developed and surgeons have become increasingly aware of important issues such as patient selection and proper perioperative care in ambulatory surgery. The fundamental principle however should be that surgery undertaken as a day case must be based on proven patient safety and quality of care, units should therefore be careful when introducing new procedures. Ambulatory surgery was originally limited to procedures lasting less than 60 minutes. However with appropriate patient selection, the use of modern anesthetic agents and careful postoperative care longer surgical procedures are now regularly performed. Many units have no specified maximum duration of operation. Some hospitals have developed 23hour stay facilities to support the introduction of more major procedures and tackle postoperative complications without re-admission to another hospital. These may assist the transfer of an operation from the inpatient to the ambulatory surgery arena and extend the use of total capacity of ambulatory surgery operating theatres into the early evening.

Day of admission

The patient should be admitted to the unit and a check made to ensure there have been no changes in their health and home circumstances. Patients should be reviewed by both the surgeon and the anesthetist who will be looking after them.

Perioperative Management

Pain control

Success of ambulatory surgery is dependent on the management of postoperative pain. Pain should be assessed throughout the patients stay. This is usually performed in adults by using a Visual Analogue Scale (VAS) which consists of a 10cm line with words ‘no pain’ at the start and ‘worst imaginable pain’ at the end. The patient is asked to put a cross in a position on the line which represents how much pain they are experiencing at the moment. The distance along the line is measured and recorded. A measurement of less than 3 cm is often accepted as indicating acceptable analgesia. Pain control requires a multimodal or balanced approach using local anaesthesia, Non Steroidal Ant-inflammatory Drugs (NSAIDs), paracetamol, short acting opioids (alfentanil, fentanyl) and the avoidance of long acting opioids (morphine) where possible. Pain management requires a team approach involving the surgeon, anesthetist and the nursing staff. For example pain at the end of laparoscopic surgery can be minimized by infiltration of local anesthesia into the port sites before they are inserted letting out as much carbon dioxide as possible from the abdomen using normal saline peritoneal lavage at the end of the procedure

Infiltration anesthesia

Infiltration of the operative site with local an aesthetic is simple, safe and provides satisfactory analgesia after most operations. There is evidence that the infiltration of local an aesthesia prior to skin incision provides better postoperative analgesia and may reduce the intraoperative analgesic requirements. Topical local anesthetic as eye drops or local anesthetic creams e.g. EMLA cream also provide effective postoperative analgesia for procedures such as squint surgery and circumcision.

NSAIDS

NSAIDS should be given whenever there are no contra-indications. The use of the intravenous or PR routes of administration is not necessary and there is evidence that giving the first dose orally about 1-hour preoperatively produces better and longer lasting pain relief.

Paracetamol

Paracetamol has well established safety and analgesia profile and it reduces the need for more potent opioids with their unwanted side effects. Intravenous paracetamol is available in many countries but is expensive – appropriate oral dosage given preoperatively should form part of the multimodal approach to pain relief.

Regional Anesthesia

Peripheral nerve blocks can provide excellent conditions for ambulatory surgery. Patients may be discharged home with residual sensory or motor blockade, provided the limb is protected and assistance is available for the patient at the home. The introduction of low dose spinal anaesthesia has increased the suitability of central neural blockade for ambulatory surgery. This can be useful for lower limb, perineal and lower abdominal procedures and may allow more problematic patients to be done as a day case. The use of small gauge pencil point needles has reduced the incidence of post dural puncture headache to less than 1%.

Recovery Process

First Stage Recovery

This constitutes the initial recovery period following anesthesia, it starts from handover of the patient to the care of the recovery nurse until the patient is discharged to the ward. In ambulatory surgery the aim should be to ensure that the patient awakes pain free, without nausea and is quickly orientated. This will minimize the amount of time the patient needs to stay in the Recovery Room. Even in the best hands patients will develop problems in the Recovery Room and it is important that the nursing staff have protocols agreed by the an aesthetic department that they can follow for the management of post-operative nausea, vomiting and pain. The aim should be to control these as quickly as possible so as to ensure the smooth transition back to the ward area for second stage recovery. It is important to note that the facilities required for the Recovery Room will be similar to those for inpatient surgery. Discharge criteria will also be similar.

Second Stage Recovery

This is an important phase of the ambulatory surgery process and the management and education of both the patient and their care giver during second stage recovery is crucial to our success. It is this stage more than any other that can mean the difference between providing a quality service or what is merely seen as being part of a 'production line' or 'conveyer belt'. Furthermore, success at this stage can make a large difference to the admission rate from your day unit. With this in mind, it is essential that patients are given time to recover and do not feel pressurized into leaving too early. However, it is also important that the staff have a routine for the mobilization of patients. This routine will not only need to be different for the various specialties and operations, but also sometimes between surgeons in the same specialty and for different patients.

Environment

The use of beds is not recommended in ambulatory surgery, as they reinforce the 'patient role' in the minds of our patients, their care givers and even the medical and nursing staff. The use of trolleys immediately introduces to everyone the concept that this is a short visit to hospital. Suitable trolleys help by: reducing manual moving of patients (reducing dangers to both patient and staff in an area of fast throughput) and assisting the postoperative mobilization of the patient

Every day unit needs to evaluate the trolleys available on the market and find those that suit their patient population and the type of surgery performed. Ideally the trolley should:

- have a reasonably thick comfortable mattress (as the patient may spend several hours on it)
- have a good range of height adjustment (a trolley that obviates the need for steps to get on and off will be inherently safer)
- meet all surgical requirements (width, height adjustment, attachments)
- meet all anaesthetic requirements (ease of tipping head down, easy to push!)
- meet safety requirements (suitable sides to prevent patient falling, able to deal with the maximum weight of patient allowed on the day unit, adaptable for paediatric use)

It is therefore obvious that anaesthetic considerations form only one part of the design of a successful ambulatory surgery trolley. Careful selection can yield benefits to all users but, unfortunately, there may also be a need for some degree of compromise. The day unit should also have sufficient numbers of reclining chairs to allow graduation of patients into the semi-recumbent position, as this can help as part of this continual process of getting patients ready for

discharge. The ward area used should also have: sufficient staffing to allow patient monitoring and education

 a quiet restful atmosphere

 privacy

 ample bathroom/toilet facilities

 facilities to provide fluids and food

Hints and tips

The choice of suitable food and fluids in the recovery process can make a large differenceto your success rate and the quality of service perceived by your patients. Many of you who have worked on delivery wards in maternity units will be aware of the effect of the smell of toast on your taste buds. It does appear to work in ambulatory surgery patients, and is worth considering. Patients often have a dry mouth after anaesthesia and sandwiches can be difficult to eat – it does appear that buttered toast is much easier for patients to swallow. A further tip that can be useful is the use of distraction therapy in children following their surgery. The provision of a video/television and a supply of a suitable choice of children's films and cartoons returns many screaming children (who may feel confused, sick or be in pain) into quiet docile human being

Patient discharge and support

Every patient should be seen following their operation by the anesthetist and surgeon involved in their care. However in many countries the final assessment of when the patient is 'street fit' or ready for discharge is performed by nursing staff. Each day unit needs to identify clear discharge criteria as part of a written policy for staff to follow. These need to consider social factors as well as a medical assessment of sufficient recovery for discharge. The following table gives the areas to be covered

 Vital signs should be stable for at least one hour

 Oriented to time, place and person

 Adequate pain control and has a supply of oral analgesics

 Understand how to use oral analgesia supplied and has been given written information about these

 Ability to dress and walk where appropriate

 Minimal nausea, vomiting or dizziness

 Has at least taken oral fluids

□ Minimal bleeding or wound drainage

□ Has passed urine (only if appropriate to surgery)

□ Has a responsible adult to take them home

□ Has agreed to have a care giver at home for next 24 hours

□ Written and oral instructions given about postoperative care

□ Knows when to come back for follow up (if appropriate) □ Emergency contact number supplied.

All patients should receive verbal and written instructions on discharge which should include details about any symptoms that they might experience during the first 24 hours after surgery. Guidance should be given about not driving for at least 24 hours though this will vary according to the operation performed. Further information about the use of machinery, signing legal documents, returning to work and when sutures should be removed should also be provided. All patients should also be supplied with information about what to do in an emergency and be provided with a contact number for use when they need urgent advice. Attention to these details helps ensure that the patient feels supported and the provision of a contact number helps reduce the number of patients visiting their Primary Care Doctor (General Practitioner).

Discharge analgesia

Objective

To maintain an acceptable level of analgesia with minimal side effects after discharge from the day surgical facility.

Drugs

Analgesia after discharge from ambulatory surgery is based upon

□ Paracetamol

□ NSAIDs

□ Opioids

□ Local analgesia

□ Topical analgesia

Paracetamol-Paracetamol is a mainstay due to safety profile and few side effects. The effect is limited, and frequently needs support by stronger acting drugs. Oral dosage is preferable when possible, as rectal doses are absorbed unpredictably.

NSAIDs

NSAIDs constitute the next step. Ibuprofen and naproxen have the most favourable cardiac risk profile. NSAIDs may be given as required or at fixed intervals according to needs. The rapid onset of ibuprofen is useful in as required use. Cox-2 selective drugs offer little or no platelet inhibition, but the risk of cardiac complications is larger. In the frail or elderly patient renal function must be considered especially if the patient is on an ACE inhibitor, the NSAID dose and duration must be reduced accordingly and proton pump inhibitors prescribed liberally.

Opioids

When other measures fail to achieve adequate analgesia, the patient may need opioids after discharge. Oral morphine preparations and oxycodone are widely employed. Although codeine is still in regular use, 5% of Caucasians lack the necessary enzyme converting codeine to morphine, while others are ultrafast metabolisers and risk increased side effects. For these reasons, many units do not use codeine in ambulatory surgery. At discharge, patients may be given a limited dose of opioids and laxative for as required use at home.

Local Anaesthesia

Duration of local analgesia may be extended by connecting a disposable mechanical pump to an indwelling catheter, inserted along peripheral nerves or as a wound catheter. After instruction, the patient may remove the catheter at a set time.

Topical anaesthesia

Lidocaine formulations may be useful after ophthalmic surgery, circumcision and other operations with localized mucosal pain.

Supply of analgesic drugs

This will depend on the custom and practice of the local health service. If no drugs are to be supplied then the patient must receive information preoperatively about the need for analgesics, so he or she can stock the drugs before surgery. Where drugs are to be provided then the expected amount of analgesics and adjuvant drugs may be given to the patient at discharge. The amount handed out must be documented.

Information

Information at discharge must include recommended maximal daily doses of paracetamol and NSAIDs, the need for laxatives when taking opioids and possible need for proton pump inhibitors.

Monitoring Quality – use of audit and standards

Audit and subsequent action is of fundamental importance to the successful practice of ambulatory surgery. Furthermore, failure to establish standards and implement satisfactory monitoring, audit and quality measures will lead to problems for patients, their General Practitioners and ultimately the day unit concerned. As we move clinical activity from the inpatient setting to ambulatory surgery it is important that this clinical activity is monitored and audited to ensure that problems experienced by patients or primary health care colleagues are quickly identified and rectified. The move to ambulatory surgery is probably the biggest change in practice in any health service and requires effective management. If quality is compromised in any way then patients are affected and it is important that we pick this up and deal with it quickly.

Monitoring

This can be defined as maintaining regular surveillance and can even include the concept of regulation. The combination of surveillance and regulation is useful for our discussion. Monitoring allows a Day Unit to judge its performance against explicit standards. Standards in this context can be defined as agreed measures by which performance or achievement can be judged. They can be set locally (by a unit), nationally (by the government) or internationally (IAAS Standards) and provide a yardstick against which to measure performance. Examples of factors suitable for monitoring include number of cancellations as a result of the patient being found to be unsuitable on the day of surgery proportion of patients admitted overnight proportion of patients readmitted within one week did not attend rate utilization of theatre time by each surgeon proportion of ambulatory surgery to elective inpatient surgery number of patients contacting the unit post discharge with problems number of patients requiring intervention of GP post discharge number of patients cancelled on day of operation The number of cancellations on the day of surgery provides a clear indication of the effectiveness of the preoperative assessment service. The proportion of patients admitted overnight provides early warning of problem areas that need attention. The reasons for all admissions should be carefully examined, are patients being assessed appropriately or areinappropriate operations being performed on the unit. Similarly the number of patients readmitted due to complications of their surgery is important - is the surgeon operating on inappropriate patients? Every time a patient does not attend the opportunity is lost to use a valuable resource i.e. the nursing and clinical time that has been set aside for the management of that patient. The number of patients contacting the unit with problems or requiring intervention of their general practitioner post discharge provides an indication of problems with patient selection, anaesthetic technique, surgical technique or discharge arrangements. These are some of the reasons that you may consider monitoring some of these areas, you may well have thought of others that are more important for your unit.

Telephone follow up service

Telephone follow up after day case surgery has been found to be very useful when developing ambulatory surgery. The purposes of such a service are twofold; 1. to provide post-discharge support for patients, 2. to gather specific data for audit purposes in this early post-operative period This sounds really supportive and it seems difficult to perceive how an individual would not wish to be contacted to discuss how they are feeling. However, like any other aspect of treatment or care, patients have the right to refuse and so permission to contact them at home must be sought prior to discharge. Although an unstructured phone call may seem the best approach to maintain informality, the use of a structured questionnaire will provide much better feedback for the ambulatory surgery unit. Areas to be covered should be to ask about the severity of post-operative side effects such as drowsiness, sore throat, headache, muscular aches, nausea and vomiting. This should be supplemented with questions to assess the degree of pain experienced and how well it has been controlled.

VALUE ADDED COURSE

DAY CARE SURGERY

Annexure II

STUDENT ENROLLMENT LIST (JAN-JUNE 2019)

S.No.	University no	Name of the student	Year / CRRI	Signature
1.	U14MB281	NILA.R	CRRI	Nila. R
2.	U14MB282	NIMINESH.B.S	CRRI	Niminesh
3.	U14MB283	NIVETHA. B	CRRI	Nivetha
4.	U14MB284	NONG LEGO	CRRI	Nong Lego.
5.	U14MB285	OBED NEWMAI	CRRI	obed Newmai
6.	U14MB286	PAVITHRA. S	CRRI	Pavithra
7.	U14MB287	PRADEEPA. A	CRRI	Pradeepa
8.	U14MB288	PRASANNA.S	CRRI	Prasanna
9.	U14MB289	PRAVEENKUMAR.V	CRRI	Praveen kumar
10.	U14MB290	PREMKUMAR. P	CRRI	Prem kumar
11.	U14MB291	PRIATHAM SWAMINATHAN.S	CRRI	Priatham Swaminathan
12.	U14MB292	PRITHVIRAJAN. R	CRRI	Prithvirajan
13.	U14MB293	PRIYADHARSHINI.K	CRRI	Priyadharshini
14.	U14MB294	PRIYADHARSHINI.P	CRRI	Priyadharshini
15.	U14MB295	RAJALINGAM. N	CRRI	Rajalingam
16.	U14MB296	RAJESWARI. J	CRRI	Rajeswari
17.	U14MB297	RAMKATHIR	CRRI	Ramkathir
18.	U14MB298	RANGARAJAN. R	CRRI	Rangarajan
19.	U14MB299	RAVEENDHAREN.V	CRRI	Raveendharen
20.	U14MB300	RENIL KUMAR. A	CRRI	Renil kumar.

RESOURCE PERSON

DR. M KALASREE

COORDINATOR

Dr S NITHIANANDAM

Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502

Annexure III

MCQs DAY CARE SURGERY

1. Following surgeries can be done as day care procedure
   a. Fibroadenoma breast
   b. Gastrojejunostomy
   c. Craniotomy
   d. CABG

2. Lab investigations for day care surgery are
   a. EEG
   b. Hb
   c. ECHO
   d. None of the above

3. Following anesthesia can be given for day care surgry
   a. TIVA
   b. Caudal anaesthesia
   c. Filed block
   d. All of the above

4. The best anaesthesia for day care surgery is
   a. Peripheral nerve blocks
   b. General anaesthesia
   c. Epidural anesthesia
   d. All of the above

5. Best analgesia for day care surgery
   a. Morphine
   b. IV Paracetamol
   c. IV Propofol
   d. IV Diclofenac Sodium

6. Advantages of day care surgery
   a. High morbidity
   b. Early discharge
   c. Expensive
   d. Higher respiratory complications

7. Exclusion criteria for day care surgery
    a. ASA I
    b. ASAII
    c. ASAIII
    d. ASA V

8. All the following are designs of ambulatory surgery facilities except
    a. Office based surgery
    b. Self contained ambulatory surgery unit
    c. Self contained ambulatory ward
    d. Post anaesthesia care unit

9. Pain assessed by
    a. VAS
    b. ALDRED SCORE
    c. GCS
    d. None

10. The recovery ward should contain

    a. Privacy
    b. Rest rooms
    c. To provide food/fluids
    d. All of the above

R. NILA

8/10

Annexure III

MCQs DAY CARE SURGERY

1. Following surgeries can be done as day care procedure
   a. Fibroadenoma breast
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   b. ALDRED SCORE
   c. GCS
   d. None

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    a. Privacy
    b. Rest rooms
    c. To provide food/fluids
    d. All of the above

OBED NEWMAI

6/10

Annexure III

MCQs DAY CARE SURGERY

1. Following surgeries can be done as day care procedure
   a. Fibroadenoma breast
   b. Gastrojejunostomy
   c. Craniotomy
   d. CABG ✓

2. Lab investigations for day care surgery are
   a. EEG
   b. Hb ✓
   c. ECHO
   d. None of the above

3. Following anesthesia can be given for day care surgry
   a. TIVA
   b. Caudal anaesthesia
   c. Filed block ✓
   d. All of the above

4. The best anaesthesia for day care surgery is
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   d. IV Diclofenac Sodium

6. Advantages of day care surgery
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9. Pain assessed by
   a. VAS
   b. ALDRED SCORE
   c. GCS
   d. None

10. The recovery ward should contain

    a. Privacy
    b. Rest rooms
    c. To provide food/fluids
    d. All of the above

Annexure V
Student Feedback Form

Course Name: **DAY CARE SURGERY**

Subject Code: **ANAES 09**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Annexure V
Student Feedback Form

Course Name: **DAY CARE SURGERY**

Subject Code: **ANAES 09**

Name of Student: Rajeswari - J Roll No.: U14MB296

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Keep it up

Annexure V
Student Feedback Form

Course Name: **DAY CARE SURGERY**

Subject Code: **ANAES 09**

Name of Student: Premkumar. P Roll No.: 0114MB290

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

Very Good.

From
Dr M Kalasree
Head Of Department Incharge
Department of Anaesthesia
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry

Date: 06.05.2019

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry

Sub: Completion of value-added course: DAY CARE SURGERY

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Day Care Surgery in Jan-June 2019 for 20 students. We solicit your kind action to send certificates for all the participants, whose name list is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,
Dr. M Kalasree

Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502

Encl: Certificates

Photographs

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _RAJESHWARI J_____ has actively participated in the Value Added Course on Day Care Surgery held during January - June 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.KALASREE M
RESOURCE PERSON

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE
OF MEDICAL SCIENCES
Ozhukarai, Kudapakkam, PUDUCHERRY 605 502

Dr. KALASREE M
COORDINATOR

Head of Dept. of Anesthesiology
Sri Lakshmi Narayana Institute of Medical Sciences
Ozhukarai, Kudapakkam, Puducherry - 605 502.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _RANGARAJAN R_____ has actively participated in the Value Added Course on Day Care Surgery held during January - June 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.KALASREE M
RESOURCE PERSON

DEPARTMENT OF ANAESTHESIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, KUDAPAKKAM, PUDUCHERRY-605 502.

Dr. KALSREE M
COORDINATOR

Head of Dept.
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502.


WAITING LOBBY
REDMI K20 PRO
AI TRIPLE CAMERA

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSUDU, AGARAM VILLAGE, KUDAPAKKAM POST,PUDUCHERRY-605502.

Date 29.12.2018

From
DR.BALAJI SUBRAMANIYAN. R
Professor and Head
Department of dentistry,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: SALIVA

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled:_**SALIVA** on 3.1.2019. We solicit your kind permission for the same.

Kind Regard

DR.BALAJI SUBRAMANIYAN. R

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: DR.JAYALAKSHMI

The HOD: DR.BALAJI SUBRAMNIYAN

The Expert: GNANANANDHAR

The committee has discussed about the course and is approved.

Dean Subject Expert HOD

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

DEPARTMENT OF DENTISTRY
Sri Lakshmi Narayana Institute Of Medical ...
PONDICHERRY - 605 502.

Dr. BALAJI SUBRAMANIAN, MDS.
Reg. No. 4545
Professor HOD Dental
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam Post, Puducherry-605 502

OFFICE OF THE DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

30.12.18

Sub: Organising Value-added Course: SALIVA reg

With reference to the above mentioned subject, it is to bring to your notice that SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,
, **Bharath Institute of Higher Education and Research**, is organizing **"SALIVA ON 3.1.19"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before2.1.19 Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. G. JAYALAKSHMI, BSc., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Dean

Encl: Copy of Course content and Registration form.

Course Proposal

Course Title: SALIVA

Course Objective: To Enlighten the important role of saliva for general practitioners.

Course Outcome: in depth knowledge to recognize abnormalities

Course Audience: MBBS Students

Course Coordinator: Dr. BALAJI.R

Course Faculties with Qualification and Designation:

1. **Dr. GNANANADHAR M.D.S& ASSISTANT PROFESSOR**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1.	3.1.19	Salivary composition	4PM-7PM	3 hrs
2.	13.1.19	Applied anatomy of Salivary glands	4pm-7 pm	3hrs
3.	23.1.19	Dry mouth/ Xerostomia	5pm-8pm	3 hrs
4.	29.1.19	Sialolithiasis	4pm-7pm	3hrs
5.	3.2.19	Investigations in salivary glands dysfunction	5pm-8pm	3 hrs
6.	11.2.19	Parotitis	5pm-8pm	3 hrs
7.	19.2.19	Dysphagia	4pm-7pm	3 hrs
8.	23.2.19	Early childhood caries	5pm-8pm	3 hrs
9.	27.2.19	Salivary tumours	5pm-8pm	3 hrs
10.	3.3.19	Management of dry mouth	4pm-7pm	3 hrs
			Total Hours	30

REFERENCE BOOKS: (Minimum 2)

1. **MACCULLUM TEXT BOOK OF ORAL PATHOLOGY**
2. **SHAFER'S TEXT BOOK ON ORAL PATHOLOGY**

SALIVA

ABSTRACT

Physiology of saliva evolves in supporting many important activities in human life. Changes in age, environmental and living condition as well as eating habit would influence salivary function. Saliva plays a role in determining the development pattern and oral health. Saliva has a unique function in the defense mechanism to microorganism in the oral environment. Research focuses on the salivary physiology is limited and seems to be separated from medical and dental professional education. Better and deeper comprehensive understanding of saliva in health and disease is needed. Nowadays, many studies have used saliva to find diagnosis markers for specific diseases. Salivary analysis is intended to give descriptive information on disease status for prevention, monitoring and treatment purposes. To give understanding on salivary physiology in order to add new views of its application in the field of medicine and dentistry.

Physiology emphasizes normal constitution (static) and regulation (dynamic) of functional systems. The understanding is essential to conceive aberrations, their origins and consequences, and rational ways to rectify or prevent them to maintain healthy state. The significance of saliva physiology to both oral and systemic health is enormous. It constitutes the unique and dynamic ecologic milieu of oral cavity. Multiple components in saliva participate in homeostasis vital to health of oral structures. Lubrication of oral tissue facilitates speaking, chewing and swallowing. Hydrodynamic flushing serves debridement and levage. Saliva has key role in safeguarding hard and soft oral structures to ensure smooth feeding and nutrition.

INTRODUCTION

Saliva, one of the several fluids occurring in the human organism is of paramount importance to the dentist. An understanding of the role of saliva in complete dentures is essential for dental practice. There is hardly any aspect of clinical practice in which salivary glands and saliva do not play an obvious or hidden role. It has many mechanical and chemical functions and is a fairly sensitive parameter of certain bodily functions. With the exception of a portion of the anterior part of the hard palate, salivary glands are seen everywhere in the oral cavity.

The patient who wears complete denture prostheses depends on this oral fluid to provide adhesion and at the same time to prevent friction between the denture and the mucosa. So any alteration in saliva has a significant effect in these patients.

Relatively early, physiologists focused interest on the glands of the digestive tract and their secretions; fundamental knowledge of the salivary glands dates back to the work of Heidenheim, Pavlov, and Langley in the nineteenth century. In the present century, workers such as Babkin and Emmelin have contributed substantially to knowledge of the physiology of salivary glands.

The patient who wears complete denture prostheses depends on this oral fluid to provide adhesion and at the same time to prevent friction between the denture and the mucosa [1].

ANATOMY AND INNERVATION OF SALIVARY GLANDS

Salivary glands cover the entire oral cavity. Two of the three largest pairs are situated in the floor of the mouth; the third is located in the cheek around the ascending ramus of the mandible. The other smaller glands are situated in the lips, tongue, and palate. Three types, of secretory units (alveoli) are recognized, according to their secretion, viz., mucous, serous and mixed.

The only purely mucous glands are the palatine, molar, and lingual; the parotid glands are purely serous; the reminders are mixed. Of the latter, the sublingual gland has mainly a mucous secretion, and that of the submandibular gland is mainly serous. The individual glandular units in the three large salivary glands - the parotid, sublingual, and submandibular empty into the oral cavity via one or a few common excretory ducts. The sublingual gland, the smallest of the large

glands, is not a unitary gland but is made up of some thirty smaller glands, which empty along the sublingual fold in the floor of the mouth; the anterior sublingual glands form a larger unit, whose secretion is emptied through a duct, the major sublingual duct, into the so called sublingual caruncle. This eminence also contains the opening of the duct of the submandibular gland which, situated on the inner side of the mandible in the submandibular fovea, empties into the sublingual caruncula via a duct about 2 inches long.

Mean daily salivary output ranges from 500 to 1500 ml, and the average volume of saliva present in the oral cavity is approximately 1 ml. The rate of secretion follows a circadian rhythm, decreasing during sleep and increasing during the waking hours. Since most of this fluid is swallowed and reabsorbed by the gut it is not lost. Some salivary components are derived from blood plasma, and others are synthesized within the salivary glands

There is great variability in individual salivary flow rates. The accepted range of normal flow for unstimulated saliva is anything above 0.1 ml/min. For stimulated saliva, the minimum volume for the accepted norm increases to 0.2 ml/min. Any unstimulated flow rate below 0.1 ml/min is considered hypofunction[11].

Microscopic anatomy of salivary glands: Salivary glands are made up of a large number of individual secretory units, which consist of an acinus, an intercalated duct, and a striated duct. Many thousands of these secretory units converge on a main excretory duct that extends from the gland mass to drain into the oral cavity The terminology applied to the different parts of the secretory unit reflects differences in cytoarchitecture. Saliva forms at the proximal end of the duct in pyramid-shaped acinar cells arranged in spherical collections called acini. Acinar cells are by far the most numerous of the cell types and account for the bulk of the tissue making up a salivary gland. Several acini converge on a single intercalated duct, which connects to other intercalated ducts, which in turn converge on a striated duct or directly into the granular segments of the striated ducts if present. Many striated ducts connect to a few excretory ducts which all merge to form a single main excretory duct.

In addition to the secretory units other structures are found in salivary glands. Most notable are the myoepithelial cells, which envelop acini and intercalated ducts in long cytoplasmic extensions containing filaments that have contractile properties. Salivary glands possess a rich blood supply important not only in nutrient supply, but also as a major source of many components of saliva that are directly derived from the blood. Associated with the acinar and

duct cells are neural elements responsible for the control of salivary secretion, blood flow and the contraction of myoepithelial cells

CONTROL OF SALIVARY SECRETION

Parasympathetic control

Parasympathetic fibers to the submandibular and sublingual glands exit the brain stem in the nervus intermedius (facial, cranial nerve VII, nerve sensory branch), and join the chorda tympani, which then merges with the lingual nerve (a branch of the trigeminal nerve). The parasympathetic fibers then connect in the submandibular ganglion, and the postganglionic fibers distribute to the two glands. The efferent supply to parotid and lingual (von Ebner's) salivary glands travel in the glossopharyngeal nerve (IX). Parasympathetic fibers to the parotid gland travel in the tympanic plexus, lesser superficial petrosal nerve and synapse in the otic ganglion. Postganglionic fibers travel to the parotid gland in the auriculotemporal nerve. Lingual salivary glands receive their efferent parasympathetic supply through the lingual-tonsilar branch of the glossopharyngeal nerve.

Sympathetic Control

The sympathetic nerve supply to the salivary glands is derived from the superior cervical ganglion. Preganglionic fibers to the superior cervical ganglion have cell bodies located in the intermediolateral nucleus situated in the upper thoracic segments of the spinal cord. The preganglionic fibers ascend in the paravertebral sympathetic trunk to the superior cervic ganglion. After a synapse in the ganglion the postganglionic fibers travel to the glands as a plexus of nerves associated with blood vessels.

Distribution of Nerve Fibers in Glands

Once the secretomotor fibers reach the gland they distribute and connect acinar cells, myoepithelial cells, and blood vessels. Two types of neuroeffector relationship have been shown between nerve endings and acinar cell basement membranes. In the first, termed epilemmal, the axon is separated from the acinar cells by a basal lamina. In the second, called hypolemmal, the axon is closely apposed to the acinar cell beneath the basal lamina. The second type is usually but not always associated with parasympathetic, cholinergic innervation, whereas the first is often related to sympathetic innervation[7].

COMPOSITION AND FLOW OF SALIVA

Saliva is a very dilute fluid, composed of more than 99% water and only 1 % of saliva is made up of ions and organic components. Saliva is usually a dilute aqueous solution that is hypotonic when compared to serum. Lower levels of glucose, bicarbonate, and urea in unstimulated saliva augment the hypotonic environment to enhance taste. The normal pH of saliva is 6 to 7, meaning that it is slightly acidic. The pH in salivary flow can range from 5.3 (low flow) to 7.8 (peak flow) [11].

Inorganic components

The most important cations of saliva are sodium and potassium; the major osmotically active anions are chloride and bicarbonate. Other electrolytes that are present include calcium phosphate, fluoride, thiocyanate, magnesium sulfate, and iodine. Water and the ionic constituents of saliva are derived by translocation from blood plasma. However, although salivary electrolytes are derived from the blood supply, their ionic concentrations are not identical to plasma, so that saliva is not merely an ultrafiltrate of plasma.

Organic components:

Saliva contains many organic components with diverse functions, such as enzymatic action, coating of tissue surfaces, protection of dental tissues, and control of tissue growth. The digestive enzyme amylase is the organic component found in highest concentration in saliva. Lipase secreted by the lingual (von Ebner's) salivary glands probably has a very significant role in digestion. Lingual lipase is the enzyme responsible for the first step in fat digestion and is active at stomach pH. Mucous glycoproteins secreted in saliva have a high molecular weight and consist of multiple oligosaccharide chains attached to a peptide core. All oral soft tissues coated with mucous glycoproteins, which are thought to act as a trap for bacteria and a regulator of interaction and interchange between surface epithelial cells and the oral environment. Some of these glycoproteins bind strongly to the tooth surface and are, therefore, an important constituent of enamel pellicle.

Numerous other proteins found in saliva are not secretary in function .Secretory immunoglobulin A (lgA) is synthesized by plasma cells. Lysozyme in concert with other salivary bactericidal agents is probably important in oral protective functions.

The salivary duct cells are capable of secreting complex molecules such as nerve growth factor and kallikrein, but although the functions of these macromolecules are well established, they are probably of little importance if secreted into the oral cavity, unless some undiscovered function emerges[7].

A tyrosine-rich peptide, called statherin, may play a role in stabilizing supersaturated solutions of calcium and phosphate and therefore prevents calcium precipitating from saliva. The functions of other peptides such as histadine-rich peptide are unknown, although it has been suggested that they have a role in pellicle formation. Other possible functions for these proteins include aggregation of bacteria, which contributes to oral clearance of the microorganisms.

FUNCTIONS OF SALIVA

Cleansing: The mucosa and dentition are coated by a layer of mucin that impedes the surface accumulation of food and other debris. The flow of saliva continually washes this material off surfaces towards the back of the mouth where it is eventually swallowed.

Lubrication: There is considerable movement between the structures within the oral cavity in addition to stretching of the mucosa during normal activities. Saliva, by virtue of its rheological properties, forms a continuous surface film over all surfaces, its viscoelastic nature facilitating the maintenance throughout function. For this lubricative function, the water content, mucins and proline-rich proteins are necessary.

Mucosal integrity: The mucosa is maintained in an hydrated state because of the surface-charged aqueous film. Mucins are important in maintaining this protective for the epithelium, and the electrolyte content of the saliva is also relevant. Potential mucosal irritants are diluted in saliva and the array of antimicrobial systems is involved in promoting a healthy commensal flora. Growth factors, such as epidermal growth factor, have the potential to act topically although their importance in the mouth is unclear.

Buffering: The principal buffering agent in saliva is bicarbonate, although phosphate and proteins also contribute to its buffering capacity, protecting the dentition from demineralization by plaque organic acids.

Remineralisation: Saliva is supersaturated with calcium and phosphate resulting in, at neutral pH, the equilibrium being towards non-dissolution of the enamel. Statherin and anionic proline-rich proteins enable high concentrations of calcium and phosphate to be maintained in

saliva without precipitation but allow exchange of these ions with the hydroxyapatite surface. The remineralisation process is further enhanced by fluoride.

Antimicrobial: The attachment of micro-organisms to the mucosa and teeth is modulated by the surface film of charged glycoproteins and proteins. Several antimicrobial substances present in saliva influence fungal, bacterial and viral growth, so maintaining a balanced commensal flora. These substances include immunoglobulins, lactoferrin. lysozyme, the thiocyanate/peroxidase system, cystatins and histatins.

Digestive: Foods are dissolved or diluted in saliva, allowing them to be tasted and subsequently swallowed. Saliva also contains a number of enzymes capable of initiating digestion, such as α-amylase and lipase, although their importance in humans is unclear.

Research applications: Many areas of research involving salivary components and functions are in progress for local and systemic disease diagnosis, treatment, and prevention. The value of saliva undoubtedly will continue to increase because it serves as an easily collected, noninvasive source of information. Reflective of the status of health in the body, salivary samples can be analyzed for: (1) tissue fluid levels of naturally, therapeutically, and recreationally introduced substances; (2) emotional status; (3) hormonal status; (4) immunologic status; (5) neurologic status; and (6) nutritional/metabolic influences[11].

Salivary flow measurements revealed that mucous saliva is necessary for undisturbed function of the denture bearing mucosa and for comfort with dentures. Further, palatal saliva improves the retention of upper complete dentures.

The best lubricating components of saliva are mucins that are excreted from minor salivary glands. Mucins are complex protein molecules that are present predominantly in two molecular weight types and formed by polypeptide chains that stick together. These mucins have the properties of low solubility, high viscosity, high elasticity, and strong adhesiveness. Any intraoral contact between soft tissues, between soft tissues and teeth, or between soft tissues and prostheses benefits from the lubricating capability of saliva supplied largely by these mucins. Mastication, speech, and swallowing all are aided by the lubricating effects of mucins.

Buffering action and clearance are a second function of saliva through the following components: bicarbonate, phosphate, urea, and amphoteric proteins and enzymes. Bicarbonate is the most important buffering system. It diffuses into plaque and acts as a buffer by neutralizing acids. More than 90% of the nonbicarbonate buffering ability of saliva is attributed to low-molecular-weight, histidine-rich peptides. Urea, another buffer present in saliva, releases ammonia after being metabolized by plaque and thus increases plaque pH. The buffering action of saliva works more efficiently during stimulated high flow rates but is almost ineffective during periods of low flow with unstimulated saliva. Phosphate is likely to be important as a buffer only during unstimulated flow.

Immunologic contents of saliva include secretory IgA, IgG, and IgM. Nonimmunologic salivary contents are selected proteins, mucins, peptides, and enzymes. Secretory IgA, the largest immunologic component of saliva, is an immunoglobulin produced by plasma cells in connective tissues and translocated through the duct cells of major and minor salivary glands. IgA while active on mucosal surfaces, also acts to neutralize viruses, serves as an antibody to bacterial antigens, and works to aggregate or clump bacteria, thus inhibiting bacterial attachment to host tissues.

Lysozymes, derived from the basal cells of striated ducts in parotid glands, split bacterial cell walls, leading to the destruction and inhibition of bacterial growth. Moreover, lysozymes promote the clearance of bacteria through aggregation. Gingival crevicular fluid also contributes lysozymes from plasma.

Finally, proteins such as glycoproteins, statherins, agglutinins, histadine-rich proteins, and proline-rich proteins work to aggregate bacteria. This "clumping" process, reduces the ability of bacteria to adhere to hard or soft tissue intraoral surfaces and thereby controls bacterial, fungal, and viral colonization.

SALIVA AND DENTURE PELLICLE

Salivary constituents show high affinity of binding with denture surface may be responsible for many surface properties of denture base, which include microbial adherence subsequent plaque formation, and denture staining.

Salivary mucins and secretary Ig A in saliva are found to have a regulatory effect in attachment of microorganisms to tissues and the denture. Secretary Ig A was found to inhibit or promote the attachment of bacteria to hydroxyapatite and inhibitory effect on yeast and bacteria to buccal epithelial surface. Other salivary components as well as normal serum appear to be determinants of Candida to acrylic denture surface. Mucin is also found to modulate the adherence of microorganism to denture surface.

The pellicle layer is responsible for the formation of extrinsic staining and calculus deposition on the denture base. The spontaneous precipitation of calcium and phosphate salts influence calcifications in dentures.

When denture prosthesis is placed in the oral cavity, a layer of saliva rapidly adsorbs to the surface. This is termed acquired denture pellicle. The pressure of acquired denture pellicle is described in ultra structural studies as a thin (2-4 Micron) electron dense layer that may appear as a striated lamellar palisade. The minor salivary glands of palatal mucosa must be considered a major source of acquired denture base, but also the tissue side. This is due to their close proximity to the denture base, but also the isolating effect of maxillary palatal surface which is designed to create a border seal. This pellicle formation may predispose to denture stomatitis. Denture induced stomatitis found in 11-67% of denture patients. Many factors predisposes to denture induced stomatitis. Complete denture wearers for many years show palatal gland destruction. It may be due to pressure atrophy resulting from lost residual alveolar ridge support of denture.

SALIVA AND ORAL GALVANISM

Although oral galvanism has been known ever since the time of Galvani at the end of the eighteenth century, it did not become an important problem until after the First World War. Owing to the high price of gold at that time, dental surgeons, especially in Germany, began to use alloys containing lead, copper, tin aluminum, iron, silver, nickel, and zinc. The use of different alloys in the oral cavity, which contains such a good electrolyte as saliva, permitted the development of electrical potential differences known as "oral galvanism".

Oral galvanism is said to cause the following phenomena:

1) Sensation of pain in and around the teeth

2) Ulceration of the mucosa

3) Corrosion and discoloration

All metals tend to release ions into the solution. This tendency, which varies from one metal to another according to its chemical properties, is called the electrical soluble tension. This is counteracted by the osmotic pressure of the ions. If the soluble potential is greater than the osmotic pressure the metal dissolves by releasing positive ions into the fluid; the fluid thus becomes positively charged and the metal becomes negatively charged. This increases the osmotic pressure, and when this pressure has become equal to the soluble tension, a state of equilibrium is achieved. Between the metal and the electrolyte there is then a potential difference.

If the soluble tension of the metal is less than the osmotic pressure, the ions in the solution are charged on the metal, which thus becomes negative. In this way the soluble pressure of the metal increases and the osmotic pressure of the solution decreases. This continues until equilibrium is achieved. A potential difference arises here although the direction of current is opposite.

Generally speaking, readily oxidizing metals, such as aluminum, zinc, magnesium and iron in a solution of acids or of their salts become negatively charged while the more noble, less oxidized metals become positively charged.

The metals have been classified empirically according to their electrolytic potential. This potential is lowest among the noble metals. Each metal shows an electropositive relationship to

every successive element in a solution of equivalent ionic concentration. In other words, the position of the metal in the electromotive series may be taken as a measure of its resistance to chemical action and as a yardstick of the resistance of a metal in a given electrolyte.

The electrolytic action between two metals or alloys in the mouth will, however, be of less importance as long as an electric current can flow between them a galvanic element. In the oral cavity with saliva as the electrolyte, the continuous renewal of the saliva prevents equilibrium and thereby maintains the electrolytic action, so that part of the metal gradually goes into solution-corrosion. This is often accelerated by the presence of another metal, even if they are not in contact with each other. If, for example, aluminium and copper or a copper alloy is present in the oral cavity, ions of both metals will, independently of each other, go into solution to a certain degree. Copper alone do not readily go into solution, but the presence of aluminium, with its higher soluble potential, causes the copper ions to be discharged and to be released' as a free metal. This disturbs the equilibrium between the copper and copper solution, and both aluminium and copper corrode. The situation is however, often still more complicated because the metals used are nearly always alloys. Often several different alloys are in contact with one another, which results in a complex of electric currents. These currents sometimes produce an increase and sometimes a decrease of the eletrogalvanic phenomena[1].

When ever two metals are present in the oral cavity, in contact with and rinsed by saliva, they will produce a closed element and a circuit. In the element, chemical energy is converted into electrical energy, with the result that the filling, which acts as the anode, is dissolved. With gold and amalgam, for example, as electrodes, the amalgam will be the anode in the galvanic element and release ions into the solution as long as the current is present. The amalgam becomes corroded. The higher the potential differences between the amalgam and the other electrode, i.e., the nobler the cathode is the more rapid corrosion.

Annexure- II

VALUE ADDED COURSE

SALIVA
DI-9

List of Students Enrolled Sep 2016 – Jan- 2017

Year MBBS Student		
Sl. No	**Name of the Student**	**Roll No**
1	VINOTHINI .S	U15MB397
2	YAKSHANA. D	U15MB398
3	YAUVANNASRI. J	U15MB399
4	SRIRAM .S	U16MB381
5	SUBALAKSHMI .D	U16MB382

DR. GANANANDHAR
RESOURCE PERSON

DR. BALAJI SUBRAMANIYAN
COORDINATOR

Bharath Institute of Higher Education and Research

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,

Participant list of Value added course: SALIVA

Sl.No	Reg.No	Name of the candidate	Signature
1	U15MB397	VINOTHINI .S	
2	U15MB398	YAKSHANA. D	
3	U15MB399	YAUVANNASRI. J	
4	U16MB381	SRIRAM .S	
5	U16MB382	SUBALAKSHMI .D	

NAME: SUNITHA
ROLL NO: 016HB383

28/50

Saliva

The watery, slightly alkaline fluid secreted into the mouth by Salivary glands and mucous membrane that lines the mouth.

- Watery and frothy in consistency - produced in humans and produced and secreted from the Salivary glands.

Classification:

- Major
- Minor.

Major Salivary glands.

- parotid
- Submandibular
- Sub lingual.

Minor Salivary glands. Accessory

- Labial / buccal
- Anterior
- Palatine
- Gloss palatine
- Von - ebnerts

II. Classification of Salivary glands.

Based on the type of Saliva Secretion

- Mucous
- Serous
- Mixed.

PH- 5-8.

Function of Salivn.

- Digestive
- protective — Lubrication properties.
  — Maintenance of mucous membrane.
- Taste.
- Excretion
- Water balance.
- oral hygiene.

Disease of the Salivary glands.

- Parotitis.
- Sialo lithiasis.
- Salivary gland tumors.
  - Spino- cellular Carcinoma.
    - Breast cancer.
    - Blood cancer.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that YAKSHANA.D has actively participated in the Value Added Course on *SALIVA* held during JAN 2019 – MAR 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. GANANANADAR
RESOURCE PERSON

DR.BALAJI.R
COORDINATOR

Student Feedback Form

Course Name: SAIVA

Subject Code: MI - 9

Name of Student: SRIRAM. S Roll No.: U16MB387

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course			✓		
8	Overall rating of the course	1	2	3 ✓	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 29.12.18

Signature

COURSE COMPLETION

Date5.3.2019

From
DR. BALAJI SUBRAMANIYAN.R
DEPARTMENT OF DENTISTRY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: SALIVA

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **SALIVA** on 3.3.2019. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. BALAJI SUBRAMANIYAN.R

Dr. BALAJI SUBRAMANIAN, MDS.,
Reg. No. [illegible]
Professor HOD Dental
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Encl: Certificates

Photographs



Sri Lakshmi Narayana Institute of Medical Sciences

Date 02/01/2019

From
Dr.R.Venkataramanan,
Professor and Head,
otorhinolaryngology,
SLIMS
Bharath Institute of Higher Education and Research,
Puducherry.

To
The Dean,
SLIMS
Bharath Institute of Higher Education and Research,
Puducherry.

Sub: Permission to conduct value-added course: : Hands on training on VEMP for assessment of Vertigo reg.

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Simulation Based Training In Audiology on Jan 2019 to April 2019. We solicit your kind permission for the same.

Kind Regards

Dr.R.Venkataramanan

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:
The Dean:
The HOD:
The Expert:

The committee has discussed about the course and is approved.

Dean

(Sign&Seal)

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Dr. R. NITHISH TIMOTHY, MS.,
Reg. No.108008
Assistant Professor ENT
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

SUBJECT EXPERT
(Sign &Seal)

Dr. R. VENKATARAMANAN, MS.,
Reg. No: 72549
Professor ENT
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

HOD SIGN AND SEAL

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Ref. No. SLIMS/Dean Off/VAC/024 **Date:03/01/19**

From
The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

To
The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

Respected Sir

Sub: Request for permission and approval of Syllabus for certificate course (Value Added course) for the academic year 2018-19 - Reg
Ref: Requesting letter received from Departments

*****

With reference to the above, herewith forwarding the proposed list of Value-added courses for necessary permission and approval of syllabus to conduct the same.

This is for your kind information and needful action.

Thankingyou

Yours faithfully

[DEAN]

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl's:

1. Requesting letter received from department
2. Syllabus of the course
3. Details of faculty handling course

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

VALUE ADDED COURSE : Hands on training on VEMP for assessment of Vertigo

COURSE CO-ORDINATOR DETAILS

Faculty Name: Dr.R. Nithish Thimothy

Email ID:e n t s l i m s @ g m a i l . c o m

Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)

Ref. No. BHIER/ VAC/B-02 **Date:05.01.2019**

From

The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

To

The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

Sir / Madam,

Sub: Approval of Syllabus to conduct certificate course (Value Added course) for the academic year 2018-2019 – Reg.

Ref: Ref. No. SLIMS/Dean Off/VAC /024 Dated: 03.01.2019

*****

With reference to the above, it is to inform that the proposal submitted to conduct Value Added Course has been accepted and approved by BIHER, council meeting. List of the VAC are mentioned below for the academic year 2018– 2019. The abstract of the VAC course completion detail should be submitted to the Registrar office.

Thanking you

Yours faithfully

REGISTRAR

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

.

07/01/2019

Sub: Organising Value-added Course: Hands on training on VEMP for assessment of Vertigo **reg.**

With reference to the above mentioned subject, it is to bring to your notice that SLIMS,**Bharath Institute of Higher Education and Research**, is organising **"Hands on training on VEMP for assessment of Vertigo"**. The course content and registration form is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 15/01/2019. Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl: Copy of Course content

VALUE ADDED COURSE

1. Name of the programme &Code

Hands on training on VEMP for assessment of Vertigo – A value added course for the medical students.
& **ENT 09**

2. Duration &Period

30 hrs & Jan 2019-April 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Pre test and post test which includes 10 mcqs - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time Jan 2019- April 2019

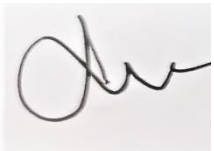
8. Year of discontinuation:2019

9. Summary report of each program year-wise

Value Added Course- Jan 2019- April 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	ENT 09	Hands on training on VEMP for assessment of Vertigo	1.Dr.Venkataramanm 2. Dr. Ganesh.S	3rd year MBBS students	9 students & 2019

10. Course FeedBack

Enclosed as Annexure- V





RESOURCEPERSON
1. **Dr.R. VENKATARAMANAN**
2. **Dr.S . GANESH**

COORDINATOR
Dr.R. NITHISH TIMOTHY

COURSE PROPOSAL

1. NAME OF THE PROGRAMME

Hands on training on VEMP for assessment of Vertigo– A value added course for the medical students.

2. AIM

Training the students with hands on experience on VEMP as an objective assessment of Vertigo

3. OBJECTIVES

a) To teach the students to connect the electrodes of VEMP
b) To teach the students to interpret the VEMP waves

4. METHODOLOGY

Students who are interested in participating in value added course are enrolled and the course is conducted for them during the non college hours for a period of 30 hours from Jan 2019 – April 2019 . This course is conducted every 6 months.

Course Audience: 3rd year MBBS students

Course Coordinator: Dr. R. Nithish Thimothy

Course Faculties with Qualification and Designation:

1.Dr. R. Venkataramanan

2.Dr. S. Ganesh

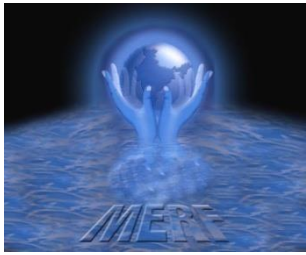
Schedule followed during the course

No	Topic	Title	Duration	Date and time
1	Hands on training on VEMP for assessment of Vertigo	Introduction of Vestibular Evoked Myogenic Potential (VEMP)	4 hrs	4pm-6pm(2/1/19),4pm-6pm(10/1/19)
		Principle and method of recording VEMP	4 hrs	4pm-6pm(23/1/19),4pm-6pm(28/1/19)
		Ocular and cervical VEMP	4 hrs	4pm-6pm(5/2/19),4pm-6pm(12/2/19),
		Clinical uses of VEMP	4 hrs	4pm-6pm(15/2/19),4pm-6pm(20/2/19),
		Basis of analysis VEMP	4 hrs	4pm-6pm(26/2/19),4pm-6pm(5/3/19)
		Demonstration of VEMP and interpretation of results	5 hrs	4pm-6pm(11/3/19),4pm-6pm(14/3/19),4pm-5pm(18/3/19)
		Hands on training on VEMP lead connection and interpretation of results and DOPS	5 hrs	4pm-6pm(25/3/19),4pm-6pm(4/4/19),4pm-5pm(11/4/19)
		TOTAL	30HRS	

REFERENCE BOOKS: 1) SCOTT BROWN 7th edition

2) ANIRBAN BISWAS 3rd edition

VESTIBULAR EVOKED MYOGENIC POTENTIALS
ITS INDICATIONS & CURRENT STATUS



VESTIBULAR EVOKED MYOGENIC POTENTIALS

- An otolith(saccule)-mediated short - latency reflex recorded from averaged sternocleidomastoid electromyography in response to clicks or tonebursts.
- Increasingly used in the evaluation of patients with vertigo



- Conventional vestibular assessment - evaluation of horizontal semicircular canal
- VEMP – evaluation of saccule, inferior vestibular nerve & vestibulocollic pathway
- VEMP is a polysynaptic response & helps in the assessment of ***lower brainstem function***, unlike the caloric tests & ABR which assess ***the upper brainstem***



- Saccule and saccular nerves have the lowest threshold to response to acoustic stimuli – ***basis of VEMP test***
- This sound sensitivity is thought to be a remnant from the saccule's use as an organ of hearing in lower animals



HISTORY OF VEMP

- Sound-evoked vestibular responses in humans were described by Tullio (1929) & Von Békésy (1935)
- Townsend et al.noticed the true origin of these potentials was the saccule
- Colebatch and Halmagyi first recorded VEMPs (1992)
- Kovach reintroduced VEMP (1994)
- Clinically used since 1992



VEMP - INDICATIONS

- Indicated in the diagnosis of peripheral and central vestibulopathies
- Differentiation of labyrinthine from retro labyrinthine lesions
- Used to monitor the efficacy of intratympanic gentamycin treatment
- Can be used in intraoperative, neurophysiological monitoring



VEMP - PATHWAYS

Sound stimulation of saccule Inferior vestibular nerve

Vestibular nucleus

MVST

LVST

Accessory nucleus & Nerve Sternocleidomastoid muscle

Leg muscles

VEMPS are ipsilateral



VEMP methods

- Click evoked VEMP – most reproducible, symmetric, and technically easy to perform.
- Air- and bone-conducted short tone bursts
- Bone conduction VEMP
- Galvanic VEMP
- Forehead taps



EQUIPMENT

- Evoked response computer
- Sound generator
- Surface electrodes to pick up neck muscle activation



VEMP - technique



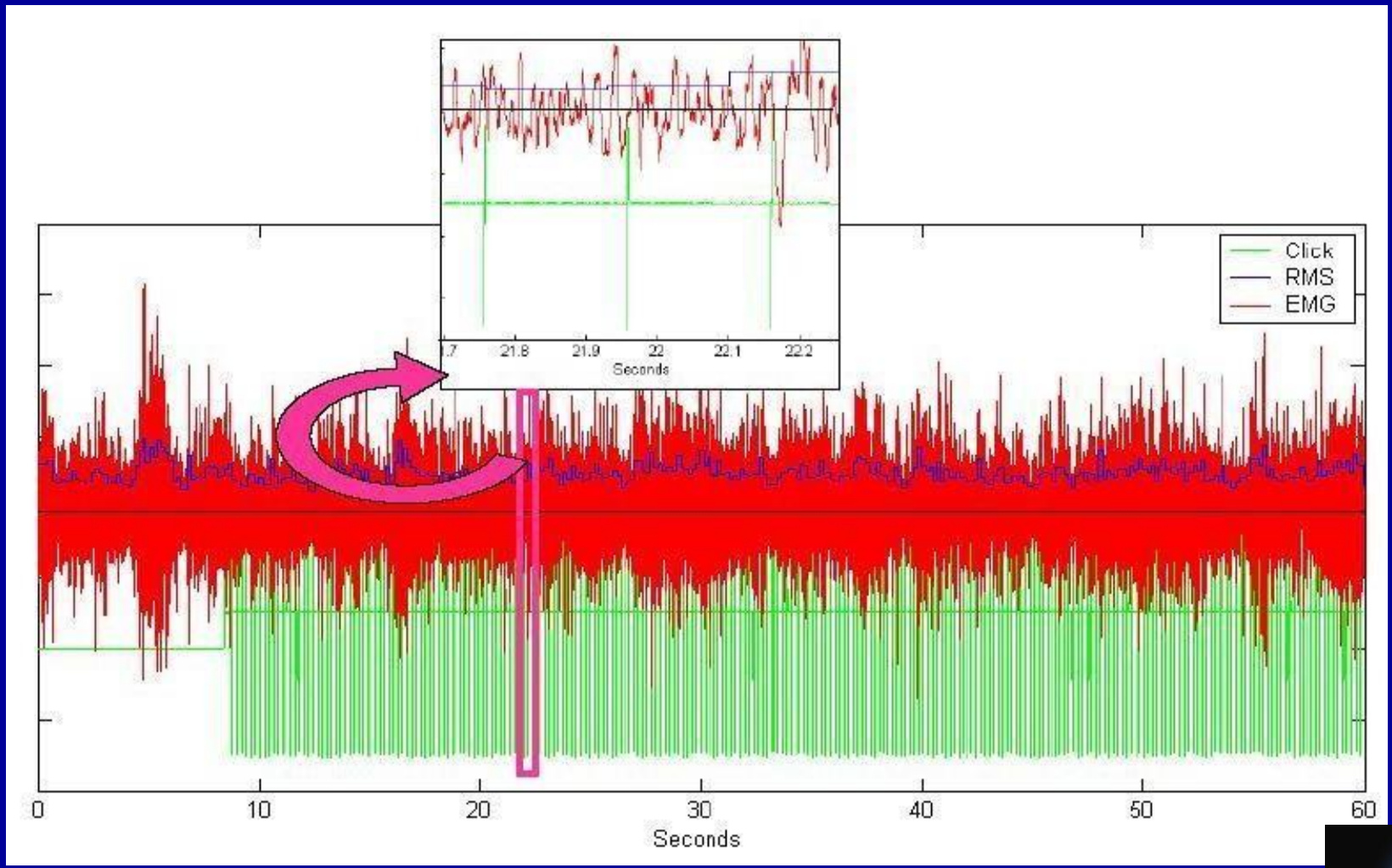
- Subjects are instructed to tense the muscle during runs of acoustic stimulation, relax between runs
- Inserts are preferable to headphones
- The response is ipsilateral, hence bilateral stimuli and bilateral recording is done
- Loud clicks (0.1 msec) or tone bursts (typically 95-100 dB nHL or louder) are repetitively presented to each ear in turn at 200 msec intervals (5/second)
- Optimum frequency: 500 - 1000 Hz
- 3 repetitions on each side



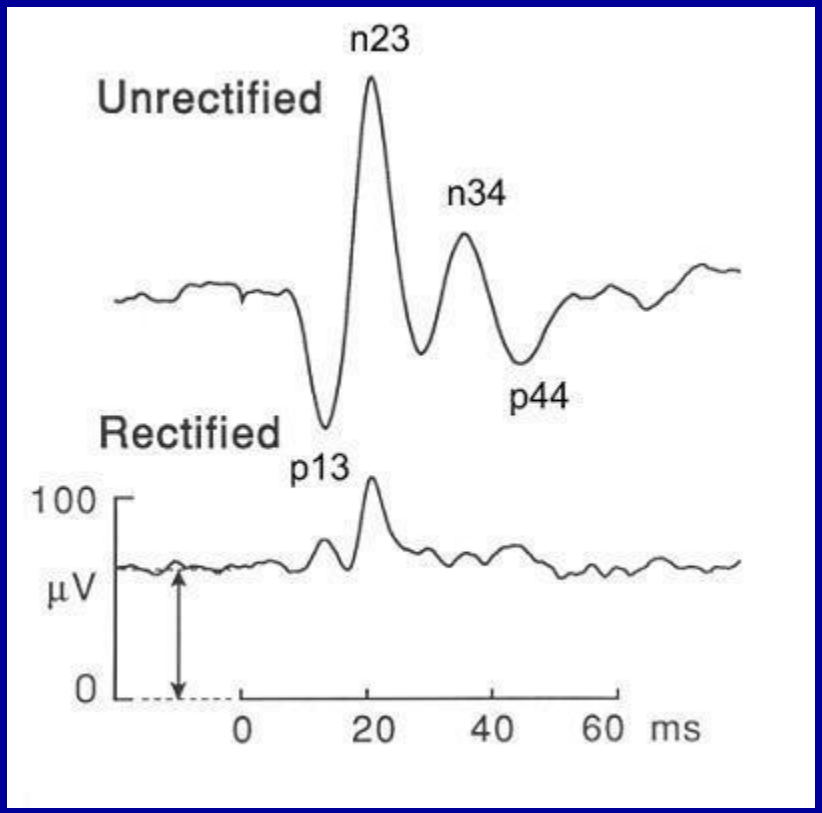
- Myogenic potentials are amplified, bandpass filtered (5-1K Hz), and averaged for at least 100 presentations
- The response evoked in the neck EMG is averaged and presented as a VEMP
- VEMP is recorded in the first 30 ms after the stimulus
- The latency, amplitude, and threshold for the p13-n23 wave is measured



NORMAL VEMP


Click
RMS
EMG
21.8
21.9
22
22.1
22.2
Seconds
0
10
20
30
40
50
60
Seconds

NORMAL VEMP



The initial biphasic p13 and n23 response is larger

The late response (n34 and p44) represents cochlear stimulation.

VEMP measures

- *Threshold - most clinically useful*

  - measures threshold in four different frequencies (250,500,750 and 1000Hz)

  - third window in the inner ear - decreased threshold

- **Latency** - prolonged in multiple sclerosis
- **Amplitude** - measured from the P13 to N23

  - fairly variable response, even between ears of the same patient



ABNORMAL VEMP

- Asymmetry is calculated by Amplitude Asymetric ratio
- If the ratio is more than 33% then asymmetry exsists
- Absent (no reproducible wave, or P1 latency outside of norms)



Attenuated or absent VEMP

- Conductive loss
- Herpes zoster oticus
- Meniere`s disease
- Aminoglycoside ototoxicity
- Vestibular schwannoma
- Post cochlear implantation
- Basilar artery migraine
- Cogan’s syndrome
- Mondini malformation
- Vestibular neuritis
- Idiopathic bilateral vestibulopathy (IBV)

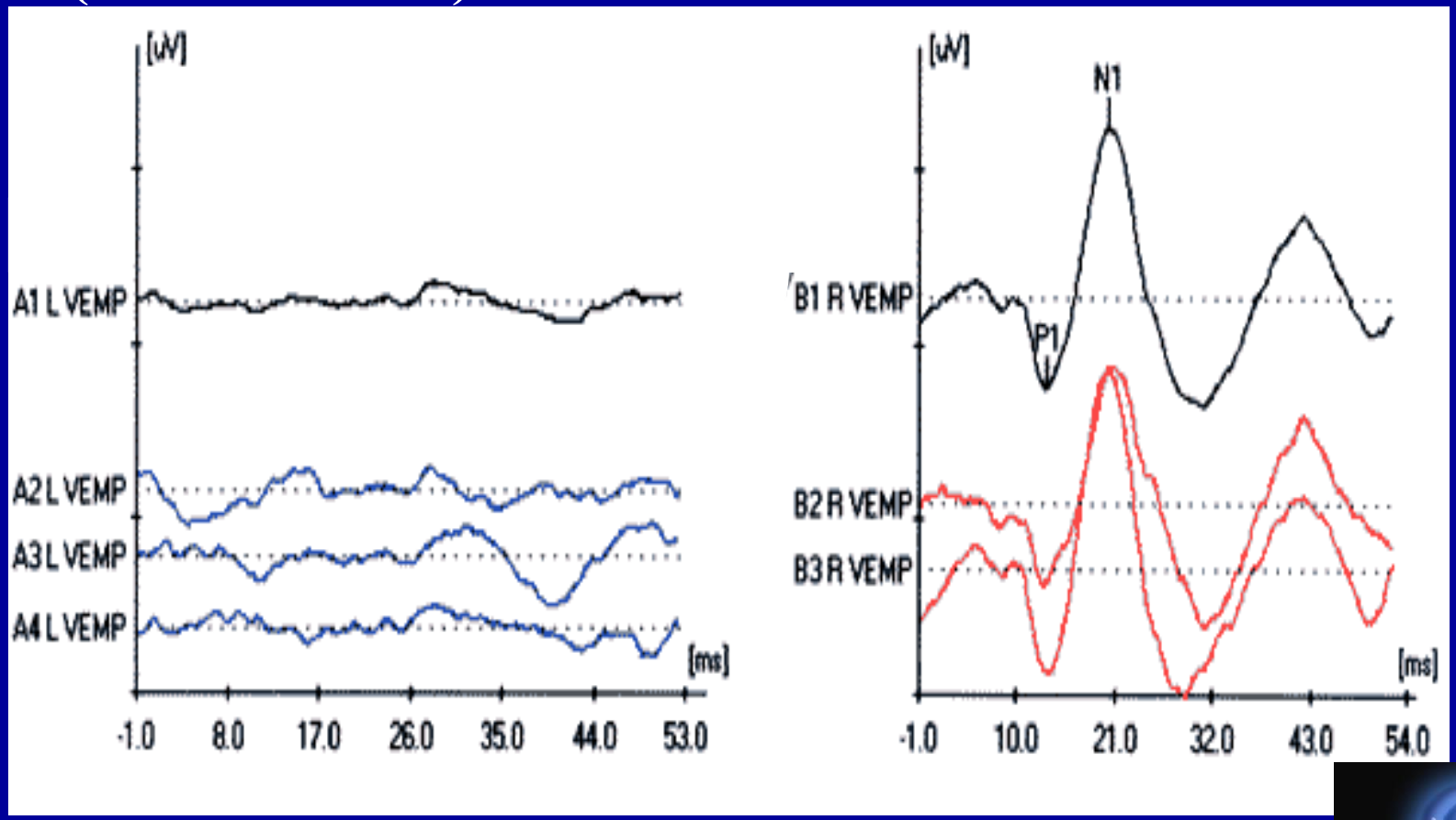


Conductive hearing loss

Left ear
(Absent VEMP)

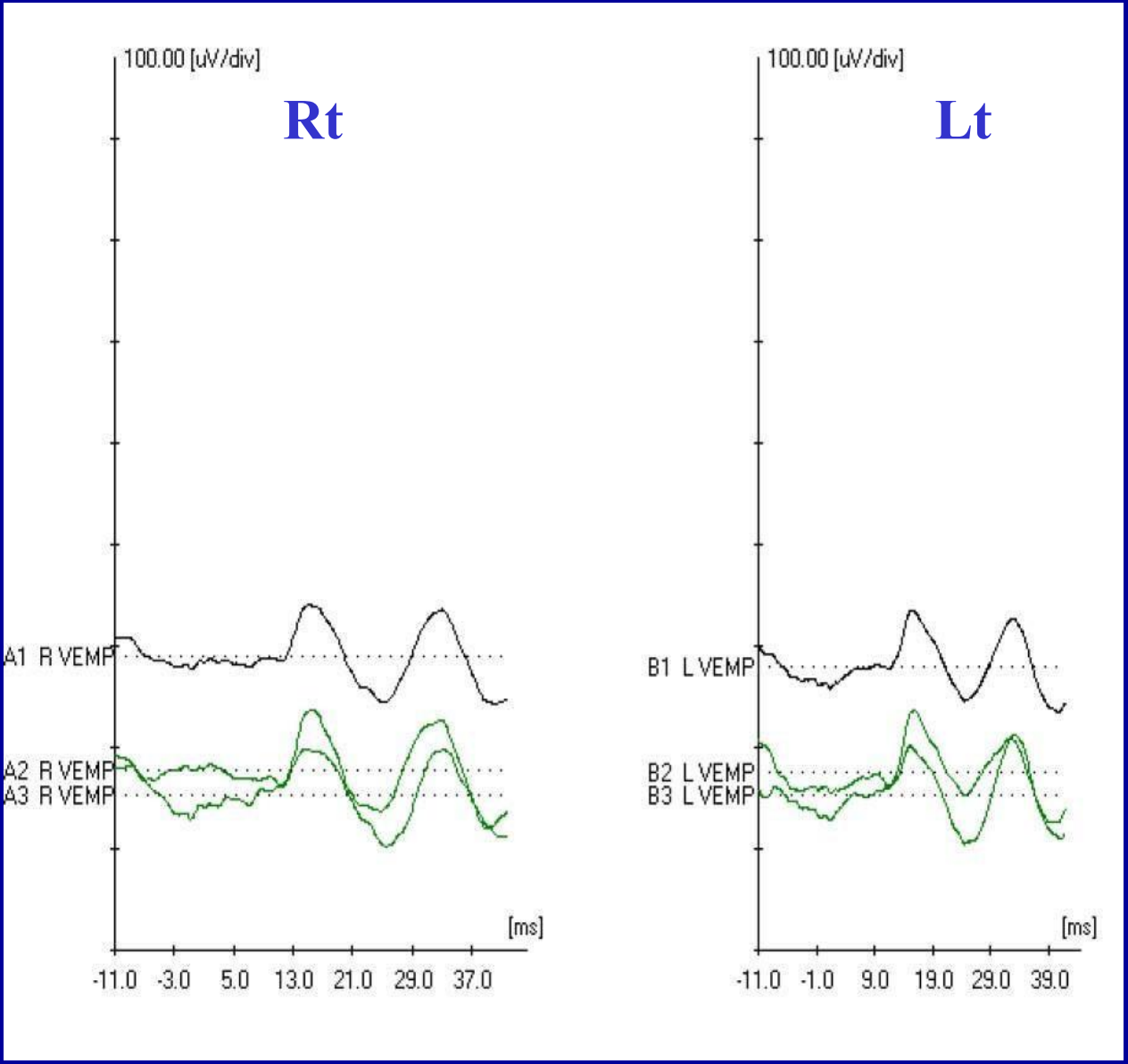
Right ear

(Normal VEMP)

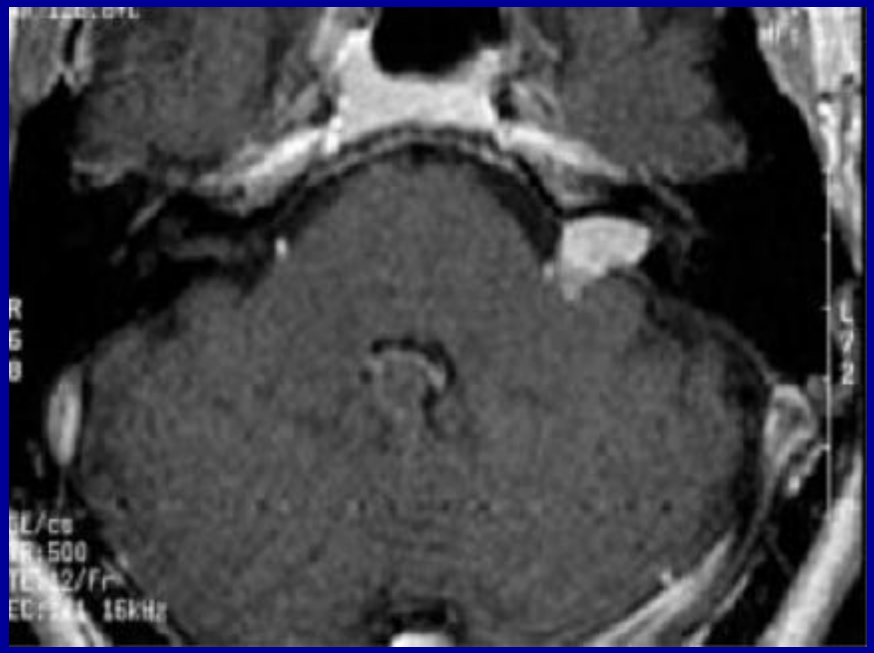


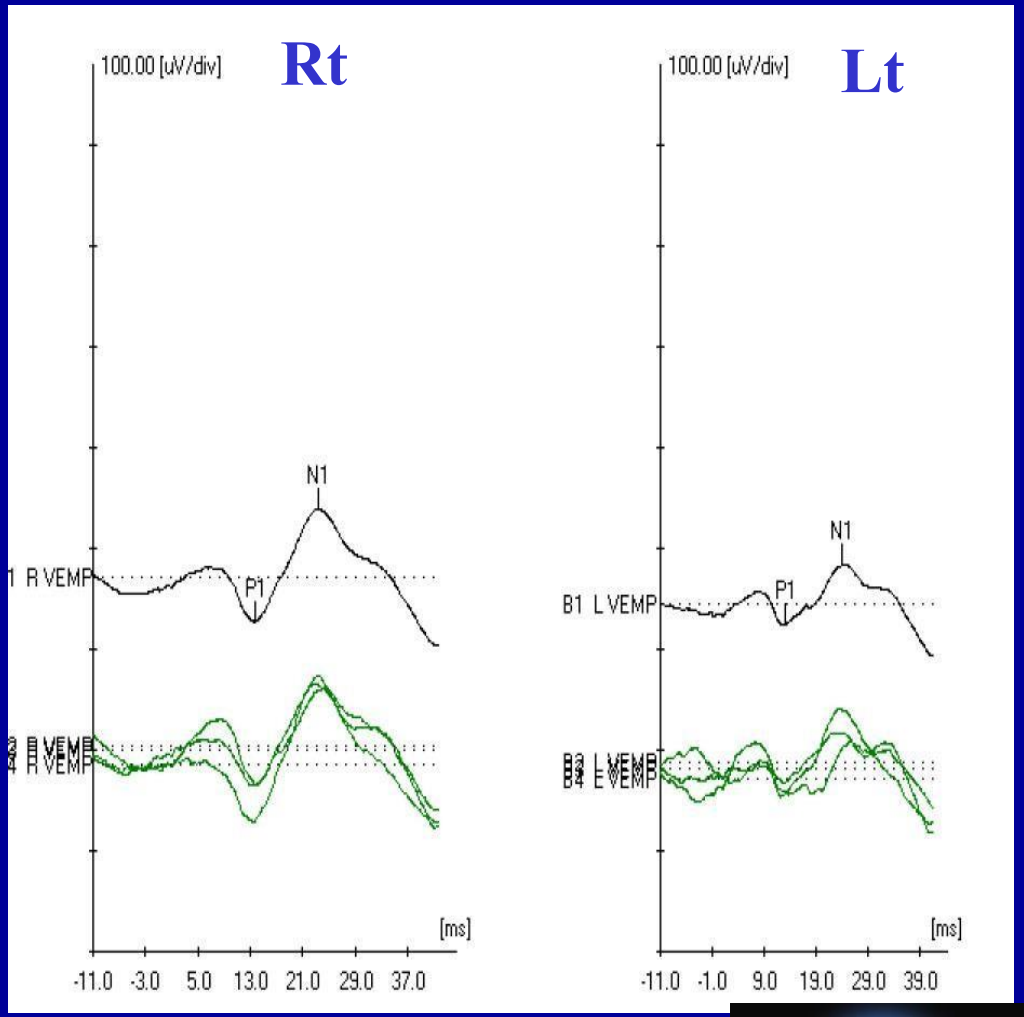


BILATERAL AMINOGLYCOSIDE OTOTOXICITY



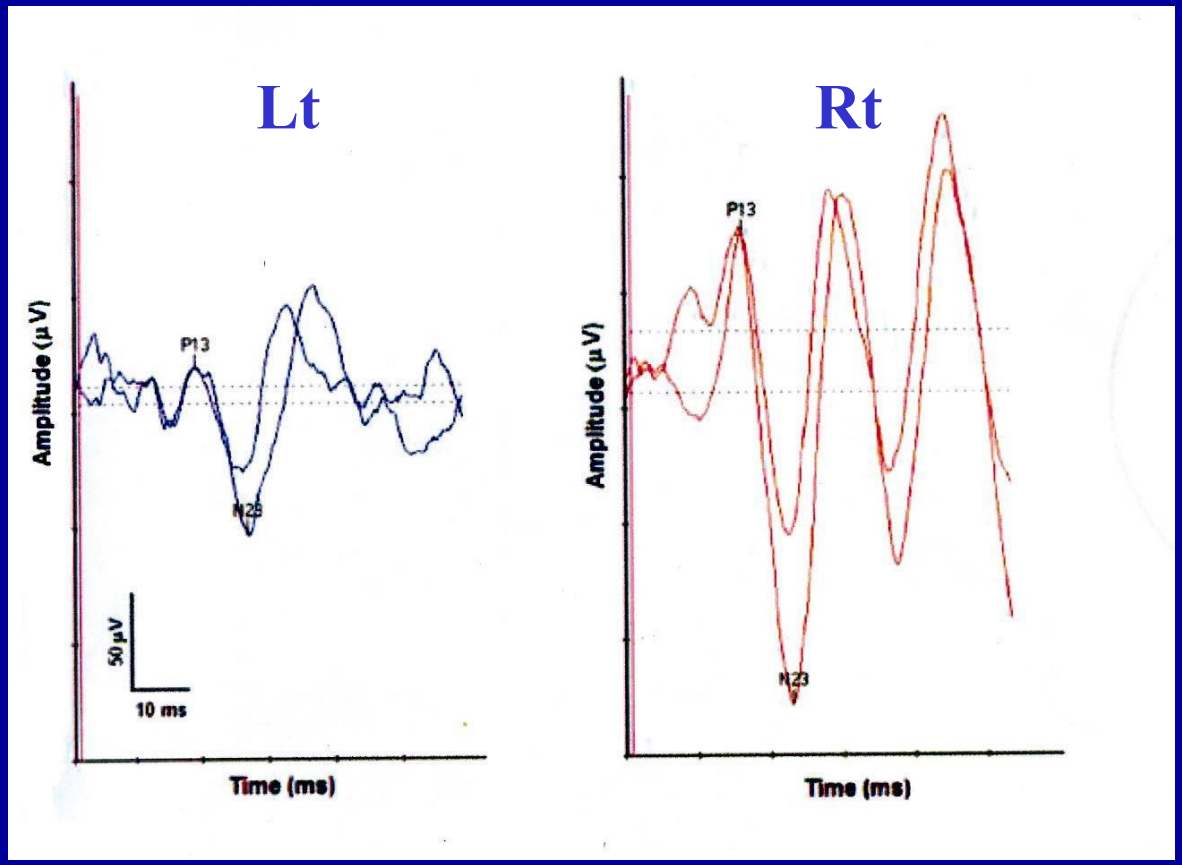
LEFT ACOUSTIC NEUROMA







VEMP - Meniere's disease



Meniere’s disease

- VEMP amplitudes can be increased in early Meniere's disease
- Absent VEMPs in advanced disease may represent collapse of the saccule
- Altered VEMP after administering glycerol



VEMP

Increased

- Superior SCC dehiscence syndrome
- Perilymphatic fistula

Asymmetrical amplitudes

- Tullio's phenomenon
- Spasmodic torticollis

Delayed

- Technical error /elderly
- Central lesions

-Brainstem stroke

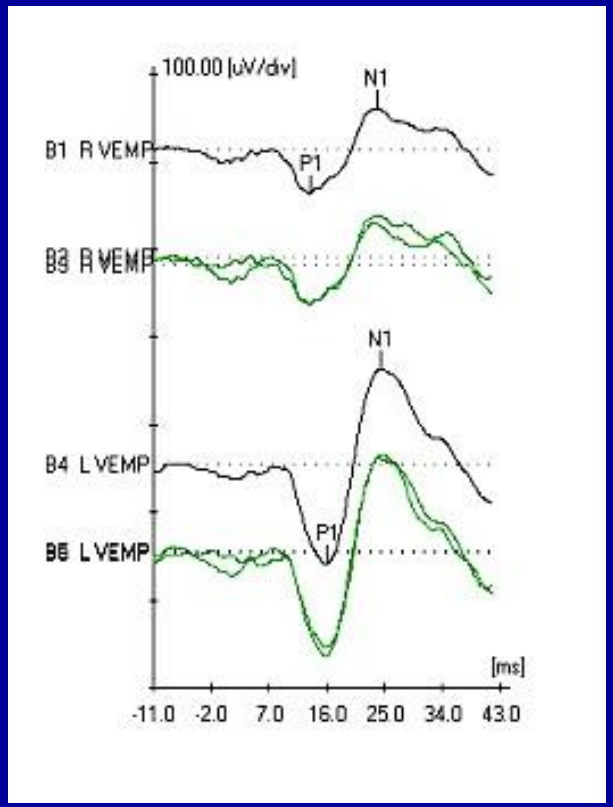
-Multiple sclerosis

-Spinocerebellar degeneration

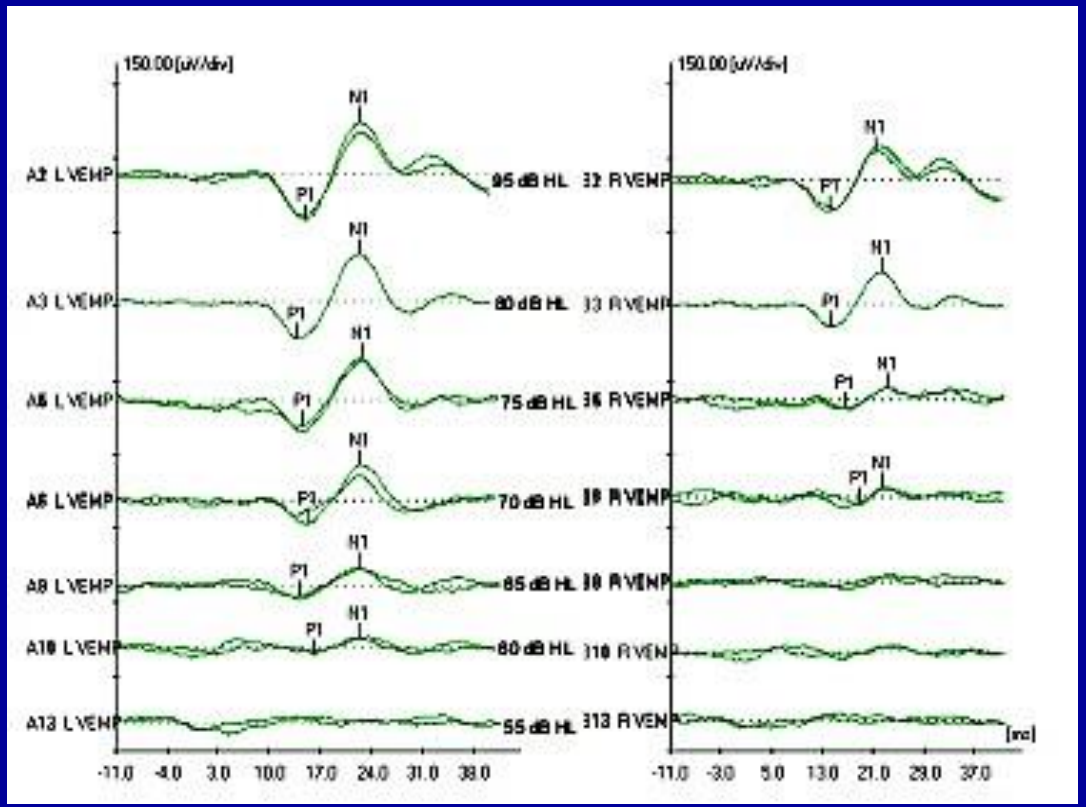
-Migraine



LEFT SUPERIOR SEMICIRCULAR DEHISCENCE



Lt Rt





VEMP - ADVANTAGES

- Specific vestibular sensory system (saccule) is assessed
- Retained in patients with profound SNHL
- Used in infants (latencies are shorter)
- Highly sensitive in the early diagnosis of retrocochlear lesions
- Robust, reproducible screening test of otolith function
- Minimal test time
- Easy to obtain & interpret
- Non-invasive, bedside test
- Does not cause discomfort



LIMITATIONS

- Conductive hearing loss obliterates VEMP's - an absent VEMP does not mean absent saccule function
- A person with a present VEMP and conductive hearing loss may have Superior semicircular canal dehiscence



CONCLUSION

- VEMP is a sound - evoked muscle reflex, or sonomotor response that can be recorded using evoked potential techniques by acoustical stimulation of the saccule
- VEMP has become an important investigative modality in the evaluation of patients with balance disorders



Annexure 2
Bharath Institute of Higher Education and Research
SLIMS

1	U16MB251	AARTHI.A
2	U16MB252	ABILASHA.K
3	U16MB253	ABITHA RAJLIN
4	U16MB254	ADAPALA PRIYANKA
5	U16MB255	ADHITHAYA RAJ .N
6	U16MB256	AJAY .N
7	U16MB257	AKSHYA .R
8	U16MB258	ALLARI KARTHIK ABHIROOP
9	U16MB259	AMAL ASHOK

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Vestibular evoked myogenic potential **(ENT09)**
STUDENT NAME:
UNIVERSITY NO:

1.Nystagmus is associated with all except:
a.cerebeller disease b.vestibular disease
c.cohlear diseae d.arold chiari malformation

2.cold caloric test stimulus
a. cochlea b. lateral semi circular canal
c .posterior SCC d. all of the above

3.VEMP in sternoclenomastoid muscle detects lesion of
a. cochlear nerve b. superior vestibular nerve
c. inferior vestibiular nerve d. inflammatory myopathy

4.Epleys maneuver
a.postional vertigo b.otosclerosis
c. ASOM d. CSOM

5.true about henneberts sign is :
a. Fistula test positive without fistula b. Fistula test positive with fistula
c. Fistula test negative without fistula d. Fistula test negative with fistula

6.at what angle is hall pike thermal caloric test done
a.15 degree b.30 degree
c. 45 degree d.60 degree

7.vertigo of peripheral vestibular origin are all except
a. meniers disease b.BPPV
c.Vestibulo basilar insufficiency d. vestibular neuronitis

8. Caloric test has :
a. Slow component only
b. Fast component only
c. Both Slow component&Fast component
d. Mainly Slow component and Fast component occasionally

9. latest treatment in BPPV
a. Intra labyrinthine streptomycin
b. intra labyrinthine steroids
c. Valsalva maneuver
d. .Eplyes maneuver

10.dix hall pike maneuver is done for assessing
a. vestibular function
b.Corneal test
c. Cochlear function
d. audiometry

PRE TEST

6.at what angle is hall pike thermal caloric test done

a.15 degree b.30 degree

X c. 45 degree d.60 degree

7.vertigo of peripheral vestibular origin are all except

a. meniers disease b.BPPV

X c.Vestibulo basilar insufficiency d. vestibular neuronitis

8. Caloric test has :

a. Slow component only

b. Fast component only

X c. Both Slow component&Fast component

d. Mainly Slow component and Fast component occasionally

9. latest treatment in BPPV

a. Intra labyrinthine streptomycin

b. Intra labyrinthine steroids

X c. Valsalva maneuver

d. .Eplyes maneuver

10.dix hall pike maneuver is done for assessing

a. vestibular function

b.Corneal test

c. Cochlear function

d. audiometry

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Vestibular evoked myogenic potential **(ENT09)**

3

STUDENT NAME: Abhilaasha .K

UNIVERSITY NO: U16MB252.

1.Nystagmus is associated with all except:

a.cerebeller disease b.vestibular disease

c.cohlear diseae d.arold chiari malformation

2.cold caloric test stimulus

a. cochlea b. lateral semi circular canal

X c .posterior SCC d. all of the above

3.VEMP in sternoclenomastoid muscle detects lesion of

a. cochlear nerve b. superior vestibular nerve

X c. inferior vestibiular nerve d. inflammatory myopathy

4.Epleys maneuver

a.postional vertigo b.otosclerosis

c. ASOM d. CSOM

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a. Fistula test positive without fistula b. Fistula test positive with fistula

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6.at what angle is hall pike thermal caloric test done

a.15 degree b.30 degree

c. 45 degree d.60 degree

7.vertigo of peripheral vestibular origin are all except

a. meniers disease b.BPPV

c.Vestibulo basilar insufficiency d. vestibular neuronitis

8. Caloric test has :

a. Slow component only

b. Fast component only

c. Both Slow component&Fast component

d. Mainly Slow component and Fast component occasionally

9. latest treatment in BPPV

a. Intra labyrinthine streptomycin

b. intra labyrinthine steroids

c. Valsalva maneuver

d. .Eplyes maneuver

10.dix hall pike maneuver is done for assessing

a. vestibular function

b.Corneal test

c. Cochlear function

d. audiometry

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Vestibular evoked myogenic potential **(ENT09)**

STUDENT NAME: Ajay - N

UNIVERSITY NO: VIGMB256

4

1.Nystagmus is associated with all except:

a.cerebeller disease b.vestibular disease

c.cohlear diseae d.arold chiari malformation

2.cold caloric test stimulus

a. cochlea b. lateral semi circular canal

X c .posterior SCC d. all of the above

3.VEMP in sternoclenomastoid muscle detects lesion of

a. cochlear nerve b. superior vestibular nerve

X c. inferior vestibiular nerve d. inflammatory myopathy

4.Epleys maneuver

a.postional vertigo b.otosclerosis

c. ASOM d. CSOM

5.true about henneberts sign is :

a. Fistula test positive without fistula b. Fistula test positive with fistula

X c. Fistula test negative without fistula d. Fistula test negative with fistula

POST TEST

6.at what angle is hall pike thermal caloric test done

a.15 degree b.30 degree

c. 45 degree d.60 degree

7.vertigo of peripheral vestibular origin are all except

a. meniers disease b.BPPV

c.Vestibulo basilar insufficiency d. vestibular neuronitis

8. Caloric test has :

a. Slow component only

b. Fast component only

c. Both Slow component&Fast component

d. Mainly Slow component and Fast component occasionally

9. latest treatment in BPPV

a. Intra labyrinthine streptomycin

b. intra labyrinthine steroids

c. Valsalva maneuver

d. .Eplyes maneuver

10.dix hall pike maneuver is done for assessing

a. vestibular function

b.Corneal test

c. Cochlear function

d. audiometry

(8)

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Vestibular evoked myogenic potential **(ENT09)**

STUDENT NAME: Ajay . V

UNIVERSITY NO: U16MB256 .

1.Nystagmus is associated with all except:

a.cerebeller disease b.vestibular disease

c.cohlear diseae d.arold chiari malformation

2.cold caloric test stimulus

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c. Valsalva maneuver

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10.dix hall pike maneuver is done for assessing

a. vestibular function

b.Corneal test

c. Cochlear function

d. audiometry

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Vestibular evoked myogenic potential **(ENT09)**

STUDENT NAME: Abilasha · K

UNIVERSITY NO: U16MB252.

1.Nystagmus is associated with all except:

a.cerebeller disease b.vestibular disease

c.cohlear diseae d.arold chiari malformation

2.cold caloric test stimulus

a. cochlea b. lateral semi circular canal

c.posterior SCC d. all of the above

3.VEMP in sternoclenomastoid muscle detects lesion of

a. cochlear nerve b. superior vestibular nerve

c. inferior vestibiular nerve d. inflammatory myopathy

4.Epleys maneuver

a.postional vertigo b.otosclerosis

c. ASOM d. CSOM

5.true about henneberts sign is :

a. Fistula test positive without fistula b. Fistula test positive with fistula

c. Fistula test negative without fistula d. Fistula test negative with fistula

ANNEXURE 4

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _____ has actively participated in the Value Added Course on Hands on training on VEMP for assessment of Vertigo held during Jan 2019 – April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. R. Venkataramanan
RESOURCE PERSON

Dr. R. Nithish thimothy
COORDINATOR

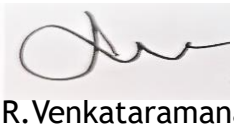
Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Dr.Akshaya.R (U16MB257) has actively participated in the Value Added Course on Hands on training on VEMP for assessment of Vertigo held during Jan 2019 – April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.



Dr.R.Venkataramanan

RESOURCE PERSON



Dr. R. Nithish thimothy

COORDINATOR

Annexure 5
Course/Training Feedback Form
Student Feedback Form

Course Name: Hands on training on VEMP for assessment of Vertigo

Subject Code: **ENT09**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Annexure 5

Course/Training Feedback Form

Student Feedback Form

Course Name: Hands on training on VEMP for assessment of Vertigo

Subject Code: **ENT09**

Name of Student: ABHASHA. K Roll No.: U16MB252

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear		✓			
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Good

Annexure 5

Course/Training Feedback Form

Student Feedback Form

Course Name: Hands on training on VEMP for assessment of Vertigo

Subject Code: **ENT09**

Name of Student: AKSHYA·R Roll No.: U16MB257

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective		✓			
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

EXCELLENT

ANNEXURE 6

Date : 15/04/2019

From
Dr.Venkataraman.R,
Dept of Otorhinolaryngology,
SLIMS
Bharath Institute of Higher Education and Research,
Puducherry.

Through Proper Channel

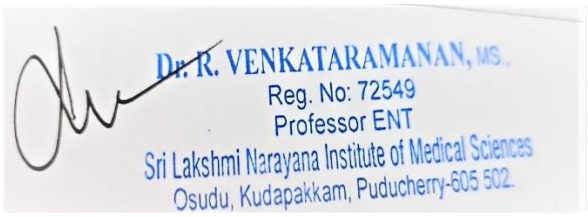
To
The Dean,
SLIMS,
Bharath Institute of Higher Education and Research,
Puducherry.

Sub: Completion of value-added course: Hands on training on VEMP for assessment of Vertigo reg.

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled:Hands on training on VEMP for assessment of VertigoonJan 2019 to April2019. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards
Dr.Venkataraman.R





SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Date: 08/12/2018

From
Dr. C. Aravind
Professor and Head,
Department of General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

Sub: Permission to conduct value-added course: EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS

Respected Madam,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: "Explaining prognosis to a patient with terminal illness" on 04/01/2019. We solicit your kind permission for the same.

Kind Regards

Dr. C. Aravind

Dr. C. ARAVIND, MD.,
Reg.No:68432
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam

FOR THE USE OF DEAN OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. C. Aravind

The Expert: Dr. Arul Murugan

The committee has discussed about the course and is approved.

Dean

Subject Expert

Dr. HOD

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

Dr. C. ARAVIND, MD.,
Reg.No:68432
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. C. ARAVANIS, M.D.
Professor & HOD, General Medicine
Govt. Rajaji Hospital & Madurai Medical College
Madurai-625 020.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affiliated to Bharath University, Chennai - TN]

Circular

14/12/2018

Sub: Organising Value-added Course: EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research**, is organising a Value added course, titled, "EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS" between January 2019 and April 2019 . The course content is enclosed below.

The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 29/12/2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

Encl: Copy of Course content

COURSE PROPOSAL

Course Title: **Explaining prognosis to a patient with terminal illness**

Course Objective: **To create an awareness among students of the Second year M.B.B.S on how to explain prognosis to a patient with terminal illness**

Course Outcome: **The importance of explaining prognosis to a patient with terminal illness has been explained. The psychological aspect of such a news on the clinician, the patient and the family has been explained.**

Course Audience: **A batch of 25 students belonging to the Second year of M.B.B.S**

Course Coordinator: **Dr. C. Aravind**

Course Faculties with Qualification and Designation:

1. Dr. Arul Murugan
   Associate Professor
   Department of Medicine
2. Dr. Venkatasamy
   Professor
   Department of Medicine

Course Curriculum/Topics with schedule

SlNo	Date	Topic	Time	Hours	Name of the faculty
1.	04/01/2019	Terminal illness	5 pm to 8 pm	3 hours	Dr. Arul Murugan
2.	11/01/2019	Preparing to share the news	4: 30 pm to 7: 30 pm	3 hours	Dr. Venkatasamy
3.	25/01/2019	Communicating with the patient and family about the illness	5 pm to 8 pm	3 hours	Dr. Arul Murugan
4.	08/02/2019	Providing options	5 pm to 8 pm	3 hours	Dr. Venkatasamy
5.	22/02/2019	Dealing with grief	5 pm to 8 pm	3 hours	Dr. Arul Murugan
6.	08/03/2019	Making a plan of action	4: 30 pm to 7: 30 pm	3 hours	Dr. Venkatasamy

7.	22/03/2019	Chemotherapy – pros and cons	5 pm to 7 pm	2 hours	Dr. Arul Murugan
8.	29/03/2019	Advancements in radiotherapy	5 pm to 7 pm	2 hours	Dr. Venkatasamy
9.	05/04/2019	Pain relief in terminal illness	4 pm to 6 pm	2 hours	Dr. Arul Murugan
10.	12/04/2019	The healer needs healing too!	4 pm to 7 pm	3 hours	Dr. C. Aravind
11.	19/04/2019	Preparing for the worst	4 pm to 7 pm	3 hours	Dr. Arul Murugan
			Total Hours	30	

REFERENCE BOOKS:

1. **HARRISON'S PRINCIPLES OF INTERNAL MEDICINE; 18th EDITION**
2. **OXFORD TEXTBOOK OF MEDICAL ONCOLOGY**

VALUE ADDED COURSE

1. Name of the programme and code

   EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS; IM10

2. Duration & period

   30 hrs; between January 2019 – April 2019

3. Information Brochure and course content of value-added courses

   Enclosed as Annexure – I

4. List of students enrolled

   Enclosed as Annexure – II

5. Assessment procedures:

   Short notes – Enclosed as Annexure – III

6. Certificate model

   Enclosed as Annexure – IV

7. No. of times offered during the same year

   1; January 2019 – April 2019

8. Year of discontinuation

   2019

9. Summary report of each program year wise:

VALUE ADDED COURSE: January 2019 – April 2019					
Sl. No.	Course code	Course name	Resource persons	Target Students	Strength and year
1	IM10	EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS	Dr. Arul Murugan Dr. Venkatasamy	Second year MBBS	25 (January 2019 – April 2019)

10. Course feedback

    Enclosed as Annexure - V

RESOURCE PERSON – Dr. Arul Murugan

DEPARTMENT OF GENERAL MEDICINE
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU, PONDICHERRY.

COORDINATOR – Dr. C. Aravind

Dr. C. ARAVIND, MD.,
Reg.No:68432
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

ANNEXURE – I

PARTICIPANT HANDBOOK



EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS

COURSE DETAILS

PARTICULARS	DESCRIPTION
Course title	EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS
Course code	IM10
Objective	1. Terminal illness 2. Preparing to share the news 3. Communicating with the patient and family about the illness 4. Providing options 5. Dealing with grief 6. Making a plan of action 7. Chemotherapy – pros and cons 8. Advancements in radiotherapy 9. Pain relief in terminal illness 10. The healer needs healing too! 11. Preparing for the worst
Key competencies	On successful completion of the course, the students will have a better knowledge on how to explain prognosis to a patient with terminal illness
Target students	Second year MBBS
Duration	30 hours; between January 2019 – April 2019
Assessment procedure	Short note questions

EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS

Terminal illness or end-stage disease is a disease that cannot be cured or adequately treated and is reasonably expected to result in the death of the patient. This term is more commonly used for progressive diseases such as cancer or advanced heart disease than for trauma. In popular use, it indicates a disease that will progress until death with near absolute certainty, regardless of treatment. A patient who has such an illness may be referred to as a terminal patient, terminally ill or simply terminal. There is no standardized life expectancy for a patient to be considered terminal, although it is generally months or less. Life expectancy for terminal patients is a rough estimate given by the physician based on previous data and does not always reflect true longevity. An illness which is lifelong but not fatal is a chronic condition.

Terminal patients have options for disease management after diagnosis. Examples include caregiving, continued treatment, hospice care, and physician-assisted suicide. Decisions regarding management are made by the patient and his or her family, although medical professionals may give recommendations or more about the services available to terminal patients.

Lifestyle after diagnosis varies depending largely on management decisions and also the nature of the disease, and there may be living restrictions depending on the condition of the patient. Oftentimes, terminal patients may experience depression or anxiety associated with oncoming death, and family and caregivers may struggle with psychological burdens as well. Psycho-therapeutic interventions may help alleviate some of these burdens, and is often incorporated in palliative care.

Because terminal patients are aware of their oncoming deaths, they have more time to prepare advance care planning, such as advance directives and living wills, which have been shown to improve end-of-life care. While death cannot be avoided, patients can still strive to die a good death.

By definition, there is not a cure or adequate treatment for terminal illnesses. However, some kinds of medical treatments may be appropriate anyway, such as treatment to reduce pain or ease breathing.

Some terminally ill patients stop all debilitating treatments to reduce unwanted side effects. Others continue aggressive treatment in the hope of an unexpected success. Still, others reject conventional medical treatment and pursue unproven treatments such as radical dietary modifications. Patients' choices about different treatments may change over time.

Palliative care is normally offered to terminally ill patients, regardless of their overall disease management style, if it seems likely to help manage symptoms such as pain and improve quality of life. Hospice care, which can be provided at home or in a long-term care facility, additionally provides emotional and spiritual support for the patient and loved ones. Some complementary approaches, such as relaxation therapy, massage, and acupuncture may relieve some symptoms and other causes of suffering.

Communication and continuous assessment of management goals are key components to addressing terminal illnesses. Physicians must be clear about the likely outcome of the illness(es) and provide an anticipated schedule with goals and landmarks in the care process. When the goals of care have changed from cure to palliation, that transition must be clearly explained and defended.

CAREGIVING

Terminal patients often need a caregiver, who could be a nurse, licensed practical nurse or a family member. Caregivers can help patients receive medications to reduce pain and control symptoms of nausea or vomiting. They can also assist the individual with daily living activities and movement. Caregivers provide assistance with food and psychological support and ensure that the individual is comfortable.

The patient's family may have questions and most caregivers can provide information to help ease the mind. Doctors generally do not provide estimates for fear of instilling false hopes or obliterate an individual's hope.

In most cases, the caregiver works along with physicians and follows professional instructions. Caregivers may call the physician or a nurse if the individual:

- experiences excessive pain.
- is in distress or having difficulty breathing.
- has difficulty passing urine or is constipated.
- has fallen and appears hurt.
- is depressed and wants to harm themselves.
- refuses to take prescribed medications, raising ethical concerns best addressed by a person with more extensive formal training.
- or if the caregiver does not know how to handle the situation.

Most caregivers become the patient's listeners and let the individual express fears and concerns without judgment. Caregivers reassure the patient and honor all advance directives. Caregivers respect the individual's need for privacy and usually hold all information confidential.

PALLIATIVE CARE

Palliative care focuses on addressing patients' needs after disease diagnosis. While palliative care is not disease treatment, it addresses patients' physical needs, such as pain management, offers emotional support, caring for the patient psychologically and spiritually, and helps patients build support systems that can help them get through difficult times. Palliative care can also help patients make decisions and come to understand what they want regarding their treatment goals and quality of life.

Palliative care is an attempt to improve patients' quality-of-life and comfort, and also provide support for family members and carers.Additionally, it lowers hospital admissions costs. However, needs for palliative care are often unmet whether due to lack of government support and also possible stigma associated with palliative care. For these reasons, the World Health Assembly recommends development of palliative care in health care systems.

Palliative care and hospice care are often confused, and they have similar goals. However, hospice care is specifically for terminal patients while palliative care is more general and offered to patients who are not necessarily terminal.

HOSPICE CARE

While hospitals focus on treating the disease, hospices focus on improving patient quality-of-life until death. A common misconception is that hospice care hastens death because patients "give up" fighting the disease. However, patients in hospice care often live the same length of time as patients in the hospital. A study of 3850 liver cancer patients found that patients who received hospice care, and those who did not, survived for the same amount of time. In fact, a study of 3399 adult lung cancer patients showed that patients who received hospice care actually survived longer than those who did not. Additionally, in both of these studies, patients receiving hospice care had significantly lower healthcare expenditures.

Hospice care allows patients to spend more time with family and friends. Since patients are in the company of other hospice patients, they have an additional support network and can learn to cope together. Hospice patients are also able to live at peace away from a hospital setting; they may live at home with a hospice provider or at an inpatient hospice facility.

MEDICATIONS FOR TERMINAL PATIENTS

Terminal patients experiencing pain, especially cancer-related pain, are often prescribed opioids to relieve suffering. The specific medication prescribed, however, will differ depending on severity of pain and disease status.

There exist inequities in availability of opioids to terminal patients, especially in countries where opioid access is limited.

A common symptom that many terminal patients experience is dyspnea, or difficulty with breathing. To ease this symptom, doctors may also prescribe opioids to patients. Some studies suggest that oral opioids may help with breathlessness. However, due to lack of consistent reliable evidence, it is currently unclear whether they truly work for this purpose.

Depending on the patient's condition, other medications will be prescribed accordingly. For example, if patients develop depression, antidepressants will be prescribed. Anti-inflammation and anti-nausea medications may also be prescribed.

CONTINUED TREATMENT

Some terminal patients opt to continue extensive treatments in hope of a miracle cure, whether by participating in experimental treatments and clinical trials or seeking more intense treatment for the disease. Rather than to "give up fighting," patients spend thousands more dollars to try to prolong life by a few more months. What these patients often do give up, however, is quality of life at the end of life by undergoing intense and often uncomfortable treatment. A meta-analysis of 34 studies including 11,326 patients from 11 countries found that less than half of all terminal patients correctly understood their disease prognosis, or the course of their disease and likeliness of survival. This could influence patients to pursue unnecessary treatment for the disease due to unrealistic expectations.

TRANSPLANT

For patients with end stage kidney failure, studies have shown that transplants increase the quality of life and decreases mortality in this population. In order to be placed on the organ transplant list, patients are referred and assessed based on criteria that ranges from current comorbidities to potential for organ rejection post transplant. Initial screening measures include: blood tests, pregnancy tests, serologic tests, urinalysis, drug screening, imaging, and physical exams.

For patients who are interested in liver transplantation, only patients with acute liver failure have the highest priority over patients with only cirrhosis. Acute liver failure patients will present with worsening symptoms of somnolence or confusion (hepatic encephalopathy) and thinner blood (increased INR) due to the liver's inability to make clotting factors.Some patients could experience portal hypertension, hemorrhages, and abdominal swelling (ascites). Model for End Stage Liver Disease (MELD) is often used to help providers decide and prioritize candidates for transplant.

PHYSICIAN-ASSISTED SUICIDE

Physician-assisted suicide (PAS) is a highly controversial concept, only legal in a few countries. In PAS, physicians, with voluntary written and verbal consent from the patient, give patients the means to die, usually through lethal drugs. The patient then chooses to "die with dignity," deciding on his/her own time and place to die. Reasons as to why patients

choose PAS differ. Factors that may play into a patient's decision include future disability and suffering, lack of control over death, impact on family, healthcare costs, insurance coverage, personal beliefs, religious beliefs, and much more.

PAS may be referred to in many different ways, such as aid in dying, assisted dying, death with dignity, and many more. These often depend on the organization and the stance they take on the issue.

Some groups favor PAS because they do not believe they will have control over their pain, because they believe they will be a burden on their family, and because they do not want to lose autonomy and control over their own lives among other reasons. They believe that allowing PAS is an act of compassion.

While some groups believe in personal choice over death, others raise concerns regarding insurance policies and potential for abuse. According to Sulmasy et al., the major non-religious arguments against physician-assisted suicide are quoted as follows:

(1) "it offends me", suicide devalues human life;

(2) slippery slope, the limits on euthanasia gradually erode;

(3) "pain can be alleviated", palliative care and modern therapeutics more and more adequately manage pain;

(4) physician integrity and patient trust, participating in suicide violates the integrity of the physician and undermines the trust patients place in physicians to heal and not to harm"

Again, there are also arguments that there are enough protections in the law that the slippery slope is avoided. For example, the Death with Dignity Act in Oregon includes waiting periods, multiple requests for lethal drugs, a psychiatric evaluation in the case of possible depression influencing decisions, and the patient personally swallowing the pills to ensure voluntary decision.

Physicians and medical professionals also have disagreeing views on PAS. Some groups, such as the American College of Physicians (ACP), the American Medical Association (AMA), the World Health Organization, American Nurses Association, Hospice Nurses Association, American Psychiatric Association, and more have issued position statements against its legalization.

The ACP's argument concerns the nature of the doctor-patient relationship and the tenets of the medical profession. They state that instead of using PAS to control death: "through high-quality care, effective communication, compassionate support, and the right resources, physicians can help patients control many aspects of how they live out life's last chapter."

Other groups such as the American Medical Students Association, the American Public Health Association, the American Medical Women's Association, and more support PAS as an act of compassion for the suffering patient.

In many cases, the argument on PAS is also tied to proper palliative care. The International Association for Hospice and Palliative Care issued a position statement arguing against considering legalizing PAS unless comprehensive palliative care systems in the country were in place. It could be argued that with proper palliative care, the patient would experience fewer intolerable symptoms, physical or emotional, and would not choose death over these symptoms. Palliative care would also ensure that patients receive proper information about their disease prognosis as not to make decisions about PAS without complete and careful consideration.

MEDICAL CARE

Many aspects of medical care are different for terminal patients compared to patients in the hospital for other reasons.

DOCTOR–PATIENT RELATIONSHIPS

Doctor–patient relationship is crucial in any medical setting, and especially so for terminal patients. There must be an inherent trust in the doctor to provide the best possible care for the patient. In the case of terminal illness, there is often ambiguity in communication with the patient about his/her condition. While terminal condition prognosis is often a grave matter, doctors do not wish to quash all hope, for it could unnecessarily harm the patient's mental state and have unintended consequences. However, being overly optimistic about outcomes can leave patients and families devastated when negative results arise, as is often the case with terminal illness.

MORTALITY PREDICTIONS

Often, a patient is considered terminally ill when his or her estimated life expectancy is six months or less, under the assumption that the disease will run its normal course based on previous data from other patients. The six-month standard is arbitrary, and best available estimates of longevity may be incorrect. Though a given patient may properly be considered terminal, this is not a guarantee that the patient will die within six months. Similarly, a patient with a slowly progressing disease, such as AIDS, may not be considered terminally ill if the best estimate of longevity is greater than six months. However, this does not guarantee that the patient will not die unexpectedly early.

In general, physicians slightly overestimate the survival time of terminally ill cancer patients, so that, for example, a person who is expected to live for about six weeks would likely die around four weeks.

A recent systematic review on palliative patients in general, rather than specifically cancer patients, states the following: "Accuracy of categorical estimates in this systematic review ranged from 23% up to 78% and continuous estimates over-predicted actual survival by, potentially, a factor of two." There was no evidence that any specific type of clinician was better at making these predictions.

HEALTHCARE SPENDING

Healthcare during the last year of life is costly, especially for patients who used hospital services often during end-of-life.

In fact, according to Langton et al., there were "exponential increases in service use and costs as death approached."

Many dying terminal patients are also brought to the emergency department (ED) at the end of life when treatment is no longer beneficial, raising costs and using limited space in the ED.

While there are often claims about "disproportionate" spending of money and resources on end-of-life patients, data have not proven this type of correlation.

The cost of healthcare for end-of-life patients is 13% of annual healthcare spending in the U.S. However, of the group of patients with the highest healthcare spending, end-of-life patients only made up 11% of these people, meaning the most expensive spending is not made up mostly of terminal patients.Many recent studies have shown that palliative care and hospice options as an alternative are much less expensive for end-of-life patients.

PSYCHOLOGICAL IMPACT

Coping with impending death is a hard topic to digest universally. Patients may experience grief, fear, loneliness, depression, and anxiety among many other possible responses. Terminal illness can also lend patients to become more prone to psychological illness such as depression and anxiety disorders. Insomnia is a common symptom of these.

It is important for loved ones to show their support for the patient during these times and to listen to his or her concerns.

People who are terminally ill may not always come to accept their impending death. For example, a person who finds strength in denial may never reach a point of acceptance or accommodation and may react negatively to any statement that threatens this defense mechanism.

IMPACT ON PATIENT

Depression is relatively common among terminal patients, and the prevalence increases as patients become sicker. Depression causes quality of life to go down, and a sizable portion of patients who request assisted suicide are depressed. These negative emotions may be heightened by lack of sleep and pain as well. Depression can be treated with antidepressants and/or therapy, but doctors often do not realize the extent of terminal patients' depression.

Because depression is common among terminal patients, the American College of Physicians recommends regular assessments for depression for this population and appropriate prescription of antidepressants.

Anxiety disorders are also relatively common for terminal patients as they face their mortality. Patients may feel distressed when thinking about what the future may hold, especially when considering the future of their families as well. It is important to note, however, that some palliative medications may facilitate anxiety.

COPING FOR PATIENTS

Caregivers may listen to the concerns of terminal patients to help them reflect on their emotions. Different forms of psychotherapy and psychosocial intervention, which can be offered with palliative care, may also help patients think about and overcome their feelings. According to Block, "most terminally ill patients benefit from an approach that combines emotional support, flexibility, appreciation of the patient's strengths, a warm and genuine relationship with the therapist, elements of life-review, and exploration of fears and concerns."

IMPACT ON FAMILY

Terminal patients' families often also suffer psychological consequences. If not well equipped to face the reality of their loved one's illness, family members may develop depressive symptoms and even have increased mortality. Taking care of sick family members may also cause stress, grief, and worry. Additionally, financial burden from medical treatment may be a source of stress.

COPING FOR FAMILY

Discussing the anticipated loss and planning for the future may help family members accept and prepare for the patient's death. Interventions may also be offered for anticipatory grief. In the case of more serious consequences such as depression, a more serious intervention or therapy is recommended.

Grief counseling and grief therapy may also be recommended for family members after a loved one's death.

DYING

When dying, patients often worry about their quality of life towards the end, including emotional and physical suffering.

In order for families and doctors to understand clearly what the patient wants for himself or herself, it is recommended that patients, doctors, and families all convene and discuss the patient's decisions before the patient becomes unable to decide.

ADVANCED DIRECTIVES

At the end of life, especially when patients are unable to make decisions on their own regarding treatment, it is often up to family members and doctors to decide what they believe the patients would have wanted regarding their deaths, which is a heavy burden and hard for family members to predict. An estimated 25% of American adults have an advanced directive, meaning the majority of Americans leave these decisions to be made by family, which can lead to conflict and guilt.

Although it may be a difficult subject to broach, it is important to discuss the patient's plans for how far to continue treatment should they become unable to decide. This must be done while the patient is still able to make the decisions, and takes the form of an advance directive. The advance directive should be updated regularly as the patient's condition changes so as to reflect the patient's wishes.

Some of the decisions that advance directives may address include receiving fluids and nutrition support, getting blood transfusions, receiving antibiotics, resuscitation (if the heart stops beating), and intubation (if the patient stops breathing).

Having an advance directive can improve end-of-life care.It is highly recommended by many research studies and meta-analyses for patients to discuss and create an advance directive with their doctors and families.

DO-NOT-RESUSCITATE

One of the options of care that patients may discuss with their families and medical providers is the do-not-resuscitate (DNR) order. This means that if the patient's heart stops, CPR and other methods to bring back heartbeat would not be performed. This is the patient's choice to make and can depend on a variety of reasons, whether based on personal beliefs or medical concerns. DNR orders can be medically and legally binding depending on the applicable jurisdiction.

Decisions like these should be indicated in the advance directive so that the patient's wishes can be carried out to improve end-of-life care.

SYMPTOMS NEAR DEATH

A variety of symptoms become more apparent when a patient is nearing death. Recognizing these symptoms and knowing what will come may help family members prepare.

During the final few weeks, symptoms will vary largely depending on the patient's disease. During the final hours, patients usually will reject food and water and will also sleep more, choosing not to interact with those around them. Their bodies may behave more irregularly, with changes in breathing, sometimes with longer pauses between breaths, irregular heart rate, low blood pressure, and coldness in the extremities. It is important to note, however, that symptoms will vary per patient.

GOOD DEATH

Patients, healthcare workers, and recently bereaved family members often describe a "good death" in terms of effective choices made in a few areas:

Assurance of effective pain and symptom management.

Education about death and its aftermath, especially as it relates to decision-making.

Completion of any significant goals, such as resolving past conflicts.

In the last hours of life, palliative sedation may be recommended by a doctor or requested by the patient to ease the symptoms of death until he or she passes away. Palliative sedation is not intended to prolong life or hasten death; it is merely meant to relieve symptoms.

Seven steps are involved in establishing goals:

1. Ensure that the medical information is as complete as possible and understood by all relevant parties.

2. Explore the pt's goals while making sure the goals are achievable.

3. Explain the options.

4. Show empathy as the pt and the family adjust to changing expectations.

5. Make a plan with realistic goals.

6. Follow through with the plan.

7. Review and revise the plan periodically as the pt's situation changes.

After the diagnosis: How to communicate with terminally ill patients

One of physicians' most difficult duties is to give patients bad news about their health or prognosis. Even with significant advances in medical education on communication in end-of-life discussions, many doctors do not always feel sufficiently prepared for this daunting task. The unease of the situation may cause physicians to avoid having meaningful discussions or communicating adequately with patients diagnosed with a terminal illness and with their families (when appropriate). Failing to communicate effectively can sometimes lead to unwanted consequences such as invasive procedures, rather than focusing on comfort and support for the patient. This, in turn, may precipitate otherwise avoidable complaints and legal actions against physicians.

A recent study identified 11 key elements of end-of-life care discussions with seriously ill patients in hospital. These include, for example, disclosing the prognosis and asking about the

patient's values in the context of healthcare decisions. They also include providing information about expected outcomes, and the risks of life-sustaining treatments and comfort measures. Patients reported that on average only 1.4 of the 11 elements had been discussed during the first few days of being admitted to hospital, and 10% of patients were not told their prognosis.

By preparing for a discussion of bad news, considering how to deal with patients' reactions, and dealing with their own emotional health, physicians can communicate effectively with patients and their families when a patient's prognosis is terminal. This can help patients make informed choices that are consistent with their values and that contribute to quality end-of-life care.

Preparing to share the news

Starting a dialogue early — when definitive test results are known and the physician has made a final diagnosis — is important for helping patients face a terminal illness.

- Rehearse how you will deliver the information. If your experience in delivering bad news is limited, consider observing a more experienced colleague or use role play to practise different scenarios.
- Schedule the discussion in a private, comfortable location. Allow sufficient time, free of interruptions. When possible, and with the patient's permission, have a family member, caregiver, or substitute decision-maker attend.
- Have the patient's medical record, including diagnostic results, on hand.
- Be prepared to provide as much information as a reasonable patient would want and need to know.

Dealing with patient reactions

Doctors may want to prepare the patient and family for the news by saying, "I have received the test results and we need to talk. I'm sorry, but I have bad news." Physicians need to be candid but compassionate, and the information should be presented in a well-organized

manner using plain, non-technical language. The literature offers suggestions for language that may be employed. At all times, it is important to be sensitive to patients' personal and cultural values, and spiritual or religious beliefs.

Most patients need time to process difficult news, and physicians should be prepared for emotional reactions including shock and distress. The discussion should proceed at the patient's pace and according to the patient's emotions. It is also important to listen and to give patients and their family opportunities to ask questions. Supplying written material such as patient aids may help patients better understand their clinical situation.

After having time to absorb the news from the initial discussion, patients and families may request follow-up discussions. During these subsequent discussions, patients should be given the opportunity to ask additional questions, and physicians should be ready to repeat the information or provide more details. At such follow-up meetings, the goals of care, treatment options, and end-of-life preferences should be discussed. The goals of care should be routinely assessed over time and remain focused on compassion and the needs of the patient. The patient's emotional state should be closely monitored. In addition to communicating with the patient and family, when appropriate, the most-responsible physician should also communicate relevant information to the care team. These discussions and actions should be documented in the medical record.

Maintaining hope is crucial for many patients. When a cure is not a likely outcome, hope may be focused on achieving comfort and quality of life. Patients will want to know about their options for palliative care, and families may want to seek available community-based support. This may also be a good time to talk with the patient about whether they want spiritual support and to direct them to resources, as appropriate. The patient needs to know that the physician cares and will provide the necessary support or find resources to do so.

Physicians need support, too

Physicians should be attentive to their own emotions during and after difficult discussions with patients and families. Physicians who feel overwhelmed or stressed may benefit from speaking with a sympathetic colleague, or contacting their provincial physician health program, which can offer individual counselling and support. As physicians' emotional

response continues after work, sharing their feelings with their loved ones, without divulging personal patient information, can also help.

The bottom line

Physicians' attitudes and ability to communicate are essential in helping patients cope with difficult news.

- Remain sensitive to the patient's cultural values and spiritual beliefs, which may help guide how much information a patient wants about their condition. Nevertheless, patients should have sufficient information to enable them to assess their options and make informed decisions about their care and plan the end of life.
- Determine patient understanding of the information being provided, and answer questions honestly and openly. Address any language, cultural, or cognitive barriers to effective communication.
- Demonstrate empathy and support to the patient and family.
- Document the consultations and communication in the medical record.

Annexure II

Bharath Institute of Higher Education and Research

Sri Lakshmi Narayana Institute of Medical Sciences

Participant list with signatures

Value added course: **EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS (dated 04/01/2019)**

Sl.No	Reg.No	Name of the candidate	Signature
1.	U16MB261	ANANYA SHARMA	
2.	U16MB262	ANGALAKUDURU DEEPCHAND	
3.	U16MB263	ANJAN BANERJEE	
4.	U16MB264	ANWESHA CHATTERJEE	
5.	U16MB265	ARCHANA .A	
6.	U16MB266	ARCHITHA.A	
7.	U16MB267	ARIVUMATHI .R	
8.	U16MB268	ARJUN.S	
9.	U16MB269	ASHVANTH KUMAR .A	
10.	U16MB270	ASMITHA S.V	
11.	U16MB282	DEBARPITA NATH	
12.	U16MB283	DEEBAK .I	
13.	U16MB284	DEEKSHITH D.R	
14.	U16MB285	DEEPIKAA D.V	
15.	U16MB286	DELFI MARY .E	
16.	U16MB287	DEVIKA.U.M	
17.	U16MB288	DHAKSHANA .M	
18.	U16MB289	EDA SAI VENKATA TEJA	

19.	U16MB290	GAURAV KUMAR	Gaurav Kumar
20.	U16MB277	BLESSY AMALA RISHA .J	Blessy. A. J

ANNEXURE - III

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

EXPLAINING PROGNOSIS FOR A PATIENT WITH TERMINAL ILLNESS

SHORT NOTES

Course Code: IM10

WRITE SHORT NOTES ON THE FOLLOWING:

1. How to prepare oneself before breaking the news to the patient and family?
2. How to help the family take in the news
3. Pain relief in terminal illness
4. Providing options to the patient and family

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Annexure - III

EXPLAINING PROGNOSIS FOR A PATIENT WITH TERMINAL ILLNESS

SHORT NOTES

Student Name:
ARJUN.S

Course Code: IM10

WRITE SHORT NOTES ON THE FOLLOWING:

1. How to prepare oneself before breaking the news to the patient and family?
2. How to help the family takein the news
3. Pain relief in terminal illness
4. Providing options to the patient and family

9/10

1) Disclosing the prognosis and asking abouthe patients values in context to healthcare decision. Considering how to deal with patients reaction and dealing with the values and that contributes to quality end of life care

2) Rehersing how to deliver the information schedule to discuss in patients comfortable location Allow sufficient time to process the information beprepared to provide as much information as possible a resonable patient would want and need to know

3) Patient relief in terminal illness is given through pallative care. pain relief in end of care is crucial because patient should be made comfortable

4) Additional follow up discussions to provide more information and details, the goals of care, treatment options and end of life preferance should be discussed communication with the family is crucial

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Annexure - III

EXPLAINING PROGNOSIS FOR A PATIENT WITH TERMINAL ILLNESS

SHORT NOTES

Student Name:

ASMITHA. S. V

Course Code: IM10

WRITE SHORT NOTES ON THE FOLLOWING:

1. How to prepare oneself before breaking the news to the patient and family?
2. How to help the family takein the news
3. Pain relief in terminal illness
4. Providing options to the patient and family

6

10

(1) First invite the pros of the patient and start with explaining the positive outcome of the illness and explain about the maximum ~~best~~ management done by doctor

(2) Explain about the proportion of the disease prevalence in the community. Compare the patient with the prevalence of disease with other patient in community.

(3) Pain relief - ① Palliative care & counselling ② Analgesics. (Morphine)

(4) Explain about Organ transplant & other terminal level of care to patient & family.

ANNEXURE-IV

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _____ARCHANA .A_____ has actively participated in the Value Added Course on **Explaining prognosis to a patient with terminal illness,** conducted between Jan 2019 - April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Arul Murugan
RESOURCE PERSON

Dr. C. Aravind
COORDINATOR

Dr. C. ARAVIND, MD.,
Professor & HOD, General Medicine
Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

ANNEXURE - IV

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _____ANJAN BANERJEE_____

has actively participated in the Value Added Course on **Explaining prognosis to a patient with terminal illness,** conducted between Jan 2019 - April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Arul Murugan
RESOURCE PERSON

Dr. C. Aravind
Reg.No:68432
COORDINATOR
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

ANNEXURE V

Student Feedback Form

Course Name:**EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS**

Subject Code: **IM10**

Name of Student: Ananya Sharma. Roll No.: 016MB261

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	✓ 5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date: 19/4/2019

ANNEXURE V

Student Feedback Form

Course Name:**EXPLAINING PROGNOSIS TO A PATIENT WITH TERMINAL ILLNESS**

Subject Code: **IM10**

Name of Student: Asmitha .S.V Roll No.: U16MB270

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5 ✓

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Date: 19/04/2019

Signature Asmitha S. V

Date: 22/04/2019

From
Dr. C. Aravind
Professor and Head,
Department of General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

Sub: Completion of value-added course: Explaining prognosis to a patient with terminal illness

Respected Madam,

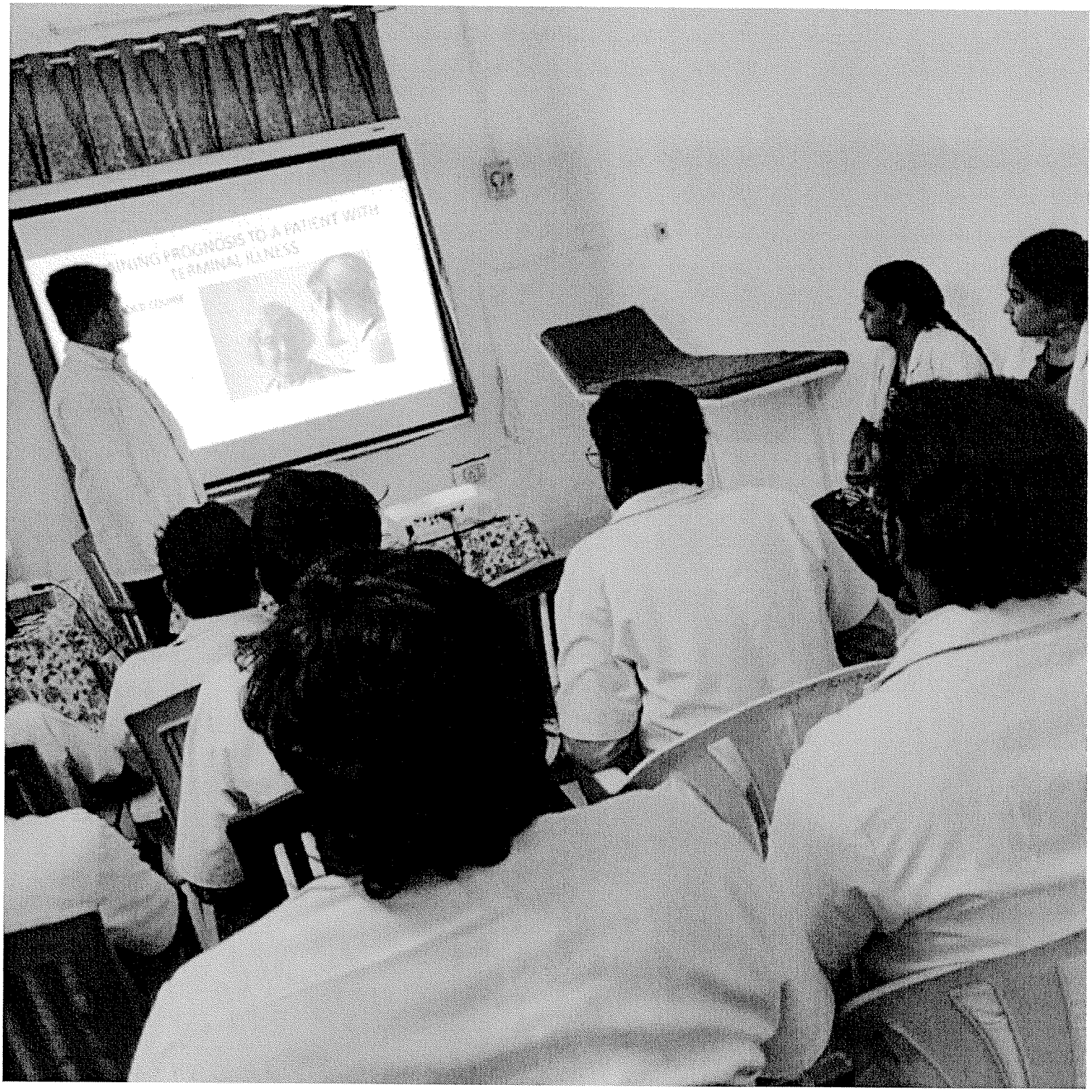
With reference to the subject mentioned above, the department has conducted the value-added course titled: **"Explaining prognosis to a patient with terminal illness"** on 19/04/2019. We solicit your kind action to send certificates for the participants. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. C. Aravind

Dr. C. ARAVIND, MD.,
Reg.No:68432
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Encl: Photographs


TERMINAL ILLNESS

Sri Lakshmi Narayana Institute of Medical Sciences

Date 3/12/2018

From
Dr K Balagurunathan,
Professor and Head,
General Surgery,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: ONCOPLASTIC BREAST SURGERY

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **ONCOPLASTIC BREAST SURGERY , 30hours course** on **JAN 2019- JUNE 2019**. We solicit your kind permission for the same.

Kind Regards

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

DR K BALAGURUNATHAN

HOD, GENERAL SURGERY

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: DR G. JAYALAKSHMI

The HOD: DR ASAYAS BOSCO CHANDRA KUMAR

The Expert: DR M SENTHIL VELAN

The committee has discussed about the course and is approved.

Dr. M. SENTHILVELAN, MS.,
Reg. No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry-605502.

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dean	Subject Expert	HOD
(Sign & Seal)	(Sign & Seal)	(Sign & Seal)

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

07.12.2018

Sub: Organising Value-added Course: ONCOPLASTIC BREAST SURGERY

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"ONCOPLASTIC BREAST SURGERY"**.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 1ST January 2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. G. JAYALAKSHMI, B.Sc., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry-605502.

Dean

Course Proposal

Course Title: ONCOPLASTIC BREAST SURGERY

Course Objective:

1. 1. Introduction
2. History of oncoplastic surgery
3. Classification of oncoplastic surgery
4. Volume displacement techniques
5. Mammoplasty techniques
6. Volume replacement techniques
7. Indications of oncoplastic surgery
8. Contraindications of oncoplastic surgery
9. Why should ops be offered to patients
10. Evaluation of outcomes
11. Conclusions
12.

Course Outcome:

Course Audience: MBBS UNDERGRADUATES

Course Coordinator: DR ASAYAS BOSCO CHANDRA KUMAR

Course Faculties with Qualification and Designation:

1. **Dr Asayas Bosco Chandra Kumar , Prof and HOD General Surgery**
2. **Dr K Balagurunatha, Prof General Surgery**
3. **Dr M Senthil Velan , Prof General Surgery**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours	Faculty
1.	22/1/2019	1. Introduction	4-6PM	2	**Dr Asayas Bosco**
2.	24/1/2019	2. History of oncoplastic surgery	4-7PM	3	**Dr K Balagurunatha**
3.	25/1/2019	3. Classification of oncoplastic surgery	4-7PM	3	**Dr Asayas Bosco**
4.	27/1/2019	4. Volume displacement	4-6PM	2	**Dr K Balagurunatha**

		techniques			
5.	30/1/2019	5. Mammoplasty techniques	4-7PM	3	**Dr Asayas Bosco**
6.	2/2/2019	6. Volume replacement techniques	4-7PM	3	**Dr M Senthil Velan**
7.	4/2/2019	7. Indications of oncoplastic surgery	4-7PM	3	**Dr Asayas Bosco**
8.	5/2/2019	8. Contraindications of oncoplastic surgery	4-6PM	2	**Dr M Senthil Velan**
9	7/2/2019	9. Why should ops be offered to patients	4-6PM	2	**Dr M Senthil Velan**
10.	9/2/2019	10. Evaluation of outcomes	4-7PM	3	**Dr Asayas Bosco**
11.	11/2/2019	11. Conclusions	4-6PM	2	**Dr M Senthil Velan**
			TOTAL HOURS	30	

REFERENCE BOOKS: (Minimum 2)

1. **Schwartz's Principles of Surgery, 10th Edition**
2. **Bailey And Love's Short Practice of Surgery 26th Ed**
3. **Sabiston Textbook of Surgery - The Biological Basis of Modern Surgical Practice, 19E**

VALUE ADDED COURSE

1. Name of the programme & Code

Oncoplastic breast surgery & GS10

2. Duration & Period

30 hrs & JAN 2019- JUNE 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 TIME , JAN 2019- JUNE 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Courses : JAN 2019- JUNE 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	GS10	Oncoplastic breast surgery	Dr. M SENTHIL VELAN	MBBS	20 (JAN 2019- JUNE 2019)

10. Course Feed Back

Enclosed as Annexure- V

Dr. M. SENTHILVELAN, MS.,
Reg. No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

RESOURCE PERSON

DR M SENTHIL VELAN

(PROF GENERAL SURGERY)

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

CO-ORDINATOR

DR ASAYAS BOSCO CHANDRAKUMAR

(HOD GENERAL SURGERY)

ONCOPLASTIC BREAST SURGERY

PARTICIPANTS HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	ONCOPLASTC BREAST SURGERY
Course Code	GS10
Objective	1. Introduction 2. History of oncoplastic surgery 3. Classification of oncoplastic surgery 4. Volume displacement techniques 5. Mammoplasty techniques 6. Volume replacement techniques 7. Indications of oncoplastic surgery 8. Contraindications of oncoplastic surgery 9. Why should ops be offered to patients 10. Evaluation of outcomes 11. conclusions

Further learning opportunities	-
Key Competencies	On successful completion of the course the students will have knowledge regarding recent advances about recent advances in radiotherapy and chemotherapy
Target Student	MBBS Students
Duration	30hrs JAN- JUNE 2019
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Multiple choice questions

Introduction

It took almost a century before the Halstedian approach to breast cancer was replaced by more conservative methods especially for early breast cancer. Breast conservation therapy was tested in several randomized trials by the NSABP group and the Milan Group and it was concluded that BCT and mastectomy were equivalent in terms of local recurrence as well as distant metastases in suitable cases. Breast conservation became the norm in the West where screen detected cancers and smaller palpable tumors were subjected to wide excision and axillary dissection and subsequently sentinel lymph node biopsy. The essence of this evolution in surgical technique has been to offer less mutilating surgeries without compromising oncological outcome. While the goal of BCS was to achieve complete removal of the tumor with adequate surgical margins, preserving the natural shape and appearance of the breast became a challenge. To address this issue, oncoplastic surgical procedures were introduced in recent years. This saw an amalgamation of the best principles of oncology along with plastic surgery leading to optimal oncologic outcomes and safety.

History of Oncoplastic surgery (OPS) in Breast Cancer

It all began in the 1990's.This term was first coined by Audretsch to describe the blending of the oncology and plastic surgery techniques. It was slow to pick up but in the last decade, rapid strides have been made in this area, as the acceptance of the various procedures and the dissemination of information has spread.

Classification of Oncoplastic Surgery

Volume Displacement Techniques

The resected defect is reconstructed by moving a range of local glandular or dermoglandular tissue into the defect. Adjacent tissue rearrangement and various mammoplasty techniques are used to achieve this end.

Adjacent tissue rearrangement is frequently used especially if the volume of breast excised is less than 20%. This is the preferred method in large to medium sized breast with reasonable ptosis and dense glandular tissue. It is also known as Type 1 oncoplasty. Adjacent tissue rearrangement involves

a) Accurate placement of skin incision

b) Skin undermining

c) Wide excision from skin to muscle

d) NAC undermining

e) Glandular reapproximation

f) De-epithelialisation and NAC repositioning

These techniques solve 90% of cases requiring oncoplasty. However, this technique may not be desirable in the elderly with fatty breasts where undermining in both the subcutaneous plane and the deep to the gland may compromise the vascularity of the displaced breast tissue. These techniques are simple to perform and do not require specific training. The cosmetic results are good and the re-excision rates are less than 10%.

Mammoplasty techniques makes use of various parenchymal flaps to fill the resection defects. They are indicated when 20-50% of the breast volume is likely to be excised, in large-medium sized breast with significant ptosis.. These are immensely useful for tumors in unfavorable locations like the central quadrant, upper inner quadrant and lower quadrants. Contralateral symmetrisation procedures with a similar procedure may benefit women with symptomatic macromastia.

The commonly used flaps are

1) The superior pedicle flap- allows for resection of tumours in the lower half of the breast.

2) The inferior pedicle flap- allows for resection of tumours located in the upper half of the breast.

Other mammoplasty techniques, which are used in specific clinical situations, are the Round block technique for almost any quadrant, the Grisotti flap for central quadrant tumours, the Batwing approach for upper half tumors located close to the areola etc

Volume Replacement Techniques

Here the resected defect is reconstructed by replacing the excised breast tissue with a similar volume of autologous tissue from an extramammary site. The preferred options include musculocutaneous flaps, pedicled flaps or free flaps

Musculocutaneous flap- The most commonly used flap in this category is the latissimus dorsi musculocutaneous flap. This versatile flap has the ability to reach almost all quadrants of the breast, specifically the superior, inferior and lateral aspects of the breast. If skin is required, a posterolateral incision is designed to harvest the flap. If skin is not required then a Mini LD flap can be harvested through an anterolateral or lateral mammary crease incision, which is also used to resect the tumour.

The other flaps based on perforators are

- The thoracodorsal artery perforator flap (TDAP)- is an adipo-cutaneous flap minus the LD muscle
- The lateral thoracic artery flap – is a fascio-cutaneous flap based on the lateral thoracic artery or the thoracodorsal artery and vein
- The lateral intercostal artery flap(LICAP)- is based on the lateral perforator of the intercostal artery

Indications of OPS

- Breast cancer for which a standard BCS is seemingly impossible without compromising the margins or cosmesis. This includes large tumors, extensive intraductal componenet, multifocal disease, poor response to neoadjuvant chemotherapy or a high tumor to breast ratio with resection of more than 10-20% of breast volume
- Tumors in any location, especially the central, medial and lower pole tumors

Contraindications to OPS

1. Large tumors that require a mastectomy to achieve clear margins
2. Insufficient residual breast after excision
3. Extensive microcalcifications

4. Multicentric disease

5. Inflammatory Carcinoma

6. Previous irradiation

7. Multiple co morbidities and chronic smoking

Why should OPS be offered to patients?

1. OPS allows for bigger resections, wider margins with good oncologic and cosmetic outcomes

2. OPS may avoid the need for mastectomy and circumvent the morbidity associated with mastectomy and immediate reconstruction. Sensory loss associated with reconstruction is also avoided

3. Secondary operations to correct breast deformities are avoided if primary OPS is undertaken

4. OPS reduces the size of the breast allowing the radiation oncologist ease of delivery radiotherapy

5. Bilateral OPS prevents breast asymmetry and allows for histopathological examination of the contralateral breast and incidental discovery of occult carcinoma.

Evaluation of outcomes

The parameters taken in account to measure outcome are

1. Local recurrence rates

2. Cosmesis

3. Patient satisfaction

Based on the limited studies, which have reported outcomes, local recurrence rates and cosmetic failure are within acceptable limits when compared with conventional BCS.

Conclusions

1. OPS has become an integral part of most breast conservation surgeries.

2. Type 1 oncoplasties can be easily mastered and can provide answers for almost 90% of cases

3. Specialised training to pick up plastic surgery techniques are recommended for Type 2 oncoplasties

4. Oncologic and cosmetic outcomes need to be assessed prospectively to establish the safety of this procedure

Annexure- II
VALUE ADDED COURSE

ONCOPLASTIC BREAST SURGERY GS10

List of Students Enrolled JAN 2019 – JUNE 2019

MBBS Student			
Sl. No	**Name of the Student**	**Roll No**	**Signature.**
1	DISHAL K P	U17MB291	
2	DIVYA PRIYA K	U17MB292	
3	DIVYANSHI SINGH	U17MB293	
4	ELAKIYA BALA	U17MB294	
5	FEMI SREE RA	U17MB295	
6	GANJI KARTHIK	U17MB296	
7	GOWTHAMAN M	U17MB297	
8	GOKLA VANI GK	U17MB298	
9	GOWTHAM B J	U17MB290	
10	GRANDHI KARISHMA	U17MB300	
11	GREESHMA SHAJI K	U17MB301	
12	GUDDATI KOTA SATYA NAGA S RAMESH	U17MB302	
13	GURUNATHAN S	U17MB303	
14	HARSH BHARTI	U17MB304	
15	HENRITTA I	U17MB305	
16	HIYA SAIKIA	U17MB306	
17	HRITHICK MANICKAM R	U17MB307	
18	JAYASHREE SAIKIA	U17MB308	
19	JITHU MOHAN	U17MB309	
20	KAILA PRASANTH KUMAR	U17MB310	

DISHA L KP
U17MB291

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

ONCOPLASTIC BREAST SURGERY

MULTIPLE CHOICE QUESTIONS

Course Code: GS10

I. ANSWER ALL THE QUESTIONS

1. Term oncoplastic surgery (OPS) was termed by

   a. Audretest

   b. Robert Koch

   c. Louis Pasteur

   d. Edward Jenner

2. Adjacent tissue rearrangement involves

   a) Accurate placement of skin incision

   b) Skin undermining

   c) Wide excision from skin to muscle

   d. all of the above

3. Mamoplasty techniques are useful in

   a. tumors in unfavorable locations

   b. when 20-50% of the breast volume is likely to be excised

   c. Both A & B are Correct

   d. none of the above

4. commonly used flaps

   a. superior pedicle flap

   b. inferior pedicle flap

   c. grissoti flap

   d. all of the above

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

5. latissmus dorsi adipocutaneous flap is based on

a. thoraco dorsal artery perforator

b. lateral thoracic artery

c. Both A & B are Correct

d. None of the above

6. contraindications of OPS

a. Large tumors that require a mastectomy to achieve clear margins

b. Insufficient residual breast after excision

c. Extensive microcalcifications

d. aN of the above

7. indications of OPS

a. high tumor to breast ratio with resection of more than 10-20% of breast volume

b. Tumors in any location, especially the central

c. Both A & B are Correct

d. None of the above

6½

ASSESSOR NAME : M. SENTHIL VELAN

SIGNATURE

DATE : 11/2/2019

Dr. M. SENTHILVELAN, MS.
Reg. No. 53175
Professor of General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu - 522

Divya Priya k
U17MB292

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

ONCOPLASTIC BREAST SURGERY

MULTIPLE CHOICE QUESTIONS

Course Code: GS10

I. ANSWER ALL THE QUESTIONS

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a. thoraco dorsal artery perforator

b. lateral thoracic artery

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d. None of the above

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a. Large tumors that require a mastectomy to achieve clear margins

b. Insufficient residual breast after excision

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d. all of the above

7. indications of OPS

a. high tumor to breast ratio with resection of more than 10-20% of breast volume

b. Tumors in any location, especially the central

c. Both A & B are Correct

d. None of the above

5/7

ASSESSOR NAME :

SIGNATURE :

DATE : 11/2/2019

Dr. M. SENTHILVELAN, MS
Reg No 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Scienc
Osudu, Kudapakkam, Puducherry-605 502

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that GREESHMA SHAJI K has actively participated in the Value Added Course on ONCOPLASTIC BREAST SURGERY held during Jan 2019 – June 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. M. SENTHILVELAN, MS.,
Reg. No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. M SENTHIL VELAN

RESOURCE PERSON

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dr.Asayas Bosco
Chandra Kumar

COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that DISHAL K P has actively participated in the Value Added Course on ONCOPLASTIC BREAST SURGERY held during Jan 2019 – June 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. M. SENTHILVELAN, MS.,
Reg. No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. M SENTHIL VELAN

RESOURCE PERSON

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dr.Asayas Bosco
Chandra Kumar

COORDINATOR

Student Feedback Form

Course Name: **ONCOPLASTIC BREAST SURGERY**

Subject Code: **GS10**

Name of Student: Dishal KP Roll No.: U17MB291

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

SL NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful			✓		✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	✓5

* Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory

Suggestions if any:

Date: 11/2/2019

Signature

Student Feedback Form

Course Name: **ONCOPLASTIC BREAST SURGERY**

Subject Code: **GS10**

Name of Student: Gowtham BJ Roll No.: U17MB290

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 11/2/2019

Signature

Date 25/6/2019

From
Dr Asayas Bosco Chandra Kumar
Professor and Head,
General Surgery,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: ONCOPLASTIC BREAST SURGERY

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **ONCOPLASTIC BREAST SURGERY** for 20students on JAN 2019- JUNE 2019. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

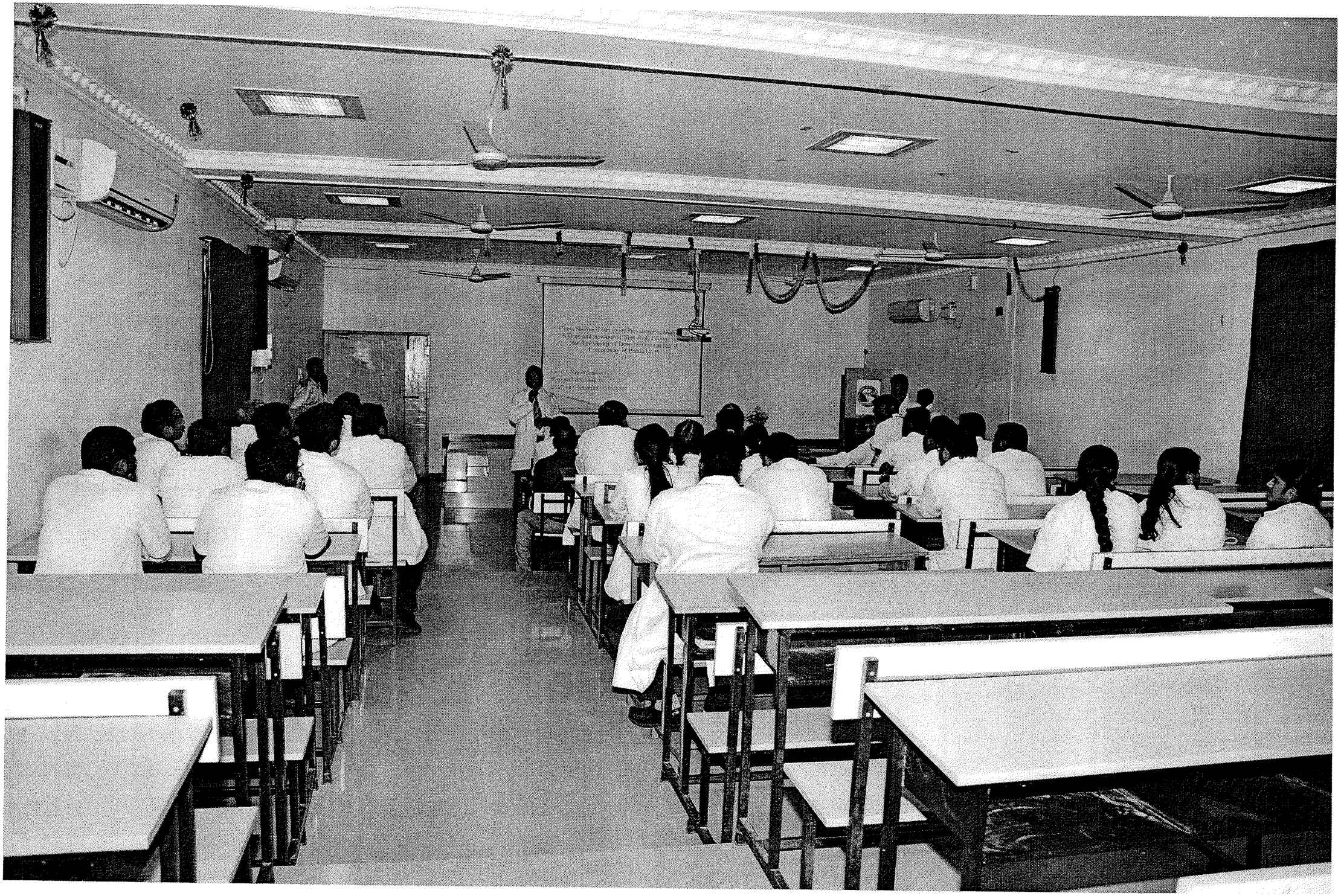
PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dr. ASAYAS BOSCO CHANDRA KUMAR

HOD General Surgery

Encl: Certificates

Photographs



SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Date:20.10.2019

From
Dr. Kalarani
Professor and HOD,
Department of Obstetrics and Gynaecology
Sri Lakshmi narayana Institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institue Of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Labour Ward Drills

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Labour Ward Drills** on April 2019 to Jan 2020. We solicit your kind permission for the same.

Kind Regards

Dr.Kalarani,

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. Kalarani

The Expert: Dr. Durga

The committee has discussed about the course and is approved.

Dean

Subject Expert

HOD

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

ASSOCIATE PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Circular

15.12.2018

Sub: Organising Value-added Course: Labour Ward Drills - reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research**, is organizing **"Labour Ward Drills"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30.12..2018. Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry-605502.

Course Proposal

Course Title: Labour Ward Drills

Course Objective:

1. **Obstetric emergency -overview**
2. **Conduct of an Labour drills**
3. **Practical skills - PPH**
4. **Practical skills - Maternal collapse**
5. **Practical skills - Eclampsia**
6. **Practical skills - Sepsis**
7. **Practical skills - category 1 C-section**
8. **Problem based case scenario**
9. **Role of anaesthesia in emergency**
10. **Role play**

Course Outcome: To gain Knowledge about Labour Ward Drills

Course Audience: Final MBBS Undergraduates

Course Coordinator: Dr.DURGA

Course Faculties with Qualification and Designation:

1. **Dr. Kalarani, Prof. and HOD, OG**
2. **Dr. R. DURGA, Assistant Professor, OG**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1	2.01.2019	Obs emergency - overview	4.00pm -7.00pm	3
2	10.01.2019	Conduct of an labour drill	4.00pm -7.00pm	3
3	8.02.2019	Practical skills - PPH	4.00pm -7.00pm	3
4	16.02.2019	Practical skills - Maternal collapse	4.00pm -7.00pm	3
5	3.03.2019	Practical skills -Eclampsia	4.00pm -7.00pm	3
6	12.03.2019	Practical skills - Sepsis	4.00pm-7.00pm	3
7	26.03.2019	Practical skills - Category 1 C SEC	4.00pm -7.00pm	3
8	5.04.2019	Problem based case scenario	4.00pm -7.00pm	3
9	11.04.2019	Role of Anaesthesia in emergency	4.00pm -7.00pm	3
10	25.04.2019	Role play	4.00pm -7.00pm	3
			Total Hours	30

REFERENCE BOOKS: (Minimum 2)

1. **Willaims Obstetrics Edition 21**
2. **Strat OG**

VALUE ADDED COURSE

1. Name of the programme& Code

Labour Ward Drills OBGY 10

2. Duration& Period

30 hrs & JANUARY 2019 TO JUNE 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7.No. of times offered during the same year:

1-JANUARY 2019 TO JUNE 2019

8. Year of discontinuation: 2020

9. Summary report of each program year-wise

Value Added Course					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength& Year**
1	OBGY 10	LABOUR WARD DRILLS	Dr. K.DURGA	FINALYEAR MBBS	JANUARY 2019 TO JUNE 2019

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

ASSOCIATE PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of Medical Sciences
OSUDU, PUDUCHERRY.

COORDINATOR

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
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PARTICIPANTS BOOKLET

LABOUR WARD DRILLS

INTRODUCTION

Asmassiveobstetrichemorrhageistheleadingcauseof maternalmortalityworldwideandamajorcontributor to maternal morbidity, this subject deserves center stageinthetrainingofmidwiferyandobstetricstaff. Thatthistrainingneedisglobalishighlighted by instancesofsubstandardcarewithdeathsasaresultof postpartumhemorrhage(PPH)inrecentUKconfi- dential reports (CEMACH).

Although much knowl- edgecanbegainedatthebedside,practicalteaching with a structured approach to this unique life- threateningemergencyprovidesasenseofsecurityand preparedness that cannot be obtained in any other manner. Several well-established courses focus on practical emergency teaching, and further information isavailablethroughthewebsitesofmanyprofessional organizations.

SomeofthecoursesrunintheUKand abroadarelistedinAddendumAattheendofthis chapter. These courses present a structured approach to resuscitation with skills, drills and scenarios taught andappliedtotheseriouslyillpatient.Asgoodassuch coursesmaybe,however,theycannotbegintotrain everyoneinallthings,andthereremainsaneedfor stronglocalsupplementationintheformofmulti- disciplinarytraining.Indeed,thelatterhasbeenshown tobeeffectiveinimprovingknowledgeandclinical outcomes.

PRACTICAL TEACHING

Thesamepreparationsshouldbemadewhetherteachingskills,drillsorscenariosaretobeused(seebelow).

Knowledge

Asoundknowledgebaseisrequiredbeforepractical teaching can be undertaken successfully. An initial lecture/workshop/discussionshouldbeorganizedif staffareunfamiliarwithpracticalteachingorif new materialistobetaught,asthisallowsstafftoprepare themselves.Italsohelpsreinforcetheideathatpracticalteachingisanopportunitytoputwhatoneknows intopractice.

Environment

Asuitablelocationshouldbefoundthatisconducive totheteachingthathasbeenplanned.Thelayoutof theroomshouldallowthoseinvolvedtoaccessthe patient(iftheteachingispatientoriented)andthose watching to see clearly. Heating and ventilation shouldbeconsidered,butacousticsarevitalandcan sometimesconflict(e.g.noisefromanopenwindow).

Whenteachingaboutobstetrichemorrhage,adelivery roomoranoperatingtheatermakesforaveryrealistic teaching environment, but it occasionally conflicts withclinicalneeds.Toavoidthis,onecanplan impromptuteachingwhenthedeliverysuiteisquiet. Impromptu or ‘unannounced’ teaching also is good fortestinghowthesystemsareworking(i.e.drills), but,asitdoesnotallowpriorplanningintermsof whoorhowmanypeoplecanbetaught,itmaybeless usefulwhenrunningclinicalscenarios.

Anotheralter- nativeistoconsiderreducingelectivesurgerytofacilitatetraininginanoperatingtheateratagiventime, remembering, of course, that labor ward workloads aretotallyunpredictableandaback- upteachinglocationneedstobeavailable(forexample,aseminar roomorantenatalclassroom).

Setting the tone

Theinstructorshouldgiveageneralexplanationatthe beginningoftheteachingsessioninordertoestablish themoodandmotivatethelearnersbyoutliningthe usefulnessofthecontent.Asimpleintroductionisall thatisrequired.Forexample,'Obstetrichemorrhage is the leading cause of maternal death globally,and todaywearegoingtorunthroughasimulatedcaseof placentalabruption.

Theaimisforyoutoconsolidate andapplyyourknowledgeinthisarea,aprocess whichshouldassistyouwhenyoufaceasimilarsituationinarealemergency'.Atthisstage,italsomaybe usefultointroducetheclinicalproblemthecontext ofrecenteventseitherlocallyorsomethingthatmay havebeenreportedinthelaypress.

Thespecificobjectivesofthesessionshouldthenbe explainedalongwithwhatisexpectedofeveryonein termsofwhoisgoingtodowhat,andwhetherquestionscanbeaskedthroughoutorbekepttilltheend. Itisextremelyusefultoallowquestioningthroughout, asmanypeoplewillforgetifaskedtowaittilltheend. However, this process can spoil the momentum ofa scenarioandroleplaysessionandmustbejudged anew in eachsession.

Dialogue

Theactual'doing'inpracticalteachingandroleplay worksthroughthesimulationthatcomefromstarting fromveryspecificinstructions.Progresscanvary accordingtowhatthelearnerdoes,andtheinstructor needstostayalertandflexibleinordertoremainin control, to cover all intended teaching points andto guidethesessiontoanappropriateconclusion.

Feedback

Thisissometimesknownascritiqueordebriefingand isanessentialpartofthelearningprocessasitpro-motesretentionofimportantpoints.Anumberof techniquescanbeused,butthemainideaistoidentify and promote the good (salient) points(remembering othersintheteachinggroupmaynothaveknown thesebeforehand)andtoidentifyinasensitivefashion, anydeficiencies(lackofknowledgeorerrors).

One form of systematic feedback, describedby Pendleton and known as Pendleton's rules,comprises fourstages:thelearnersayswhatshe/hedidwell;then whatshe/hecouldimproveupon;thisisfollowedby thetrainerstatingwhatthelearnerdidwell;followed by what could be improved upon. Allowing the learner to comment first provides the instructor an opportunitytoassessthecandidate'sinsightintoheror hisownabilityandbehavior.Theinstructorthenhas the opportunity to highlight both good practice and areasforimprovementnotalreadycoveredbythe learnerinordertostressandreinforcelearningpoints to allpresent.

Anothermethodoffeedbackinvolvesdebriefingas alearningconversation.Thisislessrigidinstylecom-paredwiththeaboveandinvolves:

Makinganopeninggambit(individualizedstartto theconversationdependingonhowthingswent, such as 'That seemed to go well, what doyou think?'or'Thatwasratherdifficult,let'sseeifwe canworkoutwhatwasgoingon'etc.);

Jointly exploring any issues that emerge (listening andresponding,andinvolvingthewholegroupto widentheconversationasneeded);

Sharethoughtsofwholegroupandtheinstructor considering the learning of the whole group, whilebeingcarefulnottooverloadthepractice candidate.

Closure

Bearinginmindthatadultsneedtounderstandsome- thing before they change their behavior, it iscrucial thatquestionsanddiscussionbeencouraged.Asum- mary of the key learning points from the session shouldthenbeprovided,sothateveryoneleavesthe teaching/learning with a clear message of the most importantissues.

DRILLS, SKILLS AND SCENARIOS

Thesethreestylesofteachingdifferintheiraims.Each requiresandtestsdifferentskillsandknowledge,the featuresofwhicharesummarizedinTable1,together withexamplesofsuitableteachingmaterial.

Drills

Thesearepracticeor‘dummy’runsandarecomparabletofirepracticesintestinglocalsystems.Runninga drillnotonlyallowslocalscrutiny(i.e.whatactually happenswhenthealarmisputout),butalsocanbea veryeffectivetestoflocalarrangementsandservicesas wellasstaffknowledgeofthem.

Preparations for a drill

Whenrunningdrills,thestaffshouldbefacedwiththe drillinanormalclinicalarea,unprepared,inorderto receivearealisticideaofwhatwouldhappenina truesituation.Clearly,adrillshouldnotconflictwith patientcare,andtimingmustdependtosomeextent onexistingworkload.Theleadclinicianfortheteachingsessionshould,however,haveinformedthelead midwifeand,inthecaseofanobstetrichemorrhage, the transfusion hematologist and other necessaryindi- viduals,suchastransportationstaff.Thisisnotonlyas amatterofcourtesy,butalsotoplantimingsinorder to avoid clashes of interests. Thetransfusionhematologistmaypreparespareserumforgrouping andmakeemptybloodbagsavailableforthe‘dummy run’.

Running the drill

Figure 1 illustrates an example of an assessmentsheet for a massive obstetric hemorrhage drill,suggesting thingsthatcanusefullybemonitoredincluding:

1. Whorespondstotheinitialemergencybuzzer?
2. Istheappropriateemergencycallputout?
3. Howeffectiveistheemergencybleepingsystem?
4. Istransportationalertedandrespond?
5. Dotransfusionstaffreceiveanycommunication?
6. Howquicklydoesbloodarriveatthebedside?
7. Howquicklyisthepatienttransferredtotheoper- atingtheater?
8. Whendoestheanesthetist/consultant/hematologist arrive?

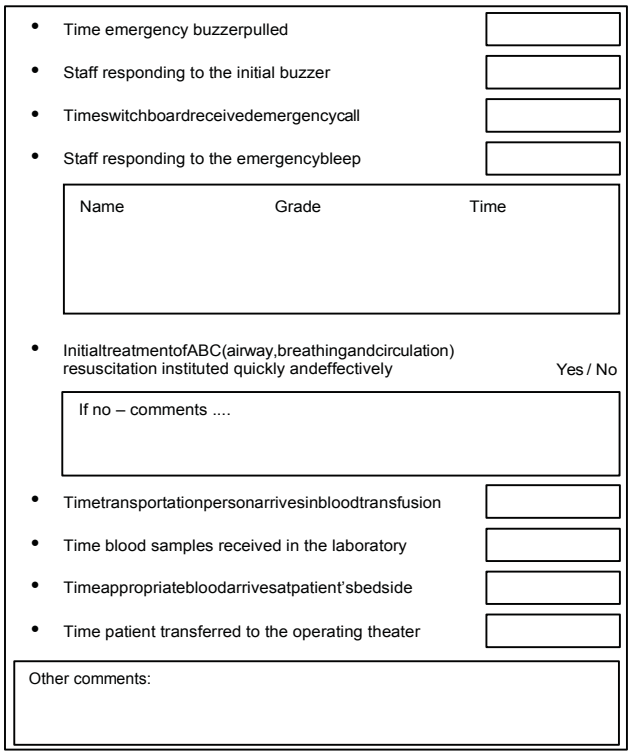

Figure 1 An assessment sheet for massive obstetric hemorrhage drill. This assessment sheet can be expanded to include the response times for individual doctors, and their reactions and action.

Table 1 Key features and differences in skills, drills and scenario teaching

	Skill	*Drill*	*Scenario*
Definition	Acquisitionofaskill	Achainofeventsinresponsetoaproblem	Improvizedclinicalroleplay
Aimoftheteaching	Ensurecorrecttechnique	Testthelocalemergencysystem	Applyandpracticeclinicalcareina improvized set-up
Teachingenvironment	Seminarroom	Throughouthospitalinday-to-day environment	Seminarroom,operatingtheateror deliveryroom
Examples of things suitable for teaching and testing in relation to obstetric hemorrhage	Brace suture Rusch balloon Aortocaval compression CPR Bimanual uterinecompression IV cutdown	Responsetotheemergencymassive obstetric hemorrhagecall	APH – abruption – placental previa PPH – atony – trauma – RPOC
Skillmix	Doctorsandmidwives	Alldeliverysuitestaffandlaboratorystaff, hematologists andporters	Multidisciplinary: obstetricians, midwives, anesthetists, pediatricians

CPR, cardiopulmonary resuscitation; APH, antepartum hemorrhage; PPH, postpartum hemorrhage; RPOC, retained products of conception

Suchanalysescanhelptoillustratesystemfailuresand modify local policies. The identification of problems stimulates and informs development of appropriate guidelines.Clarifyingtherolesofdiversestaffand streamliningactivitycanalsoimprovefutureresponses and improve care. Such developments can bemonitoredatfuturedrillsandimprovementsinthesystem should be fed back to staff. Having run drills for obstetric hemorrhage at Queen Charlotte's and ChelseaHospitalformanyyears,thefollowingare examplesofproblemsidentifiedandsystemchanges made inresponse.

Communication problems and how they were addressed As identified in numerous Confidential Enquiries,problemsincommunicationoftenhamper emergencyresponses.Wefoundthatwestruggled withinstructionsfromclinicianstobloodtransfusion staffregardingwhatwasneededandwhenitwas needed:Wasitpossibletowaitforgroup-compatible bloodorevencross-matchedblood?Howlongtowait tohavebloodatthebedside?Whatclottingproducts wereneededwhen?Thesearesomeexamplesofquestionsthatareoftennotclarified'overthephone'. Itsoonbecameobviousthatthisjobwasnormally delegatedtosomeoneveryjunioronthedeliverysuite andmisunderstandingswerecommon.
Ourresponsewasfirst,toinstallaredphoneinthe obstetricoperatingtheaterbasedonthedeliverysuite thatlinkedexclusivelywitharedphoneinthetransfusion laboratory. This enabled blood requirementsto bediscussedbytheanesthetistdirectlywithtransfusion staffwithouthavingtoleavethepatienttogooutside thetheater.Second,wethenidentifiedtimelimitsfor transfusingbloodatthebedside(forexample,'We need4unitsofbloodwithin30minutes'),ratherthan discussing whether to wait for blood to be cross-matchedornot.Thisleftthelaboratoryinnodoubtof the clinical needs and has minimized delay inblood arrivingatthebedsidewhenneeded.

Problems with transportation and how they were addressed In the past, the transportation person arrivedinthedeliverysuitewhenahemorrhagecall wasputouttotakebloodsamplestothelaboratoryfor grouping/cross-matching;however,thiswasdeemed inefficientanddelayedbloodbeingbroughttothe bedsideinthemosturgentcases.

Oursolutionwasfirsttochangetheprocesssothat thetransportationpersonwentstraighttothelaboratoryinreadinessfortheurgentneedofcollecting O-negativeblood.Second,apneumaticchutewas installedforsamplestobesenttothelaboratorywhich hasalsohelpedinthiscontext.Iftheclinicalcondition ofthepatientcanwaitforgroup-compatibleblood, thetransportationpersonstaysinthetransfusionlaboratoryuntilthesamplehasarrivedbychuteandhas been grouped, ultimately bringing the appropriate bloodtothedeliverysuite.Thistypeofthinkingis especially relevant in large modern hospitals where clinicalandlaboratoryservicesarenotonlyondifferentfloorsbutindifferent,oftenwidelyseparated, buildings.

Skills

Theteachingofpracticalskillsisofgreatimportance inobstetrichemorrhageteachingsessions.Theneed for specific teaching often becomes apparentduring thediscussionandquestioningwhenrunningascenario.Thingsmayhavebeenmentionedwhichare notfullyunderstood,andsuchcircumstancesillustrate howimportantitisforscenarioteachingtobeconstructive(seebelowforexamples).Staffmustfeelable toquestionwhatsomethingisorhowitisdone.In obstetric hemorrhage, the following skills maybe highlightedandneedtobetaught:

1. Medicalskills
2. bimanual uterinecompression
3. aorticcompression
4. cardiopulmonaryresuscitation
5. Surgicalskills
6. insertionofaninflatableuterineballoon
7. insertion of a Bracesuture
8. intravenouscut-downforvenousaccess.

Preparation for skills teaching

Teachinganypracticalskillthatmayberequiredinan emergency, should be executed slowly and calmly, givingampletimeforreflection,questionsandpractice.Theuseofmanikinsandsurgicalaidsworkswell, butonemustremembertopointoutthedifferencesto beexpectedwhenworking*invivo*(suchastheneedto keepaninflatableuterineballoonwellintothecavity whileinflatingit,orhowtodealwiththetendencyfor thebracesuturetoslipofftheuterinecornualareas (‘theshoulders’)whilepullingittight).

Running the skills teaching

Thisteachingprocessisbestperformedinfoursteps:

1. *Step 1* The instructor demonstrates the skill in silence.Theskillisperformedatnormalspeedsothat thecandidatesappreciatetheultimateaim.
2. *Step 2* The instructor then demonstrates the skill slowlywithacommentary.Providingthecommentaryandbreakingthetechniquedownaddsunders tanding to the process and can highlight points ofcautionandsafetyaswellasaddinghelpfulhints.
3. *Step3*Thelearnerprovidesthecommentary,which theinstructorfollowswhiledemonstratingtheskillfor thethirdtime.Theinstructormustbecarefulnotto assume knowledge on the learner’s part during this processandstopinmid-flowiferrorsaremade.This stepiscrucialintermsofsurgicalsafety,astheinstructorcantellwhatthelearnerunderstands.Anyerrorsor omissions can be addressed immediately. This step may need to berepeated.
4. *Step 4*Once step 3 is completed satisfactorily, the learnerisallowedtoperformtheskillwhileproviding acommentaryunderdirectsupervision.

Scenario teaching

Thesepracticalteachingsessionsdescribeaclinical pictureandfacilitateroleplaytomanagetheproblem. Theaimofsuchteachingistodemonstrateappropriate clinical behavior, including not only whether an individualhastherequisitelevelofclinicalknowledge andhowitisapplied,butalsohowindividualswork together as a team and communicate. Suchinteractionscanbecomplexandareworthdescribingfurther beforeillustratingmassivehemorrhagescenarios.

Teamwork

Theabilitytoworktogetherasateamisabsolutely requisitetogoodclinicalcare.Individualspossessdif-feringlevelsofexpertise,andthegroup’sabilityto carryoutspecifictasksdependsupontheinterpersonal skillsofallteammembers.Watchingagroupworking togethercanhighlightitsproblemsandhelpfocus remedialactionintermsofteamwork(orlackthereof) andoccasionallyindividualbehavior.

Everyteamneedsaleader,anddecidingwhothe leaderistobecansometimesbedifficult.Itisimpor-tanttorecognizethattheteamleaderneednotbe themostseniorpersonand,asthescenariodevelops,

sometimes the leader will need to change. In any event,theleadershouldhaveappropriateknowledge andskills,beagoodcommunicatorandmotivator,be able to maintain situation awareness (see thewhole picture)anddistributetheworkload.Atthesame time,watchingstaffadapttoeachothercanbehugely instructive,anddiscussingtheseissuesafterwardscan helpthemunderstandeachother,aswellasindividual needs andstresses.

Communication

The process of asking for and providinginformation andoflisteningtowhatotherpeoplearetryingtosay shouldbesimple.Itclearlyisnot,however,andis repeatedly raised as a problem area in Confidential Mortality Reports. In the Confidential Enquiry Report of 1997–1999[6], the greatest (and recurrent) causeofsubstandardcareinmaternaldeathswasfailure of communication and team workingbetweenprofessionals. When running practical teachingsessions,communicationwithintheteamcanbewitnessed and discussed afterwards. Generally speaking, when dealing with any emergency, singleprecise commandsshouldbeaddressedtospecificindividuals. Voicesshouldnotberaisedandanairofcalmcontrolideallyshouldbeapparent.Unfortunately,some individualstendtobecomeoverexcited,andnoise levelscanbuildupinemergencysituations,allof whichcanaffecteveryone'sbehavior,aswellasmake itexceedinglydifficulttohearwhatisbeingsaidwithout resorting to shouting. Pointing out such behavioralfeaturesunderstressduringmockemergencies canonlyhelptoraiseawareness.

Preparingforscenarioteaching

Whenpreparingforroleplay,itisimportanttotryto makethingsasrealisticaspossible.

ThepatientDependingonthesubject,eitheramanbegoodforcollapseandcardiopulmonaryresuscitationeneeded(forexample,themodelcanpretendtofit abruption).Eithercansuitmassiveobstetrichemoreveryoneusuallylearnsagreatdealwithregardtohow emergencies ikinoralivepersonisappropriate.Manikinstendto tion,whereaslivemodelsarebetterwhenresponses ineclampsia,orcangroananddescribepainwithan rhage.However,theadvantageofalivemodelisthat alllevelsofstaffcommunicatewithapatientinsuch

The equipmentRunning clinical scenarios is more realistic if appropriate equipment is available. This maybequitesimple(e.g.lateraltiltandoxygen,but usingithelpstoillustratewhatimportantfeatureshave been dealt with and what omissions have occurred (e.g.intravenousaccessorurinarycatheter).Table2 suggestsaminimumequipmentlistforamassive hemorrhagescenario.

Table 2 Basic equipment list for practical obstetric hemorrhage training

Airway and breathing
Guedel airway
Oxygen mask with bag and tubing Stethoscope
Circulatory
Wedge(toprovidelateraltiltforthepelvis) Tape
Two large-bore intravenous cannulae (14 F) 20-ml syringe
Bloodtubesforfullbloodcount(FBC),cross-match(XM),clotting studies
2-literbagsofcrystalloidrunthroughadministrationsets Catheter

Specific equipment for massive obstetric hemorrhage
Intrauterine inflatable balloon and bladder syringe

Running the scenario

1. *Who should be involved?* It is often difficult to decidewhoshouldbeinvolvedintheroleplayand whoisbetterlefttowatchquietly.Ifstaffmembersare inexperiencedwithscenarioteaching,itisbestinitially toaskforvolunteers.Lackofvolunteersmaybedueto simplefactorssuchasbeingshy,butitmayresultfrom fearofignorancebeingexposedorraisingissuesof competency.Itisforthisreasonthatdidacticteaching isabsolutelyrequiredpriortorunningscenariotrain- ing,sothatthetheoreticalmaterialhasalreadybeen covered. If this has taken place, thosepreviously unsureofthetheorybehindtheproblemcanbuildon theirnewlyacquiredknowledgeinapracticalway. Indeed,oncemembersofstaffbecomeusedtothis methodofteaching,morewillcomeforward.Occa- sionally,someonemayneedtobeinvitedtojoinin, butthisshouldbedonesensitivelyandwithsupport.
2. *Give people defined roles*People need to be given a definedroleandtoldwhattheycanorcannotexpect intermsofback-up.Forexample,'Youarethesenior house officer who has just answered theemergency buzzertothismultiparouspatient.Shehasjustbled briskly following spontaneous vaginal delivery. The midwifeishere,butallotherstaffarebusywithan emergencyintheaterandyoushouldnotexpecthelp foratleast10minutes.Pleasecarryonasyouwouldin reallife.Iwillgiveyouanyobservationsyourequest.
3. *Keeping the scenario going* The patient can be primedtogivecertainresponses,andmonitorscanbe preparedwithreadings(cardiotocographpaperstick- ingoutofamachine/bloodpressurerecordingsona monitor,etc.),butitistheinstructor'sroletokeepthe scenarioflowingandgiveasmuchoraslittleinforma- tionasisrequested.Thescenarioneedstoprogress, however, and gentle encouragement andoccasional subtlepromptscanassistthelearnerinachievingan understandingofthekeytreatmentpoints.Theaimof runningscenariosisnottodemonstrateignoranceon thepartofoneormoreindividuals,buttoempower themtoapplytheirknowledgeinalogicalandtimely manner.Dependingontheperformanceandabilityof thecandidate(s),thescenariocanberesolvedearlyor becomemorecomplex.Thisshouldbeanticipatedby the instructor well in advance. If the candidateis becomingstressed,buthasdoneallthebasickeytreat- mentpoints,thenthescenariocanresolveandthe candidatecanbecongratulated.Ifthekeytreatment pointshavenotbeenachieved,ontheotherhand, thenhelpcanbeathandintheformofaregistraror consultantarrivingtohelp.Ifthelearnerisdoinga fantasticjob,thenthescenariocanprogressandmore complex features can beadded.
4. *Prompting* This can be difficult if it is to be done sensitivelywithoutdemoralizingorembarrassingthe learner;inreality,itrequiresskillandtacttomake this form of teaching constructive.

Thefollowing examples may be useful in the massivehemorrhage situation:

- Lateraltiltcanbeforgotteninthepregnantwoman andapromptaskingwhetherthereis'anythingelse

that could improve the circulation?' may jog a response

- Ifthecandidatehasnotregisteredorrespondedto worryingobservationssuchasatachycardiaor hypotensionthenthesecanberepeatedandmade worse, e.g. 'the tachycardia has now increasedto xxx or the blood pressure is now yy/zzor unrecordable'
- Comment that uncross-matched blood is now availableifstaffhavelosttheirtrainofthoughtand had already mentioned they would request blood but then forgotten aboutit
- Providing the patient's physiological responses can slowdown/speeduptheactionasrequired.For example, once intravenous fluids have commenced, informthecandidatethatthebloodpressureis improving but that vaginal bleeding is still brisk. Thiswillencouragethecandidatetomoveonto assess thecause
- Ifthecandidatemovesawayfromtheintravenous accesswithouttakinganybloodsforlaboratory investigation,theinstructormayslowthingsdown byaskingifshe/hewoulddoanythingelsebefore movingontoassessthecauseofthebleeding.The candidate could also be prompted with an empty syringeandbloodtubes,ifnecessary,tomakea teachingpoint.

5. *Drawing things to a logical conclusion* When the scenariohasrunitscourse,allpeoplewhohavebeen involvedintheroleplayshouldbecongratulatedand thankedfortheirparticipation,andthenencouraged toengageinthefeedbackprocessasdescribedabove. Questions and discussion should then be encouraged beforeclosure,withparticularemphasisgiventothe key treatmentpoints.

Examples of possible massive obstetric hemorrhage scenariosareprovided,togetherwiththeirkeytreatmentpointsinAddendaBandC.

SUMMARY

Setting up practical teaching locally improves local processes, builds on teamwork, aids with communication,andimprovesclinicalknowledgeanditsapplicationintheemergencysituation.Itisbestkeptsimple and, because it can be stressful to those involvedin roleplay,itmustbeintroducedsensitivelyandconductedwithinanencouragingatmosphere.Staffneed toknowwhatstyleofteachingwillbeused,andwhat itaimstoaccomplish.Advertisingtheplannedcontent ofthesessioninadvancewillencouragestafftoprepareandcapitalizeonenthusiasmandlearning.Good luck.

SamplescenarioforPPHduetoatonic uterus

Instructor's information

ThisscenarioisoneofPPHduetouterineatony.You arelookingforrapidresuscitationofthewomanatthe sametimeasdiagnosingandtreatingtheproblem (uterine compression, evacuation of clots, administra- tionofuterotonicdrugsandcheckingfortrauma). Dependingonhowthescenarioflowsyoucanallow forrapidrecovery,ornot– ifbleedingpersiststhere canbediscussionaboutothercausesofhemorrhage andyouarelookingforanearlydecisiontogotothe - aterforanexaminationunderanesthetictoexclude trauma/retainedproducts.

Candidate information

A34-year-oldgrandmultiparadeliveredahealthy babyboyweighing4.00kg40minutesago.Shehad physiologicalmanagementofherthirdstage,andthe placentawasdelivered10minutesago.Themidwife hasnoticedfreshandbriskvaginalbleedingandaccosts youasyouwerewalkingpastthedeliveryroom.

Initial observations

Thepatientistalkingbutverypale;pulse110/min; bloodpressure120/80mmHg;largevolumeofblood onbedandfloor.Pleaseproceedasyouwouldinreal lifetogetherwiththemidwifewhocalledyou.Iwill giveyouanyobservationsyourequest.(Thecandidat e canbeobstetricormidwiferyaseithershouldbeable tomanagethisemergency.Iffurtherprogresstotheater isneeded,moreseniorhelpcanarriveasrequested.)

Instructor'snotes/Keytreatmentpoint stobe achieved

- Callforhelpandinitiatethemassiveobstetrichem - orrhagedrill
- Recognizethatthisisacirculatoryproblem:prog- ressrapidlythroughairwayandbreathingandattach face mask foroxygen
- Establish intravenousaccess
- Sendbloodforfullbloodcount,cross- match,coag- ulation andU&Es
- Commencewarmedintravenousfluids
- Do clinical examination and diagnose uterine atony
- Administertransabdominaluterinemassage
- Administer a uterotonicagent
- Performavaginalexaminationandevacuateclots
- Checkforobviousvaginalorcervicallaceration s
- Do bimanual uterinecompression
- Gothroughmedicationcascadelogicallyandgiv e intravenousfluidsandbloodappropriately
- Consider examination under anesthetic ifpatient failstorespondandconsiderothercausesofPPH
- Knowledge of surgical techniques to controlhem- orrhage,i.e.Rüschballoon,bracesuture,etc.

Thisscenarioismorecomplex–aprecipitatelabor withthepossibilityofaconcealedabruptionorgenital tract trauma. The focus will be ondistinguishing betweenabruption,genitaltracttraumaandretained products/membranes with/without disseminated intravascularcoagulation(DIC).Howthisscenariowill unfoldwilldependonthelearner'sexperienceand ability.Youarelookingforrapidresuscitationofthe womanatthesametimeasdiagnosingandtreatingthe problem (uterine compression, evacuation of clots, administration of uterotonic drugs and checkingfor trauma).Onthisoccasionbleedingpersistsandyouare lookingforanearlydecisiontogototheaterforan examination under anesthetic. For a junior traineeyou maychoosetoletthemfindandrepairavaginalor cervicaltear,butforaseniortraineeyoucantakethem furtherwithDIC,bloodandclottingproducts,checkingforacidosisandneedforventilation,etc.

Candidate information

A24-year-oldprimiparaisinducedat42weeks'gestation.Sheishavingintermittentabdominalpainwhen the prostaglandin is inserted. One hour later she is transferredtothedeliverysuiteinextremepainand20 minutes later she delivers a 3.8 kg baby boyrapidly followed by theplacenta.

Initial observations

Talking; pulse is 100/min; blood pressure 115/70 mmHg; steady trickle of blood vaginally.

Pleaseproceedasyouwouldinreallifeand Iwill giveyouanyobservationsyourequest.

Instructor's notes/Key treatment points achieved

- Callforhelpandinstitutemassivehemorrhagecall
- Recognize circulatory problem. Move swiftly throughairwayandbreathing.Administerface maskoxygen
- Insert intravenousaccess
- Sendbloodforfullbloodcount,crossmatchand coagulationscreen
- Commencewarmedintravenousfluids
- Abdominal examination to confirm uteruswell contracted
- Vaginal examination to check for vaginal lacerations
- Transfertotheaterforanalgesiaandexamination
- Catheterize
- FullEUA:checkvagina,cervixanduterinecavity
- Iftraumafound–timelyrepair?
- If products membranes remaining – evacuation performed?

IfDIC–knowledgeofbloodproducts,significance of acidosis, need forITU

Emergencies on the labour ward may have obstetric, anaesthetic, or general

medical causes.

The response to any urgent call to labour ward must adopt an 'ABC' approach with early recognition of problems specific to the parturient. There is good evidence that mandatory skills and drills training can improve outcome in emergency situations.
Obstetric anaesthetists primary role in the maternity unit is the provision of anaesthesia and analgesia to women in labour and who require Caesarean delivery. In addition, they are essential members of the multidisciplinary team who will assist with the management of the various types of emergency that can arise in the maternity unit.

Emergency problems in obstetric patients pose a unique set of challenges....

These situations are generally rare, so even experienced clinicians may only have limited experience.

Obstetric units are frequently geographically remote, so clinicians may be working in unfamiliar surroundings.

Obstetric patients are generally fit and healthy, so, faced with a physiological insult, will initially compensate, before deteriorating precipitously, prompting an urgent call for help.

The emergencies that may lead to an urgent call to labour ward are.....

1. **Maternal collapse** is the generic term that may be used to describe the endpoint of a variety of clinical problems. It is defined as 'an acute event involving the cardiorespiratory systems and/or brain resulting in a reduced or absent conscious level (and potentially death), at any stage in pregnancy and up to 6 weeks postdelivery

• Maternal collapse may arise as a result of pregnancy-related conditions, pre-existing disease, or co-incidentally during pregnancy

Four Hs and four Ts

- Hypoxia
- Hypovolaemia
- Hypothermia
- Hypo- or hyper-kalaemia/- magnesaemia/-calcaemia,
- Thromboembolism
- Toxins
- Tamponade
- Tensionpneumothorax

can be used to classify common causes of collapse in pregnancy, with the addition of eclampsia and intracranial haemorrhage

2. **Maternal cardiac arrest**

• Maternal cardiac arrest is rare, occurring in pregnancies and clinicians may never witness a case of maternal cardiac arrest over the course of their careers.

• Standard Advanced Life Support applies in the pregnant patient with two modifications

(i) The patient should be resuscitated with a left lateral tilt of at least 158 (but ,308) to minimize aorto-caval compression, which reduces the efficacy of chest compressions during resuscitation. •

(ii) Perimortem Caesarean section should begin within 4 min of arrest and be accomplished by 5 min.

a. The primary reason for perimortem Caesarean is to maximize the chance of maternal survival by relieving aorto-caval compression, improving venous return, and promoting transfusion of blood from the placental bed.
b. Once arrest occurs, fetal survival is also optimized by rapid delivery;
c. The best chance of survival for fetuses occurs when delivery occurs within 5 min of maternal arrest.
d. equipment required to perform a perimortem Caesarean section should be kept readily available as standard in any area that routinely cares for pregnant patients.
e. As with all cases of cardiac arrest, consideration should be given to reversible causes while resuscitation continues, Hypovolaemia may be the result of haemorrhage, which may be concealed.
f. Relative hypovolaemia can also occur secondary to vasodilatation, for example, due to sepsis, the leading indirect cause of maternal death in the most recent maternal death enquiry.
g. Cardiac disease, including myocardial infarction, arrhythmias, and cardiomyopathy, was the most common indirect cause of death and should also be considered as a cause of maternal cardiac arrest. • pulmonary or amniotic fluid embolism.

3. **Eclampsia**

- Pre-eclampsia is defined as new hypertension [diastolic arterial pressure (DAP) 90 mm Hg or systolic arterial pressure (SAP) 140 mm Hg] presenting after 20 weeks of pregnancy with significant proteinuria.
- Eclampsia is a convulsive disorder associated with pre-eclampsia.
- Control of arterial pressure
    - In patients with severe hypertension, arterial pressure should be

controlled to SAP of ,150 mm Hg and DAP between 80 and 100 mm Hg, using one of the following agents: • † labetalol (i.v. or orally), • † hydralazine (i.v.), • † nifedipine (orally).

- Before administration of hydralazine, consideration should be given to administering a fluid challenge of 500 ml of colloid, in order to prevent a catastrophic decrease in arterial pressure upon vasodilatation.

Prevention and treatment of seizures

• All patients who suffer eclamptic seizures should be treated with magnesium sulphate.
• A loading dose of 4 g should be administered i.v. over 5 min. This should be followed by an infusion of 1 g h21, which should b continued for 24 h.
• Recurrent seizures should be treated with a further bolus dose of 2–4 g over 5 min
• In contrast to seizures of other aetiology, diazepam, phenytoin, and other anticonvulsants, should not be used in eclampsia.
• At high plasma levels (5–6.5 mmol litre21) magnesium can result in paralysis of respiratory muscles and respiratory arrest. • airway should be maintained, and 10 ml of 10% calcium chloride should be given
• Treatment with magnesium sulphate should also be considered in
• all obstetric patients with severe pre-eclampsia.
This includes:
• † severe hypertension (DAP 110 mm Hg or SAP 160 mm • Hg),
• † mild or moderate hypertension associated with:
• † severe headache,
• † visual disturbances,
• † papilloedema,
• † liver tenderness,
• † clonus,
• † HELLP (Haemolysis, Elevated Liver enzymes, Low • Platelets) syndrome,
• † platelets count decreasing to below 100*109 litre,
• † abnormal liver enzymes.

High ‘spinals’
• The term ‘high spinal’ is used to describe a subarachnoid block that has extended above the higher thoracic dermatomes. However, inadvertently high block can also arise as a complication of epidural analgesia/ anaesthesia.
• There have been no reported deaths secondary to high spinal in the last 20 yr
• Maternal resuscitation has, however, resulted in hypoxic–ischaemic encephalopathy of the baby
• Hypotension and bradycardia secondary to sympathetic block of vasoconstriction and cardiac accelerator fibres. This can be compounded by aorto-caval compression.

• † Respiratory arrest after loss of motor supply to the intercostal muscles and the diaphragm.
• † Loss of consciousness secondary to lack of blood flow and block of the reticular activating system
• After resuscitation, management of a high spinal is essentially supportive.
• High-flow oxygen
• If apnoeic or shows signs of respiratory distress, intubation and ventilation.
• Cardiovascular support consists of i.v. fluids, the use of vasopressors, or ephedrine and atropine.
• Left lateral tilt.
• Fetal monitoring/ and Caesarean delivery may be necessary
• Anaesthesia and ventilation should be continued until the block has receded to the extent that the patient is able to safely maintain their airway and breathe spontaneously.

4. **Haemorrhage**

Haemorrhage is the most common cause of maternal collapse

• post-partum haemorrhage-placenta praevia, placenta accreta, placental abruption

• Uterine rupture, and ectopic pregnancy

• occult bleeding may occur, especially after Caesarean section and ectopic pregnancy.

- Other rare causes of occult bleeding include hepatic rupture and splenic artery rupture.

Initial management should include
• Inserting two large-bore i.v. cannulae,
• Administering high-flow oxygen, and obtaining blood samples for full blood count, coagulation profile, and group and screen.
• Rapid i.v. fluid resuscitation with crystalloid or colloid
• Patient warming
• While resuscitation continues, attempts should be made to identify and treat the underlying cause of haemorrhage. This may require transfer to the operating theatre.
•Coagulation factors should be administered earlier rather than later during resuscitation.

5. Uterine atony

Surgical treatments include a
• B-lynch (brace) suture, Rusch balloon insertion, surgical ligation of the external iliac arteries, or hysterectomy.
• Intervention radiology can also be used to identify and occlude a specific bleeding point.

6. Sepsis

• The onset of sepsis may vary from being insidious and non-specific to being overwhelming and rapidly fatal.
• It is characterized by reduced systemic vascular resistance due to vasodilatation, tachycardia, and tachypnoea, and the development of a metabolic lactic acidosis.
• A raised white cell count is commonly associated with sepsis; however, pregnancy also leads to an increase in white cell count, particularly during labour.

Management of the septic pregnant patient
• Resuscitation,
• Identification and
• Treatment of the source,
• Management of complications such as hypotension, and Application of organ protective strategies
• Early haemodynamic resuscitation and hence restoration of adequate oxygen supply to peripheral tissues is a key goal of therapy.
• antibiotics should be administered i.v. and at high dosage.
• Urgent microbiological advice should be sought
• Broadspectrum antibiotics should be given as first-line therapy.
• The source of sepsis should be identified as a priority.
• Swinging pyrexia should arouse suspicion of an abscess or collection, and further imaging,
• And/Or return to theatre for evacuation of products, wound exploration, or laparotomy may be necessary

7. Category 1 Caesarean section

• The classification of the urgency of Caesarean section, recognized by both the Royal College of Anaesthetists and Royal College of Obstetricians and Gynaecologists, is based upon the presence or absence of maternal or fetal compromise.
• Category 1 Caesarean section (the most urgent category) is defined as immediate threat to life of either the woman or the fetus.
• positioning the mother in the recumbent left lateral position,
• administering maternal oxygen at a high inspired percentage, and
• rapid infusion of non-glucose-based crystalloids., oxytocin infusions should be stopped or contractions inhibited, for example, by administering terbutaline 250 mg subcutaneously.
• These measures alone may result in improvement of the CTG, and downgrading of the Caesarean section from Category 1 to Category 2 (no • immediate threat to life

of the woman or fetus).

- Choice of anaesthetic technique
  - General anaesthesia is considered to be faster than regional anaesthesia.
  - Associated with increased maternal morbidity and mortality.
  - spinal anaesthesia for Category 1 Caesarean section—so-called 'rapid sequence spinal anaesthesia'.

- Principles of this approach include using a 'no- touch' technique and using sterile gloves only, utilizing other staff members to perform i.v. cannulation, limiting the number of attempts to one, and preparing the patient for general anaesthesia during attempted spinal insertion.

(10)

VALUE ADDED COURSES

LABOUR WARD DRILLS

List of Students Enrolled January 2019 – June 2019

S.No	Register No	Students List	signature
1	U16MB311	KAVITHA .M	Kavitha.
2	U16MB312	KAVIYA .K	Kaviya
3	U16MB313	KEERTHANA .K	Keerthana
4	U16MB314	KEERTHI K DAS	
5	U16MB315	KUNCHAL BALA VENKATA RAMANA REDDY	Kunchal Bala.
6	U16MB316	LAKSHMIPURAM VEDA SREEVIDYA	Lakshmi
7	U16MB317	LOGESH BABU J.S	J. Logesh.
8	U16MB318	LOKESHWARAN .M	Lokeshwaran
9	U16MB319	MADHUMITHA .R	Madhumitha
10	U16MB320	MADHUMITHA .S	
11	U16MB321	MANIMAARANE .R	Mani.
12	U16MB322	MATHIVAANANE .R	Mathivanan
13	U16MB323	MATHIVANAN .J	Mathivanan
14	U16MB324	MD ALTAF KHAN	A Altaf Khan.
15	U16MB325	MEKALA CHARAN CHOWDARY	Mekala.
16	U16MB326	MERLIN.S	Merlin.
17	U16MB327	MERLINE SHEEBA .B	Merline
18	U16MB328	MOHAN .B	Mohan.
19	U16MB329	MOHIT BHARDWAJ	Mohit Bhardwaj.
20	U16MB330	MONISH PALEI PATRA	Monish Palei Patra

LABOUR WARD DRILLS

MULTIPLE CHOICE QUESTIONS

1 **Which of the following is true statement regarding elliptical incisions ?**

a) Two times as long as it is wide

b) Five times as long as it is wide

c) Four times as long as it is wide

d) Three times as long as it is wide

2 **Consider following statements regarding abdominal incisions :**

1. Transverse incisions tend to be associated with fewer respiratory complications
2. Transverse incisions tend to be associated with better cosmetic outcome
3. Midline incisions tend to be associated with fewer respiratory complications
4. Midline incisions tend to be associated with better cosmetic outcome

3 **Identify true statements from the following ?**

a) Both 1 and 3 are true

b) Both 1 and 2 are true

c) Both 2 and 4 are true

d) Both 3 and 4 are true

4 **For abdominal wall closure, what should be the ration of the length of the suture material to the length of the wound to be closed?**

a) 3:1

b) 4:1

c) 2:1

d) 5:1

5 **Skin grafting is a form of:**

a) Primary Intention Healing

b) Secondary Intention Healing

c) Tertiary Intention Healing

d) Quaternary Intention Healing

6 **In Vascular anastomosis the suture material used should be all except:**

a) Non Absorbable

b) Elastic

c) Non Elastic

d) Monofilament

7 **In Biliary anastomoses, the suture material should have all properties except:**

a) Absorbable

b) Does not promote tissue reaction

c) Should Promote good fibrotic reaction

d) Does not promote stone formation

8 **The diameter of 0 silk in mm is:**

A) 0.500–0.599 B) 0.400–0.499 C) 0.350–0.399 D) 0.300–0.349

9 **Which of the following statement is false about bowel anastomosis?**

A Seromuscular technique is currently the most widely accepted technique of bowel anastomosis

B Extramucosal technique is currently the most widely accepted technique of bowel anastomosis

C Submucosa has a high collagen content

D Submucosa is the most stable suture layer in all sections of the gastrointestinal tract

10 Which of the following is false regarding the absorption of following suture materials:

a) Chromic is absorbed by Phagocytosis and enzymatic degradation

b) Polyglactin is absorbed by hydrolysis

c) Polyglyconate is absorbed by enzymatic degradation

d) Polydioxanone is absorbed at 180 days

REG NO – U16MB323

8/10

LABOUR WARD DRILLS (10)

MULTIPLE CHOICE QUESTIONS

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Sri Lakshmi Narayana Institute of Medical Sciences

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(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that MANIMAARANE has actively participated in the Value Added Course on Labour Ward Drills held during Jan 2019 –JUNE 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

ASSOCIATE PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

COORDINATOR

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry- 605502.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that MADHUMITHA .S has actively participated in the Value Added Course on Labour Ward Drills held during Jan 2019 –JUNE 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

ASSOCIATE PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of Medical Sciences
OSUDU, PUDUCHERRY.

COORDINATOR

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCO., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry-605502.

Annexure 4

Course/Training Feedback Form

Course:
Date:
Name:
Reg NO.
Department: Obstetrics and Gynaecology

Q 1: Please rate your overall satisfaction with the format of the course:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 2: Please rate course notes:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 3: The lecture sequence was well planned

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 4: The lectures were clear and easy to understand

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 5: Please rate the quality of pre-course administration and information:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 6: Any other suggestions:

Comments:

Thank you for taking the time to complete this survey, your comments are much appreciated.

***OPTIONAL Section*:** Name _____
Signature _____ Date _____

Annexure 4

Course/Training Feedback Form

Course: LABOUR WARD DRILLS
Date: 25/08/2019
Name: MERLIN, S
Reg NO. U16MB326
Department: Obstetrics and Gynaecology

Q 1: Please rate your overall satisfaction with the format of the course:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 2: Please rate course notes:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 3: The lecture sequence was well planned

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 4: The lectures were clear and easy to understand

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 5: Please rate the quality of pre-course administration and information:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 6: Any other suggestions: NILL

Comments:

Thank you for taking the time to complete this survey, your comments are much appreciated.

***OPTIONAL Section*:** Name _____
Signature _____ Date _____

Annexure 4

Course/Training Feedback Form

Course: LABOUR WARD DRILLS
Date: 24/01/2020
Name: KAVIYA. K
Reg NO. U16MB312
Department: Obstetrics and Gynaecology

Q 1: Please rate your overall satisfaction with the format of the course:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 2: Please rate course notes:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 3: The lecture sequence was well planned

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 4: The lectures were clear and easy to understand

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 5: Please rate the quality of pre-course administration and information:

a. Excellent b. Very Good c. Satisfactory d. unsatisfactory

Q 6: Any other suggestions: NILL

Comments:

Thank you for taking the time to complete this survey, your comments are much appreciated.

***OPTIONAL Section*:** Name _____
Signature _____ Date _____

Date: 24..06.2019

From
Dr. K.DURGA
Assistant Professor,
Obstetrics and Gynaecology,
Sri Lakshmi Narayana institute of Medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Labour Ward Drills

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Labour Ward Drills** on JAN 2019- JUN2019. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

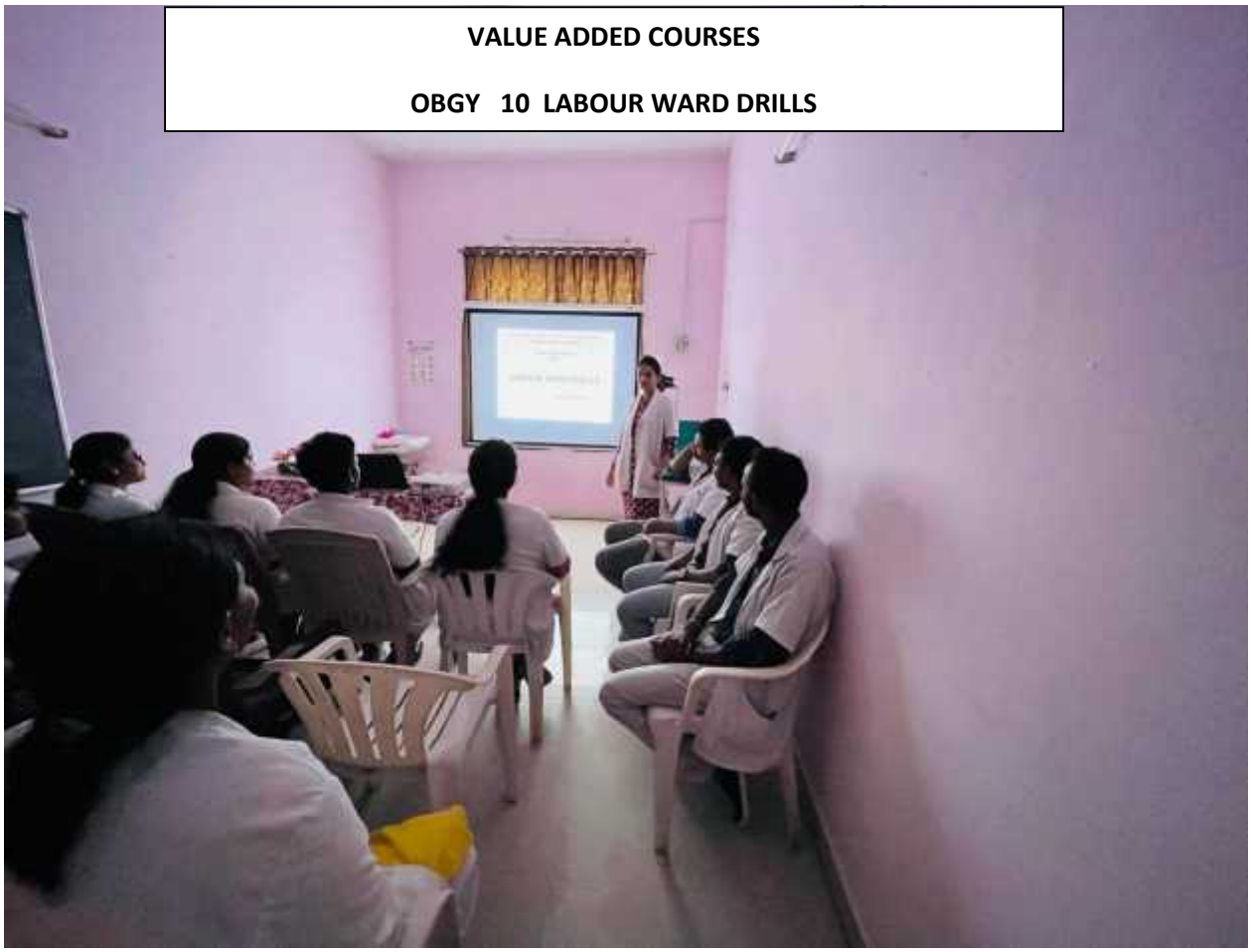
Dr.DURGA



ASSOCIATE PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

VALUE ADDED COURSES

OBGY 10 LABOUR WARD DRILLS



Sri Lakshmi Narayana Institute of Medical Sciences

Date:02.12.2018

From
DR .V.R.Shridhar
Professor and Head,
Department of Psychiatry,
Sri Lakshmi Narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Bipolar mood disorders , classification and its management

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled **Bipolar mood disorders , classification and its management** on 02/01/2019 . We solicit your kind permission for the same.

Kind Regards

Dr.V.R. Sridhar

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. A.Sugumaran**

The HOD: **Dr. V.R.Sridhar**

The Expert: **Dr. Arun Seetharaman.** The committee has discussed about the course and is approved.

Dean (Sign & Seal)

Subject Expert (Sign & Seal)

Dr. ARUN SEETHARAMAN, MD.,
Reg. No: 91440
Associate Professor, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

HOD (Sign & Seal))

Dr. V. R. SRIDHAR, MD.,D.P.M.,
Reg. No: 30995
Professor & HOD, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affiliated to Bharath University, Chennai - TN]

Circular

15.12.2018

Sub: Organising Value-added Course: Bipolar mood disorders , classification and its management

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Bipolar mood disorders , classification and its management"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30/12/2018. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content

Course Proposal

Course Title: **Bipolar mood disorders , classification and its management**

Course Objective:

Awareness on the importance of BIPOLAR DISORDER
Awareness On The Contributing Factors To Bipolar Disorders Biopsychosocial Model Of Approach
Identify diagnostic criteria for bipolar disorders

Course Outcome:

Course Audience: FINAL YEAR STUDENTS of 2019 Batch
Course Coordinator: Dr.V.R. Shridhar
Course Faculties with Qualification and Designation:
1.Dr.V.R.SHRIDHAR, Professor & HOD
2.Dr.Arun, Assistant Professor
Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Resource person	Time	Hours
1.	14.01.2019	**Mood Disorders: Introduction and historical prevalence**	Dr.Arun	4-5p.m	1
2.	15.01.2019	**Mood Disorders: Epidemiology**	Dr.Arun	2-3p.m	1
3.	16.01.2019	**Mood Disorders: Genetics**	Dr.Arun	4-6p.m	2
4.	18.01.2019	**Mood Disorders: Clinical Features**	Dr.Arun	4-6p.m	2
5.	20.01.2019	**Mood Disorders: Intrapsychic and Interpersonal Aspects**	Dr.Arun	4-6p.m	2
6.	21.01.2019	**Mood Disorders: Suicidal Behavior**	Dr.Arun	4-5p.m	2
7.	22.01.2019	**Mood Disorders: Pharmacological Treatment of Bipolar Disorders**	Dr.Arun	4-5P.M	1
8.	23.01.2019	**Mood Disorders: Psychotherapy**	Dr.Arun	4-5p.m	1
9.	23.01.2019	**Mood Disorders: Neurobiology**	Dr. Shridhar	4-5p.m	
10.	25.01.2019	**Mood Disorders: Predictors**	Dr.Arun	4-6p.m	2
11.	27.01.2019	**Mood Disorders: ECT**	Dr.Arun	4-6p.m	1
12.	28.01.2019	**Mood Disorders: Course and outcome**	Dr.Arun	4-6p.m	2

13.	15.03.2019	Pre course and Post Course evaluation, Feedback analysis from Likert scale	Dr.Arun	2-5p.m	3
		Practical Class I	Dr. Shridhar		
13.	02.02.2019	History taking	Dr. Shridhar	2-3 PM	1
14.	03.02.2019	Mental status examination	Dr. Shridhar	2-3 PM	1
15.	04.02.2019	Non-pharmacological treatment	Dr. Shridhar	2-4 PM	2
16.	05.02.2019	ECT	Dr. Shridhar	2-4 PM	2
17.	28.02.2019	Psychoeducation	Dr. Shridhar	2-4p.m	2
		Total			30 hrs

REFERENCE BOOKS:

1.Comprehensive textbook of PSYCHIATRY by Kaplan and Saddocks.

2. OXFORD TEXTBOOK OF PSYCHIATRY

3. DSM 5 AND ICD 10

4.SYNOPSIS OF PSYCHIATRY BY KAPLAN AND SADDOCK

VALUE ADDED COURSE

1. Name of the programme & Code

Bipolar mood disorders , classification and its management

2. Duration & Period

,January –march 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Assessment by multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 Time - January -March 2018

8. Year of discontinuation: 2018

9. Summary report of each program year-wise

Value Added Course- JAN –MARCH 2018					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PSYC08	Bipolar mood disorders , classification and its management	Dr. SRIDHAR Dr. Arun	FINAL YEAR	15 students January – March 2018

10. Course Feed Back

Enclosed as Annexure- V photographs captured during the conduct of the course.

Kind Regards,

Dr. Sridhar

RESOURCE PERSON

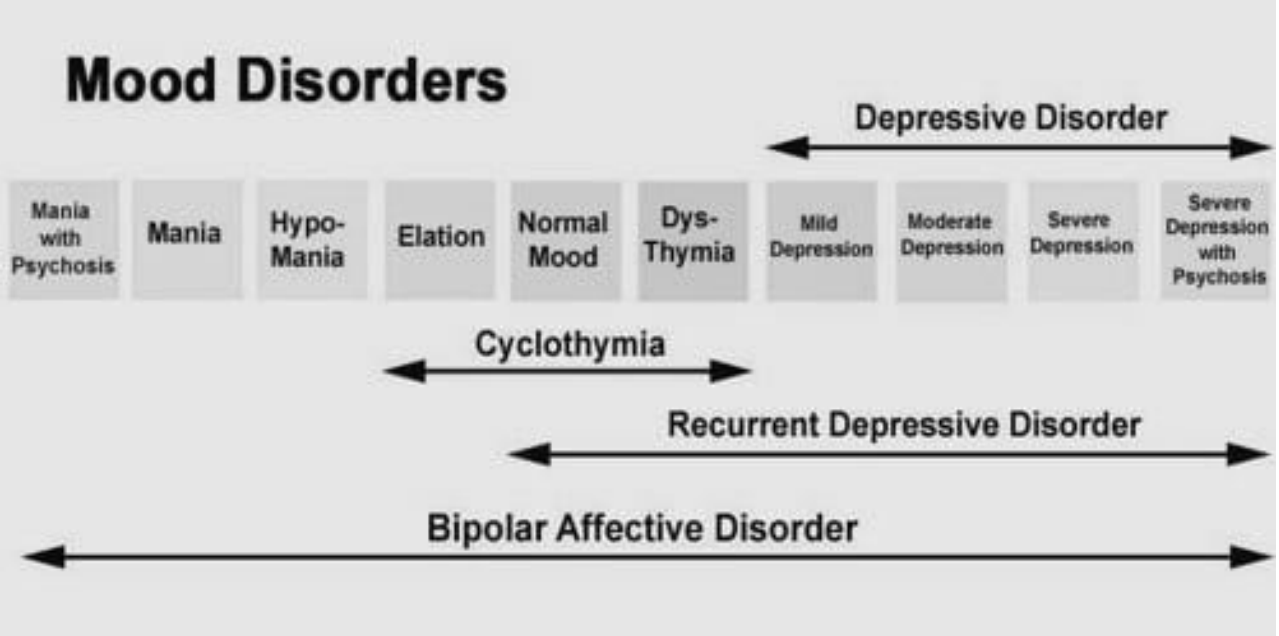
1. **Dr..SRIDHAR**
2. **Dr.Arun**

Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

COORDINATOR
Dr.V.R.SRIDHAR

Osudu, Kudapakkam, Puducherry-605 502.

BIPOLAR MOOD DISORDERS , CLASSIFICATION AND ITS MANAGEMENT



PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	**Description**
Course Title	Mood Disorders
Course Code	PSYC08
Objective	1. Introduction 2. Epidemiology 3. Aetiology 4. Laboratory, brain imaging, & psychological test 5. Clinical assessment 6. Differential diagnosis 7. Course & prognosis 8. Treatment
Further learning opportunities	Mood disorder & its management
Key Competencies	On successful completion of the course the students will have skill in handling patients with mood disorder.
Target Student	3RD Year MBBS Students
Duration	30hrs Every January – June 2019
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Multiple choice questions

Contents

- 1Signs and symptoms
  - 1.1Manic episodes
  - 1.2Hypomanic episodes
  - 1.3Depressive episodes
  - 1.4Mixed affective episodes
  - 1.5Comorbid conditions
- 2Causes
  - 2.1Genetic
  - 2.2Environmental
  - 2.3Neurological
- 3Proposed mechanisms
- 4Diagnosis
  - 4.1Differential diagnosis
  - 4.2Bipolar spectrum
  - 4.3Criteria and subtypes
  - 4.4Children
  - 4.5Elderly
- 5Prevention
- 6Management
  - 6.1Psychosocial
  - 6.2Medication
  - 6.3Children
- 7Prognosis
  - 7.1Functioning
  - 7.2Recovery and recurrence
  - 7.3Suicide
- 8Epidemiology
- 9History
- 10Society and culture
  - 10.1Cost
  - 10.2Advocacy
  - 10.3Notable cases
  - 10.4Media portrayals

10.5Creativity

I.Introduction

Disorders of mood—sometimes called affective disorders encompass a large spectrum of disorders in which pathologic mood disturbances dominate the clinical picture. They include the following:

1. Major depressive disorder

2. Persistent depressive disorder (Dysthymia)

3. Cyclothymic disorder

4. Disruptive mood dysregulation disorder

5. Premenstrual dysphoric disorder

6. Bipolar (I and II) and related disorders

7. Mood disorders (depressive and bipolar related) due to another medical condition

8. Substance/Medication-induced mood (depressive and bipolar related) disorder

9. The general category of unspecified depressive and bipolar and related disorders

Mood is a pervasive and sustained feeling tone that is experienced internally and that influences a person's behavior and perception of the world. Affect is the external expression of mood. Mood can be normal, elevated, or depressed. Healthy persons experience a wide range of moods and have an equally large repertoire of affective expressions; they feel in control of their moods and affects.

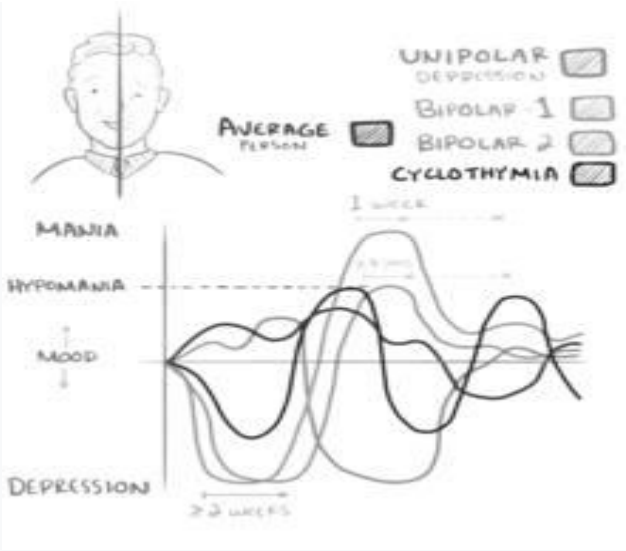
Bipolar disorder, previously known as **manic depression**, is a mental disorder characterized by periods of depression and periods of abnormally elevated mood that last from days to weeks each.[4][5][7] If the elevated mood is severe or associated with psychosis, it is called mania; if it is less severe, it is called hypomania.[4] During mania, an individual behaves or feels abnormally energetic, happy, or irritable,[4] and they often make impulsive decisions with little regard for the consequences.[5] There is usually also a reduced need for sleep during manic phases.[5] During periods of depression, the individual may experience crying and have a negative outlook on life and poor eye contact with others.[4] The risk of suicide is high; over a period of 20 years, 6% of those with bipolar disorder died by suicide, while 30–40% engaged in self-harm.[4] Other mental health issues, such as anxiety disorders and substance use disorders, are commonly associated with bipolar disorder.[4]

While the causes of bipolar disorder are not clearly understood, both genetic and environmental factors are thought to play a role.[4] Many genes, each with small effects, may contribute to the development of disorder.[4][8] Genetic factors account for about 70–90% of the risk of developing bipolar disorder.[9][10] Environmental risk factors include a history of childhood abuse and long-term stress.[4] The condition is classified as bipolar I disorder if there has been at least one manic episode, with or without depressive episodes, and as bipolar II disorder if there has been at least one hypomanic episode (but no full manic episodes) and one major depressive episode.[5] If the symptoms are due to drugs or medical problems, they are not diagnosed as bipolar disorder.[5] Other conditions having overlapping symptoms with bipolar disorder include attention deficit hyperactivity disorder, personality disorders, schizophrenia, and substance use disorder as well as many other medical conditions.[4] Medical testing is not required for a diagnosis, though blood tests or medical imaging can rule out other problems.[11]

Mood stabilizers—lithium and certain anticonvulsants such as valproate and carbamazepine—are the mainstay of long-term relapse prevention.[12] Antipsychotics are given during acute manic episodes as well as in cases where mood stabilizers are poorly tolerated or ineffective or where compliance is poor.[12] There is some evidence that psychotherapy improves the course of this disorder.[13] The use of antidepressants in depressive episodes is controversial—they can be effective but have been implicated in triggering manic episodes.[14] The treatment of depressive episodes is often difficult.[12] Electroconvulsive therapy (ECT) is effective in acute manic and depressed episodes, especially with psychosis or catatonia.[a][12] Admission to a psychiatric hospital may be required if a person is a risk to themselves or others; involuntary treatment is sometimes necessary if the affected person refuses treatment.[4]

Bipolar disorder occurs in approximately 1% of the global population.[12] In the United States, about 3% are estimated to be affected at some point in their life; rates appear to be similar in females and males.[6][16] The most common age at which symptoms begin is 20; an earlier onset in life is associated with a worse prognosis.[17] Around a quarter to a third of people with bipolar disorder have financial, social, or work-related problems due to the illness.[4] Bipolar disorder is among the top 20 causes of disability worldwide and leads to substantial costs for society.[18] Due to lifestyle choices and the side effects of medications, the risk of death from natural causes such as coronary heart disease in people with bipolar disorder is twice that of the general population.[4]

Signs and symptoms



Bipolar mood shifts

Late adolescence and early adulthood are peak years for the onset of bipolar disorder.[19][20] The condition is characterized by intermittent episodes of mania or depression, with an absence of symptoms in between.[21] During these episodes, people with bipolar disorder exhibit disruptions in normal mood, psychomotor activity-the level of physical activity that is influenced by mood-(e.g., constant fidgeting with mania or slowed movements with depression), circadian rhythm, and cognition. Mania can present with varying levels of mood disturbance, ranging from euphoria that is associated with "classic mania" to dysphoria and irritability.[22] Psychotic symptoms such as delusions or hallucinations may occur in both manic and depressive episodes, their content and nature is consistent with the person's prevailing mood.[4]

According to the DSM-5 criteria, mania is distinguished from hypomania by length, as hypomania is present if elevated mood symptoms are present for at least four consecutive days, and mania is present if such symptoms are present for more than a week. Unlike mania, hypomania is not always associated with impaired functioning.[12] The biological mechanisms responsible for switching from a manic or hypomanic episode to a depressive episode, or vice versa, remain poorly understood.[23]

Manic episodes



An 1892 color lithograph depicting a woman diagnosed with *hilarious mania*

Also known as a manic episode, mania is a distinct period of at least one week of elevated or irritable mood, which can range from euphoria to delirium. The core symptom of mania involves an increase in energy of psychomotor activity. Mania can also present with increased self-esteem or grandiosity, racing thoughts, pressured speech that is difficult to interrupt, decreased need for sleep, disinhibited social behavior,[22] increased goal-oriented activities and impaired judgment—exhibition of behaviors characterized as impulsive or high-risk, such as hypersexuality or excessive spending.[24][25][26] To meet the definition for a manic episode, these behaviors must impair the individual's ability to socialize or work.[24][26] If untreated, a manic episode usually lasts three to six months.[27]

In severe manic episodes, a person can experience psychotic symptoms, where thought content is affected along with mood.[26] They may feel unstoppable, or as if they have a special relationship with God, a great mission to accomplish, or other grandiose or delusional ideas.[28] This may lead to violent behavior and, sometimes, hospitalization in an inpatient psychiatric hospital.[25][26] The severity of manic symptoms can be measured by rating scales such as the Young Mania Rating Scale, though questions remain about the reliability of these scales.[29]

The onset of a manic or depressive episode is often foreshadowed by sleep disturbance.[30] Mood changes, psychomotor and appetite changes, and an increase in anxiety can also occur up to three weeks before a manic episode develops.[*medical citation needed*] Manic individuals often have a history of substance abuse developed over years as a form of "self-medication".[31]

Hypomanic episodes



An 1858 lithograph captioned 'Melancholy passing into mania'

Hypomania is the milder form of mania, defined as at least four days of the same criteria as mania,[26] but which does not cause a significant decrease in the individual's ability to socialize or work, lacks psychotic features such as delusions or hallucinations, and does not require psychiatric hospitalization.[24] Overall functioning may actually increase during episodes of hypomania and is thought to serve as a defense mechanism against depression by some.[32] Hypomanic episodes rarely progress to full-blown manic episodes.[32] Some people who experience hypomania show increased creativity[26][33] while others are irritable or demonstrate poor judgment.[10]

Hypomania may feel good to some persons who experience it, though most people who experience hypomania state that the stress of the experience is very painful.[26] Bipolar people who experience hypomania tend to forget the effects of their actions on those around them. Even when family and friends recognize mood swings, the individual will often deny that anything is wrong.[34] If not accompanied by depressive episodes, hypomanic episodes are often not deemed problematic, unless the mood changes are uncontrollable, or volatile.[32] Most commonly, symptoms continue for a few weeks to a few months.[35]

Depressive episodes

Main article: Major depressive disorder



'Melancholy' by William Bagg, after a photograph by Hugh Welch Diamond

Symptoms of the depressive phase of bipolar disorder include persistent feelings of sadness, irritability or anger, loss of interest in previously enjoyed activities, excessive or inappropriate guilt, hopelessness, sleeping too much or not enough, changes in appetite and/or weight, fatigue, problems concentrating, self-loathing or feelings of worthlessness, and thoughts of death or suicide.[36] Although the DSM-5 criteria for diagnosing unipolar and bipolar episodes are the same, some clinical features are more common in the latter, including increased sleep, sudden onset and resolution of symptoms, significant weight gain or loss, and severe episodes after childbirth.[12]

The earlier the age of onset, the more likely the first few episodes are to be depressive.[37] For most people with bipolar types 1 and 2, the depressive episodes are much longer than the manic or hypomanic episodes.[17] Since a diagnosis of bipolar disorder requires a manic or hypomanic episode, many affected individuals are initially misdiagnosed as having major depression and incorrectly treated with prescribed antidepressants.[38]

Mixed affective episodes

Main article: Mixed affective state

In bipolar disorder, a mixed state is an episode during which symptoms of both mania and depression occur simultaneously.[39] Individuals experiencing a mixed state may have manic symptoms such as grandiose thoughts while simultaneously experiencing depressive symptoms such as excessive guilt or feeling suicidal.[39] They are considered to have a higher risk for suicidal behavior as depressive emotions such as hopelessness are often paired with mood swings or difficulties with impulse control.[39] Anxiety disorders occur more frequently a comorbidity in mixed bipolar episodes than in non-mixed bipolar depression or mania.[39] Substance abuse (including alcohol) also follows this trend, thereby appearing to depict bipolar symptoms as no more than a consequence of substance abuse.[39]

Comorbid conditions

The diagnosis of bipolar disorder can be complicated by coexisting (comorbid) psychiatric conditions including obsessive-compulsive disorder, substance-use disorder, eating disorders, attention deficit hyperactivity disorder, social phobia, premenstrual syndrome (including premenstrual dysphoric disorder), or panic disorder.[31][36][40][41] A thorough longitudinal analysis of symptoms and episodes, assisted if possible by discussions with friends and family members, is crucial to establishing a treatment plan where these comorbidities exist.[42] Children of parents with bipolar disorder more frequently have other mental health problems.[*needs update*][43]

People with bipolar disorder often have other co-existing psychiatric conditions such as anxiety (present in about 71% of people with bipolar disorder), substance use (56%), personality disorders (36%) and attention deficit hyperactivity disorder (10–20%) which can add to the burden of illness and worsen the prognosis.[17] Certain medical conditions are also more common in people with bipolar disorder as compared to the general population. This includes increased rates of metabolic syndrome (present in 37% of people with bipolar disorder), migraine headaches (35%), obesity (21%) and type 2 diabetes (14%).[17] This contributes to a risk of death that is two times higher in those with bipolar disorder as compared to the general population.[17]

Causes

The causes of bipolar disorder likely vary between individuals and the exact mechanism underlying the disorder remains unclear.[44] Genetic influences are believed to account for 73–93% of the risk of developing the disorder indicating a strong hereditary component.[10] The overall heritability of the bipolar spectrum has been estimated at 0.71.[45] Twin studies have been limited by relatively small sample sizes but have indicated a substantial genetic contribution, as well as environmental influence. For bipolar I disorder, the rate at which identical twins (same genes) will both have bipolar I disorder (concordance) is around 40%, compared to about 5% in fraternal twins.[24][46] A combination of bipolar I, II, and cyclothymia similarly produced rates of 42% and 11% (identical and fraternal twins, respectively).[45] The rates of bipolar II combinations without bipolar I are lower—bipolar II at 23 and 17%, and bipolar II combining with cyclothymia at 33 and 14%—, which may reflect relatively higher genetic heterogeneity.[45]

The cause of bipolar disorders overlaps with major depressive disorder. When defining concordance as the co-twins having either bipolar disorder or major depression, then the concordance rate rises to 67% in identical twins and 19% in fraternal twins.[47] The relatively low concordance between fraternal twins brought up together suggests that shared family environmental effects are

limited, although the ability to detect them has been limited by small sample sizes.[45]

Differential diagnosis

Mental disorders that can have symptoms similar to those seen in bipolar disorder include schizophrenia, major depressive disorder,[89] attention deficit hyperactivity disorder (ADHD), and certain personality disorders, such as borderline personality disorder.[90][91][92] A key difference between bipolar disorder and borderline personality disorder is the nature of the mood swings; in contrast to the sustained changes to mood over days to weeks or longer, those of the latter condition (more accurately called emotional dysregulation) are sudden and often short-lived, and secondary to social stressors.[93]

Although there are no biological tests that are diagnostic of bipolar disorder,[50] blood tests and/or imaging are carried out to investigate whether medical illnesses with clinical presentations similar to that of bipolar disorder are present before making a definitive diagnosis. Neurologic diseases such as multiple sclerosis, complex partial seizures, strokes, brain tumors, Wilson's disease, traumatic brain injury, Huntington's disease, and complex migraines can mimic features of bipolar disorder.[83] An EEG may be used to exclude neurological disorders such as epilepsy, and a CT scan or MRI of the head may be used to exclude brain lesions.[83] Additionally, disorders of the endocrine system such as hypothyroidism, hyperthyroidism, and Cushing's disease are in the differential as is the connective tissue disease systemic lupus erythematosus. Infectious causes of mania that may appear similar to bipolar mania include herpes encephalitis, HIV, influenza, or neurosyphilis.[83] Certain vitamin deficiencies such as pellagra (niacin deficiency), Vitamin B12 deficiency, folate deficiency, and Wernicke Korsakoff syndrome (thiamine deficiency) can also lead to mania.[83] Common medications that can cause manic symptoms include antidepressants, prednisone, Parkinson's disease medications, thyroid hormone, stimulants (including cocaine and methamphetamine), and certain antibiotics.[94]

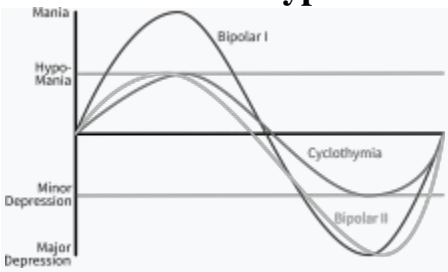
Bipolar spectrum



Since Emil Kraepelin's distinction between bipolar disorder and schizophrenia in the 19th century, researchers have defined a spectrum of different types of bipolar disorder.

Bipolar spectrum disorders include: bipolar I disorder, bipolar II disorder, cyclothymic disorder and cases where subthreshold symptoms are found to cause clinically significant impairment or distress.[5][83][86] These disorders involve major depressive episodes that alternate with manic or hypomanic episodes, or with mixed episodes that feature symptoms of both mood states.[5] The concept of the bipolar spectrum is similar to that of Emil Kraepelin's original concept of manic depressive illness.[95] Bipolar II disorder was established as a diagnosis in 1994 within DSM IV; though debate continues over whether it is a distinct entity, part of a spectrum, or exists at all.[96]

Criteria and subtypes



Simplified graphical comparison of bipolar I, bipolar II and cyclothymia[97][98]:267

The DSM and the ICD characterize bipolar disorder as a spectrum of disorders occurring on a continuum. The DSM-5 and ICD-11 lists three specific subtypes:[5][86]

- Bipolar I disorder: At least one manic episode is necessary to make the diagnosis;[99] depressive episodes are common in the vast majority of cases with bipolar disorder I, but are unnecessary for the diagnosis.[24] Specifiers such as "mild, moderate, moderate-severe, severe" and "with psychotic

features" should be added as applicable to indicate the presentation and course of the disorder.[5]

- Bipolar II disorder: No manic episodes and one or more hypomanic episodes and one or more major depressive episode.[99] Hypomanic episodes do not go to the full extremes of mania (*i.e.*, do not usually cause severe social or occupational impairment, and are without psychosis), and this can make bipolar II more difficult to diagnose, since the hypomanic episodes may simply appear as periods of successful high productivity and are reported less frequently than a distressing, crippling depression.
- Cyclothymia: A history of hypomanic episodes with periods of depression that do not meet criteria for major depressive episodes.[100]

When relevant, specifiers for *peripartum onset* and *with rapid cycling* should be used with any subtype. Individuals who have subthreshold symptoms that cause clinically significant distress or impairment, but do not meet full criteria for one of the three subtypes may be diagnosed with other specified or unspecified bipolar disorder. Other specified bipolar disorder is used when a clinician chooses to provide an explanation for why the full criteria were not met (e.g., hypomania without a prior major depressive episode).[5] If the condition is thought to have a non-psychiatric medical cause, the diagnosis of *bipolar and related disorder due to another medical condition* is made, while *substance/medication-induced bipolar and related disorder* is used if a medication is thought to have triggered the condition.[101]

Rapid cycling

Most people who meet criteria for bipolar disorder experience a number of episodes, on average 0.4 to 0.7 per year, lasting three to six months.[102] *Rapid cycling*, however, is a course specifier that may be applied to any bipolar subtype. It is defined as having four or more mood disturbance episodes within a one-year span. Rapid cycling is usually temporary but is common amongst people with bipolar disorder and affects between 25.8%–45.3% of them at some point in their life.[36][103] These episodes are separated from each other by a remission (partial or full) for at least two months or a switch in mood polarity (i.e., from a depressive episode to a manic episode or vice versa).[24] The definition of rapid cycling most frequently cited in the literature (including the DSM-V and ICD-11) is that of Dunner and Fieve: at least four major depressive, manic, hypomanic or mixed episodes during a 12-month period.[104] The literature examining the pharmacological treatment of rapid cycling is sparse and there is no clear consensus with respect to its optimal pharmacological management.[105] People with the rapid cycling or ultradian subtypes of bipolar disorder tend to be more difficult to treat and less responsive to medications than other people with bipolar disorder.[106]

Children

Main article: Bipolar disorder in children



Lithium is the only medication approved by the FDA for treating mania in children.

In the 1920s, Kraepelin noted that manic episodes are rare before puberty.[107] In general, bipolar disorder in children was not recognized in the first half of the twentieth century. This issue diminished with an increased following of the DSM criteria in the last part of the twentieth century.[107][108] The diagnosis of childhood bipolar disorder, while formerly controversial,[109] has gained greater acceptance among childhood and adolescent psychiatrists.[110] American children and adolescents diagnosed with bipolar disorder in community hospitals increased 4-fold reaching rates of up to 40% in 10 years around the beginning of the 21st century, while in outpatient clinics it doubled reaching 6%.[109] Studies using DSM criteria show that up to 1% of youth may have bipolar disorder.[107] The DSM-5 has established a diagnosis—disruptive mood dysregulation disorder—that covers children with long-term, persistent irritability that had at times been misdiagnosed as having bipolar disorder,[111] distinct from irritability in bipolar disorder that is restricted to discrete mood episodes.[110]

Elderly

Bipolar disorder is uncommon in older patients, with measured lifetime prevalence of 1% in over 60s and 12-month prevalence of 0.1 to 0.5% in people over 65. Despite this, it is overrepresented in psychiatric admissions, making up 4 to 8% of inpatient admission to aged care psychiatry units, and the incidence of mood disorders is increasing overall with the aging population. Depressive episodes more commonly present with sleep disturbance, fatigue, hopelessness about the future, slowed thinking, and poor concentration and memory; the last three symptoms are seen in what is known as pseudodementia. Clinical features also differ between those with late onset bipolar disorder and those who developed it early in life; the former group present with milder manic episodes, more prominent cognitive changes and have a background of worse psychosocial functioning, while the latter present more commonly with mixed affective episodes,[112] and have a stronger family history of illness.[113] Older people with bipolar disorder suffer cognitive changes, particularly in executive

functions such as abstract thinking and switching cognitive sets, as well as concentrating for long periods and decision-making.[112]

Suicide

Bipolar disorder can cause suicidal ideation that leads to suicide attempts. Individuals whose bipolar disorder begins with a depressive or mixed affective episode seem to have a poorer prognosis and an increased risk of suicide.[89] One out of two people with bipolar disorder attempt suicide at least once during their lifetime and many attempts are successfully completed.[40] The annual average suicide rate is 0.4%, which is 10–20 times that of the general population.[150] The number of deaths from suicide in bipolar disorder is between 18 and 25 times higher than would be expected in similarly aged people without bipolar disorder.[151] The lifetime risk of suicide has been estimated to be as high as 20% in those with bipolar disorder.[24]

Risk factors for suicide attempts and death from suicide in people with bipolar disorder include older age, prior suicide attempts, a depressive or mixed index episode (first episode), a manic index episode with psychotic symptoms, hopelessness or psychomotor agitation present during the episodes, co-existing anxiety disorder, a first degree relative with a mood disorder or suicide, interpersonal conflicts, occupational problems, bereavement or social isolation.[17]

Epidemiology



Burden of bipolar disorder around the world: disability-adjusted life years per 100,000 inhabitants in 2004.

Bipolar disorder is the sixth leading cause of disability worldwide and has a lifetime prevalence of about 1 to 3% in the general population.[6][152][153] However, a reanalysis of data from the National Epidemiological Catchment Area survey in the United States suggested that 0.8% of the population experience a manic episode at least once (the diagnostic threshold for bipolar I) and a further 0.5% have a hypomanic episode (the diagnostic threshold for bipolar II or cyclothymia). Including sub-threshold diagnostic criteria, such as one or two symptoms over a short time-period, an additional 5.1% of the population, adding up to a total of 6.4%, were classified as having a bipolar spectrum disorder.[154] A more recent analysis of data from a second US National Comorbidity Survey found that 1% met lifetime prevalence criteria for bipolar I, 1.1% for bipolar II, and 2.4% for subthreshold symptoms.[155] Estimates vary about how many children and young adults have

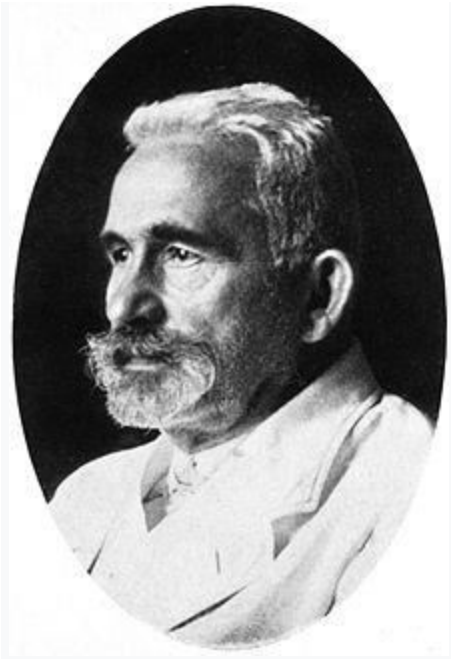
bipolar disorder.[110] These estimates range from 0.6 to 15% depending on differing settings, methods, and referral settings, raising suspicions of overdiagnosis.[110] One meta-analysis of bipolar disorder in young people worldwide estimated that about 1.8% of people between the ages of seven and 21 have bipolar disorder.[110] Similar to adults, bipolar disorder in children and adolescents is thought to occur at a similar frequency in boys and girls.[110]

There are conceptual and methodological limitations and variations in the findings. Prevalence studies of bipolar disorder are typically carried out by lay interviewers who follow fully structured/fixed interview schemes; responses to single items from such interviews may suffer limited validity. In addition, diagnoses (and therefore estimates of prevalence) vary depending on whether a categorical or spectrum approach is used. This consideration has led to concerns about the potential for both under diagnosis and over diagnosis.[156]

The incidence of bipolar disorder is similar in men and women[157] as well as across different cultures and ethnic groups.[158] A 2000 study by the World Health Organization found that prevalence and incidence of bipolar disorder are very similar across the world. Age-standardized prevalence per 100,000 ranged from 421.0 in South Asia to 481.7 in Africa and Europe for men and from 450.3 in Africa and Europe to 491.6 in Oceania for women. However, severity may differ widely across the globe. Disability-adjusted life year rates, for example, appear to be higher in developing countries, where medical coverage may be poorer and medication less available.[159] Within the United States, Asian Americans have significantly lower rates than their African and European American counterparts.[160] In 2017, the Global Burden of Disease Study estimated there were 4.5 million new cases and a total of 45.5 million cases globally.[161]

History

Main article: History of bipolar disorder



German psychiatrist Emil Kraepelin first distinguished between manic–depressive illness and "dementia praecox" (now known as schizophrenia) in the late 19th century.

In the early 1800s, French psychiatrist Jean-Étienne Dominique Esquirol's lypemania, one of his affective monomanias, was the first elaboration on what was to become modern depression.[162] The basis of the current conceptualization of bipolar illness can be traced back to the 1850s. In 1850, Jean-Pierre Falret described "circular insanity" (la folie circulaire, French pronunciation: [la fɔli siʁ.ky.lɛʁ]); the lecture was summarized in 1851 in the "Gazette des hôpitaux" ("Hospital Gazette").[2] Three years later, in 1854, Jules-Gabriel-François Baillarger (1809–1890) described to the French Imperial Académie Nationale de Médecine a biphasic mental illness causing recurrent oscillations between mania and melancholia, which he termed *folie à double forme* (French pronunciation: [fɔli a dubl fɔʀm], "madness in double form").[2][163] Baillarger's original paper, "De la folie à double forme," appeared in the medical journal *Annales médico-psychologiques* (*Medico-psychological annals*) in 1854.[2]

These concepts were developed by the German psychiatrist Emil Kraepelin (1856–1926), who, using Kahlbaum's concept of cyclothymia,[164] categorized and studied the natural course of untreated bipolar patients. He coined the term *manic depressive psychosis*, after noting that periods of acute illness, manic or depressive, were generally punctuated by relatively symptom-free intervals where the patient was able to function normally.[165]

The term "manic–depressive *reaction*" appeared in the first version of the DSM in 1952, influenced by the legacy of Adolf Meyer.[166] Subtyping into "unipolar"

depressive disorders and bipolar disorders has its origin in Karl Kleist's concept – since 1911 – of unipolar and bipolar affective disorders, which was used by Karl Leonhard in 1957 to differentiate between unipolar and bipolar disorder in depression.[167] These subtypes have been regarded as separate conditions since publication of the DSM-III. The subtypes bipolar II and rapid cycling have been included since the DSM-IV, based on work from the 1970s by David Dunner, Elliot Gershon, Frederick Goodwin, Ronald Fieve, and Joseph Fleiss.[168][169][170]

Society and culture

See also: List of people with bipolar disorder, Category:Books about bipolar disorder, and Category:Films about bipolar disorder



Singer Rosemary Clooney's public revelation of bipolar disorder made her an early celebrity spokesperson for mental illness.[171]

Cost

The United States spent approximately $202.1 billion on people diagnosed with bipolar disorder I (excluding other subtypes of bipolar disorder and undiagnosed people) in 2015.[135] One analysis estimated that the United Kingdom spent approximately £5.2 billion on the disorder in 2007.[172][173] In addition to the economic costs, bipolar disorder is a leading cause of disability and lost productivity worldwide.[18] People with bipolar disorder are generally more disabled, have a lower level of functioning, longer duration of illness, and increased rates of work absenteeism and decreased productivity when compared to people experiencing other mental health disorders.[174] The decrease in the productivity seen in those who care for people with bipolar disorder also significantly contributes to these costs.[175]

Advocacy

There are widespread issues with social stigma, stereotypes, and prejudice against individuals with a diagnosis of bipolar disorder.[176] In 2000, actress Carrie Fisher went public with her bipolar disorder diagnosis. She became one of the most well-recognized advocates for people with bipolar disorder in the public eye and fiercely advocated to eliminate the stigma surrounding mental illnesses, including bipolar disorder.[177] Stephen Fried, who has written extensively on the topic, noted that Fisher helped to draw attention to the disorder's chronicity, relapsing nature, and that bipolar disorder relapses do not indicate a lack of discipline or moral shortcomings.[177] Since being diagnosed at age 37, actor Stephen Fry has pushed to raise awareness of the condition, with his 2006 documentary *Stephen Fry: The Secret Life of the Manic Depressive*.[178][179] In an effort to ease the social stigma associated with bipolar disorder, the orchestra conductor Ronald Braunstein cofounded the ME/2 Orchestra with his wife Caroline Whiddon in 2011. Braunstein was diagnosed with bipolar disorder in 1985 and his concerts with the ME/2 Orchestra were conceived in order to create a welcoming performance environment for his musical colleagues, while also raising public awareness about mental illness.[180][181]

Notable cases

Numerous authors have written about bipolar disorder and many successful people have openly discussed their experience with it. Kay Redfield Jamison, a clinical psychologist and professor of psychiatry at the Johns Hopkins University School of Medicine, profiled her own bipolar disorder in her memoir *An Unquiet Mind* (1995).[182] Several celebrities have also publicly shared that they have bipolar disorder; in addition to Carrie Fisher and Stephen Fry these include Catherine Zeta-Jones, Mariah Carey, Jane Pauley, Demi Lovato,[177] and Selena Gomez.[183]

Media portrayals

Several dramatic works have portrayed characters with traits suggestive of the diagnosis which have been the subject of discussion by psychiatrists and film experts alike.

In *Mr. Jones* (1993), (Richard Gere) swings from a manic episode into a depressive phase and back again, spending time in a psychiatric hospital and displaying many of the features of the syndrome.[184] In *The Mosquito Coast* (1986), Allie Fox (Harrison Ford) displays some features including recklessness, grandiosity, increased goal-directed activity and mood lability, as well as some paranoia.[185] Psychiatrists have suggested that Willy Loman, the main character in Arthur Miller's classic play *Death of a Salesman*, has bipolar disorder.[186]

The 2009 drama *90210* featured a character, Silver, who was diagnosed with bipolar disorder.[187] Stacey Slater, a character from the BBC soap EastEnders,

has been diagnosed with the disorder. The storyline was developed as part of the BBC's Headroom campaign.[188] The Channel 4 soap *Brookside* had earlier featured a story about bipolar disorder when the character Jimmy Corkhill was diagnosed with the condition.[189] 2011 Showtime's political thriller drama *Homeland* protagonist Carrie Mathison has bipolar disorder, which she has kept secret since her school days.[190] The 2014 ABC medical drama, *Black Box*, featured a world-renowned neuroscientist with bipolar disorder.[191] In the TV series *Dave*, the main character Dave, played by Lil Dicky who plays a fictionalized version of himself, is an aspiring rapper. Lil Dicky's real-life hype man GaTa plays himself. In an episode, after being off his medication and having an episode, GaTa tearfully confesses to having bipolar disorder and that was the reason for his episode. GaTa suffers from bipolar disorder in real life, but, as with his character in the show, is able to maintain it with medication.[192]

Creativity

Main article: Creativity and mental illness § Bipolar disorder

A link between mental illness and professional success or creativity has been suggested, including in accounts by Socrates, Seneca the Younger, and Cesare Lombroso. Despite prominence in popular culture, the link between creativity and bipolar has not been rigorously studied. This area of study also is likely affected by confirmation bias. Some evidence suggests that some heritable component of bipolar disorder overlaps with heritable components of creativity. Probands of people with bipolar disorder are more likely to be professionally successful, as well as to demonstrate temperamental traits similar to bipolar disorder. Furthermore, while studies of the frequency of bipolar disorder in creative population samples have been conflicting, full-blown bipolar disorder in creative samples is rare.[193]

II. Epidemiology

A. Incidence and prevalence. Mood disorders are common. The annual incidence of bipolar illness is less than 1%, but it is difficult to estimate because milder forms of bipolar disorder are often missed

B. Sex: bipolar I disorder is equal in women and men. Manic episodes are more common in women, and

C. Age: The age of onset for bipolar I disorder is usually about age 30. However, the disorder also occurs in young children as well as older adults

III. Etiology Genetic

Behavioral genetic studies have suggested that many chromosomal regions and candidate genes are related to bipolar disorder susceptibility with each gene exerting a mild to moderate effect.[40] The risk of bipolar disorder is nearly ten-fold higher in first-degree relatives of those with bipolar disorder than in the general population; similarly, the risk of major depressive disorder is three times higher in relatives of those with bipolar disorder than in the general population.[24]

Although the first genetic linkage finding for mania was in 1969,[48] linkage studies have been inconsistent.[24] Findings point strongly to heterogeneity, with different genes implicated in different families.[49] Robust and replicable genome-wide significant associations showed several common single-nucleotide polymorphisms (SNPs) are associated with bipolar disorder, including variants within the genes *CACNA1C*, *ODZ4*, and *NCAN*.[40][50] The largest and most recent genome-wide association study failed to find any locus that exerts a large effect, reinforcing the idea that no single gene is responsible for bipolar disorder in most cases.[50] Polymorphisms in *BDNF*, *DRD4*, *DAO*, and *TPH1* have been frequently associated with bipolar disorder and were initially associated in a meta-analysis, but this association disappeared after correction for multiple testing.[51] On the other hand, two polymorphisms in *TPH2* were identified as being associated with bipolar disorder.[52]

Due to the inconsistent findings in a genome-wide association study, multiple studies have undertaken the approach of analyzing SNPs in biological pathways. Signaling pathways traditionally associated with bipolar disorder that have been supported by these studies include corticotropin-releasing hormone signaling, cardiac β-adrenergic signaling, Phospholipase C signaling, glutamate receptor signaling,[53] cardiac hypertrophy signaling, Wnt signaling, Notch signaling,[54] and endothelin 1 signaling. Of the 16 genes identified in these pathways, three were found to be dysregulated in the dorsolateral prefrontal cortex portion of the brain in post-mortem studies: *CACNA1C*, *GNG2*, and *ITPR2*.[55]

Bipolar disorder is associated with reduced expression of specific DNA repair enzymes and increased levels of oxidative DNA damages.[56]

Environmental

Psychosocial factors play a significant role in the development and course of bipolar disorder, and individual psychosocial variables may interact with genetic dispositions.[57] Recent life events and interpersonal relationships likely contribute to the onset and recurrence of bipolar mood episodes, just as they do for unipolar depression.[58] In surveys, 30–50% of adults diagnosed with bipolar disorder report traumatic/abusive experiences in childhood, which is associated with earlier onset, a higher rate of suicide attempts, and more co-occurring disorders such as post-traumatic stress disorder.[59] The number of reported

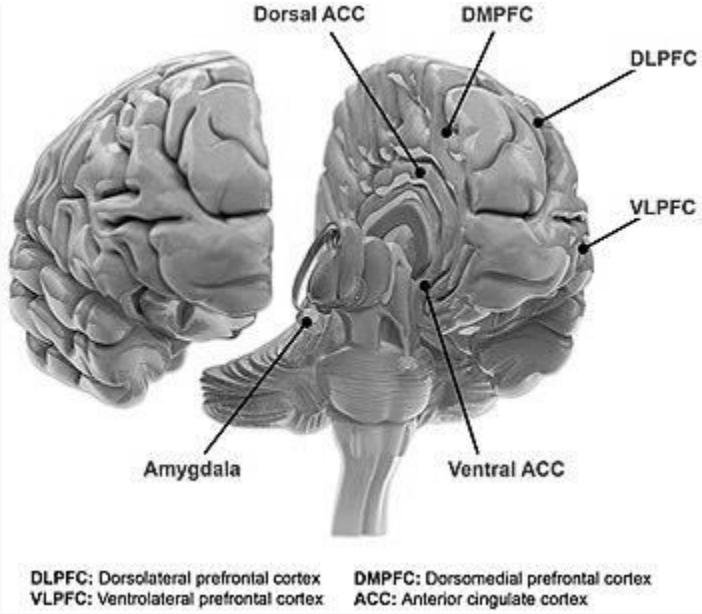
stressful events in childhood is higher in those with an adult diagnosis of bipolar spectrum disorder than in those without, particularly events stemming from a harsh environment rather than from the child's own behavior.[60] Acutely, mania can be induced by sleep deprivation in around 30% of people with bipolar disorder.[61]

Neurological

Less commonly, bipolar disorder or a bipolar-like disorder may occur as a result of or in association with a neurological condition or injury including stroke, traumatic brain injury, HIV infection, multiple sclerosis, porphyria, and rarely temporal lobe epilepsy.[62]

Proposed mechanisms

Further information: Biology of bipolar disorder



Brain imaging studies have revealed differences in the volume of various brain regions between patients with bipolar disorder and healthy control subjects.

The precise mechanisms that cause bipolar disorder are not well understood. Bipolar disorder is thought to be associated with abnormalities in the structure and function of certain brain areas responsible for cognitive tasks and the processing of emotions.[21] A neurologic model for bipolar disorder proposes that the emotional circuitry of the brain can be divided into two main parts.[21] The ventral system (regulates emotional perception) includes brain structures such as the amygdala, insula, ventral striatum, ventral anterior cingulate cortex, and the prefrontal cortex.[21] The dorsal system (responsible for emotional regulation) includes the hippocampus, dorsal anterior cingulate cortex, and other parts of the prefrontal cortex.[21] The model hypothesizes that bipolar disorder may occur when the ventral system is overactivated and the dorsal system is underactivated.[21] Other models suggest the ability to regulate

emotions is disrupted in people with bipolar disorder and that dysfunction of the ventricular prefrontal cortex (vPFC) is crucial to this disruption.[21]

Meta-analyses of structural MRI studies have shown that certain brain regions (e.g., the left rostral anterior cingulate cortex, fronto-insular cortex, ventral prefrontal cortex, and claustrum) are smaller in people with bipolar disorder, whereas other are larger (lateral ventricles, globus pallidus, subgenual anterior cingulate, and the amygdala). Additionally, these meta-analyses found that people with bipolar disorder have higher rates of deep white matter hyperintensities.[63][64][65][66]

Functional MRI findings suggest that the vPFC regulates the limbic system, especially the amygdala.[67] In people with bipolar disorder, decreased vPFC activity allows for dysregulated activity of the amygdala, which likely contributes to labile mood and poor emotional regulation.[67] Consistent with this, pharmacological treatment of mania returns vPFC activity to the levels in non-manic people, suggesting that vPFC activity is an indicator of mood state. However, while pharmacological treatment of mania reduces amygdala hyperactivity, it remains more active than the amygdala of those without bipolar disorder, suggesting amygdala activity may be a marker of the disorder rather than the current mood state.[68] Manic and depressive episodes tend to be characterized by dysfunction in different regions of the vPFC. Manic episodes appear to be associated with decreased activation of the right vPFC whereas depressive episodes are associated with decreased activation of the left vPFC.[67]

People with bipolar disorder who are in a euthymic mood state show decreased activity in the lingual gyrus compared to people without bipolar disorder.[21] In contrast, they demonstrate decreased activity in the inferior frontal cortex during manic episodes compared to people without the disorder.[21] Similar studies examining the differences in brain activity between people with bipolar disorder and those without did not find a consistent area in the brain that was more or less active when comparing these two groups.[21] People with bipolar have increased activation of left hemisphere ventral limbic areas—which mediate emotional experiences and generation of emotional responses—and decreased activation of right hemisphere cortical structures related to cognition—structures associated with the regulation of emotions.[69]

Neuroscientists have proposed additional models to try to explain the cause of bipolar disorder. One proposed model for bipolar disorder suggests that hypersensitivity of reward circuits consisting of frontostriatal circuits causes mania, and decreased sensitivity of these circuits causes depression.[70] According to the "kindling" hypothesis, when people who are genetically predisposed toward bipolar disorder experience stressful events, the stress threshold at which mood changes occur becomes progressively lower,

until the episodes eventually start (and recur) spontaneously. There is evidence supporting an association between early-life stress and dysfunction of the hypothalamic-pituitary-adrenal axis leading to its overactivation, which may play a role in the pathogenesis of bipolar disorder.[71][72] Other brain components that have been proposed to play a role in bipolar disorder are the mitochondria[44] and a sodium ATPase pump.[73] Circadian rhythms and regulation of the hormone melatonin also seem to be altered.[74]

Dopamine, a neurotransmitter responsible for mood cycling, has increased transmission during the manic phase.[23][75] The dopamine hypothesis states that the increase in dopamine results in secondary homeostatic downregulation of key system elements and receptors such as lower sensitivity of dopaminergic receptors. This results in decreased dopamine transmission characteristic of the depressive phase.[23] The depressive phase ends with homeostatic upregulation potentially restarting the cycle over again.[76] Glutamate is significantly increased within the left dorsolateral prefrontal cortex during the manic phase of bipolar disorder, and returns to normal levels once the phase is over.[77]

Medications used to treat bipolar may exert their effect by modulating intracellular signaling, such as through depleting myo-inositol levels, inhibition of cAMP signaling, and through altering subunits of the dopamine-associated G-protein.[78] Consistent with this, elevated levels of $G_{\alpha i}$, $G_{\alpha s}$, and $G_{\alpha q/11}$ have been reported in brain and blood samples, along with increased protein kinase A (PKA) expression and sensitivity;[79] typically, PKA activates as part of the intracellular signalling cascade downstream from the detachment of $G_{\alpha s}$ subunit from the G protein complex.

Decreased levels of 5-hydroxyindoleacetic acid, a byproduct of serotonin, are present in the cerebrospinal fluid of persons with bipolar disorder during both the depressed and manic phases. Increased dopaminergic activity has been hypothesized in manic states due to the ability of dopamine agonists to stimulate mania in people with bipolar disorder. Decreased sensitivity of regulatory α_2 adrenergic receptors as well as increased cell counts in the locus coeruleus indicated increased noradrenergic activity in manic people. Low plasma GABA levels on both sides of the mood spectrum have been found.[80] One review found no difference in monoamine levels, but found abnormal norepinephrine turnover in people with bipolar disorder.[81] Tyrosine depletion was found to reduce the effects of methamphetamine in people with bipolar disorder as well as symptoms of mania, implicating dopamine in mania. VMAT2 binding was found to be increased in one study of people with bipolar mania.[82]

Diagnosis

Bipolar disorder is commonly diagnosed during adolescence or early adulthood, but onset can occur throughout life.[5][83] Its diagnosis is based on the self-

reported experiences of the individual, abnormal behavior reported by family members, friends or co-workers, observable signs of illness as assessed by a clinician, and ideally a medical work-up to rule-out other causes. Caregiver-scored rating scales, specifically from the mother, are more accurate than teacher and youth-scored reports in identifying youths with bipolar disorder.[84] Assessment is usually done on an outpatient basis; admission to an inpatient facility is considered if there is a risk to oneself or others. The most widely used criteria for diagnosing bipolar disorder are from the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (DSM-5) and the World Health Organization's (WHO) *International Statistical Classification of Diseases and Related Health Problems*, 10th Edition (ICD-10). The ICD-10 criteria are used more often in clinical settings outside of the U.S. while the DSM criteria are used within the U.S. and are the prevailing criteria used internationally in research studies. The DSM-5, published in 2013, includes further and more accurate specifiers compared to its predecessor, the DSM-IV-TR.[85] This work has influenced the upcoming eleventh revision of the ICD, which includes the various diagnoses within the bipolar spectrum of the DSM-V.[86]

Several rating scales for the screening and evaluation of bipolar disorder exist,[87] including the Bipolar spectrum diagnostic scale, Mood Disorder Questionnaire, the General Behavior Inventory and the Hypomania Checklist.[88] The use of evaluation scales cannot substitute a full clinical interview but they serve to systematize the recollection of symptoms.[88] On the other hand, instruments for screening bipolar disorder tend to have lower sensitivity.[87]

A.Neurotransmitters

Dopamine: increased in mania.

B. Psychosocial

1. Psychoanalytic: Mania and elation are viewed as defense against underlying depression. Rigid superego serves to punish person with feelings of guilt about unconscious sexual or aggressive impulses

2. Stressful life events: Often precede first episodes of mood disorders. Such events may cause permanent neuronal changes that predispose a person to subsequent episodes of a mood disorder.

IV. Laboratory, Brain Imaging, and Psychological Tests

A.Dexamethasone suppression test. Nonsuppression (positive test result) represents hyper secretion of cortisol secondary to hyperactivity of

hypothalamic–pituitary–adrenal axis. Abnormal in 50% of patients with major depression but is of limited clinical usefulness owing to frequency of false-positives and false-negatives. Diminished release of TSH in response to thyrotropin-releasing hormone (TRH) reported in both depression and mania. Prolactin release decreased in response to tryptophan. Tests are not definitive

B. Brain imaging: Enlarged cerebral ventricles on computed tomography (CT) in some patients with mania Magnetic resonance spectroscopy (MRS) studies of patients with bipolar I disorder have produced data consistent with the hypothesis that the pathophysiology of the disorder may involve an abnormal regulation of membrane phospholipid metabolism.

C. Psychological tests

1. Rating scales: Young Manic Rating Scale are scored by the examiner

2. Thematic apperception test (TAT). Series of 30 pictures depicting ambiguous situations and interpersonal events. Patient creates a story about each scene. Depressives will create depressed stories, manics more grandiose and dramatic ones.

V. Clinical Assessment There are two types of bipolar disorder: bipolar I characterized by the occurrence of manic episodes with or without a major depressive episode and bipolar II characterized by at least one depressive episode with or without a hypomanic episode.

A. Mania (manic episode). Persistent elevated expansive mood.

1. Information obtained from history

a. Erratic and disinhibited behavior.

(1) Excessive spending or gambling.

(2) Impulsive travel.

(3) Hypersexuality, promiscuity.

b. Overextended in activities and responsibilities.

c. Low frustration tolerance with irritability, outbursts of anger.

d. Vegetative signs. (1) Increased libido. (2) Weight loss, anorexia. (3) Insomnia (expressed as no need to sleep). (4) Excessive energy.

2. Information obtained from mental status examination

a. General appearance and behavior. Psychomotor agitation; seductive, colorful clothing; excessive makeup; inattention to personal appearance or

bizarre combinations of clothes; intrusive; entertaining; threatening; hyperexcited.

b. Affect. Labile, intense (may have rapid depressive shifts).

c. Mood. Euphoric, expansive, irritable, demanding, flirtatious.

d. Speech. Pressured, loud, dramatic, exaggerated; may become incoherent.

e. Thought content. Highly elevated self-esteem, grandiose, extremely egocentric; delusions and less frequently hallucinations (mood-congruent themes of inflated self-worth and power, most often grandiose and paranoid).

f. Thought process. Flight of ideas (if severe, can lead to incoherence); racing thoughts, neologisms, clang associations, circumstantiality, tangentially.

g. Sensorium. Highly distractible, difficulty concentrating; memory, if not too distracted, generally intact; abstract thinking generally intact.

h. Insight and judgment. Extremely impaired; often total denial of illness and inability to make any organized or rational decisions.

C. Other types of bipolar disorders

1. Rapid-cycling bipolar disorder. Four or more depressive, manic, or mixed episodes within 12 months. Bipolar disorder with mixed or rapid-cycling episodes appears to be more chronic than bipolar disorder without alternating episodes.

2. Hypomania. Elevated mood associated with decreased need for sleep, hypoactivity, and hedonic pursuits. Less severe than mania with no psychotic features

VI. Differential Diagnosis

A. Mood disorder resulting from general medical condition. Depressive, manic, or mixed features or major depressive-like episode secondary to medical illness (e.g., brain tumor, metabolic illness, HIV disease, Parkinson's disease, Cushing's syndrome) Cognitive deficits are common.

1. Myxedema madness. Hypothyroidism associated with fatigability, depression, and suicidal impulses. May mimic schizophrenia, with thought disorder, delusions, hallucinations, paranoia, and agitation. More common in women.

2. Mad hatter's syndrome. Chronic mercury intoxication (poisoning) produces manic (and sometimes depressive) symptoms.

B. Substance-induced mood disorder. Mood disorders caused by a drug or toxin (e.g., cocaine, amphetamine, propranolol [Inderal], steroids). Must always be ruled out when patient presents with depressive or manic symptoms. Mood disorders often occur simultaneously with substance abuse and dependence.

C. Schizophrenia. Schizophrenia can look like a manic, major depressive, or mixed episode with psychotic features. To differentiate, rely on such factors as family history, course, premorbid history, and response to medication. Depressive-like or manic-like episode with presence of mood-incongruent psychotic features suggests schizophrenia. Thought insertion and broadcasting, loose associations, poor reality testing, or bizarre behavior may also suggest schizophrenia. Bipolar disorder with depression or mania more often is associated with mood-congruent hallucinations or delusions.

D. Grief. Not a true disorder. Known as bereavement in DSM-5. Profound sadness secondary to major loss. Presentation may be similar to that of major depressive disorder, with anhedonia, withdrawal, and vegetative signs. Remits with time. Differentiated from major depressive disorder by absence of suicidal ideation or profound feelings of hopelessness and worthlessness. Usually resolves within a year. May develop into major depressive episode in predisposed persons.

E. Personality disorders. Lifelong behavioral pattern associated with rigid defensive style; depression may occur more readily after stressful life event because of inflexibility of coping mechanisms. Manic episode may also occur more readily in predisposed people with pre-existing personality disorder. A mood disorder may be diagnosed on Axis I simultaneously with a personality disorder on Axis II.

F. Schizoaffective disorder. Signs and symptoms of schizophrenia accompany prominent mood symptoms. Course and prognosis are between those of schizophrenia and mood disorders.

G. Adjustment disorder with depressed mood. Moderate depression in response to clearly identifiable stress, which resolves as stress diminishes. Considered a maladaptive response resulting from either impairment in functioning or excessive and disproportionate intensity of symptoms. Persons with personality disorders or cognitive deficits may be more vulnerable.

H. Primary sleep disorders. Can cause anergy, dyssomnia, irritability. Distinguish from major depression by assessing for typical signs and symptoms of depression and occurrence of sleep abnormalities only in the context of depressive episodes. Consider obtaining a sleep laboratory evaluation in cases of refractory depression.

I. Other mental disorders. Eating disorders, somatoform disorders, and anxiety disorders are all commonly associated with depressive symptoms and must be considered in the differential diagnosis of a patient with depressive symptoms. Perhaps the most difficult differential is that between anxiety disorders with depression and depressive disorders with marked anxiety.

VII. Course and Prognosis: About 20% to 30% of dysthymic patients develop, in descending order of frequency, major depressive disorder (called double depression), bipolar II disorder, or bipolar I disorder. A major mood disorder, usually bipolar II disorder, develops in about 30% of patients with cyclothymic disorder. Forty-five percent of manic episodes recur. Untreated, manic episodes last 3 to 6 months, with a high rate of recurrence (average of 10 recurrences). Some 80% to 90% of manic patients eventually experience a full depressive episode. The prognosis is fair: 15% recover, 50% to 60% partially recover (multiple relapses with good interepisodic functioning), and one-third have some evidence of chronic symptoms and social deterioration.

B. Bipolar disorders

1. Biologic

a. Lithium, divalproex (Depakote), and olanzapine (Zyprexa) are first-line treatments for the manic phase of bipolar disorder, but carbamazepine (Tegretol) is also a well-established treatment. Gabapentin (Neurontin) and lamotrigine (Lamictal) are also of use. Topiramate (Topamax) is another anticonvulsant showing benefit in bipolar patients. ECT is highly effective in all phases of bipolar disorder. Carbamazepine, divalproex, and valproic acid (Depakene) may be more effective than lithium in the treatment of mixed or dysphoric mania, rapid cycling, and psychotic mania, and in the treatment of patients with a history of multiple manic episodes or comorbid substance abuse.

b. Treatment of acute manic episodes often requires adjunctive use of potent sedative drugs. Drugs commonly used at the start of treatment include clonazepam (1 mg every 4 to 6 hours) and lorazepam (Ativan) (2 mg every 4 to 6 hours). Haloperidol (Haldol) (2 to 10 mg/day), olanzapine (2.5 to 10 mg/day), and risperidone (Risperdal) (0.5 to 6 mg/day) are also of use. Bipolar patients may be particularly sensitive to the side effects of typical antipsychotics. The atypical antipsychotics (e.g., olanzapine [Zyprexa] [10 to 20 mg/day]) are often used as monotherapy for acute control and may have intrinsic antimanic properties. Physicians should attempt to taper these adjunctive agents when the patient stabilizes.

c. Lithium remains a mainstay of treatment in bipolar disorders. A blood level of 0.8 to 1.2 mEq/L is usually needed to control acute symptoms. A

complete trial should last at least 4 weeks, with 2 weeks at therapeutic levels. Prelithium workup includes a complete blood cell count, electrocardiogram (ECG), thyroid function tests, measurement of blood urea nitrogen and serum creatinine, and a pregnancy test. Lithium has a narrow therapeutic index, and levels can become toxic quickly when a patient is dehydrated. A level of 2.0 mEq or higher is toxic. Lithium treatment can be initiated at 300 mg three times per day but can be given as a single nightly dose. A level should be checked after 5 days and the dose titrated accordingly. The clinical response may take 4 days after a therapeutic level has been achieved. Typical side effects include thirst, polyuria, tremor, metallic taste, cognitive dulling, and gastrointestinal upset. Lithium can induce hypothyroidism and, in rare cases, renal toxicity. Lithium is a first-line treatment for bipolar depression and achieves an antidepressant response in 50% of patients. Lithium is most effective for prophylaxis of further mood episodes at levels of 0.8 to 1.2 mEq/L. However, in many patients, remission can be maintained at lower levels, which are better tolerated and thereby promote enhanced compliance. Patients with depressive breakthrough on lithium should be assessed for lithium-induced hypothyroidism. Lithium is excreted unchanged by the kidneys and must be used with caution in patients with renal disease. Because lithium is not metabolized by the liver, it may be the best choice for treating bipolar disorder in patients with hepatic impairment.

d. Valproic acid and divalproex have a broad therapeutic index and appear effective at levels of 50 to 125 mcg/mL. Pretreatment workup includes a complete blood cell count and liver function tests. A pregnancy test is needed because this drug can cause neural tube defects in developing fetuses. It can cause thrombocytopenia and increased transaminase levels, both of which are usually benign and self-limited but require increased blood monitoring. Fatal hepatic toxicity has been reported only in children under age 10 who received multiple anticonvulsants. Typical side effects include hair loss (which can be treated with zinc and selenium), tremor, weight gain, and sedation. Gastrointestinal upset is common but can be minimized by using enteric-coated tablets (Depakote) and titrating gradually. Valproic acid can be loaded for acute symptom control by administering at 20 mg/kg in divided doses. This strategy also produces a therapeutic level and may improve symptoms within 7 days. For outpatients, more physically brittle patients, or less severely ill patients, medication can be started at 250 to 750 mg/day and gradually titrated to a therapeutic level. Blood levels can be checked after 3 days at a particular dosage.

e. Carbamazepine is usually titrated to response rather than blood level, although many clinicians titrate to reach levels of 4 to 12 mcg/mL. Pretreatment evaluation should include liver function tests and a complete blood cell count as well as ECG, electrolytes, reticulocytes, and pregnancy test. Side effects include

nausea, sedation, and ataxia. Hepatic toxicity, hyponatremia, or bone marrow suppression may rarely occur. Rash occurs in 10% of patients. Exfoliative rashes (Stevens–Johnson syndrome) are rare but potentially fatal. The drug can be started at 200 to 600 mg/day, with adjustments every 5 days based on clinical response. Improvement may be seen 7 to 14 days after a therapeutic dose has been achieved. Drug interactions complicate carbamazepine use and probably relegate it to second-line status. It is a potent enzyme inducer and can lower levels of other psychotropics, such as haloperidol. Carbamazepine induces its own metabolism (autoinduction), and the dosage often needs to be increased during the first few months of treatment to maintain a therapeutic level and clinical response.

f. Lamotrigine and gabapentin are anticonvulsants that may have antidepressant, antimanic, and mood-stabilizing properties. They do not require blood monitoring. Gabapentin is excreted exclusively by the kidneys. It has a benign side-effect profile that can include sedation or activation, dizziness, and fatigue. It does not interact with other drugs. Dose reduction in patients with renal insufficiency is required. Gabapentin can be titrated aggressively, and therapeutic response has been reported at dosages of 300 to 3,600 mg/day. It has a short half-life, and dosing to three times a day is required. Lamotrigine requires gradual titration to decrease the risk for rash, which occurs in 10% of patients. Stevens– Johnson syndrome occurs in 0.1% of patients treated with lamotrigine. Other side effects include nausea, sedation, ataxia, and insomnia. Dosage can be initiated at 25 to 50 mg/day for 2 weeks and then increased slowly to 150 to 250 mg twice daily. Valproate raises lamotrigine levels. In the presence of valproate, lamotrigine titration should be slower and dosages lower (e.g., 25 mg orally four times daily for 2 weeks, with 25-mg increases every 2 weeks to a maximum of 150 mg/day). Topiramate has shown efficacy in bipolar disorders. Its side effects include fatigue and cognitive dulling. This drug has the unique property of causing weight loss. One series of overweight patients with bipolar disorder lost an average of 5% of their body weight while taking topiramate as an adjunct to other medications. The starting dosage is usually 25 to 50 mg/day to a maximum of 400 mg/day.

g. Maintenance treatment is required in patients with recurrent illness. During long-term treatment, laboratory monitoring is required for lithium, valproic acid, and carbamazepine. These requirements are outlined in Chapter 25.

h. Patients who do not respond adequately to one mood stabilizer may do well with combination treatment. Lithium and valproic acid are commonly used together. Increased neurotoxicity is a risk, but the combination is safe. Other combinations include lithium plus carbamazepine, carbamazepine plus valproic acid (requires increased laboratory monitoring for drug interactions and hepatic toxicity), and combinations with the newer anticonvulsants.

i. Other agents used in bipolar disorder include verapamil (Isoptin, Calan), nimodipine (Nimotop), clonidine (Catapres), clonazepam, and levothyroxine (Levoxyl, Levothroid, Synthroid). Atypical, second-generation antipsychotics may also be of use in bipolar patients. Quetiapine (Seroquel) has been approved for use and risperidone (Risperdal) and clozapine (Clozaril) have been shown to have antimanic and mood-stabilizing properties.

j. ECT should be considered in refractory or emergent cases.

2. Psychological.

Psychotherapy in conjunction with antimanic drugs (e.g., lithium) is more effective than either treatment alone. Psychotherapy is not indicated when a patient is experiencing a manic episode. In this situation, the safety of the patient and others must be paramount, and pharmacologic and physical steps must be taken to protect and calm the patient.

a. Cognitive. Has been studied in relation to increasing compliance with lithium therapy among patients with bipolar disorder.

b. Behavioral. Can be most effective during inpatient treatment of manic patients. Helps to set limits on impulsive or inappropriate behavior through such techniques as positive and negative reinforcement and token economies.

c. Psychoanalytically oriented. Can be beneficial in the recovery and stabilization of manic patients if patient is capable of and desires insight into underlying conflicts that may trigger and fuel manic episodes. Can also help patients understand resistance to medication and thus increase compliance.

d. Supportive. Indicated particularly during acute phases and in early recompensation. Some patients can tolerate only supportive therapy, whereas others can tolerate insight-oriented therapy. Supportive therapy more often is indicated for patients with chronic bipolar disorder, who may have significant interepisodic residual symptoms and experience social deterioration.

e. Group. Can be helpful in challenging denial and defensive grandiosity of manic patients. Useful in addressing such common issues among manic patients as loneliness, shame, inadequacy, fear of mental illness, and loss of control. Helpful in reintegrating patients socially. Family. Particularly important with bipolar patients because their disorder is strongly familial (22% to 25% of first-degree relatives) and because manic episodes are so disruptive to patients' interpersonal relationships and jobs. During manic episodes, patients may spend huge amounts of family money or act with sexual inappropriateness; residual feelings of anger, guilt, and shame among family members must be addressed. Ways to help with compliance and recognizing triggering events can be explored.

Prevention

Attempts at prevention of bipolar disorder have focused on stress (such as childhood adversity or highly conflictual families) which, although not a diagnostically specific causal agent for bipolar, does place genetically and biologically vulnerable individuals at risk for a more severe course of illness.[114]

Management

Main article: Treatment of bipolar disorder

The aim of management is to treat acute episodes safely with medication and work with the patient in long-term maintenance to prevent further episodes and optimise function using a combination of pharmacological and psychotherapeutic techniques.[12] Hospitalization may be required especially with the manic episodes present in bipolar I. This can be voluntary or (local legislation permitting) involuntary. Long-term inpatient stays are now less common due to deinstitutionalization, although these can still occur.[115] Following (or in lieu of) a hospital admission, support services available can include drop-in centers, visits from members of a community mental health team or an Assertive Community Treatment team, supported employment, patient-led support groups, and intensive outpatient programs. These are sometimes referred to as partial-inpatient programs.[116]

Psychosocial

Psychotherapy aims to assist a person with bipolar disorder in accepting and understanding their diagnosis, coping with various types of stress, improving their interpersonal relationships, and recognizing prodromal symptoms before full-blown recurrence.[10] Cognitive behavioral therapy, family-focused therapy, and psychoeducation have the most evidence for efficacy in regard to relapse prevention, while interpersonal and social rhythm therapy and cognitive-behavioral therapy appear the most effective in regard to residual depressive symptoms. Most studies have been based only on bipolar I, however, and treatment during the acute phase can be a particular challenge.[117] Some clinicians emphasize the need to talk with individuals experiencing mania, to develop a therapeutic alliance in support of recovery.[118]

Medication



Lithium is often used to treat bipolar disorder and has the best evidence for reducing suicide.

Medications may differ depending on what episode is being treated.[12] The medication with the best overall evidence is lithium, which is an effective treatment for acute manic episodes, preventing relapses, and bipolar depression.[119][120] Lithium reduces the risk of suicide, self-harm, and death in people with bipolar disorder.[121] Antipsychotics and mood stabilizers used together are quicker and more effective at treating mania than either class of drug used alone. Some analyses indicate antipsychotics alone are also more effective at treating acute mania.[12] Mood stabilizers are used for long-term maintenance but have not demonstrated the ability to quickly treat acute bipolar depression.[106] It is unclear if ketamine (a common general dissociative anesthetic used in surgery) is useful in bipolar disorder.[122]

Mood stabilizers

Lithium and the anticonvulsants carbamazepine, lamotrigine, and valproic acid are classed as mood stabilizers due to their effect on the mood states in bipolar disorder.[106] Lithium is preferred for long-term mood stabilization,[58] although it erodes kidney and thyroid function over extended periods.[12] Valproate has become a commonly prescribed treatment and effectively treats manic episodes.[123] Carbamazepine is less effective in preventing relapse than lithium or valproate.[124][125] Lamotrigine has some efficacy in treating depression, and this benefit is greatest in more severe depression.[126] It has also been shown to have some benefit in preventing bipolar disorder relapses, though there are concerns about the studies done, and is of no benefit in rapid cycling subtype of bipolar disorder.[127] Valproate and carbamazepine are teratogenic and should be avoided as a treatment in women of childbearing age, but discontinuation of these medications during pregnancy is associated with a high risk of relapse.[17] The effectiveness of topiramate is unknown.[128]

Antipsychotics

Antipsychotic medications are effective for short-term treatment of bipolar manic episodes and appear to be superior to lithium and anticonvulsants for this purpose.[58] Atypical antipsychotics are also indicated for bipolar depression refractory to treatment with mood stabilizers.[106] Olanzapine is effective in preventing relapses, although the supporting evidence is weaker than the evidence for lithium.[129] A 2006 review found that haloperidol was an effective treatment for acute mania, limited data supported no difference in overall efficacy between haloperidol, olanzapine or risperidone, and that it could be less effective than aripiprazole.[130] Carbamazepine effectively treats manic episodes, with some evidence it has greater benefit in rapid-cycling bipolar disorder, or those with more psychotic symptoms or more symptoms similar to that of schizoaffective disorder.

Antidepressants

Antidepressants are not recommended for use alone in the treatment of bipolar disorder and have not been found to be of any benefit over mood stabilizers.[12][131] Atypical antipsychotic medications (e.g., aripiprazole) are preferred over antidepressants to augment the effects of mood stabilizers due to the lack of efficacy of antidepressants in bipolar disorder.[106] Treatment of bipolar disorder using antidepressants carries a risk of affective switches; where a person switches from depression to manic or hypomanic phases.[17] The risk of affective switches is higher in bipolar I depression; antidepressants are generally avoided in bipolar I disorder or only used with mood stabilizers when they are deemed necessary.[17] There is also a risk of accelerating cycling between phases when antidepressants are used in bipolar disorder.[17]

Other

Short courses of benzodiazepines are used in addition to other medications for calming effect until mood stabilizing become effective.[132] Electroconvulsive therapy (ECT) is an effective form of treatment for acute mood disturbances in those with bipolar disorder, especially when psychotic or catatonic features are displayed. ECT is also recommended for use in pregnant women with bipolar disorder.[12]

Children

Treating bipolar disorder in children involves medication and psychotherapy.[109] Unfortunately, the literature and research on the effects of psychosocial therapy on bipolar spectrum disorders are scarce, making it difficult to determine the efficacy of various therapies.[133] Mood stabilizers and atypical antipsychotics are commonly prescribed.[109] Among the former, lithium is the only compound approved by the FDA for children.[107] Psychological treatment combines normally education on the disease, group therapy, and cognitive behavioral therapy.[109] Long-term medication is often needed.[109]

Prognosis

A lifelong condition with periods of partial or full recovery in between recurrent episodes of relapse,[36][134] bipolar disorder is considered to be a major health problem worldwide because of the increased rates of disability and premature mortality.[134] It is also associated with co-occurring psychiatric and medical problems, higher rates of death from natural causes (e.g., cardiovascular disease), and high rates of initial under- or misdiagnosis, causing a delay in appropriate treatment and contributing to poorer prognoses.[4][37] When compared to the general population, people with bipolar disorder also have higher rates of other serious medical comorbidities including diabetes mellitus, respiratory diseases, HIV, and Hepatitis C virus infection.[135] After a diagnosis is made, it remains difficult to achieve complete remission of all symptoms with the currently available psychiatric medications and symptoms often become progressively more severe over time.[87][136]

Compliance with medications is one of the most significant factors that can decrease the rate and severity of relapse and have a positive impact on overall prognosis.[137] However, the types of medications used in treating BD commonly cause side effects[138] and more than 75% of individuals with BD inconsistently take their medications for various reasons.[137] Of the various types of the disorder, rapid cycling (four or more episodes in one year) is associated with the worst prognosis due to higher rates of self-harm and suicide.[36] Individuals diagnosed with bipolar who have a family history of bipolar disorder are at a greater risk for more frequent manic/hypomanic episodes.[139] Early onset and psychotic features are also associated with worse outcomes,[140][141] as well as subtypes that are nonresponsive to lithium.[136]

Early recognition and intervention also improve prognosis as the symptoms in earlier stages are less severe and more responsive to treatment.[136] Onset after adolescence is connected to better prognoses for both genders, and being male is a protective factor against higher levels of depression. For women, better social functioning before developing bipolar disorder and being a parent are protective towards suicide attempts.[139]

Functioning

Changes in cognitive processes and abilities are seen in mood disorders, with those of bipolar disorder being greater than those in major depressive disorder.[142] These include reduced attentional and executive capabilities and impaired memory.[143] People with bipolar disorder often experience a decline in cognitive functioning during (or possibly before) their first episode, after which a certain degree of cognitive dysfunction typically becomes permanent, with more severe impairment during acute phases and moderate impairment during periods of remission. As a result, two-thirds of people with BD continue to experience impaired psychosocial functioning in between episodes even when

their mood symptoms are in full remission. A similar pattern is seen in both BD-I and BD-II, but people with BD-II experience a lesser degree of impairment.[138] When bipolar disorder occurs in children, it severely and adversely affects their psychosocial development.[110] Children and adolescents with bipolar disorder have higher rates of significant difficulties with substance abuse, psychosis, academic difficulties, behavioral problems, social difficulties, and legal problems.[110] Cognitive deficits typically increase over the course of the illness. Higher degrees of impairment correlate with the number of previous manic episodes and hospitalizations, and with the presence of psychotic symptoms.[144] Early intervention can slow the progression of cognitive impairment, while treatment at later stages can help reduce distress and negative consequences related to cognitive dysfunction.[136]

Despite the overly ambitious goals that are frequently part of manic episodes, symptoms of mania undermine the ability to achieve these goals and often interfere with an individual's social and occupational functioning. One third of people with BD remain unemployed for one year following a hospitalization for mania.[145] Depressive symptoms during and between episodes, which occur much more frequently for most people than hypomanic or manic symptoms over the course of illness, are associated with lower functional recovery in between episodes, including unemployment or underemployment for both BD-I and BD-II.[5][146] However, the course of illness (duration, age of onset, number of hospitalizations, and presence or not of rapid cycling) and cognitive performance are the best predictors of employment outcomes in individuals with bipolar disorder, followed by symptoms of depression and years of education.[146]

Recovery and recurrence

A naturalistic study from first admission for mania or mixed episode (representing the hospitalized and therefore most severe cases) found that 50% achieved syndromal recovery (no longer meeting criteria for the diagnosis) within six weeks and 98% within two years. Within two years, 72% achieved symptomatic recovery (no symptoms at all) and 43% achieved functional recovery (regaining of prior occupational and residential status). However, 40% went on to experience a new episode of mania or depression within 2 years of syndromal recovery, and 19% switched phases without recovery.[147]

Symptoms preceding a relapse (prodromal), specially those related to mania, can be reliably identified by people with bipolar disorder.[148] There have been intents to teach patients coping strategies when noticing such symptoms with encouraging results.[149]

Assessment Procedure

Multiple choice questions based assessment after successful completion of theory and practical sessions

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCE

VALUE ADDED COURSE STUDENT DETAILS

BIPOLAR MOOD DISORDERS , CLASSIFICATION AND ITS MANAGEMENT FOR 3rd YEAR STUDENTS

S.No	Register No	Students List	Department	Signature
1	U15MB364	SHALINI. A	Psychiatry	
2	U15MB365	SHANMUGA PRIYANGA. A	Psychiatry	
3	U15MB366	SHARUMATHI.E	Psychiatry	
4	U15MB367	SHIYAM. M	Psychiatry	
5	U15MB368	SHRIRAAM .K	Psychiatry	
6	U15MB369	SIVA SAKTHI VELAN .A.V	Psychiatry	
7	U15MB370	SIVAKUMAR. S	Psychiatry	
8	U15MB371	SIVANAMBI .S	Psychiatry	
9	U15MB372	SOPHIYA .L	Psychiatry	
10	U15MB373	SOUNDARIYA.M	Psychiatry	
11	U15MB374	SOWMYA LAKSHMI .I	Psychiatry	

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12	U15MB375	SREERAM.M	Psychiatry	
13	U15MB376	SRINIVASAN.R	Psychiatry	
14	U15MB377	SRUTHI .S	Psychiatry	
15	U15MB378	SUBALAKSHMI .C	Psychiatry	

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Bipolar mood disorders , classification and its management

Candidate Name		Assessor Name	
Date of Assessment		Assessor Position	

MULTIPLE CHOICE QUESTIONS

Course Code: PSYC08

I. ANSWER ALL THE QUESTIONS

Annexure - IV

1) Mania involves:

a) Boundless, frenzied energy.

b) Feelings of euphoria.

c) Ideas coming too fast and too many.

d) All of the above.

Check your answer

2) Depressed individuals exhibit which of the following symptoms?

a) Behavioural symptoms.

b) Physical symptoms.

c) Cognitive symptoms.

d) All of the above.

Check your answer

3) Which of the following is a behavioural symptom exhibited by individuals suffering unipolar depression?

a) Unpredictable and erratic behaviour.

b) Compulsive checking.

c) Stay in bed for long periods.

d) Ritualised behaviour.

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Check your answer

4) DSM-IV-TR criteria for a major depressive episode includes which of the following?

a) Symptoms cause clinically significant distress or impairment in social functioning.

b) Symptoms are not due to physiological effects of substance misuse.

c) Symptoms are not accounted for by bereavement.

d) All of the above.

Check your answer

6) The experience of two years of hypomania symptoms that do not meet the criteria for a manic episode is known as:

a) Dysthymic Disorder.

b) Dissociative disorder.

c) Cyclothymic Disorder.

d) Personality disorder.

9) In DSM-IV-TR Bipolar I disorder includes which of the following symptoms?

a) Currently (or most recently) in a Manic Episode.

b) The previous occurrence of at least one Major Depressive Episode, Manic Episode or Mixed Episode.

c) Mood episodes are not better accounted for by psychotic disorders.

d) All of the above.

Check your answer

10) In Bipolar II Disorder, major depressive episodes alternate with periods of:

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a) Hyperventilation.

b) Hypomania.

c) Hypothermia.

d) Hypoxia.

Check your answer

29) What percent of individuals taking tricyclic drugs show improvement?

a) 30-35%.

b) 80-85%.

c) 10-15%.

d) 60-65%.

Check your answer

30) One of the major drug therapies for Bipolar disorder is:

a) Chlorpromazine.

b) Lithium carbonate.

c) Clozapine.

d) Benzodiazepine.

Check your answer

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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Bipolar mood disorders , classification and its management

Candidate Name	SIVASHAKTHI VELAN A.V	Assessor Name	DR. ARUN
Date of Assessment	13.5.2019	Assessor Position	ASSOCIATE PROFESSOR

UNIVERSITY REG NO:- U15MB369

9/9

MULTIPLE CHOICE QUESTIONS

Course Code: PSYC08

I. ANSWER ALL THE QUESTIONS

Annexure - IV

1) Mania involves:

- a) Boundless, frenzied energy.
- b) Feelings of euphoria.
- c) Ideas coming too fast and too many.
- d) All of the above.

Check your answer

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- b) Physical symptoms.
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- d) All of the above.

Check your answer

3) Which of the following is a behavioural symptom exhibited by individuals suffering unipolar depression?

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c) Stay in bed for long periods.

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Check your answer

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a) Symptoms cause clinically significant distress or impairment in social functioning.

b) Symptoms are not due to physiological effects of substance misuse.

c) Symptoms are not accounted for by bereavement.

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Check your answer

6) The experience of two years of hypomania symptoms that do not meet the criteria for a manic episode is known as:

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d) Personality disorder.

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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

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d) Benzodiazepine.

Check your answer

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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Bipolar mood disorders , classification and its management

Candidate Name	SHRIRAAM . K .	Assessor Name	Dr ARUN
Date of Assessment	13-5-2019	Assessor Position	ASSOCIATE PROFESSOR

UNIVERSITY REG NO:- U1SMB368

7/9

MULTIPLE CHOICE QUESTIONS

Course Code: PSYC08

I. ANSWER ALL THE QUESTIONS

Annexure - IV

1) Mania involves:

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- b) Feelings of euphoria.
- c) Ideas coming too fast and too many.
- d) All of the above.

Check your answer

2) Depressed individuals exhibit which of the following symptoms?

- a) Behavioural symptoms.
- b) Physical symptoms.
- c) Cognitive symptoms.
- d) All of the above.

Check your answer

3) Which of the following is a behavioural symptom exhibited by individuals suffering unipolar depression?

a) Unpredictable and erratic behaviour.

b) Compulsive checking.

c) Stay in bed for long periods.

d) Ritualised behaviour.

Check your answer

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b) Symptoms are not due to physiological effects of substance misuse.

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- b) Lithium carbonate.
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- d) Benzodiazepine.

Check your answer

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SOUNDARIYA A.M has actively participated in the Value Added Course on **Bipolar mood disorders , classification and its management** held during Jan – march 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. C. ARUN SEETHARAMAN
RESOURCE PERSON
Dr. ARUN SEETHARAMAN, MD.,
Reg. No: 91440
Associate Professor, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. V.R.SRIDHAR
Dr. V. R. SRIDHAR, MD.,D.P.M.,
COORDINATOR
Professor & HOD, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under Section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SIVANAMBI.S (U15MB372) has actively participated in the Value Added Course on **Bipolar mood disorders , classification and its management** held during Jan – march 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. C. ARUN SEETHARAMAN

RESOURCE PERSON

Dr. ARUN SEETHARAMAN, MD.,
Reg. No: 91440
Associate Professor, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry 605 502

Dr. V.R.SRIDHAR

COORDINATOR

Dr. V. R. SRIDHAR, MD., D.P.M.,
Reg. No: 30995
Professor & HOD, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Student Feedback Form

Course Name: **BIPOLAR MOOD DISORDERS**
Subject Code: **PSYC08**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Signature

Date:

Student Feedback Form

Course Name: **BIPOLAR DISORDERS**

Subject Code: **PSYC08**

Name of Student: SOPHIYA · L Roll No.: U15MB372

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3 ✓	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Student Feedback Form

Course Name: **BIPOLAR DISORDERS**

Subject Code: **PSYC08**

Name of Student: SHIYAM Roll No.: U15MB367

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	✓4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 30-03-2019

From

Dr.V.R.Shridhar
Professor and Head,
Department of Psychiatry,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

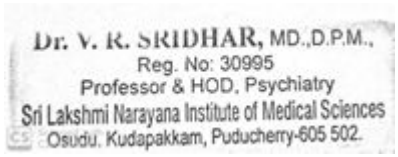
Sub: Completion of value-added course : Bipolar mood disorders , classification and its management

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled**: Bipolar mood disorders , classification and its management** . We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

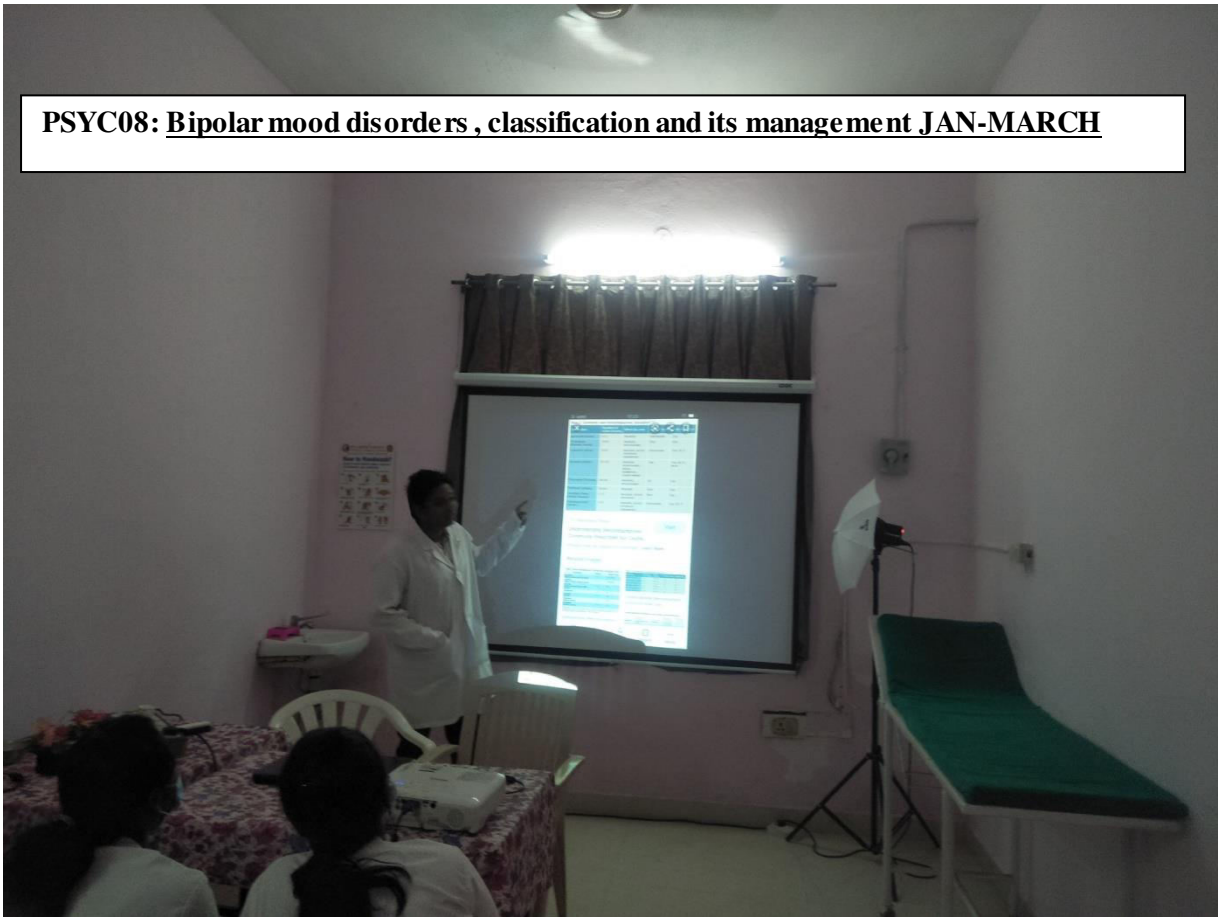
Dr. Sridhar



Encl: Certificates

Photographs

PSYC08: Bipolar mood disorders , classification and its management JAN-MARCH



SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSSUDU AGARAM VILLAGE; KUDAPAKKAM POST,PONDICHERRY - 605003

Date 3.1.2019

From
Dr. PAMMY SINHA ,
HOD
Pathology
SriLakshmiNarayanaInstituteofMedicalSciences,Puducherry
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
SriLakshmiNarayanaInstituteofMedicalSciences,Puducherry
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Synovial fluid and biopsy

Dear Madam,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Synovial fluid and biopsy** on Feb – April 2019. We solicit your kind permission for the same.

Kind Regard
Dr. PAMMY SINHA

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. PAMMY SINHA

The Expert: Dr. J.PRIYADARSHINI The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign &Seal)	(Sign &Seal)	(Sign &Seal)

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam
Villanur Commune Puducherry

DEPARTMENT OF PATHOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSSUDU AGARAM VILLAGE; KUDAPAKKAM POST,PONDICHERRY - 605003

Circular

10.1.19

Sub: Organising Value-added Course: Synovial fluid and biopsy

With reference to the above mentioned subject, it is to bring to your notice that **SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES Bharath Institute of Higher Education and Research**, is organising**"Synovial fluid and biopsy_"** from feb 2019. The course content is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 31.01.2019 . Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Encl: Copy of Course content

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

Course Proposal

Course Title: Synovial fluid and biopsy

Course Objective:

1. To define the automation and shall be able to discuss the principle and procedure to be followed in analyzer.
2. Should know about the parts and principle of Analyzer
3. Should be able to run analyzer and should also know about the trouble shooting

Course Outcome: Should know about the tissue processing in detail
Course Audience: IInd year MBBS
Course Coordinator: Dr.Pammy sinha
Course Faculties with Qualification and Designation:
1. Dr.J.Priyadarshini , Assistant Professor
2. Dr.V.Saravanakumari , Assistant Professor
Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Faculty	Hours
1.	2.2.2019	NORMAL SYNOVIAL HISTOLOGY	1.30-4 pm	**Dr.J.Priyadarshini**	2.5 hrs
2.	9.2.2019	FORMATION / FUNCTION	1.30-4 pm	**Dr.V.Saravanakumari**	2.5 hrs
3.	16.2.2019	NORMAL SYNOVIAL FLUID	1.30-4 pm	**Dr.J.Priyadarshini**	2.5 hrs
4.	23.2.2019	NORMAL SYNOVIAL CYTOLOGY	1.30-4 pm	**Dr.V.Saravanakumari**	2.5 hrs
5.	2.3.2019	SYNOVIAL FLUID CONSTITUENTS	1.30-4 pm	**Dr.J.Priyadarshini**	2.5 hrs
6.	9.3.2019	WHEN IS IT ORDERED? SYNOVIAL FLUID COLLECTION	1.30-4 pm	**Dr.V.Saravanakumari**	2.5 hrs
7.	16.3.2019	INDICATION FOR SY.BIOPSY	1.30-4 pm	**Dr.J.Priyadarshini**	2.5 hrs
8.	23.3.2019	SYNOVIAL BIOPSY IN INFLAMMATION	1.30-4 pm	**Dr.V.Saravanakumari**	2.5 hrs

		Practical Class			
9.	30.3.2019	Physical examination of synovial fluid	1.30-4 pm	**Dr.J.Priyadarshini**	2.5 hrs
10.	6.4.2019	RECOMMENDED TEST	1.30-4 pm	**Dr.J.Priyadarshini**	2.5 hrs
11.	13.4.2019	SPECIAL TESTS	1.30-4 pm	**Dr.J.Priyadarshini**	2.5 hrs
12	20.4.2019	Microscopic analysis of synovial fliud	1.30-4 pm	**Dr.V.Saravanakumari**	2.5 hrs
		Total			30 hrs

REFERENCE BOOKS:

1.Clinical Applications of Synovial Biopsy

Antonio Manzo,* Serena Bugatti, and Silvia Rossi

2.. **Diagnostic value of blind synovial biopsy in clinical practice**

E. J. A. Kroot, A. E. A. M. Weel, J. M. W. Hazes, P. E. Zondervan, M. P. Heijboer, P. L. A. van Daele, R. J. E. M. Dolhain

VALUE ADDED COURSE

1. Name of the programme & Code

Synovial fluid and biopsy PA10

2. Duration & Period

30 hrs Feb -April 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short notes questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time Feb-April 2019

8. Year of discontinuation: 2020

9. Summary report of each program year-wise

Value Added Course- Feb-April 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PA10	**Synovial fluid and biopsy**	Dr. J.Priyadharisini	IInd MBBS	Feb -April 2019

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

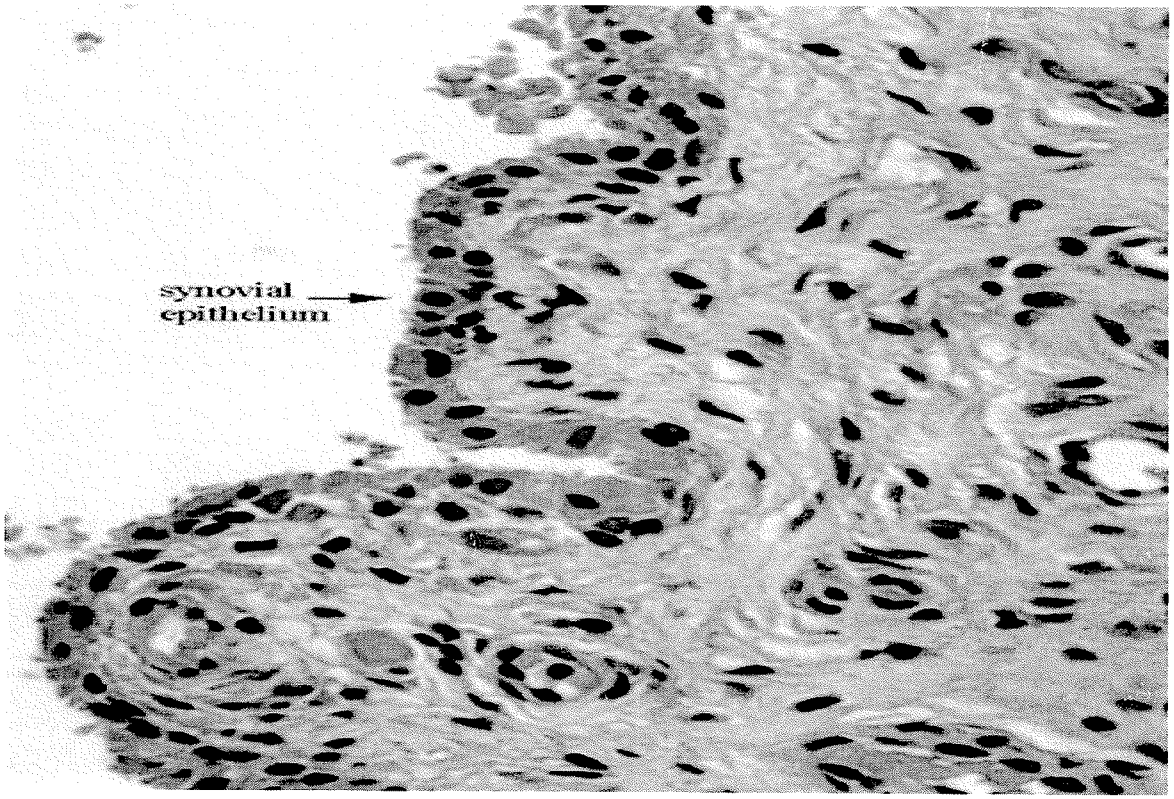
Dr. J.Priyadharisini

COORDINATOR

Dr. Pammy Sinha

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

Synovial fluid and biopsy



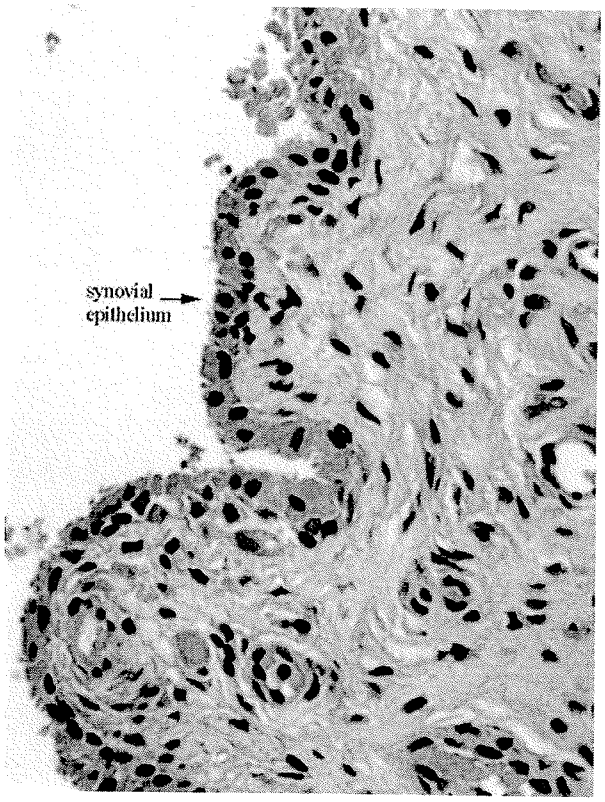
PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	SYNOVIAL CYTOLOGY AND BIOPSY
Course Code	PA10
Objective	1. NORMAL SYNOVIAL HISTOLOGY 2. FORMATION / FUNCTION 3. NORMAL SYNOVIAL FLUID 4. NORMAL SYNOVIAL CYTOLOGY 5. SYNOVIAL FLUID CONSTITUENTS 6. WHEN IS IT ORDERED? 7. SYNOVIAL FLUID COLLECTION 8. RECOMMENDED TESTS 9. SPECIAL TESTS 10. SYNOVIAL FLUID EXAM 11. SYNOVIAL BIOPSY IN INFLAMMATION 12. CLINICAL USEFULNESS OF SYNOVIAL FLUID 13. LIMITATION FOR SYNOVIAL FLUID CYTOLOGY 14. INDICATION FOR SY.BIOPSY 15. ROLE OF MOLECULAR TECHNIQUE
Further learning opportunities	INTERPRETATION OF SYNOVIAL FLUID
Key Competencies	On successful completion of the course the students will have skill in handling and interpretation of synovial fluid
Target Student	II MBBS Students
Duration	30hrs Feb – April2019
Theory Session	20hrs
Practical Session	10hrs
Assessment Procedure	Short notes

NORMAL SYNOVIAL HISTOLOGY :

- SINGLE LAYERED OR DOUBLE LAYERED
- LOW COLUMNAR TO CUBOIDAL EPITHELIUM
- SUB EPI SHOWS FIBRO COLLAGENOUS TISSUE AND THIN WALLED BLOOD VESSELS



- **FORMATION / FUNCTION : SYNOVIOCYTES**

- synthetic group

- phagocytic group

- Formed by filtration of plasma
- Exchange between the surrounding cartilage
- SYNOVIAL FLUID

- Produced by synovial membrane

- Viscous fluid

- Lubricant

- Cushions and reduces friction - Knees, shoulders, hips, hands and feet

- **NORMAL SYNOVIAL FLUID**:
- COLOR – Yellow
- CLARITY – Clear
- VISCOSITY – High
- MUCIN CLOT – Firm
- Should not be clotted
- WBC counts should be 0 to 200/cum
- POLYS -- <25
- CRYSTALS – Absent
- CULTURE – Sterile
- **NORMAL SYNOVIAL CYTOLOGY :**
- Scattered cells
- Mono nuclear histiocytes (65%)
- Sparse lymphocytes
- Sparse neutrophils
- Isolated single synovial cells
- Cartilage cells are usually absent
- Background should be clear

WHEN IS IT ORDERED?

ARTHROCENTESIS

1. MONOARTHRITIS (acute or chronic)
2. TRAUMA (with joint effusion)
3. MONOARTHRITIS IN CHRONIC POLYARTHRITIS

4. JOINT INFECTION/ HEMARTHROSIS/CRYSTAL INDUCED ARTHRITIS

SYNOVIAL FLUID COLLECTION

- **Sterile, disposable needle**
- **Divided in to 3 parts**
- **3 to 10ml into heparinized tube for microbiological studies**
- **2 to 5ml into anticoag.tube for microscopic examination**
- **5ml for chemical analysis**

RECOMMENDED TESTS

- **ROUTINE TESTS**
- **Gross examination**
- **Total and diff leukocyte counts**
- **Gram stain and culture**
- **Crystal examination with polarized light**

SPECIAL TESTS

- **Fungal tests**
- **Acid fast tests**
- **PCR for bacterial and mycobacterial DNA**
- **Glucose differential**
- **Lactate and other organic acids**
- **Complement**
- **Enzymes**
- **Uric acid levels**

SYNOVIAL FLUID EXAM

- **PHYSICAL EXAMINATION**
- **CHEMICAL EXAMINATION**
- **MICROSCOPIC EXAMINATION**
- **EXAMINATION FOR MICROORGANISM**

CLINICAL USEFULNESS OF SYNOVIAL FLUID

- **RHEUMATOID ARTHRITIS**
- **OSTEOARTHRITIS**
- **TRAUMATIC ARTHRITIS**
- **GOUTY ARTHRITIS**
- **REITERS SYNDROME**
- **PIG. VILLO. SYNOVITIS**
- **SEPTIC ARTHRITIS**

LIMITATION FOR SYNOVIAL FLUID CYTOLOGY

- **Joints not easy to aspirate (MTP)**
- **Minimal effusion**
- **Painful joint**
- **Crystals not all the time appreciated**
- **Observers experience**
- **Synovial tumors**

INDICATION FOR SY.BIOPSY

- **If fluid cytology does not CORRELATE with clinical findings**
- **BENIGN LESIONS**

- Pig.villo.nodular synovitis

- Synovial chondromatosis

- Synovial hemangioma

- Synovial lipoma

- **MALIGNANT LESIONS**

- **Synovial chondrosarcoma**

- **Malignant tenosynovial giant cell tumor**

ROLE OF MOLECULAR TECHNIQUE

- **PCR TECH – For mycobacterial TB DNA**
- **ELECTRON MICROSCOPE – For crystal arthritis**
- **GAS LIQUID CHROMATOGRAPHY – For organic acids**

VALUE ADDED COURSE

SYNOVIAL CYTOLOGY AND BIOPSY

List of Students Enrolled- Feb-April 2019, PA10

2nd Year MBBS Student			Signature
Sl. No	Name of the Student	Roll No	
1	FAUSTINA BAJWIN .S	U18MB291	
2	G SRI SAI NITISH	U18MB292	
3	GAUR DARSHANA PURUSHOTTAM GAUR	U18MB293	
4	GHATKAR SAYALL KRISHNA	U18MB294	
5	GOKUL M S	U18MB295	
6	GOPIKA .P	U18MB296	
7	HARI BALA SIDDHARTH T.R	U18MB297	
8	HARSHINI R C	U18MB298	
9	HIBA MOIDEEN .K	U18MB299	
10	INDHU S	U18MB300	
11	INDU V	U18MB301	
12	INDUKURI SAI AKANKSHA	U18MB302	
13	IPSITA SETHY	U18MB303	
14	JAGADEESAN S.R	U18MB304	
15	JAHNAVI REDDY .M	U18MB305	
16	JAISHREE .S	U18MB306	
17	JANANI V	U18MB307	
18	JASMEET NIRANJAN	U18MB308	
19	JAYALAKSHMI S	U18MB309	
20	JAYAREDDYGARI SAI RUCHITHA	U18MB310	

RESOURCE FACULTY

DEPARTMENT OF PATHOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

COORDINATOR

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Synovial fluid and biopsy

Course Code: PA 10

I. ANSWER ANY SIX QUESTIONS

1.NORMAL SYNOVIAL FLUID CONSTITUENTS

2.WHEN IS IT ORDERED?

3.SYNOVIAL FLUID COLLECTION METHOD

4.SYNOVIAL FLUID EXAM

5.SYNOVIAL BIOPSY IN INFLAMMATION

6.CLINICAL USEFULNESS OF SYNOVIAL FLUID

7.LIMITATION FOR SYNOVIAL FLUID CYTOLOGY

8.INDICATION FOR SY.BIOPSY

9.ROLE OF MOLECULAR TECHNIQUE

SYNOVIAL FLUID CYTOLOGY.

Faustina Bajwin. S
U18MB291
Roll No. 40

24/30

Q. Answer the questions:-

1. Normal Synovial fluid constituents.

Normal Synovial fluid contains 3-4 mg/ml hyaluronan (hyaluronic acid), a polymer of disaccharides composed of D-glucaronic acid and D-N-acetylglucosamine joined by alternating beta-1,4 and beta 1,3 glycosidic bonds.

Normal Synovial fluid is straw-coloured, clear and slightly sticky or stringy. Abnormal synovial fluid may be cloudy and thicker or thinner than normal fluid. Cloudiness could mean there are crystals, excess white blood cells, or microorganisms in the fluid. If you have gout, the fluid will contain crystals.

2. Normal Synovial fluid ordered.

Color and clarity may vary. Normal Synovial fluid is clear and colorless or straw-colored. Abnormal fluid may look cloudy, opaque, and/or differently colored. For example, cloudy fluid may indicate an infection, and pink or reddish fluid may indicate the presence of blood.

JANANI.V
U18MB307

Synovial fluid and biopsy.

29/30

1. Normal synovial fluid contains 3-4 mg/ml hyaluronic acid a polymer of disaccharides composed of D-glucoronic acid and D-N acetylglucosamine joint by alternating beta 1,4 and 1,3 glycosidic bonds.

3. Numb the area around the affected joints using the local anaesthetic injection or a numbing spray. insert a needle and syringe into the joint between the two bones draw out a small sample of synovial fluid through the syringe and deposite it into a container send the sample to a laboratory for analysis.

4. Synovial fluid also known as joint fluid is thick liquid located between your joints. The fluids cushion the bone and reduce the friction when you move your joints

An exam of physical quantities of fluid such as color or thickness.

SYNOVIAL FLUID CYTOLOGY.

Faustina Bajwin. S
U18MB291
Roll No. 40

19/20

2. Answer the questions:-

1. Normal Synovial fluid constituents.

Normal Synovial fluid contains 3-4 mg/ml hyaluronan (hyaluronic acid), a polymer of disaccharides composed of D-glucaronic acid and D-N-acetylglucosamine joined by alternating beta-1,4 and beta 1,3 glycosidic bonds.

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JANANI.V
U18MB307

Synovial fluid and biopsy

20/30

1. Normal synovial fluid contains 3-4 mg/ml hyaluronic acid a polymer of disaccharides composed of D-glucoronic acid and D-N acetylglucosamine joint by alternating beta 1,4 and 1,3 glycosidic bonds.

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4. Synovial fluid also known as joint fluid is thick liquid located between your joints. The fluids cushion the bone and reduce the friction when you move your joints

An exam of physical quantities of fluid check as color or thickness.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Janani. V has actively participated in the Value Added Course on Synovial fluid and biopsy held during Feb – April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry-605 502, India.

Dr. J. PRIYADHARISINI

RESOURCE PERSON

DEPARTMENT OF PATHOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 502

Dr. PAMMY SINHA

COORDINATOR

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that HARSHINI R.C has actively participated in the Value Added Course on synovial fluid and biopsy held during Feb – April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. J.PRIYADHARISINI
RESOURCE PERSON

DEPARTMENT OF PATHOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Dr. PAMMY SINHA
COORDINATOR

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

Student Feedback Form

Course Name: **SINOVIAL FLUID AND BIOPSY**

Subject Code: **PA10**

Name of Student: Harshini RC Roll No.: U18MB298

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear		✓			
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand		✓			
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course		✓			
8	Overall rating of the course	1	2 ✓	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Nil.

Harshini

Signature

Date: 20 · 4 · 2020

Student Feedback Form

Course Name: **SINOVIAL FLUID AND BIOPSY**

Subject Code: **PA10**

Name of Student: Indu. S Roll No.: UBMB300

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	4✓	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Nil.

Signature

Date: 20.4.2020

Date: 30.04.2019

From

Dr.Pammy sinha
Professor and Head,
Department of pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Synovial fluid and biopsy

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Synovial fluid and biopsy** in IInd MBBS **Feb –April 2019 -** for 80students . We solicit your kind action to send certificates for the participants,that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

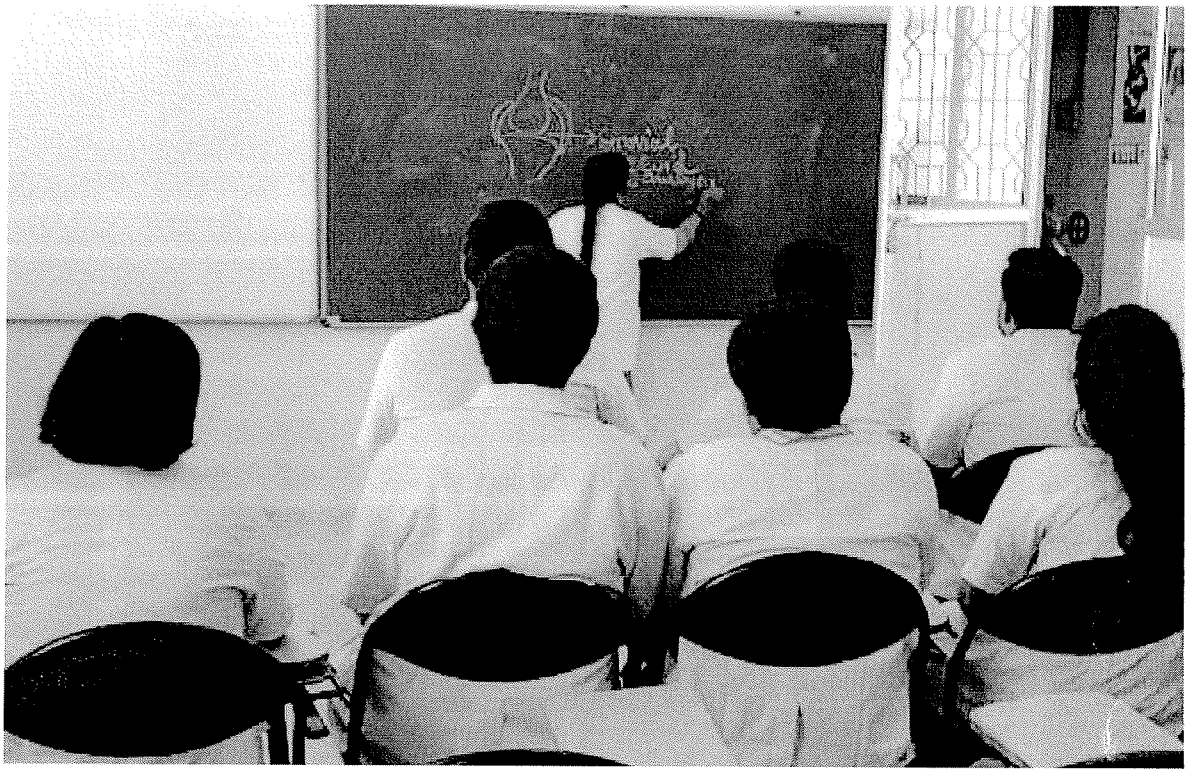
Kind Regards,

Dr. Pammy sinha

PROFESSOR & HEAD DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

Encl: Certificates

Photographs



SRI LAKSHMI NARAYANA INSTITUE OF MEDICAL SCIENCES AND HOSPITAL, PUDUCHERRY

Date: 13/01/2019

From
Dr. Somasundaram,
Professor and Head,
Dept. of Pharmacology,
Sri lakshmi narayana institue of medical sciences and hospital, Puducherry

To
The Dean,
Sri lakshmi narayana institue of medical sciences and hospital, Puducherry

Sub: Permission to conduct value-added course: Research methodology in Pharmacoeconomics

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Research methodology in Pharmacoeconomics** from Feb 2019 to August 2019. We solicit your kind permission for the same.

Kind Regards

Dr. Somasundaram,

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr.Balagurunathan HOD: Dr.Somasundaram Expert: Dr.Somasundaram Dr.Jayasheel

The committee has discussed about the course and is approved.

Dean Subject Expert HOD

Dr. G. JAYALAKSHMI, DSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Ossudu, Agaram, Kodapakkam Post,
Villianur Commune, Puducherry - 605502.

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

17/01/2019

Sub: Organising Value-added Course: Research methodology in Pharmacoeconomics.

With reference to the above mentioned subject, it is to bring to your notice that Dept. of Pharmacology from Sri Lakshmi Narayana institue of medical sciences and hospital, Puducherryis organising **"Research methodology in Pharmacoeconomics** The course content is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 31/01/2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, B.Sc., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Encl: Copy of Course content

Annexure 2 – Course Proposal

Course Title: Research Methodology in Pharmacoeconomics

CourseObjective:

Overview of Pharmacoeconomics
Types of P_E studies
Introduction to the concept of costs
Health economic in economic evaluations
Pharmacoeconomic models for conducting economic analysis
Cost effective analysis
Cost utility analysis
Cost minimization concept
Health technology assessment in India
Decision tree models for conducting cost- effective analysis
Designing a P-E model in excel
Real world evidence in health care
Mankov model in P-E
Mankov model in excel
Protocol discussion – P/E studies

CourseOutcome: An attempt to identify, measure, and evaluate the end results of health care services. It may include not only clinical and economic consequences, but also outcomes, such as patient health status and satisfaction with their health care.

Course Audience: IInd year MBBS students

Course Coordinator: Dr. Jaikumar

Course Faculties with Qualification and Designation:

1. **Dr. Somasundaram, Hod and Professor, Dept. of Pharmacology**
2. **Dr.J.Jayasheela, Assistant professor, Dept. of Pharmacology**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours	Faculty
1	05/02/19	Overview of Pharmacoeconomics	4-6 pm	2 hrs	**Dr. Somasundaram**
2	12/02/19	Types of P_E studies	4-6 pm	2 hrs	
3	19/02/19	Introduction to the concept of costs	4-6 pm	2 hrs	
4	26/02/19	Health economic in economic evaluations	4-6 pm	2 hrs	
5	23/10/18	Pharmacoeconomic models for conducting economic analysis	4-6 pm	2 hrs	
6	05/03/19	Cost effective analysis	4-6 pm	2 hrs	
7	12/03/19	Cost utility analysis	4-6 pm	2 hrs	**Dr.J.Jayasheela**
8	19/03/19	Cost minimization concept	4-6 pm	2 hrs	
9	26/03/19	Health technology assessment in India	4-6 pm	2 hrs	
10	09/04/19	Decision tree models for conducting cost- effective analysis	4-6 pm	2 hrs	
11	23/04/19	Designing a P-E model in excel	4-6 pm	2 hrs	
12	14/05/19	Real world evidence in health care	4-6 pm	2 hrs	
13	11/06/19	Mankov model in P-E	4-6 pm	2 hrs	
14	16/07/19	Mankov model in excel	4-6 pm	2 hrs	
15	06/08/19	Protocol discussion – P/E studies	4-6 pm	2 hrs	
			Total Hours	30	

REFERENCE BOOKS: i). A concise book on Pharmacoeconomics

ii). Research Methodology in Pharmacoeconomics

VALUE ADDED COURSE

1. Name of the programme & Code

Research Methodology in Pharmacoeconomics

2. Duration & Period

30 hrs & Feb 2019 – August 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short answers *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

& Feb 2019 – August 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

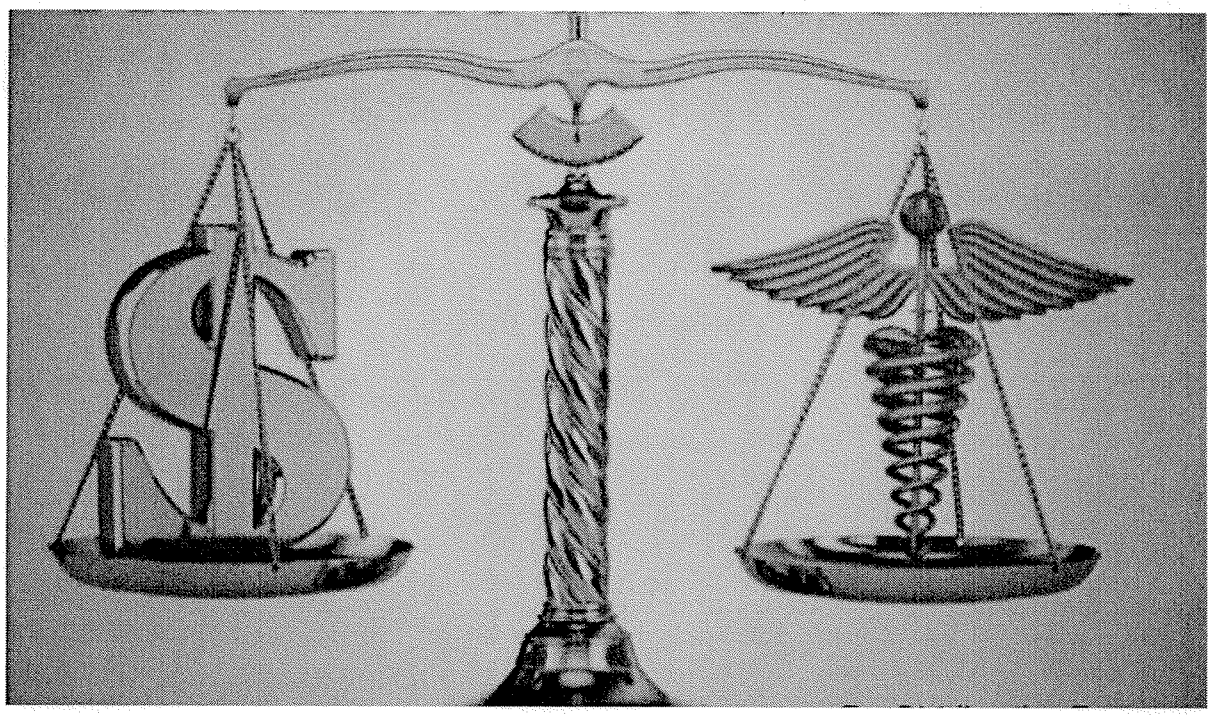
Value Added Course- Feb 2019 – August 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PH08	**Research Methodology in Pharmacoeconomics**	Dr.G.Somasundaram Dr.Jayasheela	2nd MBBS	20 (Feb 2019 – August 2019)

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON **COORDINATOR**

RESEARCH METHODOLOGY IN PHARMACOECONOMICS



PARTICIPANT HAND BOOK

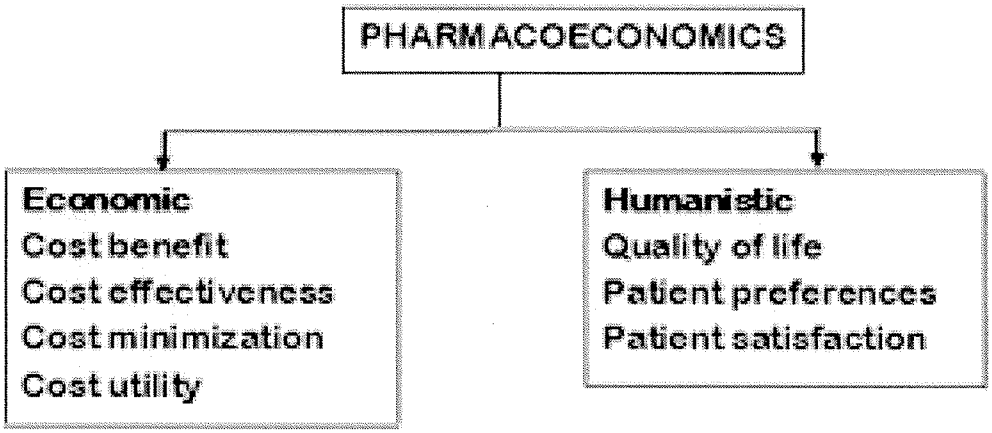
COURSE DETAILS

BIHER SLIMS

Particulars	Description
Course Title	Research methodology in Pharmacoeconomics
Course Code	PH08
Objective	Overview of Pharmacoeconomics Types of P-E studies Introduction to the concept of costs Health economic in economic evaluations Pharmacoeconomic models for conducting economic analysis Cost effective analysis Cost utility analysis Cost minimization concept Health technology assessment in India Decision tree models for conducting cost-effective analysis Designing a P-E model in excel Real world evidence in health care Mankov model in P-E Protocol designing in P-E studies
Further learning opportunities	Health economics and outcomes research
Key Competencies	On successful completion of the course the students will have knowledge in the branch of Pharmacoeconomics
Target Student	2nd MBBS Students
Duration	30hrs Feb 2019 – Aug 2019
Theory Session	18hrs
Practical Session	12hrs
Assessment Procedure	Multiple choice questions

Introduction:

Pharmacoeconomics can be defined as the branch of economics that uses cost-benefit, cost-effectiveness, cost minimization, cost-of-illness and cost-utility analyses to compare pharmaceutical products and treatment strategies (Brinsmead 2003). Pharmacoeconomics and health outcomes research are playing an increasingly important role in informing clinical development and market access decisions of new innovative medicines. It mainly works on the health economics which particularly focuses upon the costs and benefits of drug therapy



Pharmacoeconomics: Needs and Challenges

Multi-factorial Variability of Drug Pricing

Enumerable factors affect the prices of drug; some of them are as follows:

i. The sector in which medicines are purchased: The price is often higher in the private sector due to distilentor's costs and profiteering.

ii. The types of procurement agent: e.g. different prices may be paid for the same product by a public sector purchaser, such as Ministry of Health

iii. The distribution route. A patient who purchases a medicine at a hospital pharmacy may have to pay more if the hospital pharmacy purchased the product from a local wholesaler than if it has been purchased by tender and supplied through public health sector distribution system10. Many times hospital pharmacy may have limited stock of the generic drugs which one is cheaper than the branded drugs prescribed to the patient on routine basis and patient has to purchase the branded drugs in the emergency condition.

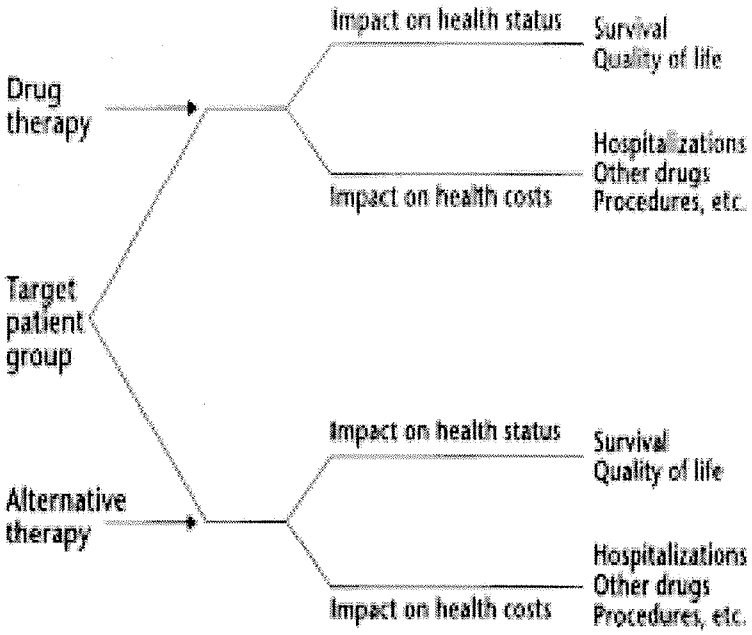
Need of Pharmacoeconomics

Pharmacoeconomics identifies measures and compares the cost and consequences of pharmaceutical products and services and describe the economic relationship involving drug research, drug production distribution, storage, pricing and used by the people. It runs through the thread of our socioeconomic system, which regulates and influences all the sectors involved in pharmaceuticals. The demand for and the cost of health care are increasing in all countries as the improvement of health technologies. All over the world, patients are affected by high price of medicines. In a developing country like India, 85% of total health expenditure is financed by house-hold out of pocket expenditure. Many poor people frequently face a choice between buying medicines or buying food or other necessities due to limited resources and high pricing of drug. So medicine prices do matter. Pharmacoeconomics has become more important over the past 20 years, due to an increases emphasis on efficient drug therapies for disease, which increase health cost etc. Pharmacoeconomics is a subdivision of health economics and results from that discipline coming of age through consolidation to diversification. Health economics, as a branch of economics is itself relatively young. Basically the pharmacoeconomics is needful in following manner:

- In Industry- Deciding among specific research and development alternatives.
- In Government- Determining program benefits and prices paid.
- In Private Sector- Designing insurance benefit coverage

Aims and Objectives of Pharmacoeconomic Evaluation

Implementation of pharmacoeconomic evaluation will help to reduce monetary burden on the consumers (by insuring global pricing strategy) for the effective management of health care system as the principle of pharmacoeconomic evaluation is to make more efficient use of limited resources for maximization of health care benefit at lower cost . In this way, it can be applied in practice to take decisions about drug therapies.



The Fundamentals

Types of Cost

Costs involved in pharmacoeconomic evaluation can be mainly divided into financial cost (mandatory cost) and economic cost (resource for which no mandatory payment is made) opportunity cost is the benefit foregone when selecting one therapy alternative over the next best alternative. Several costs can be measured when weighing up the cost of any invention. The first step in any cost analysis is identification of the various costs. These can be direct, indirect and intangible. Direct i.e. costs from the perspective of the healthcare funder: including staff costs, capital costs, drug acquisition costs. It includes physicians' fees, cost of administering the medication, costs of treating an adverse drug reaction, etc. Indirect i.e. costs from the perspective of society as a whole: for example, these might include loss of earnings, loss of productivity, loss of leisure time, due to the illness, and cost of travel to hospital etc. This would include not just the patient themselves but also their family and society as a whole. Intangible i.e. the pain, worry or other distress; which a patient or their family might suffer. These may be impossible to measure in monetary terms, but are sometimes captured in measures of quality of life.

The cost can be measured in following ways:

• Cost / unit

• Cost / treatment

• Cost / person

• Cost / person / year

• Cost / case prevented

• Cost / life saved

• Cost / DALY (disability-adjusted life year)

Outcomes

The second fundamental component of a pharmacoeconomic study is outcomes or benefits. A cost-benefit analysis compares the costs and outcomes of alternative therapies and the outcome is then expressed in monetary terms (Brien et al 1997). Cost-benefit analysis allows researchers to make comparisons across a wide variety of alternatives. It compares the costs involved in implementing a programme with the value of the outcome. Since the endpoints are measured in monetary terms, different endpoints can be studied, such as a surgical procedure compared with a pharmaceutical intervention

Methods of Pharmacoeconomic

Evaluation Pharmacoeconomic evaluations include any study designed to assess the costs (resources consumed) and consequences (clinical, humanistic) of alternative therapies The evaluation mechanisms delineated were often helpful in demonstrating the cost impact of innovative treatments, therefore granting them greater acceptance by healthcare providers, administrators, and the public.

There are basically four types of pharmacoeconomic studies.

• Cost-minimization analysis (CMA)

• Cost-effectiveness analysis (CEA)

• Cost-utility analysis (CUA)

• Cost-benefit analysis (CBA)

Cost Effective Analysis (CEA) CEA is a technique designed to assist a decision-maker in identifying a preferred choice among possible alternatives. Generally, cost-effectiveness is defined as a series of analytical and mathematical procedure that aid in the selection of a course of action from various alternative approaches. CEA evaluates multiple drug treatments for the same condition. The cost of the drug treatments are weighed against the effectiveness of the drug (Thwaits et al 1998). The costs

of drug treatments include acquisition costs, physician involvement, and nursing costs for administration of the drug. The effectiveness of drug treatment is measured in tangible measures such as length of hospital stay, duration of treatment required, and mortality rate. The results of a CEA are expressed as cost/outcome for both therapies. Pharmacoeconomic analysis should be incorporated in the clinical trial itself. However, for the majority of drugs, CEA is done on the basis of pre-existing data available in the medical literature. CEA is the most commonly applied form of economic analysis in the literature, and especially in drug therapy (Lee et al 1991). It does not allow comparisons to be made between two totally different areas of medicine with different outcomes. The key measure of these evaluations is the incremental cost effectiveness ratio (ICER), which can be determined as follows:

Incremental cost effectiveness ratio= Cost of drug A - Cost of drug B Benefits of drug A - Benefits of drug B

Cost Utility Analysis (CUA) CUA is a type of evaluation in which drugs/interventions with different outcomes can be compared. CUA is the most appropriate method to use when comparing programs and treatment alternatives that are life extending with serious side effects (e.g., cancer chemotherapy), those which produce reductions in morbidity rather than mortality (e.g., medical treatment of arthritis), and when HRQOL is the most important health outcome being examined (Bootman 1995). CUA is employed less frequently than other economic evaluation methods because of a lack of agreement on measuring utilities, difficulty comparing QALYs (quality adjusted life years) across patients and populations, and difficulty quantifying patient preferences.

Applications of Pharmacoeconomics

I. One of the primary applications of pharmacoeconomics in clinical practice today is to aid clinical and policy decision making. Through the appropriate application of pharmacoeconomics, practitioners and administrators can make better, more informed decisions regarding the products and services they provide. Complete pharmacotherapy decisions should contain assessments of three basic outcome areas whenever appropriate: economic, clinical, and humanistic outcomes (ECHO). Traditionally, most drug therapy decisions were based solely on the clinical outcomes (e.g., safety and efficacy) associated with a treatment alternative

II. II. Pharmacoeconomic data can be a powerful tool to support various clinical decisions, ranging from the level of the patient to the level of an entire healthcare system. Fig. 8

shows various decisions that can be supported using pharmacoeconomics, including effective formulary management, individual patient treatment, medication policy, and resource allocation. For discussion purposes, the application of pharmacoeconomics to decision making is divided into two basic areas: drug therapy evaluation and clinical pharmacy service evaluation.

Conclusion

The perspective of a pharmacoeconomic evaluation is paramount because the study results will be highly dependent on the perspective selected. When evaluating published pharmacoeconomic studies, factors should to be considered are study objective, study perspective, pharmacoeconomic method, study design, choice of interventions, costs and consequences, discounting, study results, sensitivity analysis and study conclusions. Majority of pharmacoeconomic guidelines provide only general and vague recommendation in many areas may be because of no consensus among the developers and challenge of sustenance for relatively young science of pharmacoeconomics. Therefore strict guidelines having uniform global standards should be formulated by an independent body comprising of people from academia, industry and health authorities. Upon implementation it would be helpful towards prescribing a rational drug therapy and pharmacist, the bridge between patients and doctors, will dispense as well as help in purchasing drugs for hospital pharmacies. This would also help in reducing the monetary burden on institutions and public.

ANNEXURE-II

VALUE ADDED COURSE

Participant list of Value added course: **Research Methodology in Pharmacoeconomics**

Feb 2019 to Aug 2019

Sl. No	Name of the Student	Register No	Signature
1	RAJKUMAR R	U18MB331	
2	RAJU .S	U18MB332	
3	RICHAL SAWIN	U18MB333	
4	RIDDHI RAJESH PRASAD	U18MB334	
5	ROHINI V	U18MB335	
6	S.R.HEENA FEEMISHNEE	U18MB336	
7	SABARISH K S	U18MB337	
8	SAI SRI MUTYALA	U18MB338	
9	SAIPURNNIMA R.K	U18MB339	
10	SANJEEV KUMAR G.S	U18MB340	
11	SARFARAZ ISLAM	U18MB341	
12	SAURABH SINGH	U18MB342	
13	SEENUVAS .P	U18MB343	
14	SHANTHALAKSHMI D	U18MB344	
15	SHASHANK RITU RAJ	U18MB345	
16	SHEETAL SHRIVASTAVA	U18MB346	
17	SHLOKA SHAW	U18MB347	
18	SHRABASTI CHATTOPADHYAY	U18MB348	
19	SHREYA GUMBER	U18MB349	
20	RAJKUMAR R	U18MB350	

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu, Agaram Village, Koodapakkam post, Puducherry – 605502

Topic- Research Methodology in Pharmacoeconomics Code: PH08

1. Which of the following statements represents the *best* definition of pharmacoeconomics?

a)Description and analysis of the costs of drug therapy to health care systems and to society
b)Process of identifying, measuring and comparing the costs, risks, and benefits of programs, services, or therapies and determining which alternative produces the best health outcomes for the resources invested
c)Putting principles, methods, and theories into practice to quantify the value of pharmacy products and services used in the real world
d)Studies that attempt to identify, measure, and evaluate the results of health care services in general

2. Which of the following statements is *true* regarding the perspective (point of view) of a pharmacoeconomic analysis?

a)Should be conducted from a single perspective.
b)Should be conducted from multiple perspectives.
c)Costs and consequences should be identified and measured relative to the perspective(s) selected.
d)Societal perspective is the only relevant and valid perspective for a local pharmacoeconomic analysis.

3. There are various categories of health care costs. Which of the following *best* represents a direct medical cost and an indirect nonmedical cost, respectively?
   a. Pain and transportation
   b. Drugs and suffering
   c. Mortality and morbidity
   d. Medical professional time and lost productivity

4. Which of the following statements *best* describes economic outcomes?
a) Medical events that occur as a result of a disease or treatment
b) Direct, indirect, and intangible costs compared with the consequences of medical treatment alternatives
c) Consequences of disease or treatment on patient functional status or quality of life
d) Cost savings associated with a disease or treatment alternative

5.Which of the following are distinguishing characteristics of a full economic evaluation?

a) Comparison of two or more treatment options
b) Determination of the least expensive treatment alternative
c) Examination of both the costs and consequences of the treatment alternatives
d) a and c
e) a and b

6. When quantifying the value of a clinical pharmacy service, your goal is to express the benefits associated with this service in a dollar value. Which economic evaluation method would you employ?

a) Cost-benefit analysis
b) Cost-effectiveness analysis
c) Cost-minimization analysis
d) Cost-utility analysis

7.The economic evaluation method known as cost-effectiveness analysis would be best applied in which of the following cases?

a) When comparing two or more treatment alternatives that differ in humanistic outcome
b) When comparing two or more treatment alternatives that are equal in clinical outcome
c) When comparing two or more treatment alternatives that differ in clinical outcome
d) When comparing two or more treatment alternatives that differ in cost

8. The appropriate use of cost-minimization analysis requires which of the following to be *true*?

a) Costs must include measures of lost productivity.
b) Outcomes must be adjusted for quality of life.
c) Data must be obtained from similar sources.
d) Consequences for each alternative must be equivalent.

9. Which of the following statements provides the *best* description of an incremental cost-effectiveness ratio?

a) A summary measurement of efficiency
b) The cost per benefit of a new strategy, independent of other treatment alternatives
c) The extra cost to obtain an extra benefit realized from switching from one alternative to another
d) The cost per quality-adjusted life year gained

10. Which of the following statements about the application of pharmacoeconomics to pharmacy decision making is *false*?

a) Pharmacoeconomics can be a powerful tool for determining the value of drug use guidelines.
b) Pharmacoeconomics should be the only consideration when making a drug therapy decision.

c) Pharmacoeconomics can assist P&T committees in incorporating clinical, economic, and humanistic outcomes of drug therapy into formulary management decisions.
d) Pharmacoeconomics can provide data to support resource allocation decisions.

Answers

1-A

2-B

3-C

4-A

5-C

6-A

7-C

8-A

9-B

10-B

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act, 1956)

CERTIFICATE OF MERIT

This is to certify that Raajkumar R has actively participated in the Value Added Course on "RESEARCH METHODOLOGY IN PHARMACOECONOMICS" held during February 2019 to August 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. G.Somasundaram
Dr.Jayasheela.J

RESOURCE PERSON

Dr.Jaikumar

COORDINATOR

Student Feedback Form

Course Name: Research methadology in Pharmaloeconomics

Subject Code: PH08

Name of Student: ROHINI V Roll No.: U18MB335

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

SRI LAKSHMI NARAYANA INSTITUE OF MEDICAL SCIENCES AND HOSPITAL, PUDUCHERRY

From

Date:07.08.2019

Dr.G.Somasundaram
Professor and Head,
Department of Pharmacology
Sri Lakshmi Narayana Institute of Medical sciences
Pondicherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical sciences
Pondicherry.

Sub: Completion of value-added course: Research methodology in pharmacoeconomics

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Research methodology in pharmacoeconomics** on **Feb 2019 to August 2019**. We solicit your kind action to send certificates for the participants, which is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr.G.Somasundaram

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Encl: Certificates

Photographs



SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Osudu, Agaram Village, Kudapakkam Post, Pondicherry – 605 502.

DEPARTMENT OF PHYSIOLOGY

Date: 04.12.2018

From
Dr.V.Senthil kumar
Professor and Head,
Physiology
Sri Lakshmi Narayana Institute of Medical sciences
Puducherry

To
The Dean,
Sri Lakshmi Narayana institute of Medical sciences
Puducherry

Sub: Permission to conduct value-added course: Certificate course in EEG interpretation & Code: PHY C10

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Certificate course in EEG interpretation & Code: PHY C10 February 2019 -April 2019. We solicit your kind permission for the same.

Kind Regards

Dr.V.Senthil kumar

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean:Dr.G.Jayalakshmi

The HOD: Dr.V.Senthil kumar

The Expert:Dr.V.Anebaracy

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign &Seal)	(Sign &Seal)	(Sign &Seal)

DEAN
LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

PROFESSOR & HOD
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Sri Lakshmi Narayana Institute O
PONDICHERRY - 60

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Ref. No. SLIMS/Dean Off/VAC / 351 **Circular** **Date: 20.12.2018**

Sub: Organising Value-added Course: Certificate course in EEG interpretation & Code: PHY C10 - Reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical sciences, is organizing "Certificate course in EEG interpretation & Code: PHY C10".The course content is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before January 2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content.

Course Proposal

Course Title: Certificate course in EEG interpretation & Code: PHY C10

Course Objective: At the end of the course,the participants should

1. Understand the functional organisation of cortical and subcortical neurons in the genesis of EEG
2. EEG waves and mechanism of generation
3. Procedure of recording of EEG
4. Clinical usuage of EEG
5. Interpretation of EEG

Course Outcome: On successful completion of the course the students will have the knowledge on various lifestyle modifications in treatment and prevention of metabolic syndrome.

Course Audience: Ist year M.B.B.S students (2018- 2019)

Course Coordinator: Dr.R.Vijayakumar

Course Faculties with Qualification and Designation

Dr.V.Anebaracy,MBBS,MD,Assistant Professor,Physiology
Dr.V.Senthil Kumar,MBBS,MD, Professor& HOD,Physiology

Course Curriculum/Topics with schedule:

SlNo	Date	Topic	Time	Faculty	Hours
1	2/02/2019	understand the functional organisation of cortical and subcortical neurons in the genesis of EEG	1.30 pm to 6.30 pm	Dr.V.Anebaracy	5
2	09/02/2019	EEG waves and mechanism of generation	2 pm to 6 pm	Dr.V.Senthil Kumar	5
3	16/02/2019	Procedure of recording of EEG 1	2 pm to 5 pm	Dr.V.Anebaracy	5
4	09/03/2019	Procedure of recording of EEG 2	2 pm to 5 pm	Dr.V.Senthil Kumar	5
5	23/03/2019	Interpretation of EEG 1	1.30 pm to	Dr.V.Anebaracy	5

			6.30 pm		
6	06/04/2019	Interpretation of EEG 2	2 pm to 6 pm	Dr.V.Anebaracy	5
			Total Hours		30

REFERENCE BOOKS:

1. EEG in Clinical Practice Hardcover by Kurupath Radhakrishnan (Author), Jagarlapudi M K Murthy (Author), Chaturbhuj Rathore (Author).

2. EEG Simplifiedby Satish Khadilkar (Author), Girish Soni (Author).

VALUE ADDED COURSE

1. Name of the programme & Code

Certificate course in EEG interpretation & Code: PHY C10

2. Duration & Period

30 hrs & February 2019 -April 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

One time from February 2019 -April 2019

8. Year of discontinuation: 2020

9. Summary report of each program year-wise

Value Added Course- February 2019 -April 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PHYC10	Online Certificate course in EEG interpretation	Dr.V.Anebaracy Dr. V. Senthilkumar	1st MBBS	20 (February 2019 -April 2019)

10. Course Feed Back

Enclosed as Annexure- V

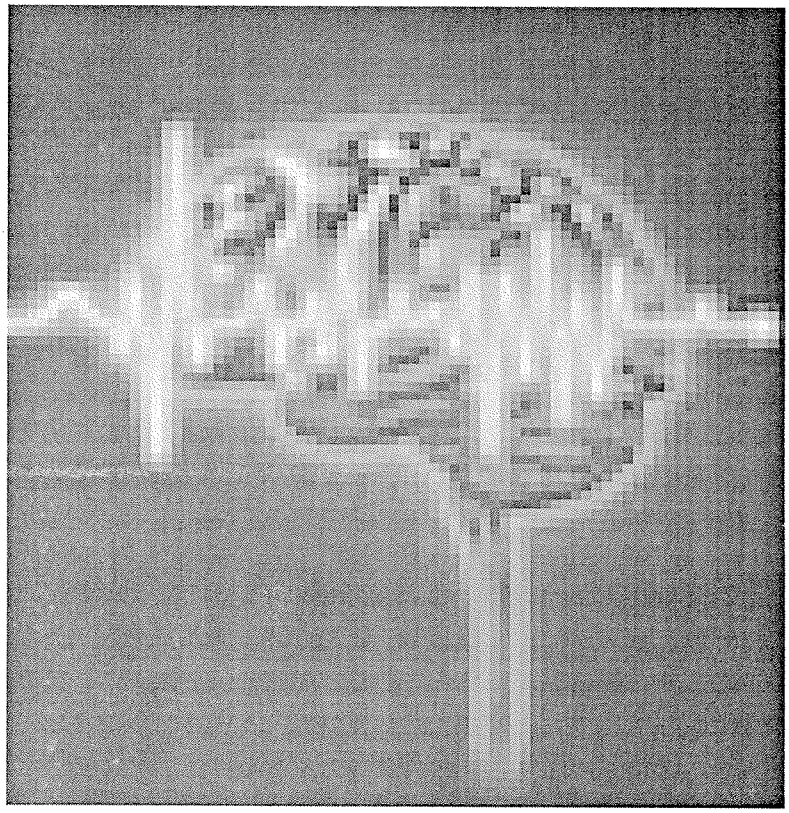
RESOURCE PERSON
Dr.V.Anebaracy

COORDINATOR
Dr.R.Vijayakumar

RESOURCE PERSON
Dr.V.Senthil Kumar VSK

CERTIFICATE COURSE IN EEG INTERPRETATION &

CODE: PHY C10



PARTICIPANT HAND BOOK

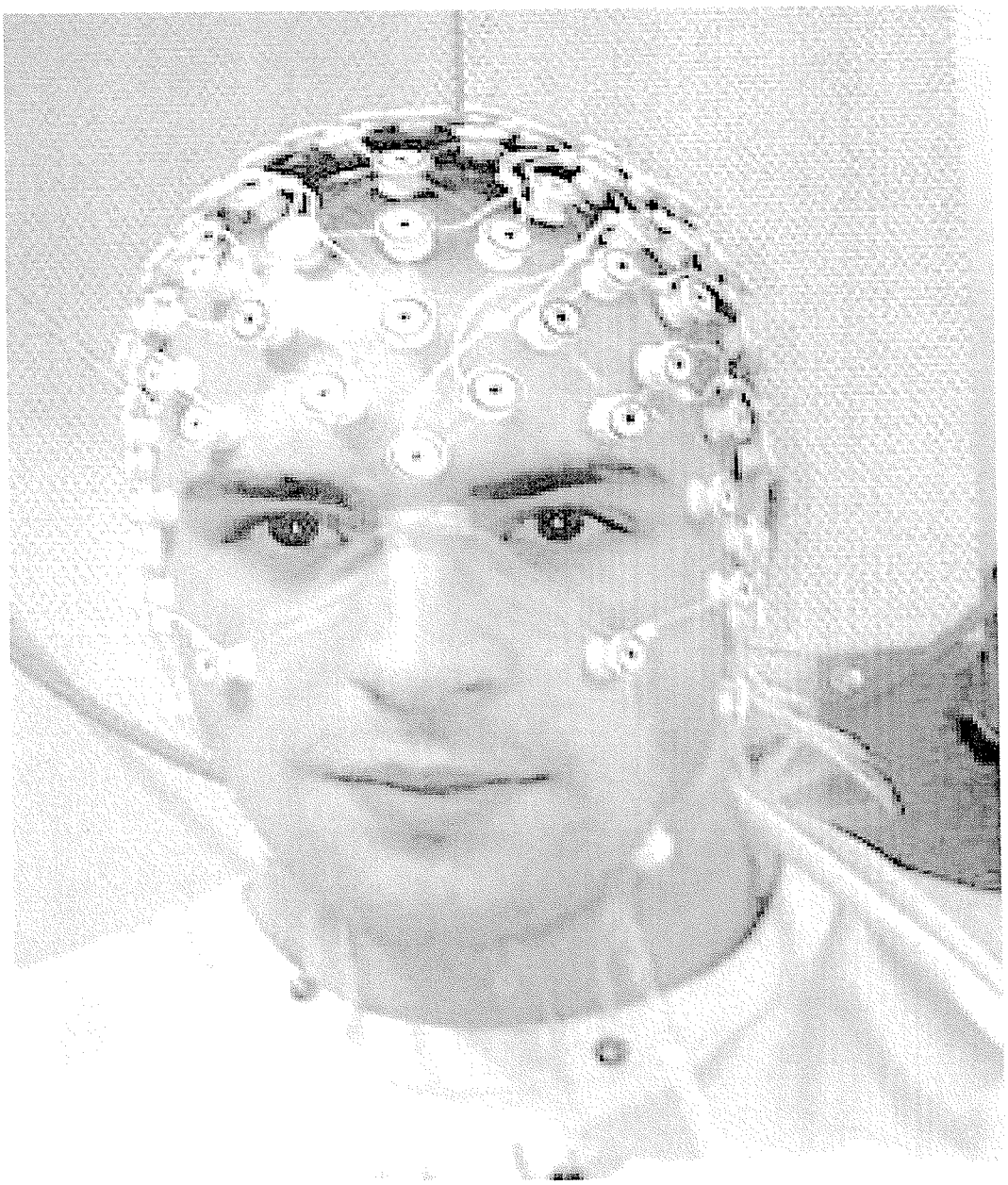
BIHER

SLIMS

COURSE DETAILS

Particulars	Description
Course Title	Certificate course in EEG interpretation
Course Code	Code: PHY C10
Objective	1. understand the functional organisation of cortical and subcortical neurons in the genesis of EEG 2. EEG waves and mechanism of generation 3.Procedure of recording of EEG 4. Clinical usuage of EEG 5. Interpretation of EEG
Further learning opportunities	Advance course in EEG interpretation.
Key Competencies	On successful completion of the course the students will have the knowledge in Basics of normal EEG and interpretation of abnormal EEG
Target Student	1st MBBS Students
Duration	30 hrs & & February 2019 -April 2019
Theory Session	20hrs
Practical Session	10hrs
Assessment Procedure	Multiple choice questions

EEG



- RECORDING OF THE ELECTRICAL ACTIVITY OF THE BRAIN IS KNOWN AS EEG.
- RECORDING OF THE ELECTRICAL ACTIVITY IS DONE BY PLACING ELECTRODES OVER THE SCALP.
- HANS BERGER IS A GERMAN PSYCHIATRIST WHO FIRST RECORDED THE EEG IN 1929.

- **Electroencephalography (EEG)** is an electrophysiological monitoring method to record electrical activity of the brain. It is typically noninvasive, with the electrodes placed along the scalp, although invasive electrodes are sometimes used, as in electrocorticography, sometimes called intracranial EEG.
- EEG measures voltage fluctuations resulting from ionic current within the neurons of the brain .Clinically, EEG refers to the recording of the brain's spontaneous electrical activity over a period of time, as recorded from multiple electrodes placed on the scalp. Diagnostic applications generally focus either on event-related potentials or on the spectral content of EEG. The former investigates potential fluctuations time locked to an event, such as 'stimulus onset' or 'button press'. The latter analyses the type of neural oscillations (popularly called "brain waves") that can be observed in EEG signals in the frequency domain.
- EEG is most often used to diagnose epilepsy, which causes abnormalities in EEG readings. It is also used to diagnose sleep disorders, depth of anesthesia, coma, encephalopathies, and brain death. EEG used to be a first-line method of diagnosis for tumors, stroke and other focal brain disorders but this use has decreased with the advent of high-resolution anatomical imaging techniques such as magnetic resonance imaging (MRI) and computed tomography (CT). Despite limited spatial

resolution, EEG continues to be a valuable tool for research and diagnosis. It is one of the few mobile techniques available and offers millisecond-range temporal resolution which is not possible with CT, PET or MRI.

- Derivatives of the EEG technique include evoked potentials (EP), which involves averaging the EEG activity time-locked to the presentation of a stimulus of some sort (visual, somatosensory, or auditory). Event-related potentials (ERPs) refer to averaged EEG responses that are time-locked to more complex processing of stimuli; this technique is used in cognitive science, cognitive psychology, and psychophysiological rese
- In 1875, Richard Caton (1842–1926), a physician practicing in Liverpool, presented his findings about electrical phenomena of the exposed cerebral hemispheres of rabbits and monkeys in the *British Medical Journal*. In 1890, Polish physiologist Adolf Beck published an investigation of spontaneous electrical activity of the brain of rabbits and dogs that included rhythmic oscillations altered by light. Beck started experiments on the electrical brain activity of animals. Beck placed electrodes directly on the surface of the brain to test for sensory stimulation. His observation of fluctuating brain activity led to the conclusion of brain waves.

USES OF EEG

EEG is one of the main diagnostic tests for epilepsy. A routine clinical EEG recording typically lasts 20–30 minutes (plus preparation time). It is a test that detects electrical activity in the brain using small, metal discs (electrodes) attached to the scalp. Routinely, EEG is used in clinical circumstances to determine changes in brain activity that might be useful in diagnosing brain disorders, especially epilepsy or another seizure disorder. An EEG might also be helpful for diagnosing or treating the following disorders:

- Brain tumor
- Brain damage from head injury
- Brain dysfunction that can have a variety of causes (encephalopathy)
- Inflammation of the brain (encephalitis)
- Stroke
- Sleep disorders

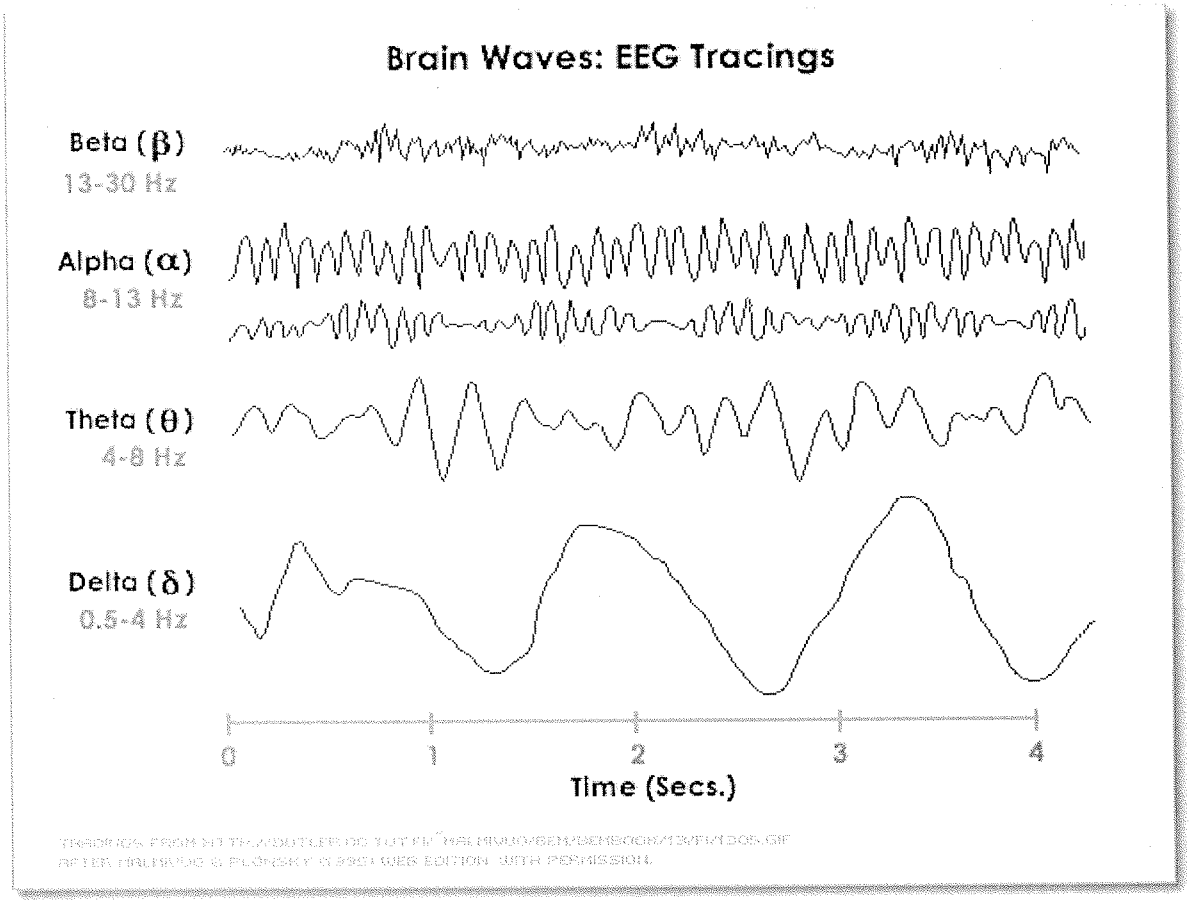
It can also:

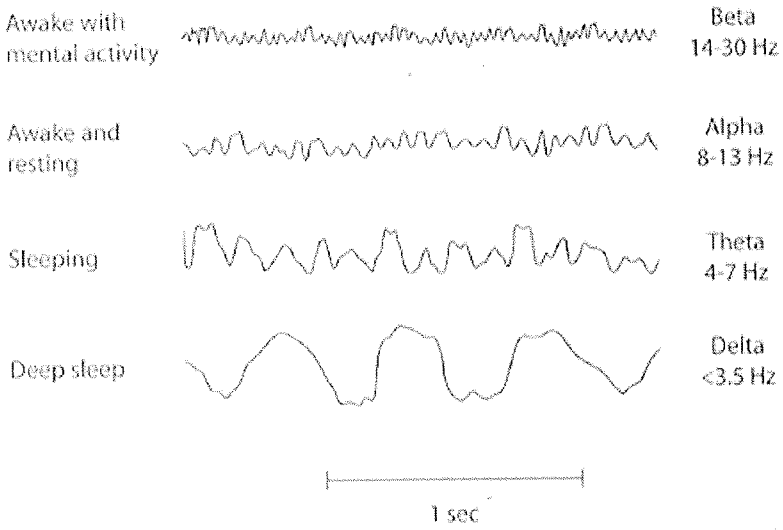
- distinguish epileptic seizures from other types of spells, such as psychogenic non-epileptic seizures, syncope (fainting), sub-cortical movement disorders and migraine variants
- differentiate "organic" encephalopathy or delirium from primary psychiatric syndromes such as catatonia

- serve as an adjunct test of brain death in comatose patients
- prognosticate in comatose patients (in certain instances)
- determine whether to wean anti-epileptic medications.

EEG WAVES

- ALPHA
- BETA
- THETA
- DELTA





Mechanisms:

The brain's electrical charge is maintained by billions of neurons. Neurons are electrically charged (or "polarized") by membrane transport proteins that pump ions across their membranes. Neurons are constantly exchanging ions with the extracellular milieu, for example to maintain resting potential and to propagate action potentials. Ions of similar charge repel each other, and when many ions are pushed out of many neurons at the same time, they can push their neighbours, who push their neighbours, and so on, in a wave. This process is known as volume conduction. When the wave of ions reaches the electrodes on the scalp, they can push or pull electrons on the metal in the electrodes. Since metal conducts the push and pull of electrons easily, the difference in push or

pull voltages between any two electrodes can be measured by a voltmeter. Recording these voltages over time gives us the EEG.

The electric potential generated by an individual neuron is far too small to be picked up by EEG or MEG. EEG activity therefore always reflects the summation of the synchronous activity of thousands or millions of neurons that have similar spatial orientation. If the cells do not have similar spatial orientation, their ions do not line up and create waves to be detected. Pyramidal neurons of the cortex are thought to produce the most EEG signal because they are well-aligned and fire together. Because voltage field gradients fall off with the square of distance, activity from deep sources is more difficult to detect than currents near the skull.

Scalp EEG activity shows oscillations at a variety of frequencies. Several of these oscillations have characteristic frequency ranges, spatial distributions and are associated with different states of brain functioning (e.g., waking and the various sleep stages). These oscillations represent synchronized activity over a network of neurons. The neuronal networks underlying some of these oscillations are understood (e.g., the thalamocortical resonance underlying sleep spindles), while many others are not (e.g., the system that generates the posterior basic rhythm). Research that measures both EEG and neuron spiking finds the relationship between the two is complex, with a combination of EEG

power in the gamma band and phase in the delta band relating most strongly to neuron spike activity.

Computer electroencephalograph:

In conventional scalp EEG, the recording is obtained by placing electrodes on the scalp with a conductive gel or paste, usually after preparing the scalp area by light abrasion to reduce impedance due to dead skin cells. Many systems typically use electrodes, each of which is attached to an individual wire. Some systems use caps or nets into which electrodes are embedded; this is particularly common when high-density arrays of electrodes are needed.

Electrode locations and names are specified by the International 10–20 system for most clinical and research applications (except when high-density arrays are used). This system ensures that the naming of electrodes is consistent across laboratories. In most clinical applications, 19 recording electrodes (plus ground and system reference) are used. A smaller number of electrodes are typically used when recording EEG from neonates. Additional electrodes can be added to the standard set-up when a clinical or research application demands increased spatial resolution for a particular area of the brain. High-density arrays (typically via cap or net) can contain up to 256 electrodes more-or-less evenly spaced around the scalp.

Each electrode is connected to one input of a differential amplifier (one amplifier per pair of electrodes); a common system reference electrode is

connected to the other input of each differential amplifier. These amplifiers amplify the voltage between the active electrode and the reference (typically 1,000–100,000 times, or 60–100 dB of voltage gain). In analog EEG, the signal is then filtered (next paragraph), and the EEG signal is output as the deflection of pens as paper passes underneath. Most EEG systems these days, however, are digital, and the amplified signal is digitized via an analog-to-digital converter, after being passed through an anti-aliasing filter. Analog-to-digital sampling typically occurs at 256–512 Hz in clinical scalp EEG; sampling rates of up to 20 kHz are used in some research applications.

During the recording, a series of activation procedures may be used. These procedures may induce normal or abnormal EEG activity that might not otherwise be seen. These procedures include hyperventilation, photic stimulation (with a strobe light), eye closure, mental activity, sleep and sleep deprivation. During (inpatient) epilepsy monitoring, a patient's typical seizure medications may be withdrawn.

The digital EEG signal is stored electronically and can be filtered for display. Typical settings for the high-pass filter and a low-pass filter are 0.5–1 Hz and 35–70 Hz respectively. The high-pass filter typically filters out slow artifact, such as electrogalvanic signals and movement artifact, whereas the low-pass filter filters out high-frequency artifacts, such as electromyographic signals. An

additional notch filter is typically used to remove artifact caused by electrical power lines (60 Hz in the United States and 50 Hz in many other countries).

The EEG signals can be captured with opensource hardware such as Open BCI and the signal can be processed by freely available EEG software such as EEGLAB or the Neurophysiological Biomarker Toolbox.

As part of an evaluation for epilepsy surgery, it may be necessary to insert electrodes near the surface of the brain, under the surface of the dura mater. This is accomplished via burr hole or craniotomy. This is referred to variously as "electrocorticography (ECoG)", "intracranial EEG (I-EEG)" or "subdural EEG (SD-EEG)". Depth electrodes may also be placed into brain structures, such as the amygdala or hippocampus, structures, which are common epileptic foci and may not be "seen" clearly by scalp EEG. The electrocorticographic signal is processed in the same manner as digital scalp EEG (above), with a couple of caveats. ECoG is typically recorded at higher sampling rates than scalp EEG because of the requirements of Nyquist theorem—the subdural signal is composed of a higher predominance of higher frequency components. Also, many of the artifacts that affect scalp EEG do not impact ECoG, and therefore display filtering is often not needed.

A typical adult human EEG signal is about 10 μV to 100 μV in amplitude when measured from the scalp.

Since an EEG voltage signal represents a difference between the voltages at two electrodes, the display of the EEG for the reading encephalographer may be set up in one of several ways. The representation of the EEG channels is referred to as a *montage*.

Sequential montage

Each channel (i.e., waveform) represents the difference between two adjacent electrodes. The entire montage consists of a series of these channels. For example, the channel "Fp1-F3" represents the difference in voltage between the Fp1 electrode and the F3 electrode. The next channel in the montage, "F3-C3", represents the voltage difference between F3 and C3, and so on through the entire array of electrodes.

Comparison of EEG bands

Band	Frequency (Hz)	Location	Normally	Pathologically
Delta	< 4	frontally in adults,	• adult slow-wave sleep • in babies	• subcortical lesions • diffuse lesions

		posteriorly in children; high-amplitude waves	• Has been found during some continuous-attention tasks	• metabolic encephalopathy hydrocephalus • deep midline lesions
			• higher in young children • drowsiness in adults and teens	
Theta	4–7	Found in locations not related to task at hand	• idling • Associated with inhibition of elicited responses (has been found to spike in situations where a person is actively trying to repress a	• focal subcortical lesions • metabolic encephalopathy • deep midline disorders • some instances of hydrocephalus

			response or action).	
Alpha	8–15	posterior regions of head, both sides, higher in amplitude on dominant side. Central sites (c3-c4) at rest	• relaxed/reflecting • closing the eyes • Also associated with inhibition control, seemingly with the purpose of timing inhibitory activity in different locations across the brain.	• coma
Beta	16–31	both sides, symmetrical	• range span: active calm →	benzodiazepines Dup15q syndrome

		distribution, most evident frontally; low-amplitude waves	intense → stressed → mild obsessive • active thinking, focus, high alert, anxious	
Gamma	> 32	Somatosensory cortex	• Displays during cross-modal sensory processing (perception that combines two different senses, such as sound and sight • Also is shown during short-term memory	• A decrease in gamma-band activity may be associated with cognitive decline, especially when related to the theta band; however, this has not been proven for use as a clinical diagnostic measurement

			matching of recognized objects, sounds, or tactile sensations	
Mu	8–12	Sensorimotor cortex	• Shows rest-state motor neurons.	• Mu suppression could indicate that motor mirror neurons are working. Deficits in Mu suppression, and thus in mirror neurons, might play a role in autism.

The practice of using only whole numbers in the definitions comes from practical considerations in the days when only whole cycles could be counted on paper records. This leads to gaps in the definitions, as seen elsewhere on this page. The theoretical definitions have always been more carefully defined to include all frequencies. Unfortunately there is no agreement in standard reference works on what these ranges should be – values for the upper end of alpha and lower end of beta include 12, 13, 14 and 15. If the threshold is taken

as 14 Hz, then the slowest beta wave has about the same duration as the longest spike (70 ms), which makes this the most useful value.

EEG Frequency bands: Improved definitions

Band	Frequency (Hz)
Delta	< 4
Theta	≥ 4 and < 8
Alpha	≥ 8 and < 14
Beta	≥ 14

Others sometimes divide the bands into sub-bands for the purposes of data analysis

Abnormal activity::

Abnormal activity can broadly be separated into epileptiform and non-epileptiform activity. It can also be separated into focal or diffuse.

Focal epileptiform discharges represent fast, synchronous potentials in a large number of neurons in a somewhat discrete area of the brain. These can occur as

interictal activity, between seizures, and represent an area of cortical irritability that may be predisposed to producing epileptic seizures. Interictal discharges are not wholly reliable for determining whether a patient has epilepsy nor where his/her seizure might originate.

Generalized epileptiform discharges often have an anterior maximum, but these are seen synchronously throughout the entire brain. They are strongly suggestive of a generalized epilepsy.

Focal non-epileptiform abnormal activity may occur over areas of the brain where there is focal damage of the cortex or white matter. It often consists of an increase in slow frequency rhythms and/or a loss of normal higher frequency rhythms. It may also appear as focal or unilateral decrease in amplitude of the EEG signal.

Diffuse non-epileptiform abnormal activity may manifest as diffuse abnormally slow rhythms or bilateral slowing of normal rhythms, such as the PBR.

Intracortical Encephalogram electrodes and sub-dural electrodes can be used in tandem to discriminate and discretize artifact from epileptiform and other severe neurological events.

More advanced measures of abnormal EEG signals have also recently received attention as possible biomarkers for different disorders such as Alzheimer's disease.

VALUE ADDED COURSE

Certificate Course in EEG Interpretation & Code: PHY C10

List of Students Enrolled: February 2019-April 2019

1st Year MBBS Student			
Sl. No	**Name of the Student**	**Registration Number**	**signature**
1	JETESH SINGH	U18MB311	
2	KAMALESH C N	U18MB312	
3	KARTHIYAYINI .G	U18MB313	
4	KEERTHANA P	U18MB314	
5	KEISHAM LUXMIRANI	U18MB315	
6	LAKKAM UMESH KUMAR	U18MB316	
7	LAKSHMI PRIYA E	U18MB317	
8	LEKIWA O PALA	U18MB318	
9	LISHI YAM	U18MB319	
10	MADAN SHUBHAM SANJAY	U18MB320	
11	MAHI TYAGI	U18MB321	
12	MANIVANNAN N	U18MB322	
13	MARYAM MOHIDEEN PITCHAI	U18MB323	
14	MEDOZHAZO RUPREO	U18MB324	
15	MOHAMMED SALMAN	U18MB325	
16	MRINAL KUMAR	U18MB326	
17	NABAM YAMIN	U18MB327	
18	NALLI VASANTHSEETAL	U18MB328	
19	NEERAJ NAMASIVAYAM	U18MB329	
20	NEHA BARMAN	U18MB330	

Manivannan N
V18MB322

Certificate course in EEG interpretation

Course Code: Code: PHY C10

8/10

MCQ (Total marks:1x 10=10 marks)

1. Electroencephalogram (EEG) rhythm was first recorded by:
A. William Einthovan
B. Egas Moniz
C. Hans Berger (1929)
D. Gaillard L

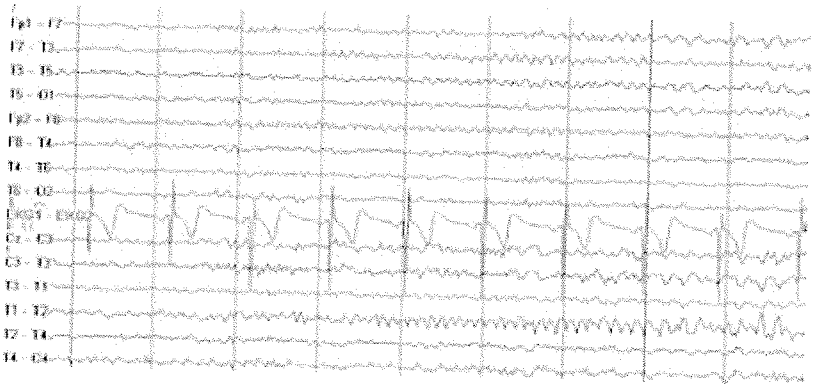
2. The most prominent EEG wave pattern of an awake, relaxed adult whose eyes are closed is:
A. Delta
B. Theta
C. Alpha
D. Beta

3. Stage 2 sleep is defined by the presence of:
A. spikes and slow waves
B. sleep spindles and K complexes.
C. rapid eye movements.
D. 1- to 2-Hz delta frequencies.

4. When people are attentive to an external stimulus or are thinking hard about something, the alpha rhythm is replaced by
A. Delta
B. Theta
C. Alpha
D. Beta
E. Gamma

5. Indications for clinical EEG assessment of psychiatric patients include, all EXCEPT
A. Rule out specific neurological disorders
B. History of head trauma or suspicion of epilepsy
C. Differentiating schizophrenia and mood disorders
D. First presentation of psychosis
E. Pre- and post electroconvulsive therapy

6. Diffuse, bilaterally synchronous 3Hz wave and spike discharges are typical EEG findings of:
A. Absence seizures
B. Infantile spasm
C. Myoclonic seizures



A. Lennox-Gastaut syndrome
B. Infantile spasms
C. Tonic seizures
D. Simple partial seizure
E. Generalized tonic-clonic (GTC)

Marks awarded : 8/10

Name of the Assessor : DR. V. Anbarasy

Signature of the Assessor :

Mrinal Kumar
U18MB326

6/10

Certificate course in EEG interpretation

Course Code: Code: PHY C10

MCQ (Total marks:1x 10=10 marks)

1. Electroencephalogram (EEG) rhythm was first recorded by:
A. William Einthovan
B. Egas Moniz
C. Hans Berger (1929)
D. Gaillard L

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4. When people are attentive to an external stimulus or are thinking hard about something, the alpha rhythm is replaced by
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B. Theta
C. Alpha
D. Beta
E. Gamma

5. Indications for clinical EEG assessment of psychiatric patients include, all EXCEPT
A. Rule out specific neurological disorders
B. History of head trauma or suspicion of epilepsy
C. Differentiating schizophrenia and mood disorders
D. First presentation of psychosis
E. Pre- and post electroconvulsive therapy

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A. Absence seizures
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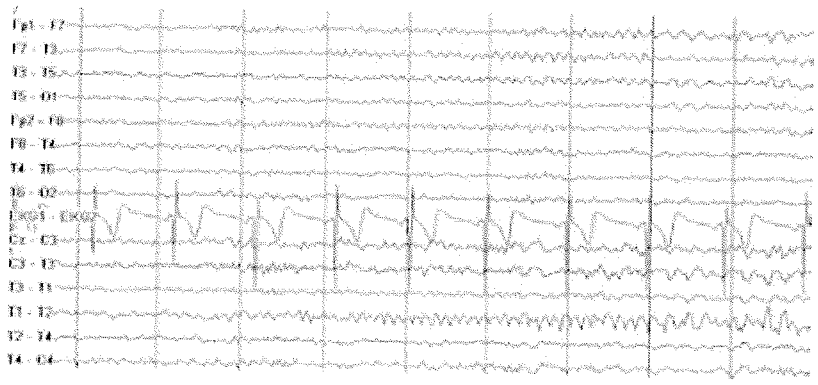


A. Lennox-Gastaut syndrome
B. Infantile spasms
C. Tonic seizures
D. Simple partial seizure
E. Generalized tonic-clonic (GTC)

Marks awarded : 6/10

Name of the Assessor : DR. D. Anbalagan

Signature of the Assessor :

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Lakkam Umesh Kumar has actively participated in the Value Added Course on EEG interpretation held during February 2019 - April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. V.Anebaracy
RESOURCE PERSON

R. Vijayakumar
Dr.R.Vijayakumar
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Madan Shubham Sanjay has actively participated in the Value Added Course on EEG interpretation held during February 2019 - April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. V.Anebaracy
RESOURCE PERSON

R. Vijayakumar
Dr.R.Vijayakumar
COORDINATOR

Student Feedback Form

Course Name: Certificate course in EEG interpretation

Subject Code: PHY C10

Name of Student: Nabeam Yamin Registration number : U18MB327

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations	✓				
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand		✓			
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course	✓				
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

We want More courses like this. Excellent teaching Sessions, Very useful!

Nabeam Yamin.

Signature

Student Feedback Form

Course Name: Certificate course in EEG interpretation

Subject Code: PHY C10

Name of Student: Nalli Vasanta Jeltkal Registration number : U18MS32

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned		✓			
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	(3)	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

We want advance course in EEG interpretation. We want more practical sessions

Signature

Date: 10.04.2019

From
Dr.V.Senthil kumar
Professor and Head,
Physiology
Sri Lakshmi Narayana Institute of Medical sciences
Puducherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical sciences
Puducherry
.

Through Proper Channel

Sub: Completion of value-added course: Certificate course in EEG interpretation & Code: PHY C10

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Certificate course in EEG interpretation & Code: PHY C10 from February 2019 - April 2019. We solicit your kind action to send certificates for the participants that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

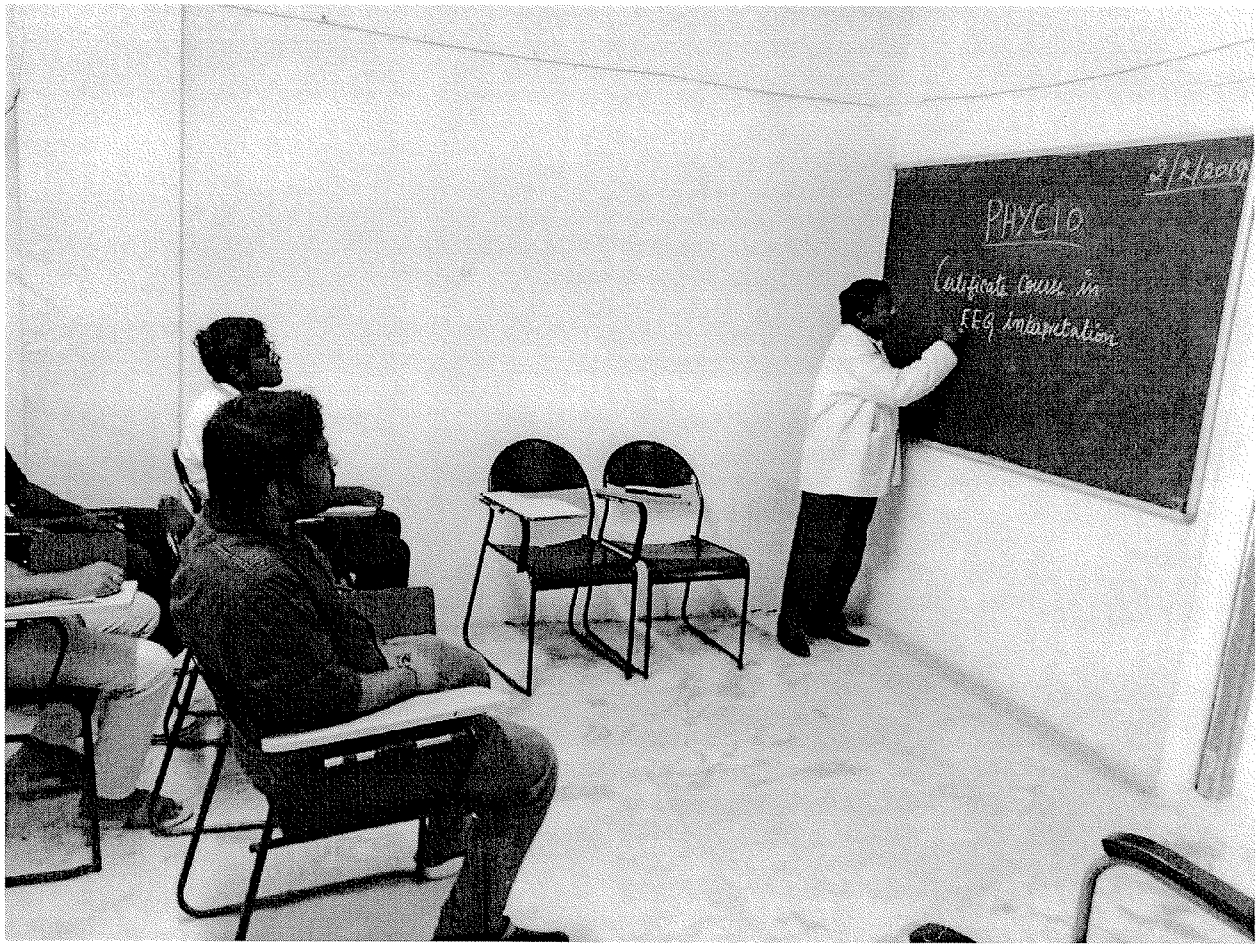
Kind Regards

VSK
Dr.V.Senthil kumar
HOD Physiology

PROFESSOR & HOD
DEPARTMENT OF PHYSIOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Encl: Certificates

Photographs


PHYCIO
Certificate course in
EEG interpretation



SLIMS,PONDICHERRY

Date 09/05/18

From

DR.R.CHIDHAMBARAM ,
Professor and Head,
Dept.of radio-diagnosis and Imaging Sciences ,
SLIMS,PONDICHERRY
Bharath Institute of Higher Education and Research,
Chennai.

To

The Dean,
SLIMS
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course:

INTEGRATED BRAIN ANATOMY-MRI BRAIN

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled **INTEGRATED BRAIN ANATOMY-MRI BRAIN** on 09/05/18. We solicit your kind permission for the same.

Kind Regards

DR.R.CHIDHAMBARAM

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. R. Chidhambaram

The Expert: Dr. T. Jothibasu.

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign & Seal)	(Sign & Seal)	(Sign & Seal)

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

BIHER SLIMS

Course Title: INTEGRATED BRAIN ANATOMY-MRI BRAIN

Course Objective: TO DEMONSTRATE INTEGRATED BRAIN ANATOMY-MRI BRAIN

Course Outcome: BETTER UNDERSTANDING OF INTEGRATED BRAIN ANATOMY-MRI BRAIN

Course Audience: ANY MEDICAL STUDENT

Course Coordinator: PROF.DR.R.CHIDHAMBARAM

Course Faculties with Qualification and Designation:

1. **DR.R.CHIDHAMBARAM,MBBS,MDRD.PROF. AND HOD**
2. **DR.SIVASUBRAMANIYAN,MBBS,DNB,ASST PROFESSOR**
3. **DR.MOHAMED HASSAN MBBS,MDRD,SENIOR RESIDENT**

Course Curriculum/Topics with schedule (Min of 30 hours)-ENCLOSED

SlNo	Date	Topic	Time	Hours
1	03-02-2019	INTRO	2:00 PM	2 hours
2	04-02-2019	GENERAL OVERVIEW	2:00 PM	2 hours
3	05-02-2019	CORTEX	2:00 PM	2 hours
4	06-02-2019	MEDULLA	2:00 PM	2 hours
5	07-02-2019	WHITE MATTER	2:00 PM	2 hours
6	08-02-2019	GYRI	2:00 PM	2 hours
7	09-02-2019	SULCI	2:00 PM	2 hours
8	10-02-2019	FISSURES.CISTERNS	2:00 PM	2 hours
9	11-02-2019	VENTRICLES	2:00 PM	2 hours
10	12-02-2019	ARTERIAL SUPPLY	2:00 PM	2 hours
11	13-02-2019	VENOUS SUPPLY	2:00 PM	2 hours
12	14-02-2019	VENOUS SINUSES	2:00 PM	2 hours
13	15-02-2019	MIDLINE STRUCTURES	2:00 PM	2 hours
14	16-02-2019	BRAIN STEM	2:00 PM	2 hours
15	17-02-2019	CEREBELLUM	2:00 PM	2 hours
			Total Hours	30

REFERENCE BOOKS: (Minimum 2)
1.GREINGER AND ALLISON.
2.MRI BASCIS

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

29.05.2019

Sub: Organising Value-added Course: INTEGRATED BRAIN ANATOMY-MRI BRAIN . reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"INTEGRATED BRAIN ANATOMY-MRI BRAIN "**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before May to June 2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content

BIHER SLIMS

VALUE ADDED COURSE

1. Name of the programme & Code :
Integrated anatomy teaching-Brain anatomy: MRI
RAD 09

2. Duration & Period
30 hrs & September 2018– January 2019 & February2019 – August 2019

3. Information Brochure and Course Content of Value Added Courses
Enclosed as Annexure- I

4. List of students enrolled
Enclosed as Annexure- II

5. Assessment procedures:
Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model
Enclosed as Annexure- IV

7. No. of times offered during the same year:
September 2018– January 2019 & February2019 – August 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- September 2018 - August 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	**RAD 09-1**	**Integrated anatomy teaching-Brain anatomy: MRI**	Dr. Sivasubramaniyan	MBBS	20 (Sep18 – Jan19)
2	**RAD 09-2**	**Integrated anatomy teaching-Brain anatomy: MRI**	Dr. Mohamed Hasan	MBBS	20 (Feb18-Aug-19)

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

COORDINATOR

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

BIHER SLIMS

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that AARTHI.Ahas actively participated in the Value Added Course on **INTEGRATED ANTOMY TEACHING-BRAIN ANATOMY:*MRI*** held during **September 2018 – January 2019** Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry-605 502, India.

Dr.M.sivasubramaniyan
RESOURCE PERSON

Dr. R.Chidhambaram
CO-ORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that AJAY.Nhas actively participated in the Value Added Course on **INTEGRATED ANTOMY TEACHING-BRAIN ANATOMY:MRI** held during **February2019 – August 2019** Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Mohamed Hassan
RESOURCE PERSON

Dr.R. Chidhambaram
CO-ORDINATOR

BIHER SLIMS

VALUE ADDED COURSE

TOPIC:- Integrated Brain Anatomy teaching - Brain Anatomy MRI.

List of Students Enrolled

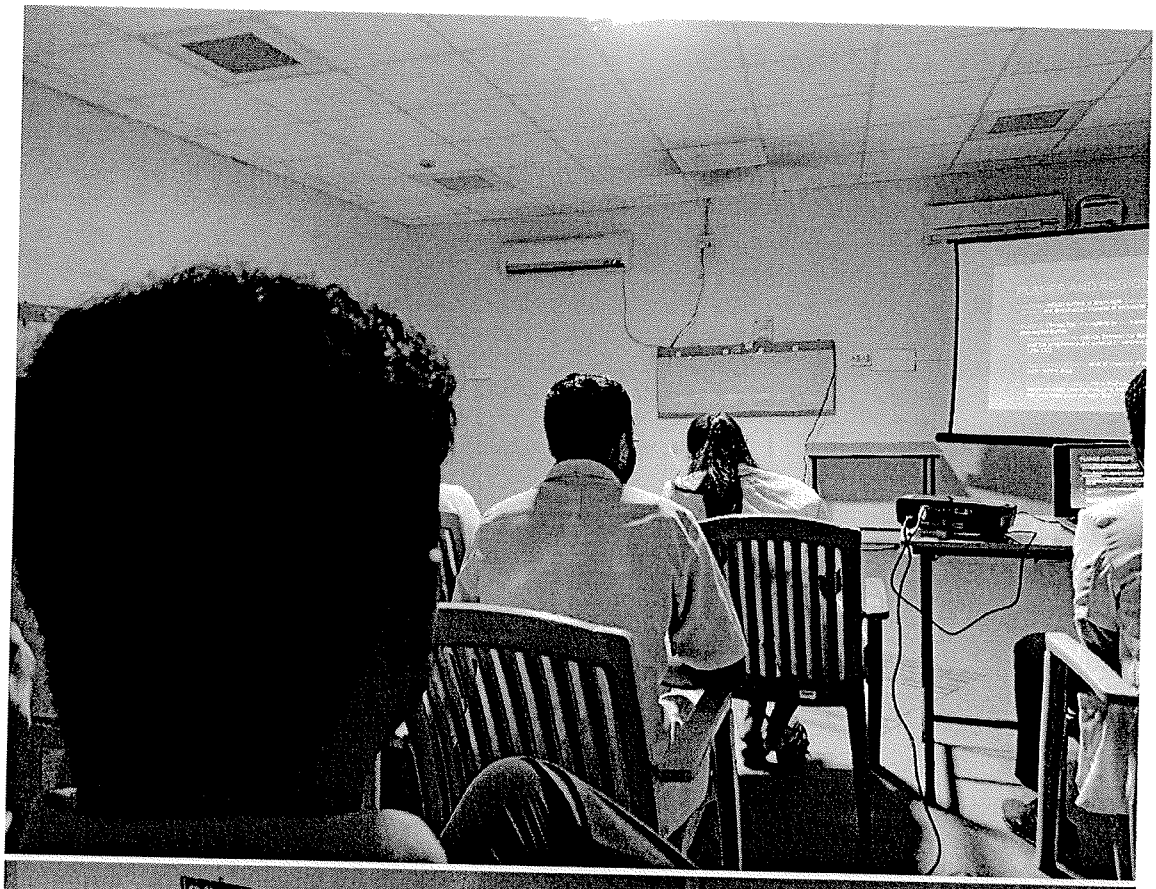
IST YEAR MBBS STUDENTS			
SI.NO.	NAME OF THE STUDENT	UNIVERSITY REG. NO.	signature
1	AARTHI.A	U16MB251	
2	ABILASHA.K	U16MB252	
3	ABITHA RAJLIN	U16MB253	
4	ADAPALA PRIYANKA	U16MB254	
5	ADHITHAYA RAJ .N	U16MB255	
6	AJAY .N	U16MB256	
7	AKSHYA .R	U16MB257	
8	ALLARI KARTHIK ABHIROOP	U16MB258	
9	AMAL ASHOK	U16MB259	
10	AMIRTHAVARSHNI .R	U16MB260	
11	ANANYA SHARMA	U16MB261	
12	ANGALAKUDURU DEEPCHAND	U16MB262	
13	ANJAN BANERJEE	U16MB263	
14	ANWESHA CHATTERJEE	U16MB264	
15	ARCHANA .A	U16MB265	
16	ARCHITHA.A	U16MB266	
17	ARIVUMATHI .R	U16MB267	
18	ARJUN.S	U16MB268	
19	ASHVANTH KUMAR .A	U16MB269	
20	ASMITHA S.V	U16MB270	
21	AVIDI. VENKATA SAISUSHMA	U16MB271	
22	AVIRAL PATPATIA	U16MB272	
23	BALACHANDRAN	U16MB273	
24	BALAJI .S	U16MB274	
25	BHASKARAN .K.C	U16MB275	
26	BHAVANI . K.M	U16MB276	
27	BLESSY AMALA RISHA .J	U16MB277	
28	CAREENA DANIEL	U16MB278	
29	CHANDRA PRAKASH.M	U16MB279	
30	CHINJU.S.R	U16MB280	

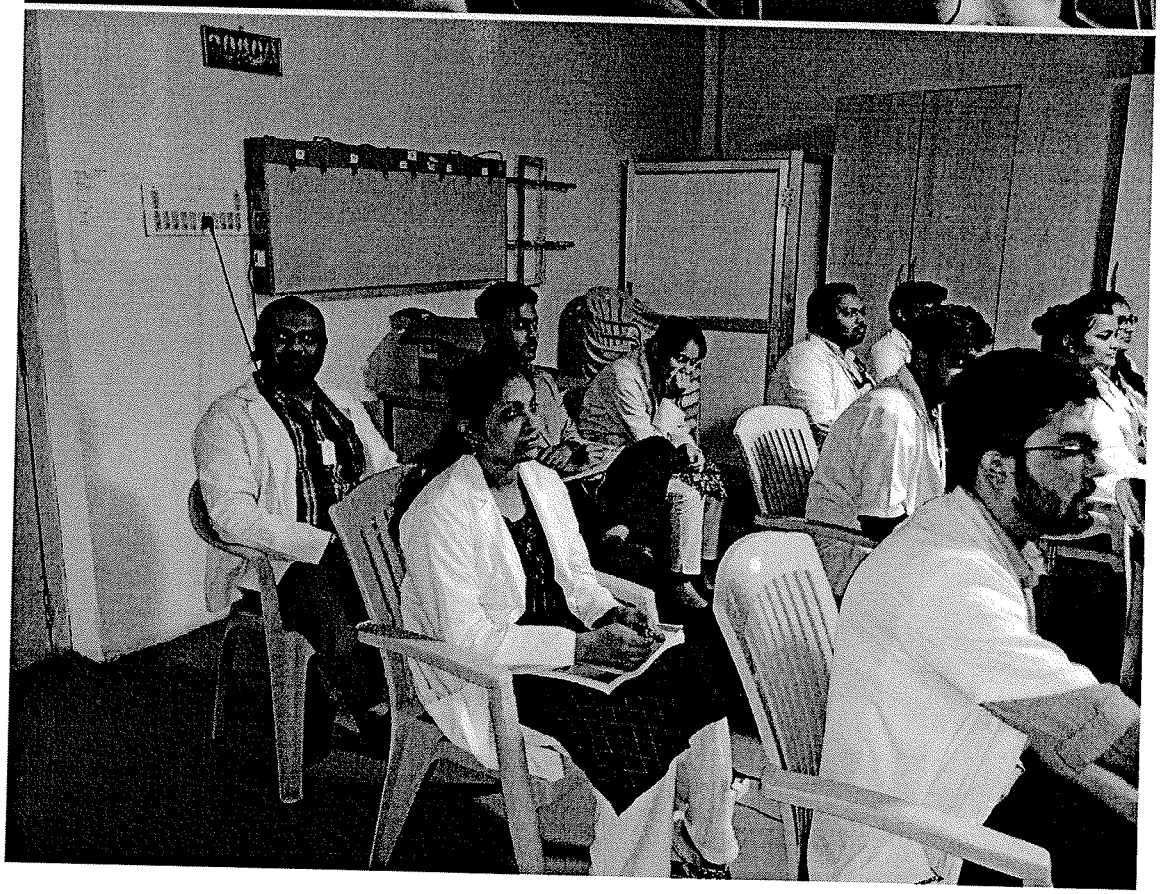
RESOURCE PERSON

COORDINATOR

Annexure-II

BIHER SLIMS





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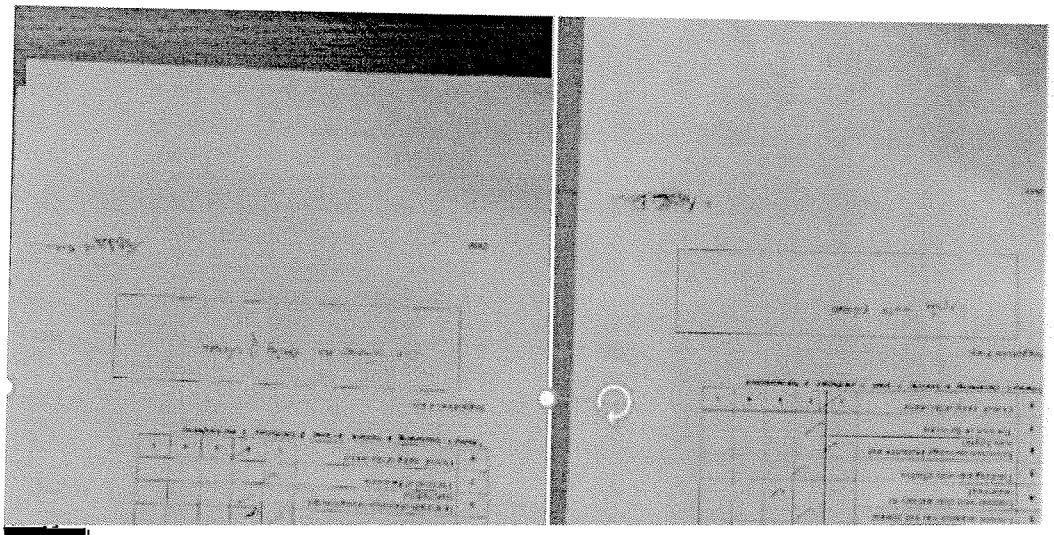
SLIMS



Ananya Sharma 016MBA61

BRAIN QUESTIONS

1. Regarding the imaging methods of the skull and brain:
(a) Skull radiograph is sensitive to cerebral pathology.
(b) Contrast between white and grey matter is superior on MRI compared to CT of the brain.
(c) The contents of the middle and posterior fossa of the brain are better visualized with CT than with MRI.
(d) On T1-weighted MRI, white matter has lower signal (darker) than grey matter.
(e) On T2-weighted MRI, grey matter has lower signal than white matter.

2. Regarding MRI of the brain:
(a) Cerebrospinal fluid has high signal on T1-weighted images.
(b) Cerebrospinal fluid has high signal on T2-weighted images.
(c) In a proton density MRI sequence, grey matter is hyperintense to white matter.
(d) In CT of the brain the white matter is darker than grey matter.
(e) The fornix and anterior commissure are hypointense on T2-weighted images.

3. Regarding the technique of brain CT and MR:
(a) The axial plane for CT is usually parallel to a line tangential to the orbital roofs running to the anterior margin of the foramen magnum.
(b) The normal choroid plexus and the pituitary gland enhance on postcontrast CT images.
(c) Mechanism of contrast enhancement of gadolinium DTPA is similar to that of iodinated contrast medium.
(d) Rapidly flowing blood is bright on a T1-weighted MRI.
(e) Time of flight MR angiography is an invasive procedure.

4. Regarding the skull:
(a) The skull vault develops in membrane.
(b) The occipital bone forms part of the central skull base.
(c) Sutures are between bones of cartilaginous ossification.
(d) Perisutural sclerosis is seen in the neonate.
(e) Sagittal sutural fusion occurs before adolescence.

5. In the skull:
(a) The anterior fontanelle (bregma) is between the frontal and parietal bones at the junction of the sagittal and coronal sutures.
(b) The posterior fontanelle (Lambda) closes around the second month after birth.
(c) Pterion usually closes by 3–4 months.
(d) The periosteum is invested externally and internally.
(e) The endosteum is the outer of the two dural layers.

6. Regarding the skull:
(a) Epicranial aponeurosis (galea aponeurotica) is loosely attached to the skull vault.
(b) The skull vault has a high signal on T1-weighted MR images.
(c) The diploic veins are found between the two tables of the skull.

(d) Emissary veins traverse the skull vault.
(e) Venous lacunae are close to the midline adjacent to the superior sagittal sinus.

7. In the skull:
(a) The frontal bone forms in two halves.
(b) The cribriform plate of ethmoid bone is interposed between the orbital plates of the frontal bone in the midline.
(c) The coronal sutures separate the parietal and frontal bones.
(d) The pterion is a point where the frontal, sphenoid, parietal, temporal bones meet.
(e) Anteriorly the parietal bone articulates with the frontal bone and lesser wing of sphenoid.

8. Regarding the sphenoid bone:
(a) The sphenoid air sinuses in the body of the sphenoid are symmetrical structures.
(b) The anterior clinoid process is part of the greater wing of sphenoid bone.
(c) The posterior clinoid process is part of the lesser wing of sphenoid bone.
(d) The posterior part of the floor of the anterior cranial fossa is formed by the lesser wing of sphenoid.
(e) Part of the middle cranial fossa is formed by the greater wing of sphenoid.

9. In the sphenoid bone:
(a) The dorsum sellae is the anterior boundary of the pituitary fossa.
(b) The dorsum sellae merges laterally with the posterior clinoid process.
(c) The foramina ovale, rotundum and spinosum are in the greater wing.
(d) The greater wing separates the frontal lobe of the brain from the infra temporal fossa below.
(e) Foramen rotundum travels from Meckel's cave to the pterygopalatine fossa.

10. Regarding the foramen of the base of the skull:
(a) Foramen ovale transmits the mandibular division of the fifth nerve.
(b) The foramen spinosum is posterolateral to the foramen ovale.
(c) The vidian or pterygoid canal is inferior to the sphenoid sinus.
(d) The internal carotid artery passes through the foramen lacerum.
(e) Foramen of Vesalius transmits an emissary vein and is medial to the foramen ovale.

BIHER SLIMS

Date: 09/05/19

From

Dr.R.CHIDHAMBARAM
Professor and Head,
Department of Radiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper

Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: **INTEGRATED BRAIN ANATOMY-MRI BRAIN**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: : **INTEGRATED BRAIN ANATOMY-MRI BRAIN** for 20 medical student (batch 2) .

We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr.R.Chidhambaram

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

Encl: Certificates

Photographs

SRI LAKSHMI NARAYANA

INSTITUTE OF MEDICAL SCIENCES

DEPARTMENT OF RADIOLOGY AND IMAGING SCIENCES

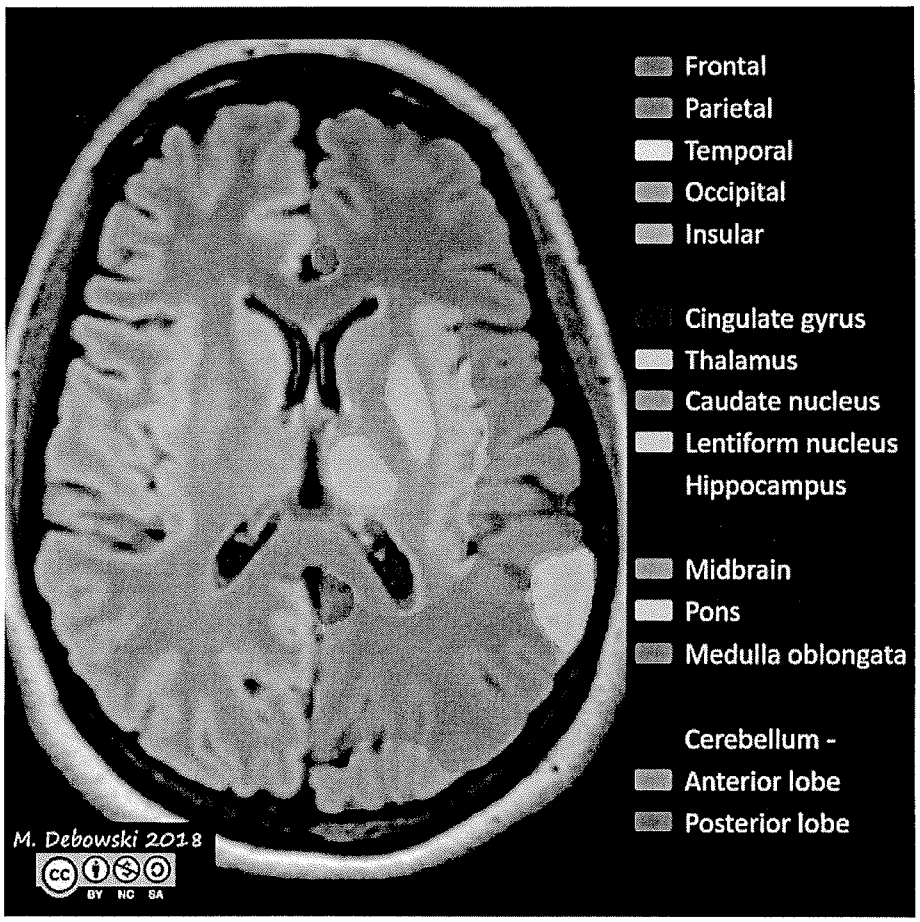
INTEGRATED

ANATOMY TEACHING

BRAIN ANATOMY: MRI

COURSE CONTENTS

Basic views
Identifying Parts of skull
Identifying brain lobes
Identifying Ventricles
Identifying Vasculature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Cerebellum -
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Posterior lobe
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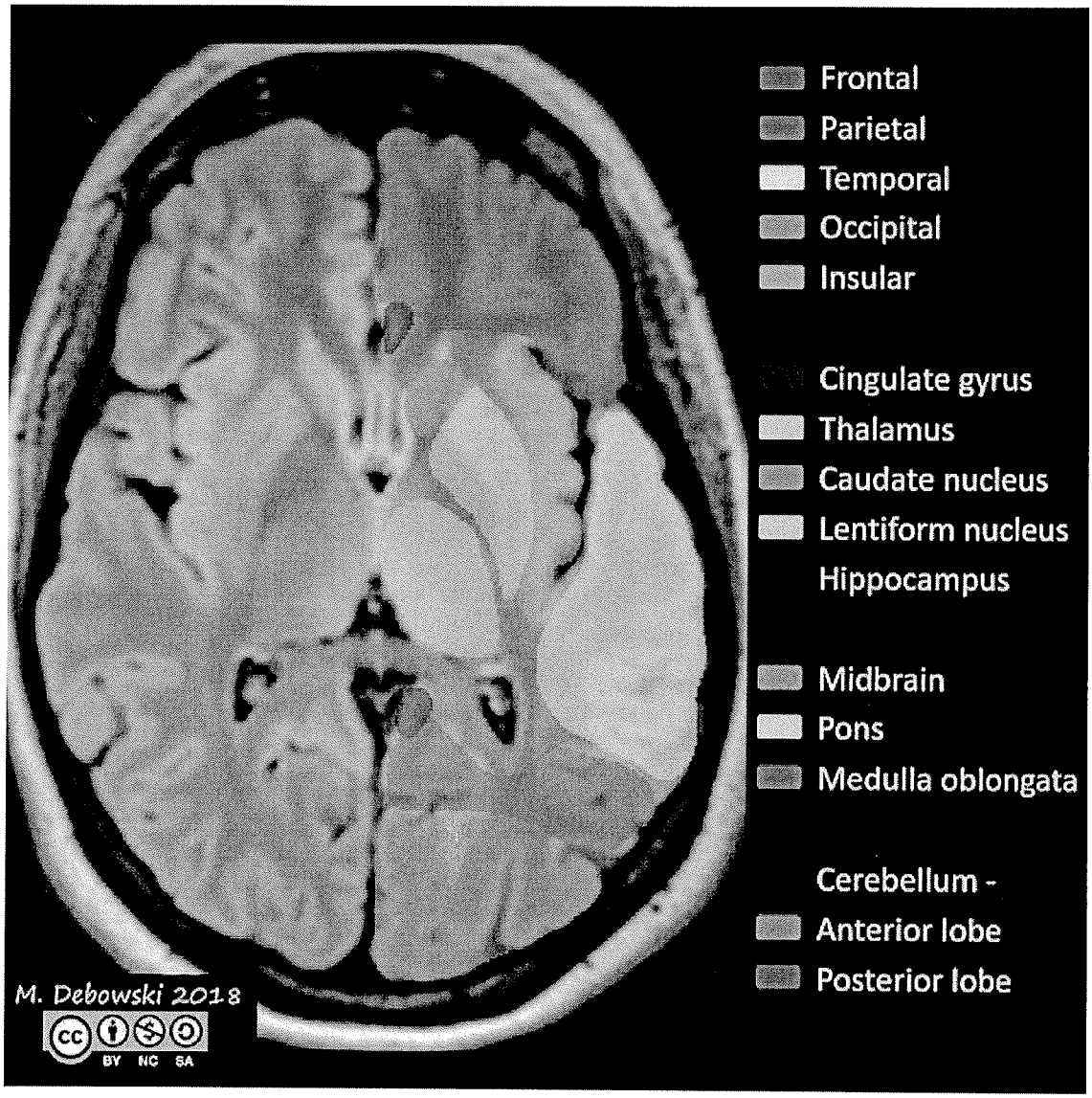
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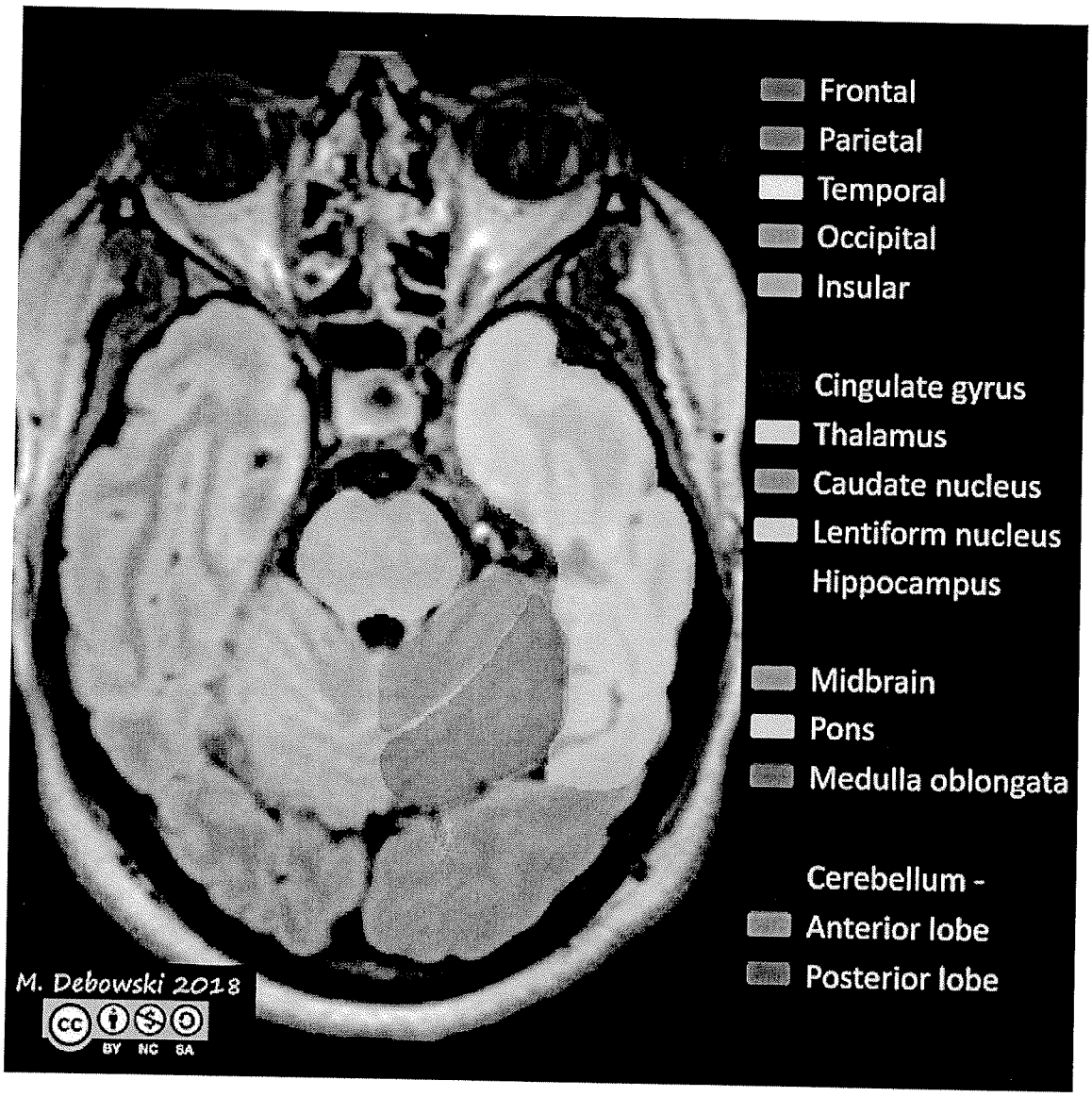
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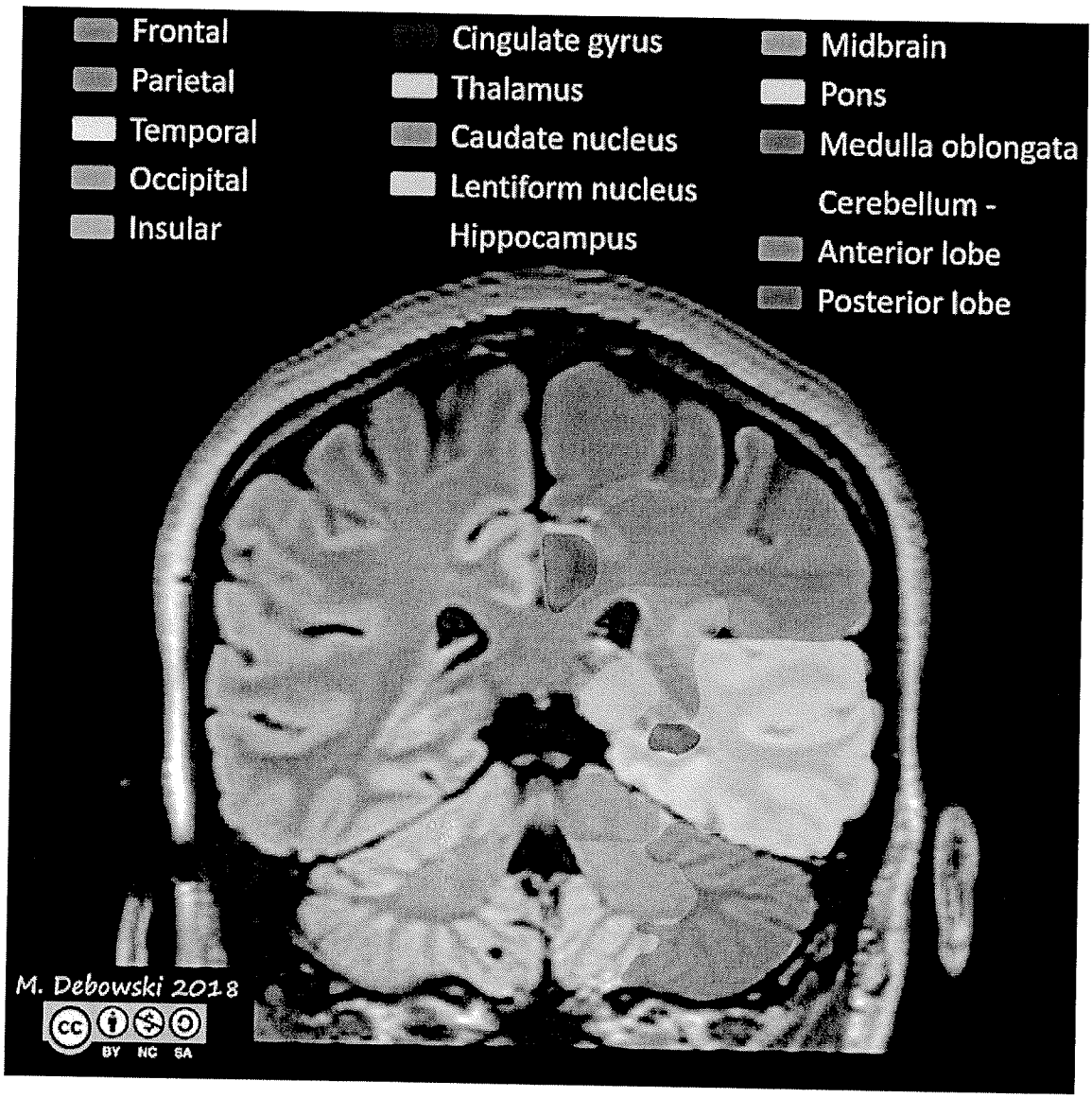
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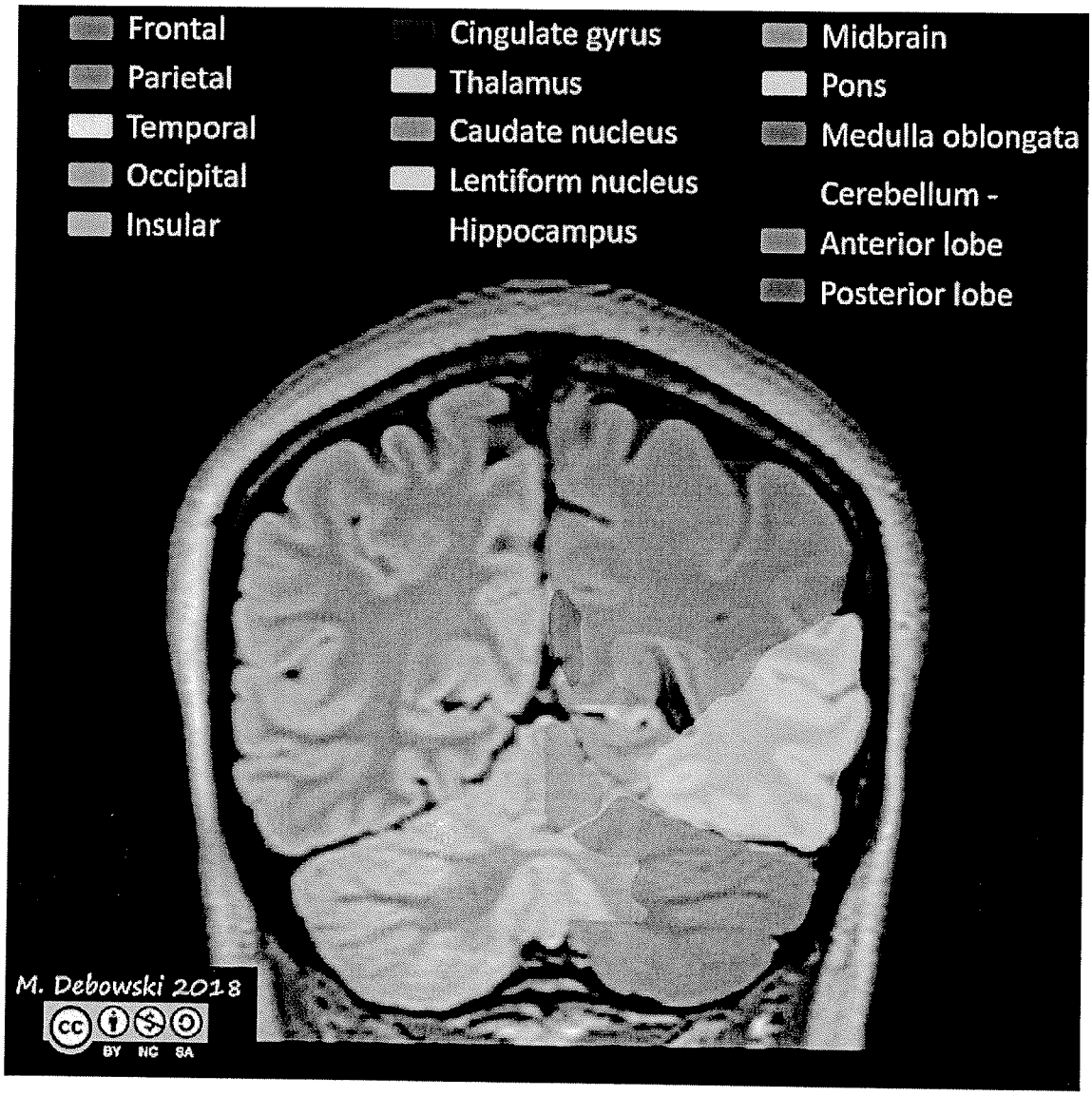
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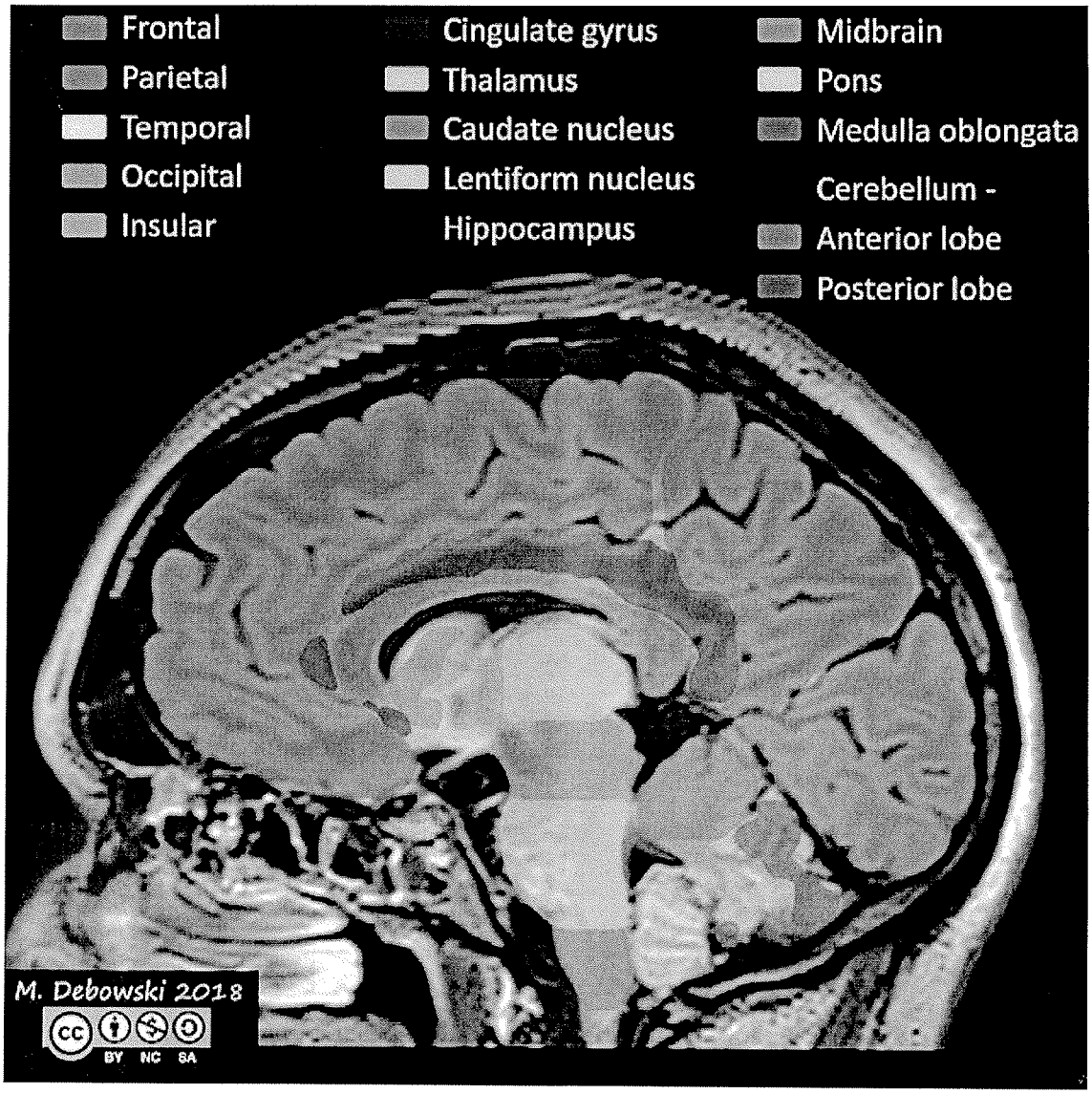
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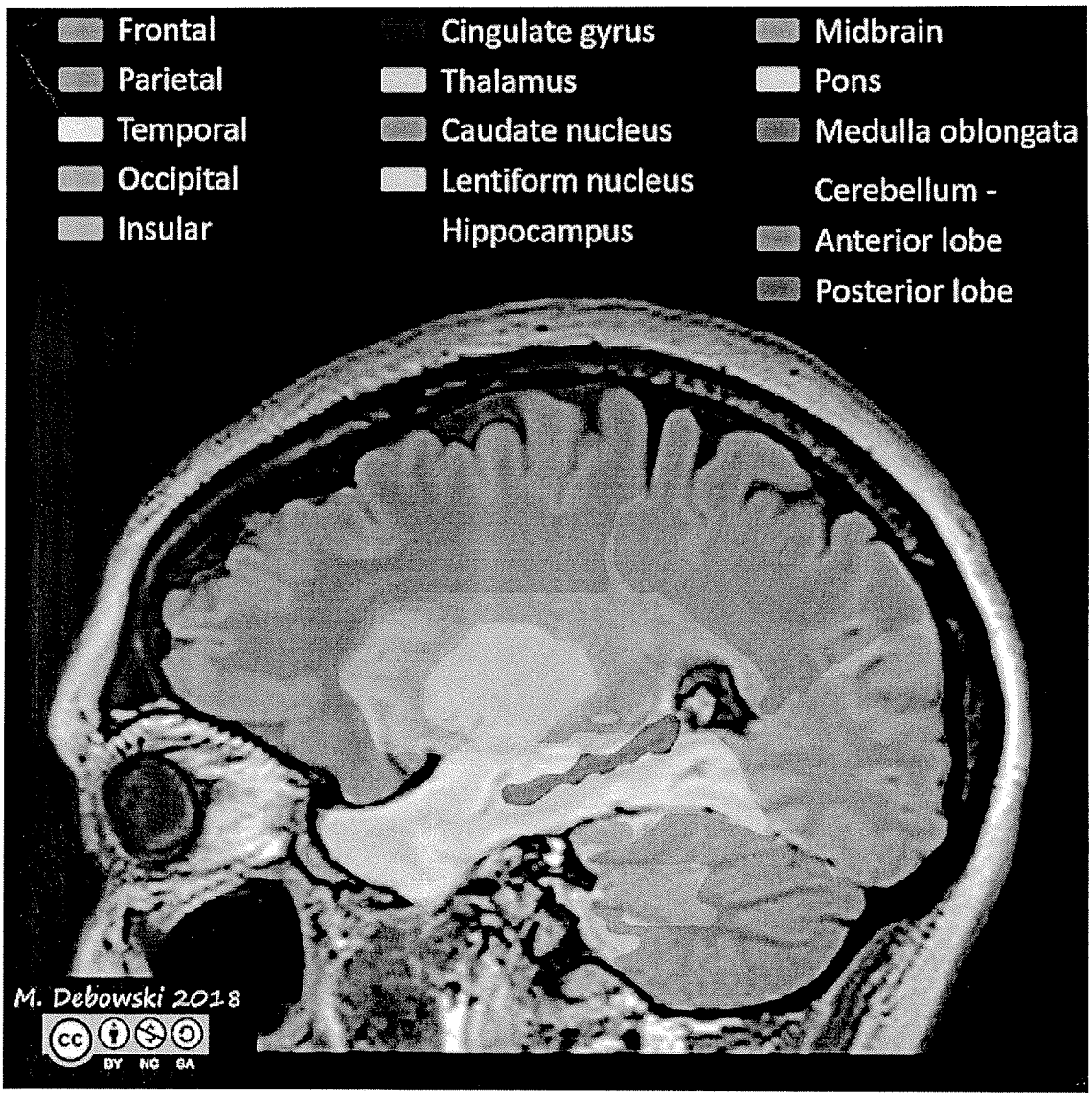
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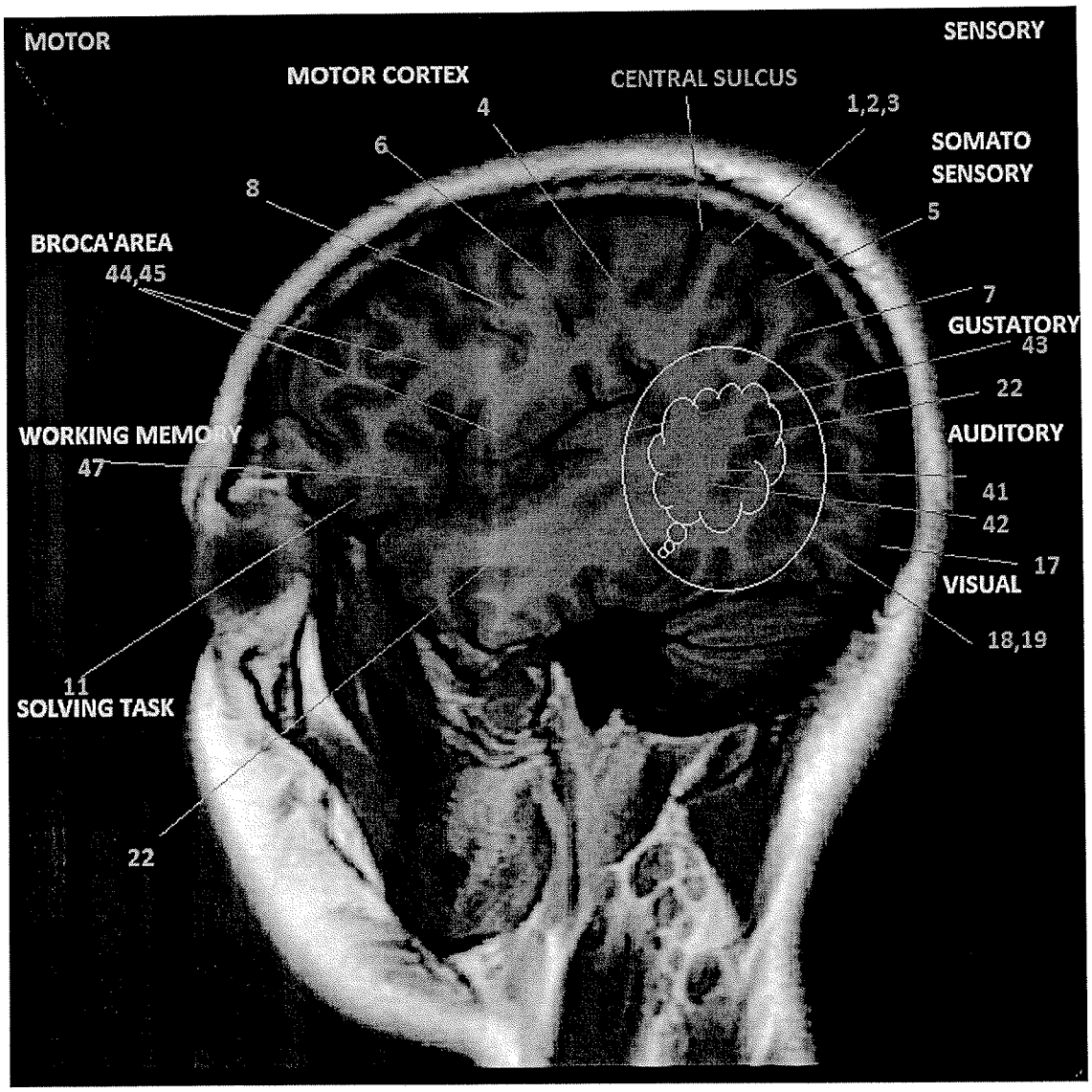


VENUE:

LECTURE HALL:II

TIME : SAT 2 TO 4 PM.

Sri Lakshmi Narayana Institute of Medical Sciences

Date: 29.11.2018

From

Dr.Jansi Rani
Professor and Head,
Department of Biochemistry,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Molecular Basis of Gestation diabetes mellitus

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Molecular Basis of Gestation diabetes mellitus** for interns May to June 2019. We solicit your kind permission for the same.

Kind Regards

Dr. Jansi Rani

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean:

The HOD: Dr. Jansi Rani

The Expert: Kajalakshmy

The committee has discussed about the course and is approved.

Dean (Sign & Seal)

Subject Expert (Sign & Seal)

HOD (Sign & Seal)

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affiliated to Bharath University, Chennai - TN]

Circular

18.01.2019

Sub: Organising Value-added Course: Molecular basis of Gestational diabetes mellitus. reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Molecular basis of Gestational diabetes mellitus".** The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before February - March 2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

Encl: Copy of Course content

VALUE ADDED COURSE

1. Name of the programme & Code

Molecular basis of Gestational diabetes mellitus – BIO-10

2. Duration & Period

30 hrs & April and May -2019-2020

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Assessment closed

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 times April and May 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- April –May -2019-20					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	BIO 10/ I Batch	**Molecular basis of Gestational diabetes mellitus**	Dr. Jansi Rani Dr.Kajalaksmy	MBBS Students	20 students MAY-JUNE 2019)

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

1. **Dr.Jansi Rani**
2. **Dr. Kajalakshmy**

COORDINATOR
Dr.Jansi Rani

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY

Course Proposal

Course Title: **Molecular Bases of Gestational diabetes Mellitus**

Course Objectives:

- GDM and T2DM share a common genetic background including glucose intolerance, insulin resistance, and insulin secretion. Respect similar risk factors and the genetic variants used to determine the risk of developing T2DM might also be associated with the prevalence of GDM.
- GDM is a major cause of prenatal morbidity and mortality, as well as maternal morbidity.

Course Outcome: The outcomes will help us to develop new therapeutic target which could be help us to manage to GDM as well as maternal it complications such as preeclampsia, hypoglycemia, respiratory distress, hyberbilirubinemia, and low birth weight.

Course Audience: MBBS students 2019 -2020 Batch

Course Coordinator: Dr.Jansi Rani

Course Faculties with Qualification and Designation:

1.Dr.Jansi Rani, Professor & HOD

2.Dr.Kajalakshmy, Assistant Professor

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1.	18-2-2019	Introduction of Gestational diabetes mellitus	2-3p.m	1
2.	19-2-2019	Prevalence of Gestational 1. Global Prevalence of GDM 2. Prevalence of GDM in India	4-6p.m	2

3.	20-2-2019	Screening guidelines of Gestational diabetes mellitus	4-6p.m	2
4.	21-2-2019	Complication of Gestational diabetes mellitus:	4-6p.m	2
5.	22-2-2019	Genetic variation and Gestational diabetes mellitus	4-6p.m	2
6.	23-2-2019	Genetic variation and Gestational diabetes mellitus	4-6	2
7.	24-2-2019	KCNJ11 gene polymorphism	4-6p.m	2
8.	25-2-2019	Relationship between KCNJ11 gene polymorphism and Biochemical	4-6p.m	2
9.	26-2-2019	KCNQ1 Gene polymorphism:	4-6p.m	2
10.	27-2-2019	Relationship between KCNQ1 gene polymorphism and Biochemical	4-6p.m	2
11.	28-2-2019	PPARgamma gene polymorphism and Gestational diabetes mellitus:	4-6p.m	2
12.	29-2-2019	Glucose kinase gene polymorphism	4-6p.m	2
13.	30-2-2019	Nutrition Therapy in Gestational Diabetes Mellitus	4-6P.m	2
14.	31-2-2019	Nutrition Therapy in Gestational Diabetes Mellitus	4-6P.m	2

15.	1-3-2019	**Nutritional Management of Gestational Diabetes and Nutritional Management of Women With a History of Gestational Diabetes**	4-6P.m	2
16.	3-3-2019	**Gestational diabetes mellitus and Pregnancy outcomes**	4-6P.M	2
		Total		31hrs

REFERENCE BOOKS:

Categories: 2020, Diabetes, Endocrinology, Endocrinology Research and Clinical Developments, Medicine & Health, Newly Published Books, Nova Medicine and Health

Diagnosis and classification of diabetes mellitus. *Diabetes Care* 2006; 29 Suppl 1:S43–S48.

American College of Obstetricians and Gynecologists Committee on Practice Bulletins-. ACOG Practice Bulletin. Clinical management guidelines for obstetrician-gynecologists. Number 30, September 2001 (replaces Technical Bulletin Number 200, December 1994). Gestational diabetes. *Obstetrics & Gynecology 98(3)*

Molecular Basis of Gestation diabetes mellitus



PARTICIPANT HAND BOOK

Annexure- I

COURSE DETAILS

Particulars	**Description**
Course Title	**Molecular Basis of Gestation diabetes mellitus**
Course Code	BIO-01
Topics and content of the course in the Hand book	1. Introduction of Gestational diabetes mellitus 2. Global Prevalence of GDM 3. Prevalence of GDM in India 4. Risk Factors in Gestational diabetes mellitus 5. Screening guidelines of Gestational diabetes mellitus 6. Complication of Gestational diabetes mellitus 7. Genetic variation and Gestational diabetes mellitus a. KCNJ11 gene polymorphism in Gestational diabetes mellitus b. KCNQ1 Gene polymorphism in Gestational diabetes mellitus c. PPARgamma gene polymorphism and Gestational diabetes mellitus d. Glucose kinase gene polymorphism in Gestational diabetes mellitus 8. IGF2B2 gene polymorphism and Gestational diabetes mellitus
Advantages of learning and evaluation	• To learn about biochemical and molecular basis of Gestational diabetes mellitus • TO identify the new protein and molecular markers of Gestational diabetes mellitus
Further learning	Protein targeting and protein expression in Gestational

Opportunities	diabetes mellitus
Key Competencies	
Target Student	MBBS and Nursing students
Duration	
Theory Session	31 hours
Assessment Procedure	

Introduction

Gestational diabetes mellitus (GDM) is the most common medical complication of pregnancy. It is associated with maternal and neonatal adverse outcomes. Maintaining adequate blood glucose levels in GDM reduces morbidity for both mother and baby. There is a lack of uniform strategies for screening and diagnosing GDM globally. This review covers the latest update in the diagnosis and management of GDM. The initial treatment of GDM consists of diet and exercise. If these measures fail to achieve glycemic goals, insulin should be initiated. Insulin analogs are more physiological than human insulin, and are associated with less risk of hypoglycemia, and may provide better glycemic control. Insulin lispro, aspart, and detemir are approved to be used in pregnancy. Insulin glargine is not approved in pregnancy, but the existing studies did not show any contraindications. The use of oral hypoglycemic agents; glyburide and metformin seems to be safe and effective in pregnancy.

KCNJ11 gene polymorphism

The KATP is a large macromolecule complex which have four rectifying potassium channel (Kir6.x) subunits and a central pore surrounded by four regulatory sulphonylurea receptors (SUR). Inward rectifying potassium channel kir6.x contains two subunit kir6.1 and kir6.2.

Sulphonylurea receptor has three isoforms:SURA, SURB. SUR1 is found in skeletal heart, and skeletal muscle, SURB is found in smoothmuscle and many neurons, SUR1 is expressed in neuro-endocrine cells, beta-cells and neurons. KATP protein has coding gene called as KCNJ11 (or kir6.2) subunit which is located on chromosome 11p15.1. The total length of KATP protein is 3418bp, containing only a 1173bp exon. KATP protein is mostly expressed in heart, skeletal muscle, vascular smooth muscle, nerves and various endocrine tissues in human. The KCNJ11 gene belongs to potassium channel gene family. The genetic variations of KCNJ11 causes replacement of glutamic acid by lysine at 23rd position, which inturn leads to reduced insulin secretion, which can ultimately leads to T2DM and Gestational diabetes mellitus.

KCNQ1 Gene polymorphism:

KCNQ1 (Potassium voltage-gated channel KQT1-like subfamily, member 1) and is located at chromosome 11p.15.5, which has family encodes a protein for a voltage-gated potassium channel. The KCNQ1 gene has total of 17exon, spans 404kb of chromosome and it has made of 676 amino acids with trans membrane regions and encodes the pore-forming alpha subunit of the voltage-gated K+ channel (KLQT1).

KCNQ1 gene polymorphism involved in both cardiac function and diabetes mellitus. IKS(slow delayed rectifier K+ channel), which has involved in the late repolarization phase of the cardiac action potential, maintained of vascular, smooth muscle tone, cell volume, regulation, leukocyte activation and proliferation and many other physiological function. KCNQ1 genes there are two genes are responsible for the regulation of IKS. One is KCNQ1 and another one is KCNE1, most important for KCNQ1 gene involved in IKS alpha subunit and KCNE1 gene responsible for beta-unit. Here alpha-subunit has positively charged and activated by depolarization. Therefore change to negative charge within cardiac cell. This repolarization involved in the late opening of the IKS channel then regulated by

phosphorylation of signalling cascade. Therefore polymorphism (or) mutation occurring in KCNQ1/KCNE1 gene, which can disrupt IKS channel. KCNQ1/KCNE1 gene might be inhibited or delayed to transport and assembly of the IKS subunit of the cell membrane from the rough endoplasmic reticulum.

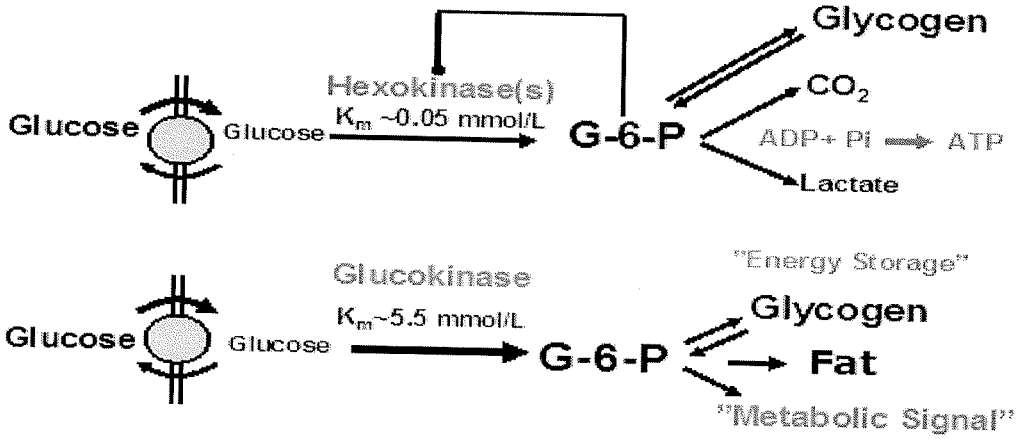
PPARgamma gene polymorphism and Gestational diabetes mellitus

Peroxisome proliferator-activated receptor contains three types namely as PPARγ, PPARβ, PPARδ. The PPARγ gene is located on chromosome 3 (10c.3p25=OMIM 601487)(191), which is contains 9 exon and spans more than 100kb. Peroxisome proliferator-activated receptor γ (PPARγ) is a nuclear hormone receptor. PPARγ has contains two isoform PPARγ1, PPARγ2 and it has 84 nucleotide and 28 aminoacids. PPARγ1 isoform expressed in adipocytes and PPARγ2 is expressed in adipocytes, vascular smooth muscle cells, macrophages, mesangial cells, and renal epithelial cells. PPARgama gene has been associated with energy metabolism, cell differentiation and the inflammatory response This Pro12Ala functional variation has been correlated with coronary heart disease (CHD), type 2 diabetes, obesity and lipid disorders, all of which are important risk for cerebrovascular disease. Some authors consider PPARγ2 gene variation to be associated with myocardial infarction, type 2 diabetes, and high insulin sensitivity, among other factors Peroxisome proliferator activity receptor gama(PPARγ) is a transcription factor with a key role in adipogenesis and insulin sensitization frequent mutations in the PPARγ gene have been described to be associated with obesity and diabetes related phenotypes. The common structural polymorphism with proline(pro) to alanine (Ala) substitution has been identified in Type2 Diabetes mellitus. An additional variant C1431T located in exon 6 of PPARγ is associated with susceptability to cardiovascular disease, leptin concentration and body mass index during pregnancy. Dynamic physiologic, metabolic and immunologic adaptations are

required to ensure fetal development and maternal wellbeing. Many of the metabolic adaptations are mediated by PPARs.

Glucose kinase gene polymorphism

The GCK gene is located at chromosome 7p15.3 and it has 12 exon splicing end and it contains 465 amino acid. This has three tissue-specific isoform present in glucosekinase gene. GCK is mainly expressed in pancreatic beta cell and hepatocyte. So it called as "pancreatic cell glucose sensor". This enzyme involved in first step of glycolysis pathway.



IGF2B2 gene polymorphism and Gestational diabetes mellitus

Insulin like growth factor 2 binding protein 2(IGF2B2) at located on the 3q27.2 chromosome and it is about 181,36 k which contains 16exon. Insulin like growth factor2 (IGF2) mRNA binding proteins (IMP1, IMP3).It has involved in RNA localization, stability, translation of RNA and mainly IGF2 plays a role in glucose homeostasis, mechanism of glucose uptake in different tissues, especially in hepatic gluconeogenesis and lipolysis pathway(201). *Dimitry A. Chistiakovet al.*, studies showed that IGF2BP2 gene involved in the regulation of IGF2 gene expression by binding of 5'-UTR of the IGF2 mRNA and it promotes to translation. *Kwok et al.*, reported that it is associated with increased risk of Gestational diabetes mellitus.

Chon et al., meta-analysis also observed IGF2BP2 gene polymorphism had increased risk of GDM. Meta-analysis studies of *Mao et al.*, report showed increased risk of diabetes mellitus and Gestational diabetes mellitus. *Chon et al.*, found polymorphism of PPARGγ2 and IGF2BP2 were associated with higher prevalence of Gestational diabetes mellitus. *Zhao et al.*, report found that rs4402960 polymorphism in IGF2BP2 is associated with and elevated risk of T2DM but these associations vary from ethnic population to other populations

Var - 2019-20

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

DEPARTMENT OF BIOCHEMISTRY (2019-2020)

S.No	Register No.	Student List	Signature
1	U19MB331	NIRMAL KUMAR B	Nirmal Kumar.
2	U19MB332	NISHANTHI V	Nishanthi.V
3	U19MB338	PAVITHRA T	Pavithra
4	U19MB336	PADMAJA T	Padmaja
5	U19MB343	PRIYADHARSHINI M	PRIYADHARSHINI
6	U19MB346	RAAJ SETHU VINAYACK R	Sethu.
7	U19MB350	RAJAGOPAL R	Rajagopal
8	U19MB347	RABYA TABASUM	Rabya Tabasum
9	U19MB345	PULAK ACHARYA	Pulak Acharya
10	U19MB334	NIVASINY P S	Nivasiny
11	U19MB340	PRADHEEP K	PRADHEEP.K
12	U19MB347	RABYA TABASUM	Rabya Tabasum
13	U19MB350	RAJAGOPAL R	Rajagopal
14	U19MB357	ROSHMASHREE S	Roshmashree
15	U19MB341	PRAKHAR GAUTAM	Gautham
16	U19MB346	RAAJ SETHU VINAYACK R	Raaj Sethu
17	U19MB347	RABYA TABASUM	Tabasum
18	U19MB355	RIYA BRUNO	Bruno
19	U19MB356	ROLLAPATI TEJESH	Rollapati Tejesh
20	U19MB357	ROSHMASHREE S	Roshmashree

SRI LAKSHMI NARAYANA INSTITITE OF MEDICAL SCIECNES

GESTATIONAL DIABETES MELLITUS

Genetic factors and diet-related behaviours are two primary determinants of diabetes but the causes of ME/CFS _____.

a. are largely psychosomatic
b. are primarily due to poor diet
c. remain a complete mystery
d. none of these

1. In _____, blood glucose homeostasis ceases to function because the beta cells of the pancreatic islets are destroyed.

a. type 1 diabetes mellitus
b. type 2 diabetes mellitus
c. gestational diabetes
d. both type 2 diabetes mellitus and gestational diabetes

2. Myalgic encephalomyelitis or chronic fatigue syndrome has also been named _____.

a. post-viral fatigue syndrome
b. systematic exertion intolerance disease
c. chronic fatigue immune dysfunction syndrome
d. all of these

4. According to the _____, ME/CFS patients are alleged to have 'unhelpful cognitions' and 'dysfunctional beliefs' that their symptoms are caused by an organic disease.

a. Impaired Belief Theory
b. Dysfunctional Belief Theory
c. Maladjusted Belief Theory
d. Inhibited Belief Theory

5. The estimated number of people in the US that have diabetes (diagnosed or undiagnosed) is

a. 22 million

b.650,000

c. 16 million

d. 8.5 million

6. The new classification of diabetes is based on

a. etiology

b. type of treatment

C. type of insulin

d. age of onset

7. Type 2 diabetes is characterized by

a. insulin resistance

b. insulin lack

C. beta cell destruction

d. none of the above

8. The hormone that is secreted by the alpha cells of the pancreas that raises blood glucose when levels are low is:

a. glucagon

b. epinephrine

C. insulin

d. cortisol

9. Type 2 diabetes typically is diagnosed at a young age.

a. True

b. False

10. The renal threshhold for glucose is _____ mg/dl.

a. 180

b. 120

c. 200

d. 140

SRI LAKSHMI NARAYANA INSTITITE OF MEDICAL SCIECNES

GESTATIONAL DIABETES MELLITUS

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b. False

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a. 180

b. 120

c. 200

d. 140

Annexure- V

Course feedback form

Course title: Date :

Course code:

Department: BIOCHEMISTRY

S.no	Design of the course	1	2	3	4	5
1	The objective of the course clear to you	✓				
2	The course contents met with your expectations	✓				
3	The lecture sequence were well planned	✓				
4	The lectures were clear and easy to understand	✓				
5	The audiovisual teaching aids were effectively used	✓	✓			
6	The instructor's encouraged interaction and was it helpful		✓			
7	The contents were illustrated with examples		✓			
8	Overall Rating of the course	✓				

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

— Excellent —

Signature

Annexure- V

Course feedback form

Course title: Date :

Course code:

Department: BIOCHEMISTRY

S.no	Design of the course	1	2	3	4	5
1	The objective of the course clear to you		✓			
2	The course contents met with your expectations		✓			
3	The lecture sequence were well planned	✓				
4	The lectures were clear and easy to understand		✓			
5	The audiovisual teaching aids were effectively used		✓			
6	The instructor's encouraged interaction and was it helpful		✓			
7	The contents were illustrated with examples	✓				
8	Overall Rating of the course		✓			

*** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory**

Suggestions if any:

– Excellent –

Signature

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SHALINI R as actively participated in the Value Added Course on **OVER VIEW OF MOLECULAR MECHANISM OF GESTATIONAL DIABETES MELLITUS** held during April 2019 – May 2020 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Kajalakshmy

RESOURCE PERSON

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502.

Dr. Jansi Rani

COORDINATOR

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SAI RAKSHIKA J as actively participated in the Value Added Course on **OVER VIEW OF MOLECULAR MECHANISM OF GESTATIONAL DIABETES MELLITUS** held during April 2019 – May 2020 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Kajalakshmy

RESOURCE PERSON

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY

Dr. Jansi Rani

COORDINATOR

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502



Date: 09.09.2019

From

Dr. Jansi Rani

Professor and Head,
Department of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course:

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Molecular basis of Gestational diabetes mellitus** We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. Jansi Rani

Encl: Certificates

Photographs

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Osudu, Agaram Village, Villianur commune, Kuduppakkam Post, Pudhucherry-605 502

Date: 07/01/2019

From

Dr. Somashekar I Tolanur
Professor and Head,
Department of Anatomy,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry-2.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry-2.

Sub: Permission to conduct value-added course: Plastination – reg.

Dear Madam,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Plastination for 1st MBBS students of 2018-2019 batch. We solicit your kind permission for the same.

Kind Regards,

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village, Pondicherry-605 507

FOR THE USE OF DEAN'S OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. Jayalakshmi. G**
The HOD: **Dr. Somashekar I Tolanur**
The Expert: **Dr. S Shanthini**

The committee has discussed about the course and is approved.

Dean
(Sign & Seal)

Subject Expert
(Sign & Seal)

HOD
(Sign & Seal)

Dr. G. JAYALAKSHMI, BSC., MBBS, DTCD, M.D.
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kuduppakkam Post,
Villianur Commune, Puducherry - 605502

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village, Pondicherry-605 507

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

18.01.2019

Sub: Organizing Value-added Course on "Plastination" – Reg.

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry affiliated to Bharath Institute of Higher Education and Research University is organizing a value added course on "Plastination" during March 2019 for Ist year M.B.B.S students (2018 – 2019 Batch). The course content for the same is enclosed below."

Dean
(Dr.G Jayalakshmi)

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Encl: Copy of course content

COURSE CONTENT

Particulars	Description
Course Title	Plastination
Course Code	AN101
Topics	1. Introduction to plastination 2. History of Plastination 3. Plastination exhibitions 4. Whole body/organ plastination 5. Luminal cast plastination 6. Sheet plastination 7. Principles of plastination 8. Plastination technique steps 9. Fixation 10. Dehydration 11. Forced impregnation of polymer in a vacuum 12. Positioning 13. Curing 14. Video demonstration of plastination technique 15. Advantages & applications in medical field
Further learning opportunities	Clinical application of plastination in medical field
Key Competencies	On successful completion of the course the students will have better understanding of complex human anatomical structures which helps in better learning & understanding of anatomy
Target Student	1st MBBS Students
Duration	30hrs, March 2019
Theory Session	28 hrs
Practical Session	2hrs
Assessment Procedure	Short answer questions

Course Proposal

Course Title:

Plastination

Course Objective:

1. Introduce the students to plastinates
2. To learn complex anatomical structures with better understanding & orientation

Course Outcome:

Knowledge on 3d oriented anatomical structures for easy learning & understanding

Course Audience: 1st year MBBS

Course Coordinator: Dr.Somashekar I Tolanur

Course Faculties with Qualification and Designation:

1. Dr. Vijisha Phalgunan, M.B.B.S., M.D, Professor/Anatomy
2. Dr. S Shanthini, M.B.B.S, M.D, Assistant Professor/Anatomy
3. Dr. B Anitha, M.B.B.S, M.D, Assistant Professor/Anatomy

Course Curriculum/subtopics with schedule (30 hours)

Sl.No	Date	Topic	Time	Hours	Faculty Name
1.	4.03.2019	Introduction to plastination	4-6p.m	2	Dr S Shanthini
2.	5.03.2019	History of Plastination	4-6p.m	2	Dr. Vijisha
3.	7.03.2019	Plastination exhibitions	4-6p.m	2	Dr. B Anitha
4.	9.03.2019	Whole body/organ plastination	2-4p.m	2	Dr.S Shanthini
5.	12.03.2019	Luminal cast plastination	4-6p.m	2	Dr. Vijisha
6.	14.03.2019	Sheet plastination	4-6p.m	2	Dr. B Anitha
7.	16.03.2019	Principles of plastination	2-4p.m	2	Dr. S Shanthini
8.	18.03.2019	Plastination technique steps	4-6p.m	2	Dr. Vijisha
9.	20.03.2019	Fixation	4-6p.m	2	Dr. B Anitha
10.	22.03.2019	Dehydration	4-6p.m	2	Dr. Vijisha
11.	23.03.2019	Forced impregnation of polymer in a vacuum	2-4p.m	2	Dr. B Anitha
12.	25.03.2019	Positioning	4-6p.m	2	Dr. S Shanthini

13.	27.03.2019	Curing	4-6p.m	2	Dr. B Anitha
14.	29.03.2019	Video demonstration of plastination technique	4-6p.m	2	Dr. B Vijisha
15.	30.03.2019	Advantages & applications in medical field	2-4p.m	2	Dr. S Shanthini
			Total Hours	30	

REFERENCE BOOKS/ARTICLES:

1. Ye, Z., Dun, A., Jiang, H. *et al.* The role of 3D printed models in the teaching of human anatomy: a systematic review and meta-analysis. *BMC Med Educ* 20, 335 (2020). https://doi.org/10.1186/s12909-020-02242-x.
2. Sharma SGS. 3D printing and its future in medical world. J Med Res Innov. 2019;3(1):e000141.
3. Garas M, M V, G N, K M-D, J H. 3D-Printed specimens as a valuable tool in anatomy education: A pilot study. Ann Anat. 2018;219:57–64.
4. Mogali SR, WY Y, HKJ T, GJS T, PH A, N Z, N L-B, MA F. Evaluation by medical students of the educational value of multi-material and multicolored three-dimensional printed models of the upper limb for anatomical education. Anat Sci Educ. 2018;11(1):54–64.
5. M V, V P. 3D printing: a valuable resource in human anatomy education. Anat Sci Int. 2015;90(1):64–5.
6. AbouHashem Y, Dayal M, Savanah S, Strkalj G. The application of 3D printing in anatomy education. Med Educ Online. 2015;20.
7. McMenamin PG, MR Q, CR M, JW A. The production of anatomical teaching resources using three-dimensional (3D) printing technology. Anat Sci Educ. 2014;7(6):479–86.

VALUE ADDED COURSE

1. Name of the programme & Code

Plastination (code - AN101)

2. Duration & Period

30 hrs & March 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short Answer Questions - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time (March 2019)

8. Year of Discontinuation: 2020

9. Summary report of each program year-wise

Value Added Courses – March 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1.	AN101	Plastination	Dr. S Shanthini Dr.Vijisha Phalgunan Dr. B Anitha	1st MBBS (2018 – 2019 Batch)	20 / March 2019

9. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

1. (Dr.S Shanthini)

2. (Dr.Vijisha Phalgunan)

3. (Dr. B Anitha)

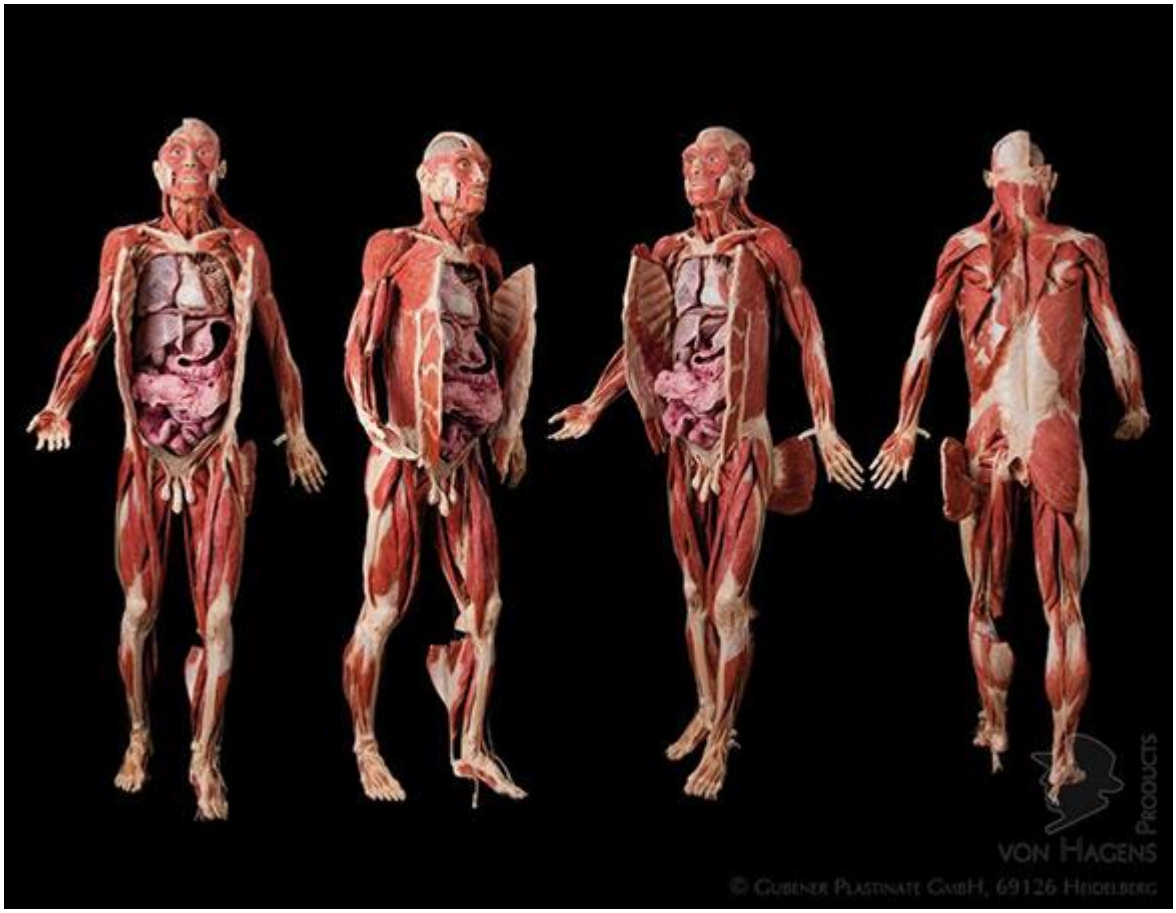
COORDINATOR

(Dr.Somashekar I Tolanur)

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village,Pondicherry-605 502

Annexure 1

PLASTINATION



PARTICIPANT HAND BOOK

BIHER SLIMS

COURSE DETAILS

Particulars	Description
Course Title	Plastination
Course Code	AN101
Objective	1. Introduction to plastination 2. History of Plastination 3. Plastination exhibitions 4. Whole body/organ plastination 5. Luminal cast plastination 6. Sheet plastination 7. Principles of plastination 8. Plastination technique steps 9. Fixation 10. Dehydration 11. Forced impregnation of polymer in a vacuum 12. Positioning 13. Curing 14. Video demonstration of plastination technique 15. Advantages & applications in medical field
Key Competencies	On successful completion of the course the students will have better understanding of complex human anatomical structures which helps in better learning & understanding of anatomy
Target Student	1st MBBS Students
Duration	30hrs March 2019 & April 2019
Theory Session	28 hrs
Practical Session	2hrs
Assessment Procedure	Short answer questions

Introduction:

Plastination is a technique or process used in anatomy to preserve bodies or body parts, first developed by Gunther_von_Hagens in 1977. The water and fat are replaced by certain plastics, yielding specimens that can be touched, do not smell or decay, and even retain most properties of the original sample

Plastination is a process of tissue preservation by embedding tissues with synthetic materials, (silicone polymers and epoxy resins) to produce dry, durable, handy and natural looking specimens (whole body or its parts). Its an unique tool for teaching of anatomy, pathology, radiology and surgery

History:

In November 1979, Gunther_von_Hagens applied for a German patent, proposing the idea of preserving animal and vegetable tissues permanently by synthetic resin impregnation. Since then, von Hagens has applied for further US patents regarding work on preserving biological tissues with polymers. With the success of his patents, von Hagens went on to form the Institute for Plastination in Heidelberg, Germany in 1993. The Institute for Plastination, along with von Hagens, made their first showing of plastinated bodies in Japan in 1995, which drew more than three million visitors. The institute maintains three international centres of plastination, in Germany, Kyrgyzstan, and China.



Gunther Von Hagens

Other methods have been in place for thousands of years to halt the decomposition of the body. Mummification used by the ancient Egyptians is a widely known method which involves the removal of body fluid and wrapping the body in linens. Prior to mummification, Egyptians would lay the body in a shallow pit in the desert and allow the sun to dehydrate the body. Formalin, an important solution to body preservation, was introduced in 1896 to help with body preservation. Soon to follow formalin, color-preserving embalming solutions were developed to preserve lifelike color and flexibility to aid in the study of the body.

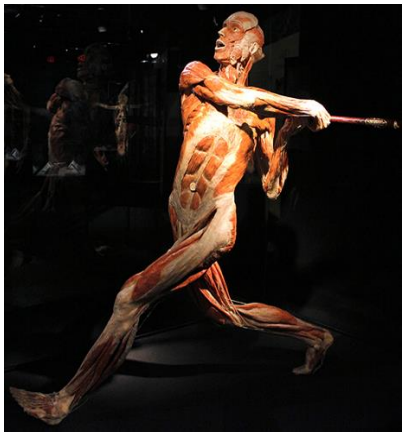
Paraffin impregnation was introduced in 1925, and the embedding of organs in plastic was developed in the 1960s. Body preservation methods current to the 21st century are cryopreservation, which involves the cooling of the body to very low temperatures to preserve the body tissues, plastination, and embalming.

Other methods used in modern times include the Silicone S 10 Standard Procedure, the Cor-Tech Room temperature procedure, the Epoxy E 12 procedure, and the Polyester P 35 (P 40) procedure. The Silicone S 10 is the procedure most often used in plastination and creates opaque, natural-looking specimen. Dow Corning Corporation's Cor-Tech Room Temperature Procedure is designed to allow plastination of specimen at room temperature to various degrees of flexibility using three combinations of polymer, crosslinker, and catalyst. According to the International Society for Plastination, the Epoxy E 12 procedure is used "for thin, transparent, and firm body and organ slices", while the Polyster P 35 (P 40) preserves "semitransparent and firm brain slices". Samples are prepared for fixation through the first method by deep freezing, while the second method works best following 4–6 weeks of preparation in a formaldehyde mixture.

Plastination Exhibitions:

For the first 20 years, plastination was used to preserve small specimens for medical study. In the early 1990s, the equipment was developed to make plastinating whole body specimens possible, each specimen taking up to 1,500-man-hours to prepare. The first exhibition of whole bodies was displayed by von Hagens in Japan in 1995.

Over the next two years, Von Hagens developed the *Körperwelten* (**Body Worlds)** public exhibitions, showing whole bodies plastinated in lifelike poses and dissected to show various structures and systems of human anatomy. The earliest exhibitions were presented in the Far East and in Germany, and Gunther von Hagens' exhibitions have subsequently been hosted by museums and venues in more than 50 cities worldwide, attracting more than 29 million visitors.





Gunther von Hagens' Body Worlds exhibitions are the original, precedent-setting public anatomical exhibitions of real human bodies, and the only anatomical exhibits that use donated bodies, willed by donors to the Institute for Plastination for the express purpose of serving the Body Worlds mission to educate the public about health and anatomy. To date, more than 10,000 people have agreed to donate their bodies to Institute for Plastination.

In 2004, Premier Exhibitions began their "Bodies Revealed" exhibition in Blackpool, England, which ran from August through October 2004. In 2005 and 2006, the company opened their "Bodies Revealed" and "Bodies...The Exhibition" in Seoul, Tampa, and New York City. The West Coast exhibition site opened on 22 June 2006 at the Tropicana Resort and Casino Las Vegas. As of June 2009, BODIES... The Exhibition is showing at the Ambassador Theatre (Dublin) in Dublin, Ireland. The exhibition was in Istanbul, Turkey, until the end of March 2011.





Plastination galleries are offered in several college medical schools, including the University of Michigan (said to possess the nation's largest such lab), Vienna University, and the JSS Medical College. Gunther von Hagens maintains a permanent exhibition of plastinates and plastination at the Plastinarium in Guben, Germany.

Types of Plastination:

Three **types of plastination** namely:

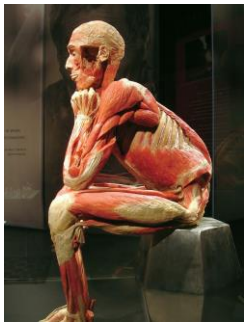
Whole body/organ plastination

Luminal cast **plastination**

Sheet **plastination**.

Whole body plastination:

Silicon (S10) and polypropylene resins are used. Total structure and relationships of an organ/body are preserved



Luminal Cast Plastination:

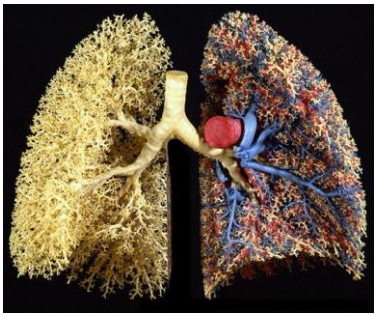
For Hollow organs like

Lungs

stomach & intestine

ventricles of brain

vascular pattern of heart and kidneys





Sheet Plastination:

Thin transparent or thick opaque sections of body or an organ is made.

Display cross sectional anatomy

Comparable to CT or MRI scan sections.

Polymers such as epoxy (E12), polyester (P35) or polypropylene (araldite) resins are used





Principles of Plastination:

Decomposition must be halted

Water & fat must be replaced by polymers

Two stages:

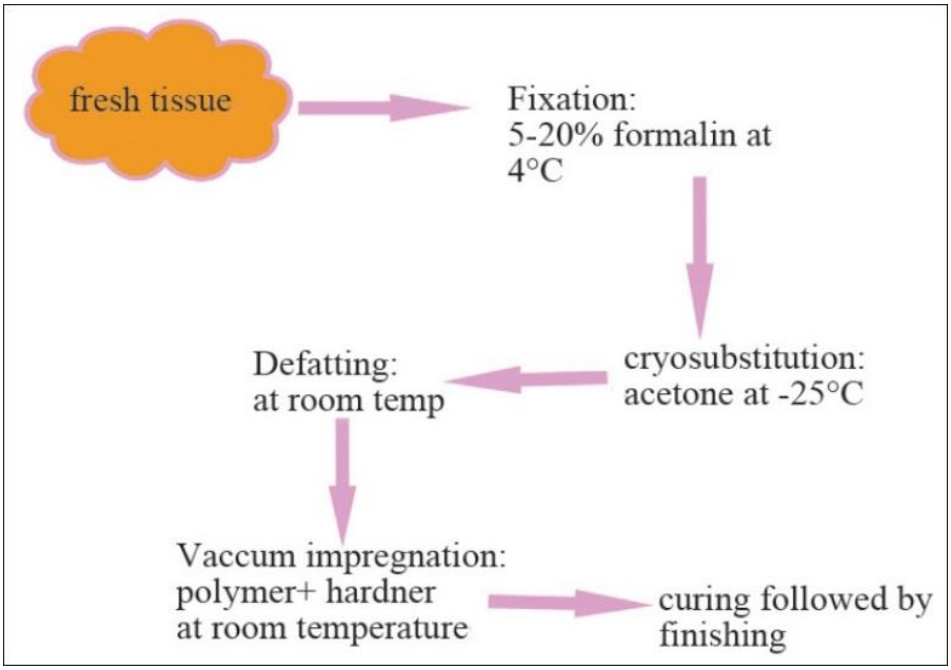
1. Fluid exchange –water & fatty tissue are replaced by acetone
2. Forced vacuum impregnation – Acetone is replaced with a polymer solution

Polymer used should be reactive, low viscosity, with suitable mechanical and optical properties like resist yellowing, suitable for grinding, with suitable refractive index. Compatible with human tissues

Plastination Technique steps:

Four steps are used in the standard process of plastination: fixation, dehydration, forced impregnation in a vacuum, and hardening. Water and lipid tissues are replaced by curable polymers, which include silicone, epoxy, and polyester-copolymer.

The first step of plastination, fixation, frequently uses a formaldehyde-based solution, and serves two functions. Dissecting the specimen to show specific anatomical elements can be time-consuming. Formaldehyde or other preserving solutions help prevent decomposition of the tissues. They may also confer a degree of rigidity. This can be beneficial in maintaining the shape or arrangement of a specimen. A stomach might be inflated or a leg bent at the knee.



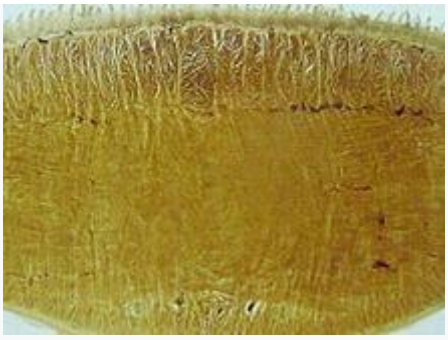
After any necessary dissections have taken place, the specimen is placed in a bath of acetone (freezing point −95 °C [-139 °F]) at −20° to −30 °C (−4 to −22 °F). The volume of the bath should be 10 times that of the specimen. The acetone is renewed two times over the course of six weeks. The acetone draws out all the water and replaces it inside the cells.

In the third step, the specimen is then placed in a bath of liquid polymer, such as silicone rubber, polyester, or epoxy resin. By creating a vacuum, the acetone is made to boil at a low temperature. As the acetone vaporizes and leaves the cells, it draws the liquid polymer in behind it, leaving a cell filled with liquid plastic. The plastic must then be cured with gas, heat, or ultraviolet light, to harden it.

A specimen can vary from a full human body to a small piece of an animal organ, and they are known as 'plastinates'. Once plastinated, the specimens and bodies are further manipulated and positioned prior to curing (hardening) of the polymer chains.

Advantages and applications of Plastination:

Plastination is useful in anatomy, serving as models and teaching tools. It is used at more than 40 medical and dental schools throughout the world as an adjunct to anatomical dissection.



Histological section of bovine tongue, epoxy technique

Students enrolled in introductory animal science courses at many universities learn animal science through collections of multispecies large-animal specimens. Plastination allows students to have hands-on experience in this field, without exposure to chemicals such as formalin. For example, plastinated canine gastrointestinal tracts are used to help in the teaching of endoscopic technique and anatomy. The plastinated specimens retain their dilated conformation by a positive pressure air flow during the curing process, which allows them to be used to teach both endoscopic technique and gastrointestinal anatomy.

With the use of plastination as a teaching method of animal science, fewer animals have to be killed for research, as the plastination process allows specimens to be studied for a long time. TTT sheet plastinates for school teaching and lay instruction provide a thorough impression of the complexity of an animal body in just one specimen.



TTT sheet plastinate of a fish

North Carolina State University's College of Veterinary Medicine in Raleigh, North Carolina, uses both plastic coating (PC) and plastination (PN) to investigate and compare the difference in the two methods. The PC method was simple and inexpensive, but the PN specimens were more flexible, durable, and lifelike than those preserved by the PC method. The use of plastination allowed the use of many body parts such as muscle, nerves, bones, ligaments, and central nervous system to be preserved.

The University of Texas Health Science Center at San Antonio was the first school in the United States to use this technique to prepare gross organ specimens for use in teaching. The New York University College of Dentistry, Philadelphia College of Osteopathic Medicine, University of Warwick, and University of Northumbria use collections of plastinates as teaching aids. The University of Vienna and the University of Sheffield have their own plastination laboratories.

References:

- von Hagens, Gunther (March 1986). Heidelberg plastination folder: collection of technical leaflets of plastination. Heidelberg: Biodur Products. OCLC 256499636. First published as von Hagens, Gunther (1985). Heidelberger Plastinationshefter Sammlung von Merkblättern zur Plastination (in German). Heidelberg: University of Heidelberg. OCLC 174501422.
- von Hagens, Gunther; Klaus Tiedemann; Wilhelm Kriz (March 1987). "The current potential of plastination". Anatomy and Embryology. **175** (4): 411–21.
- Heildelberg plastination folder

Annexure II

VALUE ADDED COURSE

Plastination (code - AN101)

List of students Enrolled – March 2019

Sl. No.	Registration Number	Name of the Student	Signature
1.	U18MB271	AYUSH JAISWAL	
2.	U18MB272	BANDHAM SANKEERTHANA	
3.	U18MB273	BORIS NAMBAM	
4.	U18MB274	BUCHHAMMAGARI SOURABH REDDY	
5.	U18MB275	CHARAN VARMA C.A	
6.	U18MB276	CHARU SAI	
7.	U18MB277	CHINKA SARAN SAI	
8.	U18MB278	CUTPIECEWALA ALIASGAR MOHAMMED	
9.	U18MB279	DATTATREYA BHATTACHARJEE	
10.	U18MB280	DEBOPRIYA DEY	
11.	U18MB281	DEVARAPALLI SAI TEJASWINI	
12.	U18MB282	DHANUSHA S	
13.	U18MB283	DHARANEESHWARAN .S	
14.	U18MB284	DHISHVANTH DHEEPAK A.N	
15.	U18MB285	DHYAN DAVID S.V	
16.	U18MB286	DISHA SHEORAN	
17.	U18MB287	DODIYA RAJANSINH KAMALSINH	
18.	U18MB288	DONNIE OLIVIA H	
19.	U18MB289	EASWAR B	
20.	U18MB290	ELDHO BABU	

RESOURCE PERSONS

1.
2.
3.

COORDINATOR

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village, Pondicherry-605 502

Annexure III

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

VALUE ADDED COURSES

Plastination

Course Code: AN101

I. ANSWER ALL THE QUESTIONS (2 x 5 = 10 marks) **Duration – 30 minutes**

a. What is plastination?

b. Mention the types of plastination with examples

c. Lists the chemicals used to prepare plastinated specimens

d. Mention the technical steps involved in plastination

e. Enumerate the uses of plastinated specimens

1/4/2019 Value added course — plastination Dhiswanth U18MB284.

8/10

2/4/2019.

1. What is plastination?

Plastination is a process of preserving tissue by embedding them with synthetic materials namely silicone & epoxy resins to produce a dry, durable, natural looking anatomical specimens. It can a whole body or its parts.

2

2. Mention the types of plastination with example?

— plastination is of 3 types:-

a) Whole body/organ — ex limbs.

b) Sheet plastination — ex. cross sections of brain & limbs.

c) Luminal cast nn → ex vascular pattern of heart, lung, kidney

2

3. List the chemicals used to prepare plastinated specimens?

Acetone & silicone polymers.

1

4. Mention the techinical steps in plastination?

→ They are of 4 steps namely Fixation, Dehydration, Forced impregnation in a vacuum & Hardening.

2

01.04.2019

VALUE ADDED COURSE - PLASTINATION

Bandham Sankeerthna

U1EMB272

7½/10

1. What is plastination?

Plastination is a process of tissue preservation by embedding tissues with synthetic materials, (silicone polymers and epoxy resins) to produce dry, durable, handy and natural looking specimens (whole body or its parts).

2. Mention types of plastination with examples?

Whole body / organ plastination - Upper limb, lower limb, whole body

Luminal cast plastination - Lungs, vascular pattern of heart & kidney

Sheet plastination - cross section of limbs, brain

3. List the chemicals used to prepare plastinated specimens?

Acetone and polymers like silicon.

4. Mention the technical steps involved in plastination?

Fixation - formaldehyde based solution (5-20% formalin at 4°C) are used which helps to prevent decomposition of the tissues. They may also confer a degree of rigidity.

Dehydration - specimen is placed in a bath of acetone (freezing point −95°C) at −20° to −30°C. Acetone draws out all the water and replaces it inside the cells.

Forced impregnation in a vacuum :- Specimen is then placed in a bath of liquid polymer. Such as silicone rubber, polyster or epoxy resin. By creating a vacuum, the acetone is boiled, vaporizes and leaves cell filled with liquid plastic.

Annexure IV

Student Feedback Form

Course Name: Plastination

Subject Code: AN101

Name of Student: CHARU SAI **Roll No.:** U18MB276

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance:

Sl. No.	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5 ✓

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

VERY INFORMATIVE SESSION.

Charu Sai

Signature of Student

Date: 30/3/2019.

Annexure IV

Student Feedback Form

Course Name: Plastination

Subject Code: AN101

Name of Student: Dharaneeshwaran.S **Roll No.:** 18MB283.

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance:

Sl. No.	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5 ✓

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Excellent sessions..!

Signature of Student
Date: 30/3/2019.

Date: 03-04-2019

From

Dr. Somashekar I Tolanur
Professor and Head,
Department of Anatomy,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry - 2.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry - 2.

Sub: Completion of value-added course: Plastination – Reg.

Dear Sir,

With reference to the subject mentioned above, the Department of Anatomy has conducted the value-added course on **Plastination** during March 2019 for 1st year MBBS Students (2018-2019 Batch). We solicit your kind action to send certificates for the participants whose list is attached with this letter. Also I am attaching the photographs captured during the conduct of the course.

Kind Regards,

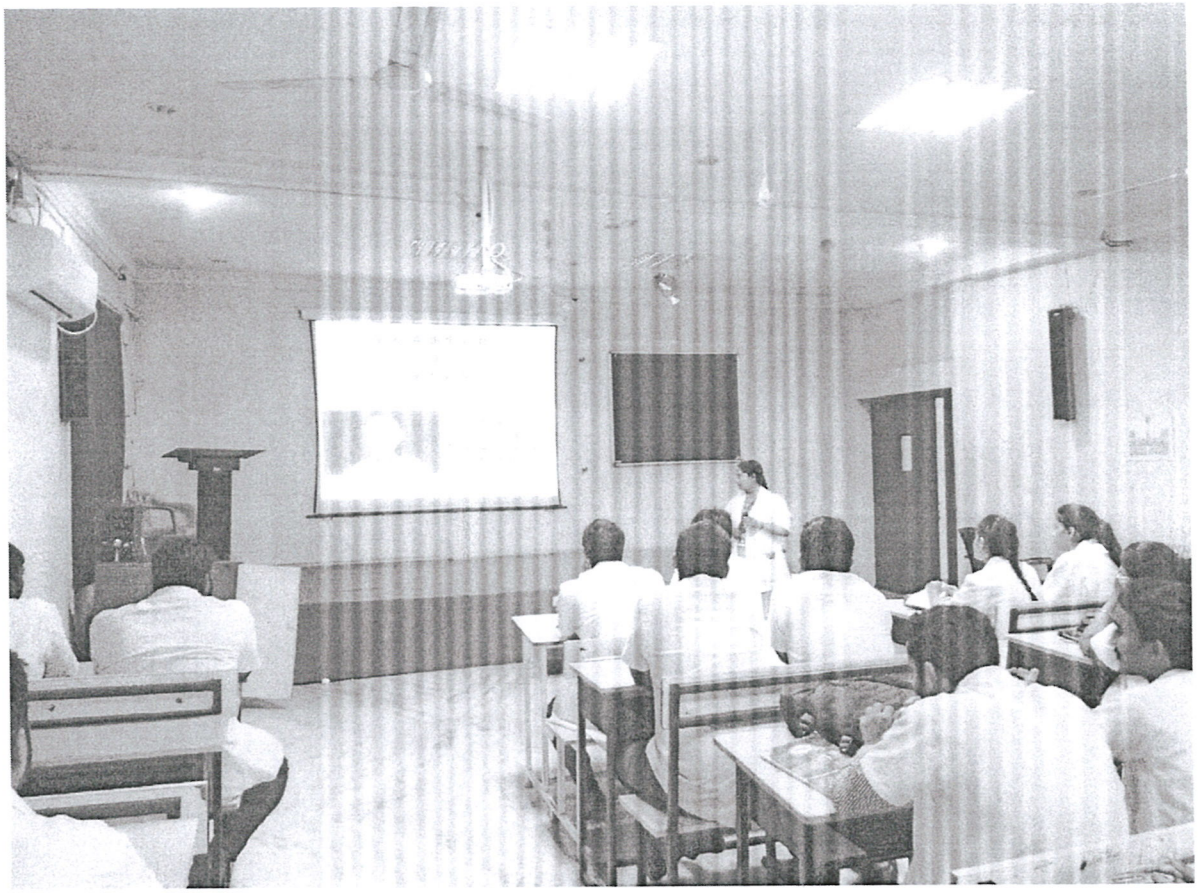
PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
Jeudu Agaram Village, Pondicherry-605 502

Encl: Participants List

Photograph

LIST OF PARTICIPANTS

Sl. No.	Registration Number	Name of the Student
1	U18MB271	AYUSH JAISWAL
2	U18MB272	BANDHAM SANKEERTHANA
3	U18MB273	BORIS NAMBAM
4	U18MB274	BUCHHAMMAGARI SOURABH REDDY
5	U18MB275	CHARAN VARMA C.A
6	U18MB276	CHARU SAI
7	U18MB277	CHINKA SARAN SAI
8	U18MB278	CUTPIECEWALA ALIASGAR MOHAMMED
9	U18MB279	DATTATREYA BHATTACHARJEE
10	U18MB280	DEBOPRIYA DEY
11	U18MB281	DEVARAPALLI SAI TEJASWINI
12	U18MB282	DHANUSHA S
13	U18MB283	DHARANEESHWARAN .S
14	U18MB284	DHISHVANTH DHEEPAK A.N
15	U18MB285	DHYAN DAVID S.V
16	U18MB286	DISHA SHEORAN
17	U18MB287	DODIYA RAJANSINH KAMALSINH
18	U18MB288	DONNIE OLIVIA H
19	U18MB289	EASWAR B
20	U18MB290	ELDHO BABU



Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that **CHARAN VARMA C.A** has actively participated in the Value Added Course on **Plastination** held during March 2019 Organized by Department of Anatomy, Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. S Shanthini **Resource person**	**Dr. B Anitha** **Resource person**	**Dr. Vijisha Phalgunan** **Resource person**	**Dr. Somasekar I Tolanur** **Co-ordinator**	**Dr. G Jayalakshmi** **Dean**

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village, Pondicherry-605 502

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that **DHANUSHA S** has actively participated in the Value Added Course on **Plastination** held during March 2019 Organized by Department of Anatomy, Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. S Shanthini **Resource person**	**Dr. B Anitha** **Resource person**	**Dr. Vijisha Phalgunan** **Resource person**	**Dr. Somasekar I Tolanur** **Co-ordinator**	**Dr. G Jayalakshmi** **Dean**

PROF & HOD OF ANATOMY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu Agaram Village, Pondicherry-605 502

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Sri Lakshmi Narayana Institute of Medical sciences

Date-20-02-19

From
Dr. K. Harsha Vardhan
Professor and Head,
Department of dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Psoriasis

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Psoriasis on 20-03-2019. We solicit your kind permission for the same.

Kind Regards

Dr. K. Harsha Vardhan

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. K. Harsha Vardhan

The Expert: Dr. A. Buvanaratchagan

The committee has discussed about the course and is approved.

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Dean | Subject Expert | HOD

Sri Lakshmi Narayana Institute of Medical sciences

Date-20-02-19

From
Dr. K. Harsha Vardhan
Professor and Head,
Department of dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Psoriasis

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Psoriasis on 20-03-2019. We solicit your kind permission for the same.

Kind Regards

Dr. K. Harsha Vardhan

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. K. Harsha Vardhan

The Expert: Dr. A. Buvanaratchagan

The committee has discussed about the course and is approved.

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.
Dean

Dr. A. BUVANARATCHAGAN, MD.,
Reg. No: 37150
Asso. Professor, Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.
Subject Expert

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY.
HOD

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OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

27.02.2019

Sub: Organising Value-added Course: Psoriasis(March 2019 – June – 2019)

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Psoriasis"**. The course content is enclosed below."

The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 13-03-2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

DEAN

Encl: Copy of Course content

Course Proposal

Course Title: **Psoriasis**
Course Objective: **To explain about pathogenesis and clinical picture of psoriasis**
Course Outcome: **Completed**
Course Audience: 2nd year mbbs students
Course Coordinator: Dr. K. Harsha Vardhan
Course Faculties with Qualification and Designation:

1 . Dr. K. Harsha Vardhan
Professor ,Department of Dermatology
2. Dr. Buvanaratchagan
Associate Professor ,Department of Dermatology

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours	Lecture taken by
1	20-3-19	Introduction	4 to 6 pm	2 hours	Dr. K. Harsha Vardhan
2	24-3-19	Pathogenesis	5 to 7 pm	2 hours	Dr. Buvanaratchagan
3	27-3-19	Predisposing factors	4:30 to 6:30 pm	2 hours	Dr. K. Harsha Vardhan
4	30-3- 19	Etiology	4 to 6 pm	2 hours	Dr. Buvanaratchagan
5	2-4-19	Triggers	5 to 7 pm	2 hours	Dr. K. Harsha Vardhan
6	7-4-19	Clinical features	5 to 7 pm	2 hours	Dr. Buvanaratchagan
7	14-4-19	Complications	4:30 to 6:30 pm	2 hours	Dr. K. Harsha Vardhan
8	17-4-19	Investigation	4 to 6 pm	2 hours	Dr. Buvanaratchagan
9	20-4-19	General care	5 to 7 pm	2 hours	Dr. K. Harsha Vardhan
10	21-4-19	Topical therapy	4:30 to 6:30 pm	2 hours	Dr. Buvanaratchagan
11	24-4-19	Systemic therapy	4 to 6 pm	2 hours	Dr. K. Harsha Vardhan
12	29-4-19	Newer treatments	5 to 7 pm	2 hours	Dr. Buvanaratchagan
13	29-4-19	Physical modalities	4 to 6 pm	2 hours	Dr. K. Harsha Vardhan
14	4-5-19	Case discussion	4:30 to 6:30 pm	2 hours	Dr. Buvanaratchagan
15	13-5-19	Q&A, mcqs	4:30 to 6:30 pm	2 hours	Dr. K. Harsha Vardhan
			Total Hours	30	

REFERENCE BOOKS:

Rooks Textbook of dermatology 9th edition

Fitzpatrick 's dermatology in general medicine 8th edition

ABSTRACT-VALUE ADDED COURSE

1. Name of the programme &

Psoriasis and DR10

2. Duration & Period

30 hrs & March 2019 to june 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Course Feed Back

Enclosed as Annexure- IV

7. No. of times offered during the same

March 2019 to june 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- March 2019 - june 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	DR10	**Psoriasis**	Dr. Buvanaratchagan	2nd year MBBS	15 (March 2019 -june 2019)

10. Certificate model

Enclosed as Annexure- V

Dr. Buvanaratchagan

RESOURCE PERSON

Dr. K. Harsha Vardhan

COORDINATOR

ABSTRACT-VALUE ADDED COURSE

1. Name of the programme &

Psoriasis and DR10

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6. Course Feed Back

Enclosed as Annexure- IV

7. No. of times offered during the same

March 2019 to june 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- March 2019 - june 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Yea**
1	DR10	**Psoriasis**	Dr. Buvanaratchagan	2nd year MBBS	15 (March 201 -june 2019)

10. Certificate model

Enclosed as Annexure- V

Dr. Buvanaratchagan

RESOURCE PERSON

Dr. A. BUVANARATCHAGAN, MD.,
Reg. No: 37150
Asso. Professor, Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. K. Harsha Vardhan

COORDINATOR

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

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ANNEXURE-1

PSORIASIS OVERVIEW



PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	Psoriasis overview
Course Code	DR10
Objective	1. To learn about the clinical features 2. To learn about the diagnosis 3. To learn about the treatment
Further learning opportunities	Recent advances in management
Key Competencies	To make a diagnosis and provide adequate treatment
Target Student	2nd year MBBS Students
Duration	30hrs march 2019 to June 2019
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Multiple choice questions

INTRODUCTION

Psoriasis is a non-contagious inflammatory disease. The main symptoms are reddish, scaly patches of skin that may itch.

It is a chronic condition that is typically associated with periods of more severe skin problems (flare-ups) followed by periods of milder skin problems or none at all. Various treatments can relieve the symptoms, but there is no cure for psoriasis.

Its severity can vary quite a lot. In some people it is bothersome more than anything else, and they can cope with it quite well. Others feel that it has a major effect on their quality of life, since the treatment and skin care can take a long time. Many people are also unhappy about having visible reddened and scaly skin patches – especially if they are on exposed areas of their body.

Sometimes the inflammation that is causing the psoriasis affects other parts of the body too, such as the joints or nails.

Symptoms

Plaque psoriasis (psoriasis vulgaris)

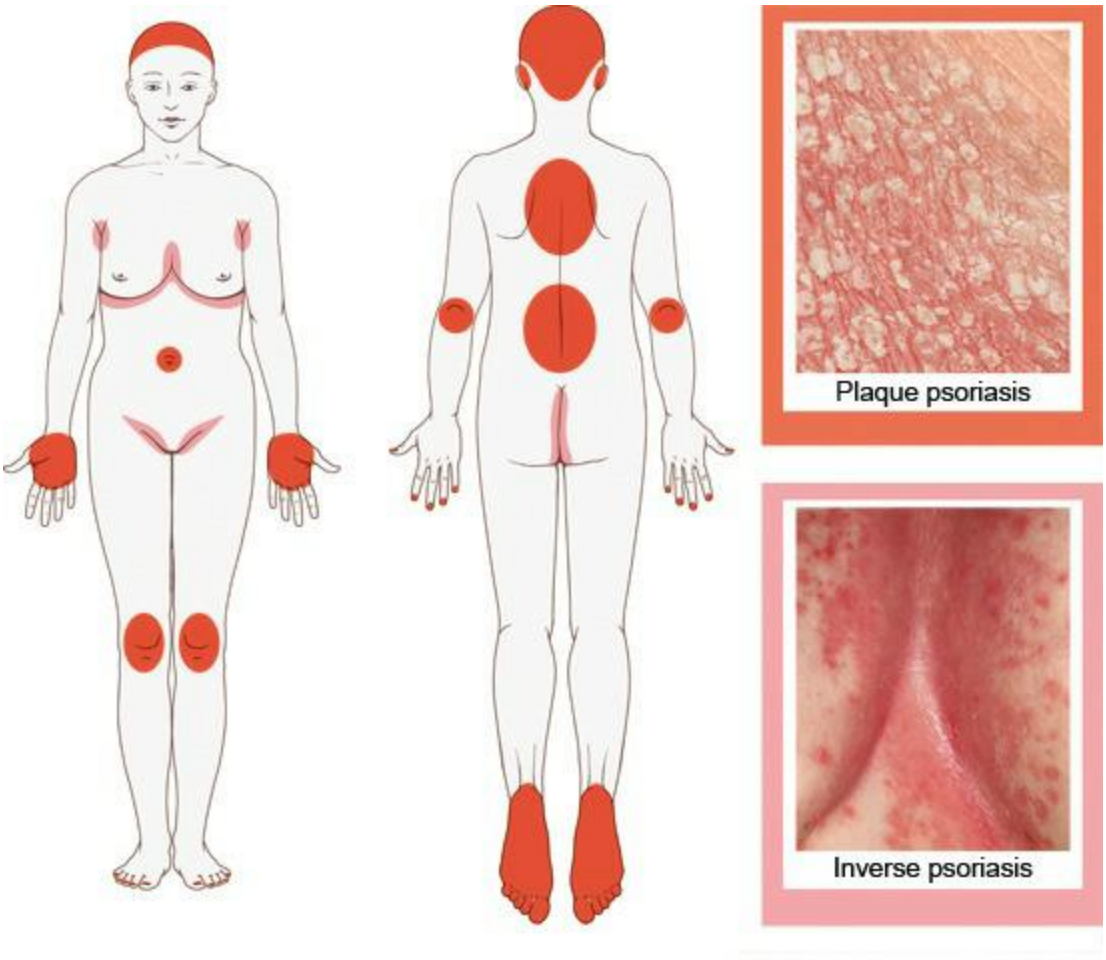
There are different kinds of psoriasis. The most common is plaque psoriasis. This condition is associated with clearly defined areas of slightly raised red patches with silvery, flaky skin. The patches of skin are referred to as "plaques," which is why it is called "plaque psoriasis." The plaques often develop symmetrically on both sides of the body, for example on both the left and right knee. They usually itch as well. The skin is often irritated from scratching, and it may be damaged.

The size of the plaques varies greatly, ranging from anywhere between one and more than ten centimeters in diameter. Some people have only a few plaques on certain parts of their body, for example only on their scalp. Others may have more, either on one part of their body or in several places.

The skin on the hands and feet can become very dry and crack. This can be very painful – especially if the cracked skin stretches when you move, comes into contact with irritants like citric acid, or bumps into something.

Plaque psoriasis can basically develop anywhere on the body. The head, elbows, knees and back are commonly affected. Plaques also often occur behind the ears and on the hands, feet and belly button.

Less commonly, they can also occur in skin folds such as the creases of skin in the groin or between the buttocks, under the armpits, in the genital area or under and between the breasts in women. That kind of psoriasis is called inverse (flexural) psoriasis. It is often less scaly because the skin in these areas generally isn't as dry and there is constant friction so not many plaques develop.



Growth and shedding of keratinocytes in psoriasis

Other forms of psoriasis

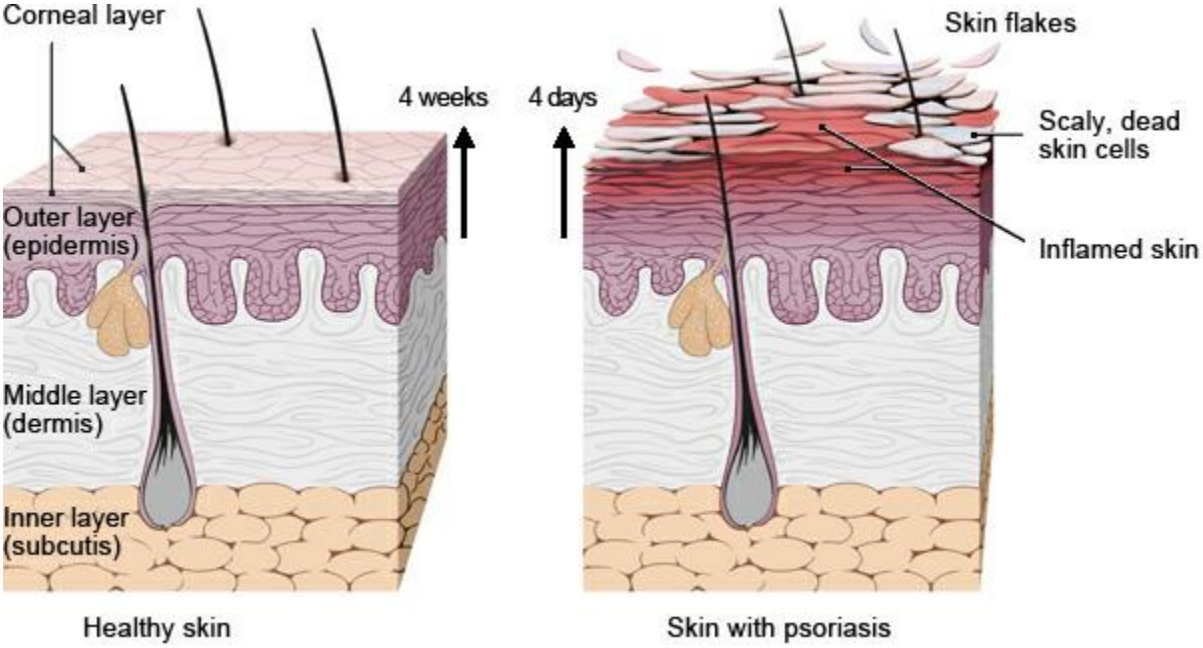
Sometimes the nails of people with plaque psoriasis are also affected. In *nail psoriasis* small holes develop in the nails (pitted nails), the nails grow thicker, or they turn yellowish-brown ("oil drop" discoloration). The nails might also become loose.

Another type of psoriasis is known as *pustular psoriasis*. Here the symptoms also include pus-filled blisters (pustules). These pustules aren't contagious, though. Pustular psoriasis can occur on its own or together with plaque psoriasis.

One quite rare form of psoriasis is *guttate psoriasis*, which is characterized by a large-scale acute rash with small, drop-like bumps. It is most common in children and teenagers, and usually occurs one to two weeks after a certain type of bacterial infection (Streptococcal infection). Guttate psoriasis may heal completely within a few weeks or months, but it can also come back or turn into plaque psoriasis.

Causes

In plaque psoriasis, the skin becomes scaly because the skin cells that harden the skin (keratinocytes) multiply too fast. These cells are found in the outermost layer of the skin and form the protective epidermis. In healthy skin they multiply, pass through several phases of development, and are then usually shed within four weeks as dead skin cells. In psoriasis, the keratinocytes go through this cycle much more quickly, sometimes in as little as four days. This results in dead skin cells not being shed quickly enough to keep up with the new skin cells being produced. The skin then becomes thicker and flakes off much more on the affected areas.



Growth and shedding of keratinocytes in psoriasis

The rapid growth of skin cells in people with psoriasis is caused by an autoimmune response. Various inflammatory processes play a key role here. The skin is often red due to inflammation and increased blood flow.

A whole series of genes have now been linked to psoriasis, but the causes of this condition are not yet absolutely clear.

Risk factors

Psoriasis is mostly caused by genetic factors. Having a family history of the disease is the greatest risk factor. The probability that a child will develop psoriasis is about 15% if one parent has the condition, and about 40% if both parents have it. But there is no reliable test for predicting whether someone will get psoriasis. And there is currently no known way to prevent psoriasis either.

Prevalence

Psoriasis is a relatively widespread disease. It is estimated that about 2% of the population is affected – that would be over 1.5 million people in a country the size of Germany. About 80% of people with psoriasis have plaque psoriasis. Men and women are equally likely to get it.

Psoriasis often first arises in the first 40 years of life, and especially commonly in teenagers or young adults. But it can start in earlier childhood as well. If it develops later in life, it usually starts between the ages of 50 and 70.

Psoriasis is sometimes categorized according to when it started: Type 1 psoriasis starts before the age of 40. Type 2 psoriasis starts later on – between the ages of 50 and 70.

Outlook

It is impossible to predict how someone's psoriasis will develop over time. The condition often comes and goes in episodes: Periods of more severe symptoms alternate with periods in which it hardly causes any trouble. Most people with psoriasis will at one point experience symptoms that are especially severe and distressing. But there are usually also phases without skin problems, or hardly any at all. Some people constantly have severe psoriasis, though.

Psoriasis flare-ups may be caused by things like a sunburn, a very hot shower, particular chemicals or minor skin injuries, scratching, tattoos or piercings.

Other triggers include emotional stress, infections and nicotine or too much alcohol. It is also thought that some medicines might act as triggers, including some malaria drugs.

Effects

Psoriasis is an inflammatory autoimmune disease that can affect the skin and other parts of the body too. It is estimated that about 20% of people with psoriasis also have inflamed joints. This is called psoriatic arthritis. It is a good idea to seek medical advice if you think you have psoriatic arthritis. The sooner joint inflammation is discovered, the better it can be treated and the easier it is to avoid joint damage.

In rare cases, psoriasis can result in chronic inflammatory bowel disease.

Many people who have psoriasis also have depression because the condition can be very emotionally trying and make you feel alone.

Studies have shown that people with psoriasis are also more likely to have high blood pressure, diabetes, and cardiovascular disease. There are various possible explanations for this. For example, many people with psoriasis are overweight and have a body mass index (BMI) of over 30. The inflammatory processes in the body can also contribute to the development of metabolic and vascular disease.

Psoriasis is usually not dangerous. Very rarely, though, it can cause life-threatening complications that require hospital treatment. For instance, psoriasis can spread over the entire

body and then cause blood poisoning and heart problems. This is called *erythrodermic psoriasis* ("erythroderm" comes from the Greek for "red skin"). The signs of this complication include fever, exhaustion, chills and swollen lymph nodes.

Diagnosis

Dermatologists (skin doctors) usually diagnose psoriasis on the basis of typical changes in the skin. They may take a small skin sample and examine it if they aren't sure. This can be a good idea when it comes to inverse psoriasis, for example: It only occurs in folds of skin and usually isn't scaly, so it is sometimes mistaken for a fungal infection. Skin samples can help to rule out fungal infections.

Nail psoriasis is sometimes confused with a fungal nail infection. But sometimes both conditions occur at the same time. A nail sample can be tested to determine whether the symptoms are being caused by a fungal infection.

The skin can also be examined to assess how severe the psoriasis is. Psoriasis is commonly considered to be severe if

- more than 10% of the body's surface is affected, or
- it occurs on the head, hands, feet, or sensitive parts of the body such as the genitals, or
- it has a major impact on the person's quality of life.

There is no universally applied scale of severity for psoriasis. The PASI (Psoriasis Area and Severity Index) is commonly used, though. It takes four factors into consideration:

- The degree of skin reddening
- The amount of skin shedding
- The thickness of the plaques
- The size of the affected areas of skin

These are used to calculate a number representing the severity of the psoriasis. A PASI of 0 means no psoriasis, and a PASI of 10 or more means moderate to severe psoriasis. This index is mostly used in scientific studies to determine whether a treatment is effective.

Treatment

There are various treatment options for psoriasis:

- **Basic therapy (skin care)**: Care of the affected areas of skin using lipid-replenishing ointments, creams or lotions. This is done to keep the skin supple, protect it from injury and relieve itching. Some products also contain medications that are supposed to reduce shedding, such as urea or salicylic acid.
- **Topical treatment**: Products containing corticosteroids or vitamin D analogues are typically used in topical treatment (treatment applied to the skin from the outside). These are available in the form of creams, ointments lotions or foams.

- **Light therapy**: Light therapy, also known as phototherapy, involves exposing the plaques to ultraviolet light (UV light). The UV light reduces inflammation in the skin, and also slows the production of cells. Sometimes medications called psoralens are used in combination with light therapy. Psoralens make the skin more sensitive to light. Light therapy is best suited for people who have moderate or severe psoriasis and in whom topical treatment alone wasn't effective enough.
- **Medications that are taken orally or injected**: These medicines are a treatment option for moderate or severe psoriasis. They inhibit the body's immune response. Methotrexate (MTX), fumaric acid esters, apremilast and biological drugs (biologics) are commonly used for this purpose.

Basic moisturizing skin care is always recommended for psoriasis – during periods without any skin problems, too.

There are also many herbal medicines for the treatment of psoriasis, including extracts of barberry (Mahonia aquifolium), birch bark or aloe vera. The effectiveness of these herbal medicines hasn't been tested in any good-quality studies, though. So it isn't known whether they can help.

Some studies suggest that people with psoriasis who are overweight can improve the condition of their skin by losing a few pounds.

It is sometimes claimed that a tonsillectomy (removal of the tonsils) can relieve psoriasis symptoms, but there hasn't been much research in this area. Tonsillectomy usually isn't recommended because the operation may cause complications such as infections, bleeding and changes to the person's voice. There are also no studies showing that having your tonsils out can cure or prevent psoriasis.

Annexure 2

Bharath Institute of Higher Education and Research

Sri Lakshmi Narayana Institute of Medical Sciences

Participant list of Value-added course: **PSORIASIS-DR10**

(March 2019 – June – 2019)

2nd Year MBBS Student			
Sl. No	**Name of the Student**	**Reg No**	**Signature**
1	THIRUKKUMARAN J.T	U17MB391	Thirukkumaran.
2	TWINKLE JAISWAL	U17MB392	Twinkle
3	UDAY CHANDRA KARUMANCHI	U17MB393	
4	VIDHYA.V	U17MB394	
5	VISHAL.S	U17MB395	Vishal. S.
6	VISHNU .K	U17MB396	
7	VIVEK AMAN SINGH	U17MB397	Vivek Aman.
8	YASHWANT RATHORE	U17MB398	Yash
9	YAZHINI MURUGAN	U17MB399	Yazhini.
11	SOURABH DAS	U17MB381	
12	SRI KAVYA G	U17MB382	Srikavya.
13	SRISHTI SINGH	U17MB383	Srishti
14	SRITAMA SAHA	U17MB384	Sritama Saha.
15	SYAMA SAJEEV	U17MB390	Syama.

Dr. Buvanaratchagan

RESOURCE PERSON

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

Dr. K. Harsha Vardhan

COORDINATOR

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ANNEXURE-3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Annexure – III

PSORIASIS

MULTIPLE CHOICE QUESTIONS

Course code: DR10

ANSWER ALL THE QUESTIONS

1. **What happens to skin cells in a person with psoriasis?**

A. Skin cells pile up on the surface of the skin before they are mature B. Mature skin cells can't make their way to the surface of the skin C. Skin cells die before becoming mature
D. B and C

2. Which body parts are often affected by psoriasis?

A. Elbows B. Scalp C. Knees D. Chest, back, and abdomen E. All of the above

3. What is a health problem that also may occur with psoriasis?

A. Hives B. Gingivitis C. Conjunctivitis D. Arthritis

4. Psoriasis falls into which category of disease?

A. Infectious disease B. Genetic disease (passed down through families) C. Autoimmune disease D. Neoplasm E. B and C

5. What can make psoriasis worse?

A. Beta blocker medicines B. Stress C. Dry climate D. All of the above

6. Itching is a common symptom of psoriasis (and other skin disorders). Which of these suggestions can help relieve the itching?

A. Apply hot packs B. Spend brief periods of time in the sun C. Use a skin moisturizer D. B and C

7. Psoriasis can interfere with quality of life. In what way?

A. Itching can interfere with sleep B. Plaques that appear on the hands can make it difficult to work C. Plaques and itching may make people self-conscious about their appearance D. All of the above

8. How is psoriasis treated?

A. Topical medicines B. Phototherapy C. Immune system treatment D. All of the above

ANNEXURE-3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Annexure – III

PSORIASIS

MULTIPLE CHOICE QUESTIONS

Course code: DR10

VISHAL-S

9/10

ANSWER ALL THE QUESTIONS

Vardhan/CH 13/5/19

1. What happens to skin cells in a person with psoriasis?

A. Skin cells pile up on the surface of the skin before they are mature B. Mature skin cells can't make their way to the surface of the skin C. Skin cells die before becoming mature D. B and C

2. Which body parts are often affected by psoriasis?

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3. What is a health problem that also may occur with psoriasis?

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4. Psoriasis falls into which category of disease?

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8. How is psoriasis treated?

A. Topical medicines B. Phototherapy C. Immune system treatment D. All of the above

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ANNEXURE-3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Annexure – III

PSORIASIS

MULTIPLE CHOICE QUESTIONS

TWINKLE JAISWAL

Course code: DR10

10/10

ANSWER ALL THE QUESTIONS

Vardhan KH 13/5/19

1. What happens to skin cells in a person with psoriasis?

A. Skin cells pile up on the surface of the skin before they are mature B. Mature skin cells can't make their way to the surface of the skin C. Skin cells die before becoming mature D. B and C

2. Which body parts are often affected by psoriasis?

A. Elbows B. Scalp C. Knees D. Chest, back, and abdomen E. All of the above

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3. What is a health problem that also may occur with psoriasis?

A. Hives B. Gingivitis C. Conjunctivitis D. Arthritis

4. Psoriasis falls into which category of disease?

A. Infectious disease B. Genetic disease (passed down through families) C. Autoimmune disease D. Neoplasm E. B and C

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6. Itching is a common symptom of psoriasis (and other skin disorders). Which of these suggestions can help relieve the itching?

A. Apply hot packs B. Spend brief periods of time in the sun C. Use a skin moisturizer D. B and C

7. Psoriasis can interfere with quality of life. In what way?

A. Itching can interfere with sleep B. Plaques that appear on the hands can make it difficult to work C. Plaques and itching may make people self-conscious about their appearance D. All of the above

8. How is psoriasis treated?

A. Topical medicines B. Phototherapy C. Immune system treatment D. All of the above

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ANNEXURE-4

Student Feedback Form

Course Name: PSORIASIS

Subject Code: **DR10**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Signature

Date:13-05-2019

ANNEXURE-4

Student Feedback Form

Course Name: PSORIASIS

Subject Code: **DR10**

Name of Student: Vishnu.S Roll No.: U17MB395

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear	✓				
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand		✓			
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful		✓			
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Vishnu.S

Signature

Date:13-05-2019

Scanned by TapScanner

ANNEXURE-4

Student Feedback Form

Course Name: PSORIASIS

Subject Code: **DR10**

Name of Student: Twinkle Jaiswal Roll No.: U17MB392

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear	✓				
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Twinkle

Signature

Date:13-05-2019

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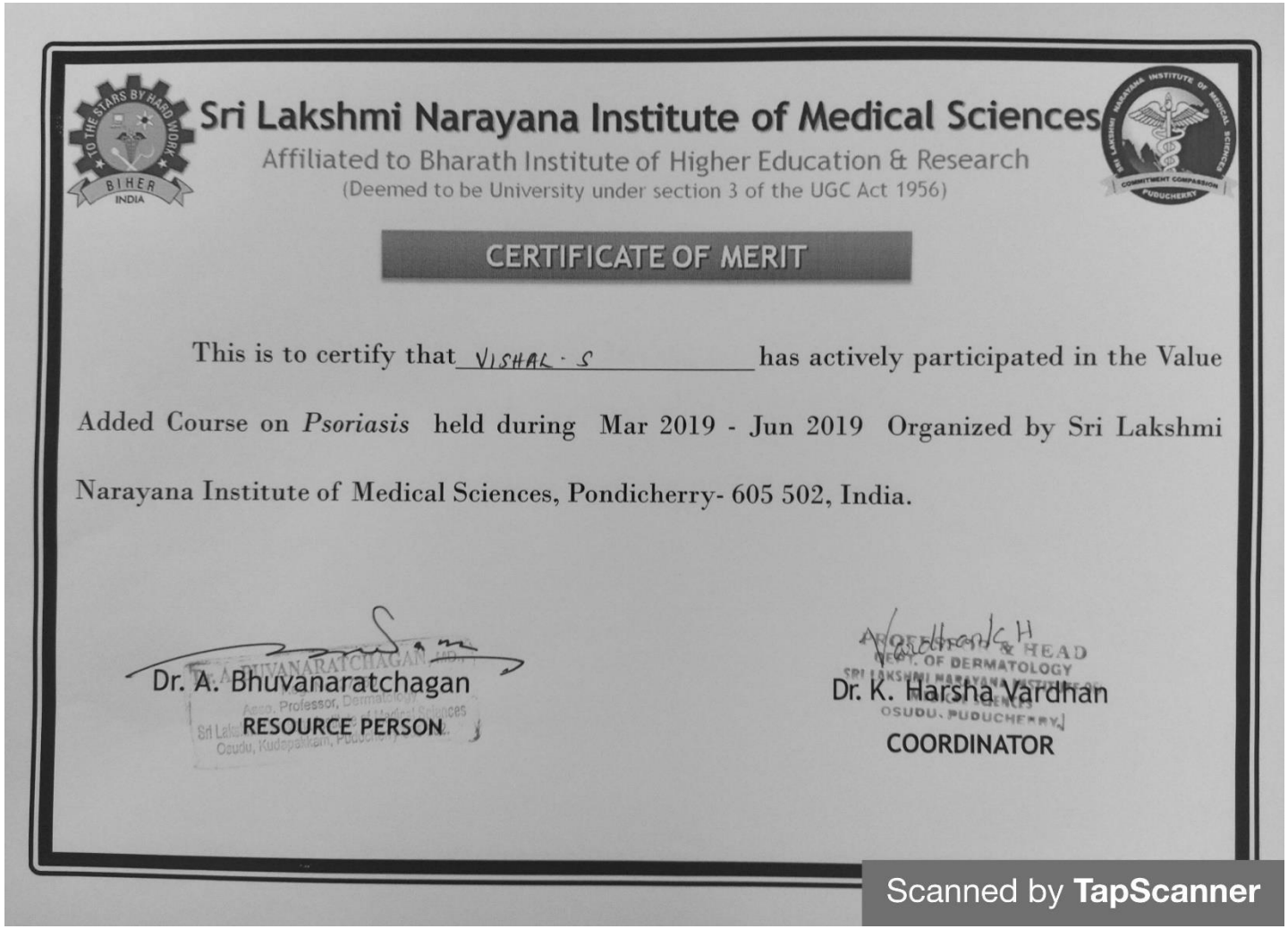

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that VISHAL · S has actively participated in the Value Added Course on *Psoriasis* held during Mar 2019 - Jun 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. A. Bhuvanaratchagan
RESOURCE PERSON

Dr. K. Harsha Vardhan
COORDINATOR

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Annexure 5

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that TWINKLE JAISWAL has actively participated in the Value Added Course on *Psoriasis* held during Mar 2019 - Jun 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. A. Bhuvanaratchagan
RESOURCE PERSON

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
OSUDU, PUDUCHERRY.

Dr. K. Harsha Vardhan
COORDINATOR

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COURSE COMPLETION LETTER Date-17-05-2019

From
Dr. K. Harsha Vardhan
Department of Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course psoriasis

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **psoriasis** on 20-03-19. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. K. Harsha Vardhan

<HOD Sign and Seal>

Encl: Certificates

Photographs

COURSE COMPLETION LETTER Date-17-05-2019

From
Dr. K. Harsha Vardhan
Department of Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course psoriasis

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **psoriasis** on 20-03-19. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. K. Harsha Vardhan

<HOD Sign and Seal>

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
PUDUCHERRY.

Encl: Certificates

Photographs

Scanned by TapScanner



Sri Lakshmi Narayana Institute of Medical Sciences

Date: 26.02.19

From
Dr.Abarna.V
Associate Professor,
Department of Microbiology,
Sri Lakshmi Narayana Institute of Medical Sciences, Pudhucherry
Bharath Institute of Higher Education and Research,Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute of Medical College,Pudhucherry
Bharath Institute of Higher Education and Research,Chennai.

Sub: Permission to conduct value-added course: Soft skill development & Human value development &Teaching and Communication Skills

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: for Soft skill development & Human value development from March 2019 to May 2019 and Teaching and Communication Skills from July 2019 to August 2019 for undergraduates. We solicit your kind permission for the same.

Kind Regards

Dr.Abarna.V

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr.Jayalakshmi.G

The HOD: Dr.Abarna.V

The Expert: Dr.Naveenkumar.C

The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign & Seal)	(Sign & Seal)	(Sign & Seal)

Dr. G. JAYALAKSHMI MBBS.,DTCD.,M.D
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

DEPT OF MICROBIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES-PONDICHERRY 605 502

DEPT OF MICROBIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES-PONDICHERRY 605 502

Sri Lakshmi Narayana Institute of Medical Sciences

Circular

01.03.2019

Sub: Organising Value-added Course: Soft skill development & Human value development -reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research,** is organising **"Soft skill development & Human value development" from** March to May 2019. The course content form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before Feb 28th 2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapat [illegible] Post,
Villanur Commune Pu[illegible]

Encl: Copy of Course content form.

Course Proposal

Course Title: Soft skill development & Human value development

Course Objective:

1. Soft skill Holistic Development Workshop
2. Emotional Intelligence
3. Soft Skill Training
4. Ethical Aptitude

Course Outcome: knowledge on the various aspects of Soft skill development
Course Audience: Medical undergraduates
Course Coordinator: Dr. Abarna.V
Course Faculties with Qualification and Designation:

1. **Dr.Naveenkumar.C,MSc;Phd Assistant Professor**
2. **Mrs.Swathi,Msc, tutor**

Course Curriculum/Topics with schedule (Min of 31 hours)

Date	Time	Topic	Hour	Lecture taken by
6.3.2019	4-5pm	Soft skill Holistic Development Workshop and Emotional Intelligence	3hr	Dr.Naveenkumar.C
13.3.2019	4-5pm	Soft Skill Training & Ethical Aptitude	3hr	Dr.Naveenkumar.C
20.3.2019	4-7pm	Induction Program & Critical Thinking	3hr	Mrs.Swathi.S
24.3.2019	4-7pm	Encourage self-reflection	3hrs	Mrs.Swathi.S
27.3.2019	4-7pm	Expand knowledge and understanding	3hrs	Dr.Abarna.V
3.4.2019	4-7pm	Provide opportunities for practice	3hrs	Dr.Naveenkumar.C
10.4.2019	4-7pm	Gender Sensitization	3hrs	Dr.Abarna.V
17.4.2019	4-7pm	Environment Protection	3hrs	Dr.Abarna.V
24.4.2019	4-7pm	Road Safety and traffic rules	3hrs	Mrs.Swathi.S
8.5.2019	4-7pm	Inner Transformation Program	3hrs	Dr.Abarna.V

VALUE ADDED COURSE

1. Name of the programme & Code

Soft skill & Human value development and MIC09

2. Duration & Period

30 hrs & March 2019 to May 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Questionnarie- *Enclosed as Annexure- III*

6. Course Feed Back

Enclosed as Annexure- IV

7. No. of times offered during the same year:

July 2019-August 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- March 2019 to May2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	MIC09	Soft skills &Human value development	Dr. C.Naveenkumar Mrs.Swathi	2nd yr MBBS	20(March 2019 to May2019)

10. Certificate model

Enclosed as Annexure- V

RESOURCE PERSON **COORDINATOR**

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
DEPARTMENT OF MICROBIOLOGY
Soft skills development& Human value development
Annexure I

Course details

Particulars	Description
Course Title	Soft skill development & Human value development
Course Code	MIC09
Objective	1. Soft skill Holistic Development Workshop 2. Emotional Intelligence 3. Soft Skill Training 4. Ethical Aptitude 5. Induction Program 6. Critical Thinking 7. Encourage self-reflection 8. Expand knowledge and understanding 9. Provide opportunities for practice 10. Gender Sensitization 11. Environment Protection 12. Road Safety and traffic rules 13. Inner Transformation Program
Further learning opportunities	Personal development skills
Key Competencies	On successful completion of the course the students will have skill to develop their emotional skills & handling road traffic rules.
Target Student	2nd yr MBBS Students
Duration	30hrs Every– March 2019 to May 2019
Theory Session	10hrs

Practical Session	20hrs
Assessment Procedure	Short answers

Date	Time	Topic	Resource person
6.3.2019	4-7pm	Soft skill Holistic Development Workshop and Emotional Intelligence	Dr.Naveenkumar.C
13.3.2019	4-7pm	Soft Skill Training & Ethical Aptitude	Dr.Naveenkumar.C
20.3.2019	4-7pm	Induction Program & Critical Thinking	Mrs.Swathi.S
24.3.2019	4-7pm	Encourage self-reflection	Mrs.Swathi.S
27.3.2019	4-7pm	Expand knowledge and understanding	Dr.Jayalakshmi.G
3.4.2019	4-7pm	Provide opportunities for practice	Dr.Naveenkumar.C
10.4.2019	4-7pm	Gender Sensitization	Dr.Jayalakshmi.G
17.4.2019	4-7pm	Environment Protection	Dr.Jayalakshmi.G
24.4.2019	4-7pm	Road Safety and traffic rules	Mrs.Swathi.S
8.5.2019	4-7pm	Inner Transformation Program	Dr.Jayalakshmi.G

Soft skill Holistic Development Workshop

This is a Value added course. This soft skill provides an in sight into vital role of soft skills in personal and professional effectiveness. The objective of this workshop is to practice active listening skills and responding skills for effective communication and describe different leadership styles to accomplish organizational goals.

The course enables students to Establish effective inter personal relationship with others, Underst and importance of active listening and body language in communication, Select appropriate words and tone of voice in verbal and written communication, Identify strategies to improve inter personal relationship, Develop skills in public speaking, Identifying appropriate personal and professional values for nursing practice, Describe potential source of stress and strategies for stress and conflict management and Develop skills in preparation and power point.

Emotional Intelligence

This is a Value added course. Happiness through Enhanced Emotional Intelligence Emotional intelligence (EQ/ EI) is defined as an ability to identify, consider and control emotions in one self and to recognize them in others, brought on by a combination of self awareness, self management, social awareness and relationship management.

Intelligent quotient (IQ) correlates with academic success but often fails to as sure personal and professional success. EQ on other and is a spastically significant factor in achieving personal and professional growth. While IQ is in born god gift ; EQ can be improved by learning strategies in areas of self awareness, social awareness and relationship management. Most of the professional courses including medical courses offer little to improve EQ of participants in this course. Present value added course is designed to enable students/participants to lead a happy and ful filling life by using strategies of EQ/EI.

Soft Skill Training

This Value added course wasde signed to train students in various soft skill techniques. The students will be trained invarious problem sharings kills and stress management .The students will be trained in team work and group dynamics.

Induction Program

Induction programs are carried out across all the specialties to orient students with the university. This programalsoaims to train students in communications kills, both with batchmates and patients . This helps to improve inter personal; relationships and maintaina good professional.

Ethical Aptitude

Soft skills development also does include an ethical aptitude towards your organization and its people. Practicing moral ethics at workplace is a way of applying fundamental values to professional situations.

A planned approach with ethical aptitude helps in excelling at resolving workplace concerns in a professional and effective manner. That is: identifying the problem, collecting and analyzing facts, understanding consequences, assessing alternatives, and then taking a decision.

Human Value Development

Gender Sensitization

Gender of a person and attitude of people towards gender have very high impact on personal and social health. Gender discrimination, female feticide, sexual harassment and abuse are results of unhealthy gender attitude. This develops unknowingly because of peculiar sexual socialization. Only information about reproductive system will not be able to change this attitude as It involves de-learning and re-learning. There is need for proactive efforts to develop healthy gender attitude. This course is introduced to deal with these issues and will help to find solutions; This course is in addition to inclusion of gender sensitization in curriculum.

Environment Protection

This Value added course is to facilitate students understanding of complex environmental issues from a problem-oriented, interdisciplinary perspective. Understand core concepts and methods from ecological and physical sciences and their application in environmental problem-solving. Appreciate key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems. Appreciate that one can apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.

Road Safety and traffic rules

This Value added course will enable students to measure the magnitude and impact of road traffic injuries, assess the key risk factors, Strengthen the evidence base for prevention, Implement promising interventions, Deliver post-crash care and transfer techniques and Formulate and implement road safety policies.

Inner Transformation Program

Health care professionals find that stress has a huge impact on their patient's health and their own. Students learn basic Heartfulness practices to manage their own stress and emotions, and improve the quality of life; 'Centered Students: where 'centeredness' is defined as a person who is self-confident, emotionally stable and well balanced. A life where stress is well managed, leading to a joyful and happy society. Students displaying values of compassion and respect for each other.

Annexure- II

VALUE ADDED COURSE

Soft skill & Human value development and MIC09

List of Students Enrolled March 2019 to May 2019

2nd yrYear MBBS Student			
Sl. No	**Name of the Student**	**Roll No**	**Signature**
1	AASHLESHA DHARKAR	U18MB251	
2	ABINAYAVARTHINI N	U18MB252	
3	ADARSH KUMAR	U18MB253	
4	AISWARYA PREMRAJ	U18MB254	
5	AKSHAYA .R	U18MB255	
6	ALOK PANDA	U18MB256	
7	AMULYA N GOWDA	U18MB257	
8	ANINDA CHAKRABORTY	U18MB258	
9	ANJALI SADHWANI	U18MB259	
10	ANKU KUMAR	U18MB260	
11	ANNIE WELLY	U18MB261	
12	ANTONY ROHAN	U18MB262	
13	ANUPAMA	U18MB263	
14	AQSA QURESHI	U18MB264	
15	ARSHAD AMIN	U18MB265	
16	ASHIQUE RIFANA M	U18MB266	
17	ASHWIN R	U18MB267	
18	ASHWINI.N	U18MB268	
19	ASMIT KESHAV	U18MB269	
20	AVIRAL TYAGI	U18MB270	

RESOURCE PERSON **COORDINATOR**

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

Soft skills development& Human value development

Short answers

Alok panda

Course Code: MIC09

I. ANSWER ALL THE QUESTIONS

1. What are the soft skills?

- Soft skills development is added to the mental.

2. How to develop a learning mindset?

to develop knowledge.

3.What are the ethical aptitude?

- ethical aptitude

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

Soft skills development& Human value development

Short answers

Annie welly

Course Code: MIC09

I. ANSWER ALL THE QUESTIONS

1. What are the soft skills?

Soft skills are developing knowledge.

2. How to develop a learning mindset?

- To practice

3.What are the ethical aptitude?

- Ethical aptitude are getting into through paper.

Annexure IV

Student Feedback Form

Course Name: **Soft skill & Human value development**

Subject Code: **MIC09**

Name of Student: Alok panda Roll No.: U18MB256

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear		✓			✓
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand		✓			✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date : 8/5/2019

Sign : Alok

Annexure IV

Student Feedback Form

Course Name: **Soft skill & Human value development**

Subject Code: **MIC09**

Name of Student: Annie Welly Roll No.: U18NB261

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 8/5/2019

Sign: Annie

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Alok panda has actively participated in the Value Added Course on Soft skill development & Human value development held during March 2019 to May 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. C.Naveenkumar
RESOURCE PERSON

Dr.Abarna.V
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that ANNIE WELLY has actively participated in the Value Added Course on Soft skill development & Human value development held during March 2019 to May 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. C.Naveenkumar
RESOURCE PERSON

Dr.Abarna.V
COORDINATOR

Date : 27.06.2019

From
Dr.Naveenkumar.C
Department of Microbiology,
Sri Lakshmi NarayanaInstitute of Medical Sciences,Pudhucherry
Bharath Institute of Higher Education and Research,Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences, Pudhucherry
Bharath Institute of Higher Education and Research,Chennai.

Sub: Completion of value-added course : Soft skill development & Human value development

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled Soft skill development & Human value development for 20 students. We solicit your kind action to send certificates for the participants, is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr.Naveenkumar.C

Encl: Certificates& photographs



Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,

PUDUCHERRY – 605 502

Date: 04.02.2019

From
Dr.Rajini.S
Professor and Head,
Department of Community Medicine,
Sri Lakshmi Narayana Institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Puducherry.

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences,
Bharath Institute of Higher Education and Research, Puducherry.

Sub: Permission to conduct value-added course: **TEAM MANAGEMENT & LEADERSHIP**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Team management & leadership from March 2019 – Aug 2019 **.** We solicit your kind permission for the same.

Kind Regards

Rajini S
PROFESSOR & HOD
DEPARTMENT OF COMMUNITY MEDICINE
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

HOD

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,

PUDUCHERRY – 605 502

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Dr.K.Balagurunathan,

The HOD: Dr.S.Rajini

The Expert: Dr.J.Barathalakshmi

The committee has discussed about the course and is approved.

PROFESSOR & HOD
DEPARTMENT OF COMMUNITY MEDICINE
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502.

Head of the Department

Resource Person

DEAN
Prof.K.BALAGURUNATHAN M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Dean

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,

PUDUCHERRY – 605 502

Circular

07.02.2019

Sub: Organising Value-added Course: Team Management & Leadership

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, Bharath Institute of Higher Education and Research, is organising a value added Programme on "TEAM MANAGEMENT & LEADERSHIP" from March – August 2019

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before **28th February 2019**. Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN
Prof.K.BALAGURUNATHAN M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Dean

VALUE ADDED COURSE

1. Name of the programme& Code

Team management and PSM01

2. Duration& Period

30 hrs &March 2019 – Aug 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7.No. of times offered during the same year:1

8. Year of discontinuation: -2020

9. Summary report of each program year-wise

Value Added Course- March 2019 – Aug 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength& Year**
1	PSM01	Team management	Dr.Rajini.S Dr.Kannan.K Dr. Barathalakshmi.J	IIIrd MBBS	15 (March 19 – August 19)

10. Course Feed Back

Enclosed as Annexure- V

Rajini S
PROFESSOR & HOD
DEPARTMENT OF COMMUNITY MEDICINE
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

RESOURCE PERSON **COORDINATOR**

Annexure 1 – Course Proposal

Course Title: **TEAM MANAGEMENT & LEADERSHIP**

Course Objective

1.Introduction to team management & leadership
2.Overview
3.Classification
4.Resolving conflicts
5.Case study
6.summary

CourseOutcome: Improvement in the knowledge of TEAM MANAGEMENT & LEADERSHIP
Course Audience: Pre-Final year students
Course Coordinator: Dr.S.Rajini
Course Faculties with Qualification and Designation:
1. Dr.S.Rajini, Professor & HOD
2.Dr.J.Barathalakshmi, Associate Professor
3.Dr.K.Kannan Course Curriculum/Topics with schedule (Min of 30 hours)

s.no	Date	Topic	Faculties	Time	Hrs
1	8.03.19	Leadership behavior- overview	Dr.S.Rajini	4-6 pm	2
2	14.03.19	Characteristics of Leadership	Dr.J.Barathalakshmi	4-6 pm	2
3	21.03.19	Principles of Leadership	Dr.K.Kannan	4-6 pm	2
4	3.04.19	Factors of Leadership	Dr.J.Barathalakshmi	4-6 pm	2
5	10.04.19	Leadership theories	Dr.S.Rajini	4-6 pm	2
6	17.04.19	Importance of team building	Dr.K.Kannan	4-6 pm	2
7	8.05.19	Classification of Leadership	Dr.J.Barathalakshmi	4-6 pm	2
8	15.05.19	Leadership styles	Dr.K.Kannan	4-6 pm	2
9	12.06.19	Modes and training of Leadership	Dr.S.Rajini	4-6 pm	2
10	19.06.19	Team management	Dr.K.Kannan	4-6 pm	2
11	26.06.19	Resolving conflicts	Dr.J.Barathalakshmi	4-6 pm	2
12	3.07.19	Change management	Dr.S.Rajini	4-6 pm	2
13	10.07.19	Leadership & co-ordination	Dr.K.Kannan	4-6 pm	2
14	01.08.19	Improving communication	Dr.J.Barathalakshmi	4-6 pm	2
15	07.08.19	Case study	Dr.J.Barathalakshmi	4-6 pm	2
		Total			30 hrs

REFERENCE BOOKS:

- Rogers, B., 2002. *Teacher Leadership and BehaviourManagement*,SAGE.
- Leatherman, W. R., 2008. *Quality Leadership Skills: Standards of Leadership Behavior*, 3rd ed., Human ResourceDevelopment.

TEAM MANAGEMENT AND LEADERSHIP

BROCHURE

Abbreviations

ADR - Alternative Dispute Resolution CBO- Community Based OrganisationCWC - Central Water Commission HRM - Human ResourceManagement
I-IUDCO - I Iousing Urban Development Corporation
IMD - India MeteorologicalDepartment
ISRO - Indian Space Research Organisation LPC - Least PreferredCo-worker
NCO - Non-Government Organisation
PDC - Professional DevelopmentCentres

Chapter I

Leadership Behaviour: An Overview

Aim

The aim of this chapter is to:

- introduce various theories of leadership
- elucidate qualities of an effectiveleader
- explain the concept of leadership

Objectives

The objectives of this chapter are to:

- explain the educational implications of 'leadership' quality in an educationalsystem
- enlist the characteristics of leadership in the educationsystem
- defineleadership

Learning outcome

At the end of this chapter, you will be able to:

- identify the factors in leadership
- differentiate between a leader and amanager
- recognise various theories of leadership and the educationsystem

1.1 Introduction

Leadershipistheprocessofinfluencingandsupportingotherstoworkenthusiasticallytowardsachievingobjecti ves. It is the crucial factor that helps an individual or a group to identify its goals and then it motivates and assists in achieving the stated goals. Three major factors that define the leadership conceptare:

- Influencesupport
- Voluntary effort
- Goalachievement

Leadership is also called as the catalyst that transforms potential into reality. The concept of leadership in itself covers all interpersonal relationships that influence the working of the institution towards its goals.

1.2 Leader Vs Manager

Often people assume that a manager and a leader play the same roles. However, there are three major points of differences between the two:

- A person emerges as a leader. The question whether s/he will or will not emerge as a leader always depends on a number of situational factors. A manager, on the other hand is always put into her/his position by appointment.
- A leader always has some informal powers (that is the ability to influence) that enables her/him to lead. S/he may or may not have the formal authority, (i.e., the right to command). A manager on the other hand, always has some formal authority. She may or may not have personal power. If she also has personal power then s/he will be much more effective as amanager.
- Aleadergenerally,seeksthoseveryobjectiveswhicharetheobjectivesofthefollowers.Thus,thereisamaturity of objectives between leader and the followers. A manager, on the other hand, seeks those objectives, which her/his subordinates do not regard as their own, clash ofobjectives.

Abraham Zaleznik, for example, delineated differences between leadership and management. He saw leaders as inspiring visionaries, concerned about substance; while he viewed managers as planners who have concerns with process.WarrenBennisfurtherexplicatedadichotomybetweenmanagersandleaders.Hedrewtwelvedistinctio ns between the two groups:

- Managers administer, leadersinnovate
- Managers ask how and when, leaders ask what andwhy
- Manager focus on systems, leaders focus onpeople
- Managers do things right, leaders do the rightthings
- Managers maintain, leadersdevelop
- Managers rely on control, leaders inspiretrust
- Managers have a short-term perspective, leaders have a longer-termperspective
- Managers accept the status-quo, leaders challenge thestatus-quo
- Managers have an eye on the bottom line, leaders have an eye on thehorizon
- Managers imitate, leadersoriginate
- Managers emulate the classic good soldier, leaders are their ownperson
- Managers copy, leaders show originality

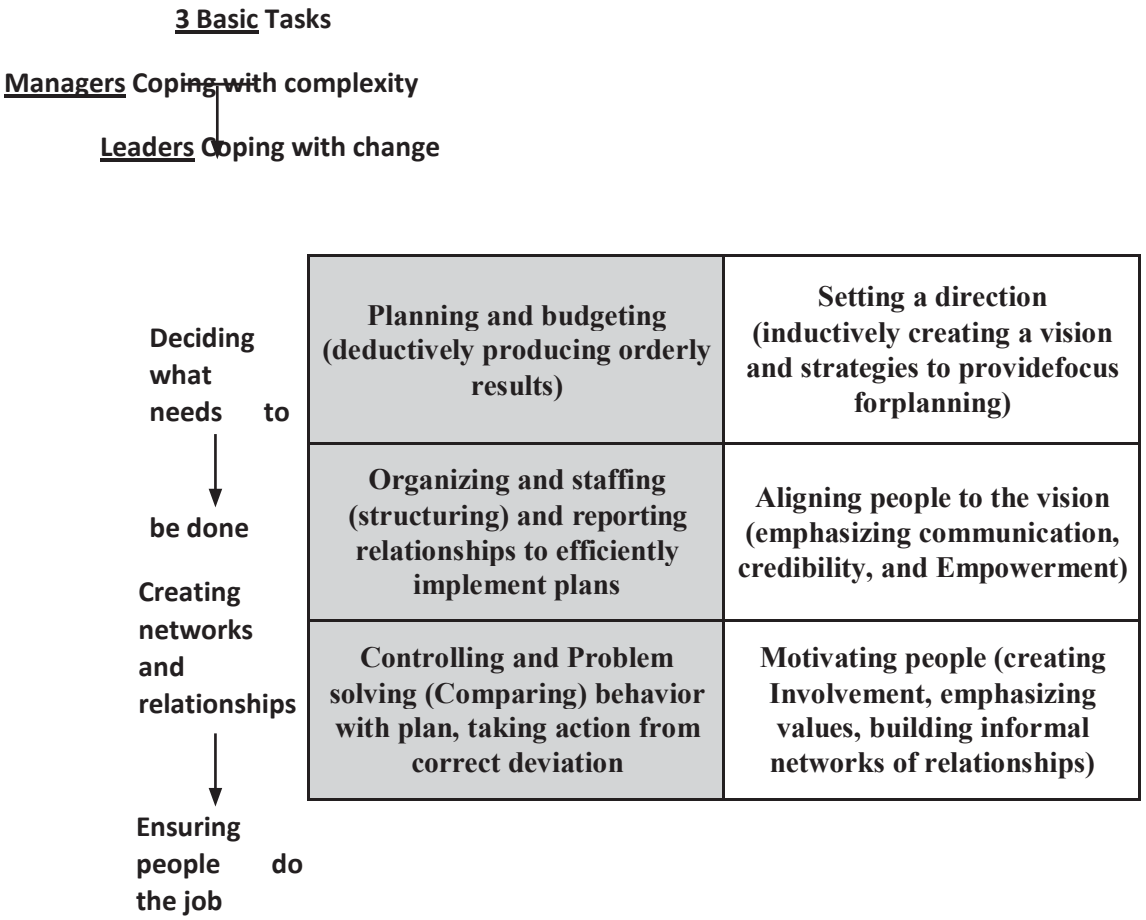

Fig. 1.1 Kotter's distinction between managers and leaders

1.3 Leadership as a Process and a Product

As a process leadership entails perceiving when changes are needed and influencing and facilitating a group's efforts
through non-coercive means, to set and achieve group goals. This process should lead to the accomplishment of six generic leadership tasks:

- Inspire a shared vision and establish standards that help the organisation or group achieve its next stage of development.
- Foster unity, collaboration and ownership, and recognise individual and teamcontributions.
- Exercise power effectively and empower others toact.
- Exert influence outside the group in order to set the right context for the group ororganisation.
- Establish an environment conducive to learning.
- Satisfy the work related needs of the members of the group asindividuals.

Asaproduct,leadershipisviewedasasetofqualitiesthatleadersmustpossessinordertosuccessfullyaccomplish thesixtasksoftheleaders.Whenanindividualbehavesinwaysthatothersinthegroup1organisationbelievewill help them achieve desired goals, that individual is seen as a leader and is perceived to possess certainattributes.

1.4 Attributes of Leaders Vis-à-vis EducationalSystem

ResearchsupportedbyNationalCentreforResearchinVocationalEducation,UniversityofCaliforniaatBerkel ey has shown fourteen attributes that best explain the variance in leader performance (Moss and Liang, 1990). These attributes are:

- Adaptableandopentochange:Theleaderencouragesandacceptssuggestionsandconstructivecriticismfrom

coworkers, and is willing to consider modifyingplans.

- Insightful:Theleaderreflectsontherelationshipamongeventsandquicklygraspsthemeaningofcomplex issues.
- Team building: The leader facilitates the development of cohesiveness and cooperation among people at work.
- Willing to accept responsibility: The leader willingly assumes higher level of duties and functions within the organisation.
- Motivate others: The leader creates an environment where others want to do theirbest.

- Communication: The leader listens closely to people at work, and organises and clearly presents information both orally and inwriting.
- Visionary: The leader looks into the future and creates new ways in which the organisation canprosper.
- Networking: The leader develops co-operative relations among individuals within and outside the organisation.
- Confident, accepting to self: The leader appears secure about abilities and recognises personal shortcomings.
- Planning: The leader in collaboration with others develops tactics and strategies for achieving organisational objectives.
- Decisionmaking:Theleadermakestimelydecisionsthatareinthebestinterestoftheorganisationbyanalysing all available information, distilling key points, and drawing relevant conclusions.
- Delegating: The leader appropriately and effectively assigns responsibility andauthority.
- Managinginformation:Theleaderidentifies,collects,organisesandanalysestheessentialinformationneeded by the organisation.
- Ethical:Theleaderactsconsistentlywiththeprinciplesoffairnessandrightorgoodconductthatcanstandthe test of close public scrutiny.
- Elevenadditionalattributeswhosefurtherdevelopmentismostlikelytobemosthelpfultomostunderrepresented groups have been identified through review of related literature. These attributes are:
- Tolerance of ambiguity and complexity: The leader comfortably handles vague and difficult situationswhere there is no simple answer or no prescribed method of proceeding.
- Courageous, risk taker: The leader willingly tries out new ideas in spite of possible loss orfailure.
- Initiating: The leader frequently introduces newideas.
- Achievement oriented: The leader shows commitment achieve goals and strives to keep improving performance.
- Persistent: The leader continues to act on beliefs despite unexpecteddifficulty.
- Conflict management: The leader brings conflict into the open and uses it to arrive at constructivesolutions.
- Tolerant of frustration: The leader acts tolerant even when things don't go asplanned.
- Committed to common good: The leader works for the benefit of the entire organisation and not just forself.
- Stress management: The leader effectively deals with the demands of high pressure worksituations.
- Usingappropriateleadershipstyle:Theleaderusesappropriateandvarietyofleadershipstylestomotivateand guide others towards attaining the common goals.
- Sensitivity, respect: The leader shows genuine concern for the feeling of others and respects individuals as individuals.

1.5 Characteristics of Leadership in the EducationalSystem

Leaders in the educational system have the ability to transform the system. Generally leaders in the system can:

- Set the pattern and guide the outcomes of co-operativeaction
- Guide educational programs, but rely on shareddecisions

- Give common understanding to common purposes andgoals
- Produce cohesiveness without which co-operation isimpossible
- Communicate with all personnel with a sense of mutual understanding and mutual loyalty to the aims of education
- Generate enthusiasm for projects and inspire working towards theircompletion
- Resolve the differences which frequently arise in growingorganisations
- Lead by example and inspiration
- Contribute to the group by advancing useful suggestions

1.6 Principles of Leadership

TheUSArmy,in1973listedthefollowingelevenprinciplesthathelpindividualsrealisetheirleadershippotential. We shall discuss these principles with respect to the educationalenvironment.

1.6.1 Know Yourself and SeekSelf-improvement

Anyleaderneedstoknowhimself/herselfintermsofwhathe/shehasdone,candoandiswillingtodo.Oncethese areidentifiedthentheleadercanconstantlybuildonimprovinghis/herskillsets.Agoodleaderissomeonewhois always evolving in one form or the other. In every school the leader could either be the Principal or the House in-chargeortheSchoolCaptainortheHouseCaptain,canbegoodleadersonlyiftheyareconfidentaboutthemselves and they are aware of their weakness and the strengths of theother members of thegroup.

1.6.2 Be TechnicallyProficient

Asaleader,onemustknowthejobandhaveasolidfamiliaritywiththetasksthatonewishesotherstoaccomplish. Here familiarity is generally expressed not in theoretical terms, but in practical - bands on terms: Technically proficient also translates into possessing the ability to delegate the responsibility to various members of the group and be able to guide them in achieving common goals.

1.6.3 Seek Responsibility and Take Responsibility, for yourActions

Asaleaderoneneedstosearchforwaystoguidetheinstitutiontonewheights.Andwhenanythinggoeswrong,a leaderalwaystakestheblameontohimselforherselfanddoesnotsearchforscapegoats.Thisisonecharacteristic that always defines leaders. That is why, often, we have seen schools to be known by theirprincipals.

AnefficientPrincipalmayalsobeagoodleaderandhe/shewouldhavetheabilityandcapacitytotakeresponsibilityo f everyactivitythathappensintheschool.Takingresponsibilitydoesnotmeanthattheleader(inaschoolenvironm ent the Principal) should take blame, but it translates into the fact the leader must be able to have a foresight-plan and anticipate events and then plan, and in spite of this if any eventuality occurs, take responsibility for theactions.

1.6.4 Make Sound and TimelyDecisions

Theuseofgoodproblemsolving,decisionmaking,andplanningtoolsaddstotheleadershipqualitiesofanindivid ual. In every school environment, you would have noticed as a teacher, that there are times when decisions need to be taken - procrastination on such decision leads an imbalance in the harmony of the institution. Hence, a leader -in theformofthePrincipalorVice Principalorhouseinchargeorschoolcaptainorhousecaptain-musttryandtake the initiative to make sound and timelydecisions.

1.6.5 Set theExample

Aleaderalwaysneedstobeagoodrolemodel."Wemustbecomethechangewewanttosee"-MahatmaGandhi. Theseareverypowerfulwordsthatdefinealeader.Intheschoolenvironment,asteachers,youmighthavenoticed that there are times when we tell the students not to do something, while we find no harm in doing the sameforbiddenthing.Thiscreatesunrestamongstthegroup,whereoneisaleader.ThereisastoryaboutAlexande rthe Great; during the conquest of world that he had embarked upon, he and his men had to cross a dessert. They were walking on the dessert for couple of days and their water and food resources were coming to an end. In thiswhole journey, historians say, Alexander was the leading man always ahead. Seeing this, his soldiers drew the courage and determination and went forward.After a few more days, they were believed to have found an oasis. Being the example of what one wants is a quality that every leader mustpossess.

1.6.6 Know Your People and Lut for theirWell-being

Aleaderissuccessfulifhe/sheknowsthepeoplehe/shetakescareof.Whenwesayknow, wemeanknowledgein termsoftheirstrengths,weaknessesandproblems.Ifaleaderisawareofthis,he/shewouldbeabletohelppeople realise institutional goals along with the personal goals of the people. In every school system it is imperative that the Principal knows the student. It might be difficult to know each and every child personally, but a real principal and faculty use to keep the studentsinformed.

1.6.7 Developed a Sense of Responsibility in yourPeople

We all know that it is the human tendency to work well under the watchful eye of a supervisor, but, a leader is successful if he/she is able to develop a sense of responsibility in people, wherein they realise the importance of their contribution to the realisation of the institutional goals. As a teacher you might have noticed that there are times when classes remain quiet and busy doing either their own work or that has been prescribed to them - in the absenceofateacher;suchclassesshowtheleadershipqualityoftheteacher.Suchteachersareabletohelpstudents develop a sense of responsibility towards completing the prescribed goals and also make efforts to ensure that the tasks given to the students are meaningful andinteresting.

1.6.8 Ensure that Tasks are Understood, Supervised, andAccomplished

An essential characteristic of a leader is not only to delegate tasks, but also to ensure that the tasks are understood
bythedoer,andthatconstanthelpandsupportisprovidedintheformofsupervisionasandwhenrequired.Inour schooltenurewemighthavenoticed,thatwhenataskisassignedtous,weareabletocompleteittothebestofour capabilityifthefollowingconditionsaremet:wearegivenindependentcharge,ourdecisionsareacceptedandwe are given suggestions and not directions and essentially there is a sense of trust that once a task given, it would be accomplished. For any teacher to have this dense of security, depends on the Principal or theleader.

1.6.9 Train as a Team

A team is a collection of people, often drawn from diverse but related groups, assigned to perform a well-defined
functionforanorganisationoraproject;teammembersalwayssharesomeresponsibilitytowardstherealisation of
thegoals.Thusleadersalwaysneedtoensuretheirmemberstrainasateam.Thisalsomeansanequalopportunity for all. One way that this can be accomplished is by allowing for teachers to participate in peer grouptraining.

1.6.10 Use the Full Capabilities of yourInstitution

A leader always knows his/ her institution very well and always ties to utilise an organisation to its

fullest of capabilities. An important evidence of this is the delegation of responsibilities amongst individuals of the team. This also ensures that all the members of the group feel a sense of belonging to the group.

1.7 Factors of Leadership

There are four factors in leadership:

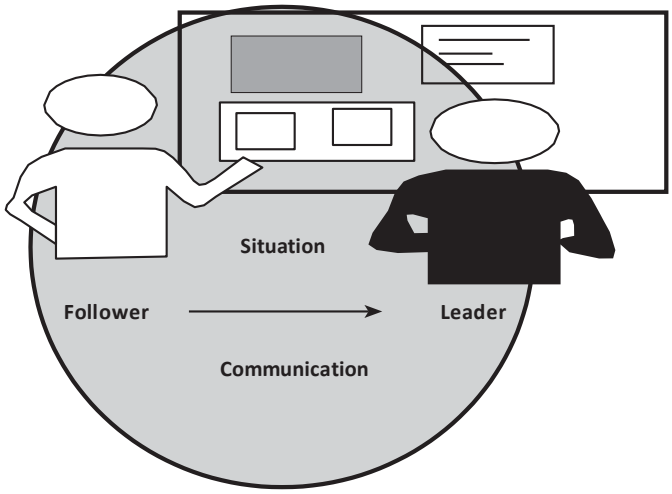

Fig. 1.2 Factors of leadership

(Source: http://www.nwlink.com/-donclarWleader/leadcon.htmlacCessed on 7June2008)

Follower; every individual needs a different style of leadership to be motivated to achieve the institutional responsibilities. New teachers might require constant reinforcement, while senior teachers might require certain amountoffreedomandresponsibility.Inthesamemannerstudentswhofloutdisciplinerequirehandlinginadifferent

manner than those students who are excelling in their respective subjects. Understanding these basic individual differences in the followers affects the leadership style and leadership itself.

1.7.1 Leader

Another factor in leadership is the leader itself. As a leader one is expected to have an honest understanding of who you are, what you know, and what you can do. An important thing about leaders is that the followers decide whether the leader is successful or not.

1.7.2 Communication

Leaders always lead through two-way communication. Much of it is nonverbal. For instance, when you "set the example," that communicates to your people that you would not ask them to perform anything that you would not be willing to do. What and how you communicate either builds or harms the relationship of the leader with the fellow members.

1.7.3 Situation

We all know that each situation elicits a different behavior in people, thus for each opportunity that is presented the leader must use his/ her judgment to decide the best course of action and the leadership style needed for each situation. This is especially true in case of the students, who can react very differently to various situations.

1.8 Leadership Theories

Leadership has been studied and therefore explained from a number of different perspectives, each with its own

insights as well as its own limitations. The following section looks into the various leadership theories.

1.8.1 Great ManTheory

GreatMantheoriesassumethatthecapacityforleadershipisinherent-thatgreatleadersarebornnotmade.These theories often portray great leaders as heroic, mythic and destined to rise to leadership when needed. The term "Great Man" was used because, at the time, leadership was thought of primarily as a male quality, especially in terms of military leadership.

1.8.2 Trait Theory

People are born with inherited traits. Some traits are particularly suited to leadership. People who make good leaders have the right (or sufficient) combination of traits. Stogdill (1974) identified the following traits and skills as critical to leaders.

Traits	**Skills**
Adaptable to situations	Clever (intelligent)
Alert to social environment	Conceptually skilled
Ambitious and achievement oriented	Creative
Assertive	Diplomatic and tactful
Cooperative	Fluent in speaking
Decisive	Knowledgeable about group task
Dependable	Organised (administrative ability)
Dominant (desire to influence others)	Persuasive
Energetic (high activity socially skilled level)	Socially skilled
Persistent	
Self-confident	
Tolerant of stress	
Willing to assume	

Table 1.1 Traits and skills

1.8.3 ContingencyTheory

In contingency theory of leadership, the success of the leader is a function of various contingencies in the form of subordinate,task,and/orgroupvariables.Theeffectivenessofagivenpatternofleaderbehavioriscontingentupon thedemandsimposedbythesituation.Contingencytheoriesareaclassofbehavioraltheorythatcontendsthatther e is no one best way of leading and that a leadership style that is effective in some situations may not be successful in others. An effect of this is that leaders who are very effective at one place and time may become unsuccessful either when transplanted to another situation or when the factors around themchange.

Thishelpstoexplainhowsomeleaderswhoseemforawhiletohavethe'Midastouch'suddenlyappeartogooff the boil and make very unsuccessful decisions. Thus, we can say that the basic assumption of this theory is that the leader's ability to lead is contingent upon various situational factors, including the leader's preferred style, the capabilities and behaviors of followers and also various other situational factors. We will look into a theory that is a part of the contingency theory of leadership.

1.8.4 Fiedler's Least Preferred Co-worker (LPC)Theory

Fiedleridentifiedtheleastpreferredco-workerscoringforleadersbyaskingthemfirsttothinkofapersonwithwhich theyworkedthattheywouldlikeleasttoworkwithagain,andthentoscorethepersononarangeofscalesbetween positive factors (friendly, helpful, cheerful, etc.) and negative factors(unfriendly, unhelpful, gloomy, etc.). A high LPCleadergenerallyscorestheotherpersonaspositiveandalowLPCleaderscoresthemasnegative.HighLPC leaders tend to have close and positive relationships and act in a supportive way, even prioritising the relationship before the task. Low LPC leaders put the task first and will turn to relationships only when they are satisfied with how the work is going. Three factors are then identified about the leader, the member and the task, asfollows:

- Leader-member relations: The nature of the interpersonal relationship between leader and follower,expressed in terms of good through poor, with qualifying modifiers attached as necessary. It is obvious that the leader's personality and the personalities of subordinates play important roles in thisvariable.
- Taskstructure:Thenatureofthesubordinate'stask,describedasstructuredorunstructured,associatedwiththe amount of creative freedom allowed the subordinate to accomplish the task, and how the task is defined.
- Positionpower:Thedegreetowhichthepositionitselfenablestheleadertogetthegroupmemberstocomply with and accept his/her direction andleadership.

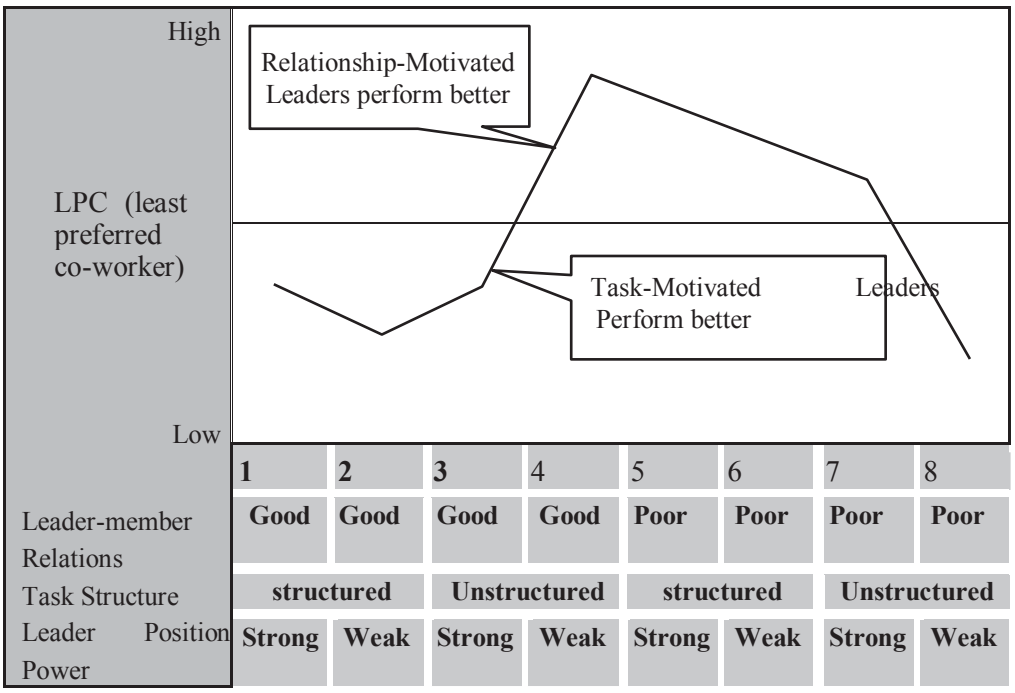

Fig. 1.3 Contingency theory

(Source: www.chan~ngminds.org/discipline~eaderhip/thoeries/elderlpc.htm)

1.8.5 SituationalTheory

Situationaltheoriesproposethatleaderschoosethebestcourseofactionbaseduponsituationalvariables.Differe nt styles of leadership may be more appropriate for certain types of decision-making. Therefore, one can say thatthe basic assumption of this theory is that the best action of the leader depends on a range of situationalfactors.

1.8.6 Hersey and Blanchard's Situational LeadershipTheory

Thebasicpremiseofthistheoryisthateffectiveleadershiprequiresleadershipflexibilitysincedifferentsituation s requiredifferentleadershipapproachesandtactics.BlanchardandHerseycharacterisedleadershipstyleinterm sof the amount of direction and of support that the leader gives to his/her followers, and so created a simplegrid:

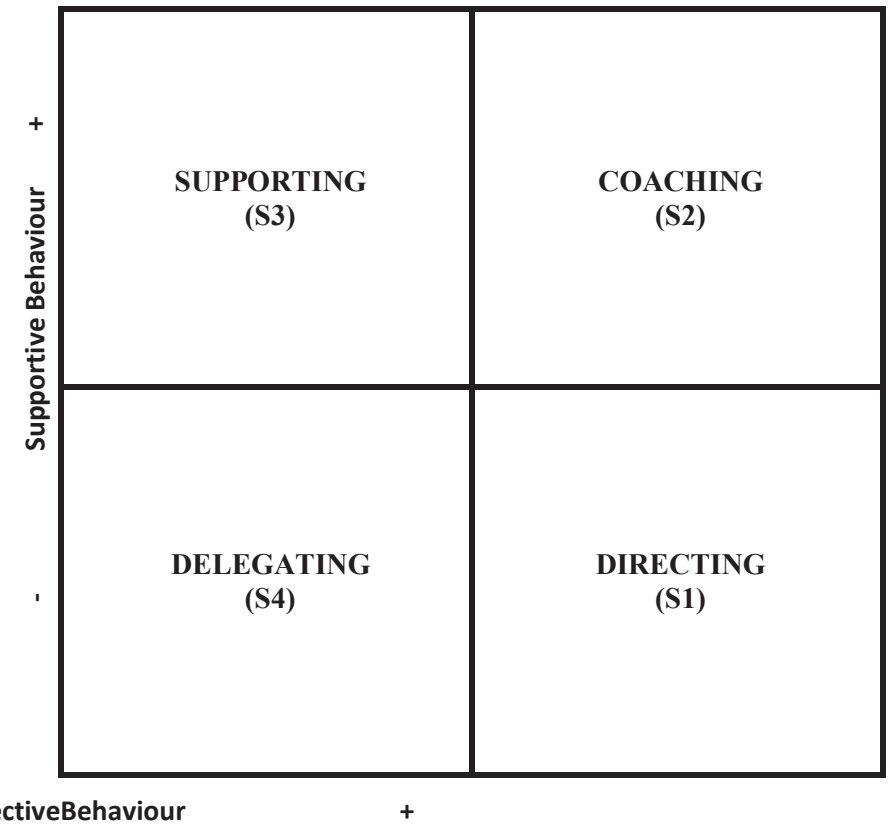

Fig. 1.4 Situational theory

(Source: http://www.chimaeraconsulting.codsitleadechtm)

- DirectingLeadersdefinetherolesandtasksofthe'follower',andsupervisethemclosely.Decisionsaremade by the leader and announced, so communication is largely one-way.
- CoachingLeadersstilldefinerolesandtasks,butseeksideasandsuggestionsfromthefollower.Decisions remain the leader's prerogative, but communication is much more two-way.
- SupportingLeaderspassday-to-daydecisions,suchastaskallocationandprocesses,tothefollower.Theleader facilitates and takes part in decisions, but control is with thefollower.
- Delegating Leaders are still involved in decisions and problem-solving, but control is with the power. 'The follower decides when and how the leader will beinvolved.
-

1.8.7 BehaviouralTheory

Behavioural theories of leadership are based upon the belief that great leaders are made, not born. Rooted in behaviourism, this leadership theory focuses on the actions of leaders, not on mental qualities or internal states. According to this theory, people can learn to become leaders through teaching and observation.

1.8.8 The Managerial Grid Model

TheManagerialGridModel(1964)isabehaviouralleadershipmodeldevelopedbyRobertBlakeandJaneMouton.

Thismodelidentifiesfivedifferentleadershipstylesbasedontheconcernforpeople(relationships)andtheconcern for production (tasks). They developed a grid as shown in the Fig. 1.5, that helps classify the leadership style as exemplifiedbytheindividual.Thegridisreadlikeanormalgraphwhereinthefirstdigitsignifiestheaxiswhile the second digit denotes the Yaxis.

- 1.1 Impoverished management: Often referred to as Laissez-faire leadership. Leaders in this position have little concern for people or productivity, avoid taking sides, and stay out of conflicts. They do just enough to get by.
- 1.9 Country club management: Managers in this position have great concern for people and little concern for production. They try to avoid conflicts and concentrate on being well liked. To them the task is less important than good interpersonal relations. Their goal is to keep peoplehappy.
- 9.1 Authority compliance. Managers in this position have great concern for production and little concern for people. They desire tight control in order to get tasks done efficiently. They consider creativity and human relations to beunnecessary.
- 5.5 Organisation man management. Often termed middle-of-the-road leadership.Leaders in this position have mediumconcernforpeopleandproduction.Theyattempttobalancetheirconcernforbothpeopleandproduction but they are not committed.
- 9.9Earnmanagement.Thisstyleofleadershipisconsideredtobeideal.Suchmanagershavegreatconcernfor bothpeopleandproduction.Theyworktomotivateemployeestoreachtheirhighestlevelsofaccomplishment. They are flexible and responsive to change, and they understand the need tochange.

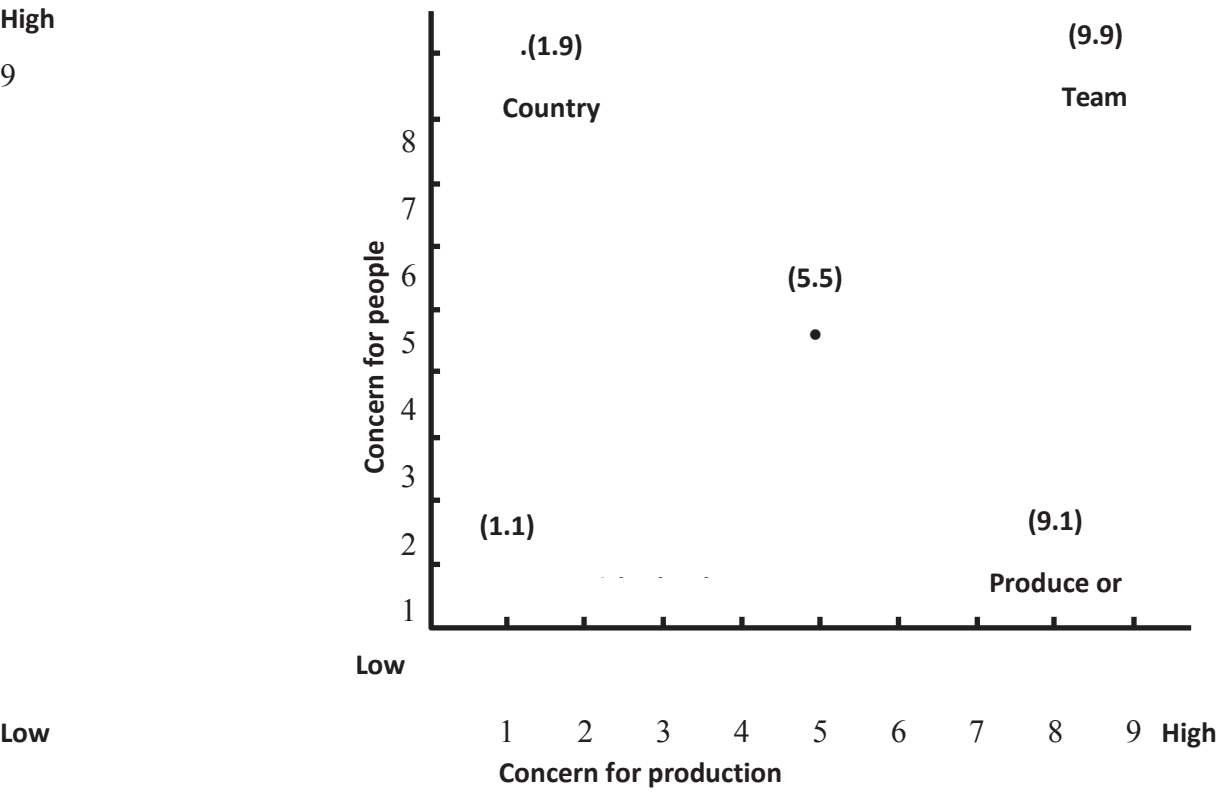

Fig. 1.5 The management grid: A graphical representation of the managerial grid

(Source: http//en.wikipedia.org/~iki/file:Managemd.PNG)

1.8.9 ParticipativeTheory

Participative leadership theories suggest that the ideal leadership style is one that takes the input of others into account. These leaders encourage participation and contributions from group members and help group members feel more relevant and committed to the decision-making process. In participative theories however, the leader retains the right to allow the input of others. Thus one can say that the participative theory of leadership assumes that involvement decision-making improves the understanding of the issues involved by those who must carryout the decisions. It believes that people are more committed to actions where they have been involved in therelevant decision-making;thatpeoplearelesscompetitiveandmorecollaborativewhentheyareworkingoncommongoals and that several people deciding together make better decisions than one personalone.

<Notparticipative **Highlyparticipative>**

Autocratic decision by leader	Leader proposes decision, listens to feedback, then decides	Team proposes decision, leader has final decision	Joint decision with team as equals	Full delegation of decision to team

1.8.10 ManagementTheory

Management theories (also known as "Transactional theories") focus on the role of supervision, organisation, and groupperformance.Thesetheoriesbaseleadershiponasystemofrewardandpunishment.Managerialtheoriesare often used in business; when employees are successful, they are rewarded; when they fail, they are reprimanded or punished.

1.8.11 RelationshipTheory

Relationship theories (also known as "Transformational theories") focus upon the connections formed between leaders and followers. These leaders motivate and inspire people by helping group members to see theimportance and utility of the task. Transformational leaders are focused on the performance of group members, but also want each person to fulfill his/her potential. These leaders often have high ethical and moralstandards.

1.9 Developing Teachers' Leadership Skills

With the advent of school and teacher education restructuring efforts, new leadership roles are emerging.

1.9.1 Emerging Opportunities for Leadership

There are many emerging opportunities for leadership in various fields; some of them are elaborated below.

- Initial teacher capacity building opportunities programs: Such programs offer an opportunity for teachers to developtheirleadershipskillseitheronafulltimebasisoronaparttimebasis.Suchprogramsshouldinvolve handsonactivitythatwouldhelptheteachertoutilisetheirexperienceandalsocontributeintermsofvalueto the respectiveschool.
- Leadershipopportunitiesattheinstitutionallevel:Anotherwaytofosterleadershipinfacultymembersorteachers is to make them involved in the decision making process at various levels in the school. This would provide an opportunity for the teachers to understand the working of the school and state policies and also would help them improve on their skills both as a teacher and as aprofessional.
- Professional Development Centres (PDC): The aim of such centers could be to serve as the locus for teacher

preparation,career-longprofessionaldevelopment,andschoolinnovationandinquiry.Heretheinvolvedteachers oreducationalleaderscanbecalledontodemonstrateskillsrequiredinmentoringprogramsandschoolbased management, as well as skills related to a wide array of peer helping approaches, inquiry methods, innovation leadership and school- universitycollection.

Devaneyofferedaninclusivelistofleadershipareasthatteachersmightbecalledontoexerciseinemergingschoo l
organisations.Thesixrolessheidentifiedcanprovideanorganiserforthedescriptivereportsontheformalprogra ms to develop leadershipskills:

- Continuing to teach and improve one's ownteaching
- Organising and leading peer reviews of schoolpractice
- Providing curriculum developmentknowledge
- Participating in school level decisionmaking
- Leading in service education and assisting otherteachers
- Participating in the performance evaluation ofteachers

Summary

- Leadershipistheprocessofinfluencingandsupportingotherstoworkenthusiasticallytowardsachieving objectives.
- Therearedifferencesbetweenleadershipandmanagement.Leadersareinspiringvisionaries,concernedabout substance; while managers are planners who have concerns withprocess.
- Leadership exists as a process and a product.
- Leaders in the school system have the ability to transform the schoolsystem.
- There are four factors in leadership: follower, situation, communication, andleader.
- Great Man theory assumes that the capacity for leadership is inherent – that great leaders are born notmade.
- Trait theory assumes that people inherit certain qualities and traits that make them better suited toleadership.
- Contingencytheoriesofleadershipfocusonparticularvariablesrelatedtotheenvironmentthatmightdetermine which particular style of leadership is best suited for thesituation.
- Situational theories propose that leaders choose the best course of action based upon situationalvariable.
- Behavioral theories of leadership are based upon the belief that great leaders are made, not born. Rooted in behaviorism, this leadership theory focuses on the actions of leaders, not on mental qualities or internalstates. According to this theory, people can learn to become leaders through teaching andobservation.
- Participativeleadershiptheoriessuggestthattheidealleadershipstyleisonethattakestheinputofothersinto account.
- Management theories (also known as "Transactional theories") focus on the role of supervision, organisation, and group performance.
- Relationshiptheories(alsoknownas"Transformationaltheories")focusupontheconnectionsformedbetween leaders and followers.
- Transformationalleadersarefocusedontheperformanceofgroupmembers,butalsowanteachpersontofulfill his/her potential.

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Chapter II

Definition of Leadership and Importance of Team Building

Aim

The aim of this chapter is to:

- introduce leadership and team building
- explain the approach of leadership
- elucidate types of leadership

Objectives

The objectives of this chapter are to:

- explain the tasks of leadership
- determine the approaches to leadership
- defineleadership

Learning outcome

At the end of this chapter, you will be able to:

- determine the team and team building
- differentiate between democratic, authoritarian and institutionalleaderships
- recognise team building aspects and present 12 Cs for team building

2.1 Introduction

Whatisleadership?Asimpledefinitionofleadershipisthatleadershipistheartofmotivatingagroupofpeopletoact towardsachievingacommongoal.Thisdefinitionofleadershipcapturestheleadershipessentialsofinspirationand preparation.Effectiveleadershipisbaseduponideas,butwillnothappenunlessthoseideascanbecommunicated to othersinawaythatengagesthem. Toputevenmoresimply,theleaderistheinspirationanddirectoroftheaction. He is the person in the group that possesses the combination of personality and leadership skills that makes others want to follow hisdirection.

Inbusiness,leadershipisweldedtoperformance.Thosewhoareviewedaseffectiveleadersarethosewhoincreas e theircompany'sbottomlines.Leadershipisaprocessbywhichapersoninfluencesotherstoaccomplishanobjecti ve and directs the organisation in a way that makes it more cohesive and coherent. Leaders carry out this process by applyingtheirleadershipknowledgeandskills.ThisiscalledProcessLeadership.However,weknowthatwehav e traitsthatcaninfluenceouractions.ThisiscalledTraitLeadershipinthatitwasoncecommontobelievethatleader s werebornratherthanmade.PeterDruckerdefinedleaderassomeonewhohasfollowers.Togainfollowersrequir es influence but does not exclude the lack of integrity in achievingthis.

Indeed, it can be argued that several of the world's greatest leaders have lacked integrity and have adopted values thatwouldnotbesharedbymanypeopletoday.Inthe21IrrefutableLawsofLeadership,JohnMaxwellsumsuphis definition of leadership as "Leadership is influence - nothing more, nothing less." This moves beyond theposition definingtheleader,tolookingattheabilityoftheleadertoinfluenceothers,thatis,boththosewhowouldconsider themselves followers, and those outside that circle. Indirectly, it also builds in leadership character, since without maintaining integrity and trustworthiness, the capability to influence willdisappear.

WarrenBennis'definitionofleadershipisfocusedmuchmoreontheindividualcapabilityoftheleader.Hedefine d leadership as a function of knowing oneself, having a vision that is well communicated, building trust among colleagues,andtakingeffectiveactiontorealiseone'sownleadershippotential.Leadershipistheartofinfluencin g otherstodirecttheirwill,abilitiesandeffortstotheachievementofleader'sgoals.Inthecontextoforganisations, leadership lies in influencing individual and group effort toward the optimum achievement of organisational objectives.

Leadershipfocuseson"people"aspectofmanagementandisbasedontheassumptionthatorganisationaleffectiven ess significantly depends on their motivation, effort and abilities. The human relations movement, beginning with the Hawthorne studies in early thirties, focused on the important role of employee motivation and group norms of organisational success. This led to the recognition of leadership effectiveness as an important determinant of organisationaleffectiveness.Itisthemanagerinhisleadershiprolewhohastostimulateandinspiretheemployee s to contribute willingly and cooperatively to the optimum achievement of organisationalgoals.

Inthiscontext,oneimportanttermwecanuse,i.e.,team.Generally,teammemberssupportoneanother.Theyoffe

r suggestions and give feedback to other members. They may disagree but work to resolve differences and reach consensus. Each and every member of the team trust and support other members. Anyone who acts as a model to others is often called a “leader”. Leadership is an attribute of that person who is an ideal for the other members of the group.

Leadership is the behaviour that affects the behaviour of other people, more than their behaviour affects that of the leader. In fact we can say that in every group every member bears some relation to the others and all of them influence and affect each other. Leader leads, suggests, orders and also guides. Other people follow him. We can say that leadership and domination are not the same meaning. According to MacIver and Page, Leadership is the capacitytopersuadeortodirectmanthatcomesfrompersonalqualitiesapartfromoffice.Itindicatesthedifference between leadership andoffice.

An individual does not become a leader only by occupying an office which carries responsibility. It is a matter of secondaryimportancethathisimportantofficeisofassistancetohiminhisendeavourtobecomealeader.Leadership depends upon the individual qualities of the person and not the office that he holds. Leadership is the termwhich

denotesthebehaviourorfunctionsoftheleader.Theleaderaffectstheindividualinsuchawaythattheysurrender themselves and follow his dictates.

AccordingtoPigors,"Leadershipisaprocessofcontrolinwhichbytheassumptionofsuperiorityapersonorgrou p regulates the activities of others for purposes of his own choosing." Considering this, we can further say that the characteristics of leadership are as follows:

- Leader is the total ideal of the followers
- Leader is shownregard
- Leader and the followers influence eachother
- Leader's order is acommand
- Leader controls the other member of the group
- Leader determines the group'sconduct
- Leader is a respected and revered person

2.2 Classification of Leadership

To know about leadership more we need to understand about the bases of leadership. We can classify leadership on
the basis of origin as follows:

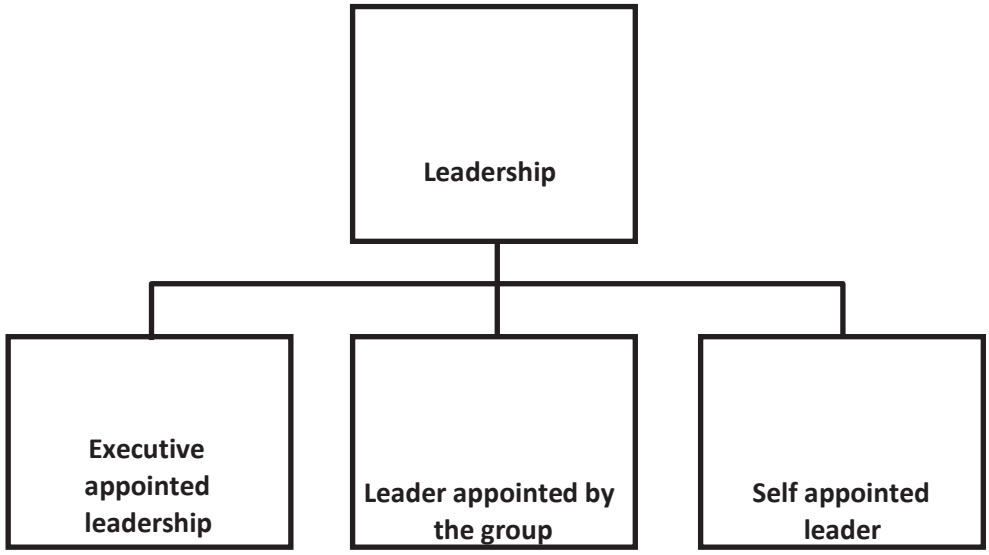

Fig. 2.1 Classification of leadership

These are explained below:

2.2.1 Executive AppointedLeadership

The person is appointed by the executive and the leadership stems from the office or post to which the person is appointed by the executive. The class of government officers is of this type.

2.2.2 Leader Appointed by theGroup

Theseleadersareelectedbythegroup.Publicleadersofpanchayats,localgroups,theLokSabhaandRajyaSabha are elected by the group.

2.2.3 Self-AppointedLeader

Therearesomeleaderswhoseauthorityderivesneitherfromtheexecutivenorthegroupbecauseitisnotvestedin

them by these groups. They advance because of their individual qualities and having attained the central position, lead the people. They are recognised as such because of theirqualities.

Besides the above, we can classify leadership on the basis of some purpose. Different groups make efforts for the achievement of different aims in their respective individual spheres. The individuals who appear to be most resourcefulintheattainmentofanypurposeandaqualifiedpersonareacceptedasleader.Wecanclassifythisinto three categories, viz.,

- Intellectualleadership:Thisleadershipisintheintellectualfield.Inthefieldofphilosophy,science,etc.,the greatest thinkers can be said as intellectual leaders because they show the way and the others follow them.
- Artistic leadership: This leadership is in the field of art, only the great artists can provide theleadership.
- Executiveleadership:Thistypeofleadershipisinthesphereofadministration,itistheauthoritativepersonality who becomes the leader. Also leadership can be on the basis of nature,viz.,

Authoritarian leadership

The authoritarian leader is an individual who likes to assert his authority. He does not consult any one in taking decisions and leads by creating fear into the hearts of his followers and subordinates. He keeps all his authority in hishandsandappointsreliablesubordinatesatcrucialposition.Leaderofthiskindisanofficerandanauthoritaria n. He prefers to issue orders and punishes who disobeyhim.

Democratic leadership

This type of leader is of a democratic mould in his thoughts, modes of action and conduct. He takes advice from everyoneandisalwaysanxioustoenlistthecooperationofanyonewhoiswillingtogiveit.Hisleadershipisbased upon sympathy, belief and affection. He does not call himself a leader and neither does he take all the authority into his own hands.

Institutional leadership

There are some individuals who occupy the highest post. His orders are appreciated and implemented because of the authority vested in his chair. The institutional leader is not leader but the officiating head.

Dominant leader

Theleaderissocalledbecausehemaintainsarelationofauthorityanddominancewithhisfollowersorsubordinat es. He does not rule over them. However, successful he may appear because of his power andauthority.

Expert leadership

A Leader of this type does not put any premium on maintaining social contact with their followers, understanding them or even knowing their thoughts. People come to them for advice from time to time, respect their opinions. Expert leaders are experts, and should not be considered as leaders. The basis of their contact with their followers and subordinates is their special ability and efficiency.

Persuasive leadership

Thepersuasiveleaderswintheheartoftheirfollowersanddotheirbesttomaintaintheclosestsocialcontactwith

them.Thesearetherealleaders.Itisonlythiskindofindividualwhoreallyexhibitsallthequalitiesofleadership. The overall picture reveals a variety of leadership style and their characteristics which we have to know about leadership. In context of organisational setting only, three major leadership style can be discussed here. These are autocratic, democratic and lassiez-faire leadership style and each of which have some significant features. Salient features of autocratic/authoritarian/production centered leadership are:

- Exercises closesupervision
- Makes most decisionhimself
- Emphasises on production
- Permits little or no initiative tosubordinates
- Gives detailed instructions anddirections
- Subordinates' suggestions and ideas are notallowed

Salient features of democratic/ employee centered leadership are:

- Delegate authority andresponsibility
- Manages throughobjectives
- Permits initiative andresponsibility
- Seeks and encourages employees'suggestions
- Participativedecision-making
- Emphasizes production as well as employeesatisfaction

Laissez-Faire leadership

- Emphasises neither production, nor employeesatisfaction
- It is directionless
- Employees are left to drifting

Transformational leadership

Besides this, there is another type of leadership, named transformational leadership. It is defined as leadership that goes beyond normal expectations by inspiring new ways of thinking, stimulating learning experiences and transmittingasenseofmission.Theseleadersaresometimescalledsuperleaders.Theyactinsuchawaythatitis possible to transform average organisation into exceptionalorganisation.

2.3 Factors of Leadership

Following are the factors of leadership:

2.3.1 Leader

Theleadermusthaveanhonestunderstandingofwhoheis,whatheknows,andwhathecando.Also,notethatitis thefollowers,nottheleaderorsomeoneelsewhodeterminesiftheleaderissuccessful.Iftheydonottrustorlack confidence in their leader, then they will be uninspired. To be successful the leader must convince his followers, that he is worthy of beingfollowed.

2.3.2 Followers

Different people require different styles of leadership. For example, a new hire requires more supervision than an experienced employee. A person who lacks motivation requires a different

approach than one with a high degree of motivation. The leader must therefore know his people. The fundamental starting point is having agood understanding of human nature, such as needs, emotions, and motivation. The leader must know his employees and their attributes.

2.3.3 Communication

The leader leads through two way communication. He has to set the example and communicate to them that he wouldnotaskthemtoperformanythingthathewouldnotbewillingtodo.Whatandhowtheleadercommunicates either builds or harms the relationship between the leader and his employees.

2.3.4 Situation

All situations are different. What one does in one situation will not always work in another? The leader must use hisjudgmenttodecidethebestcourseofactionandtheleadershipstyleneededforeachsituation.Forexample,the leadermayneedtoconfrontanemployeeforinappropriatebehavior,butiftheconfrontationistoolateortooearly, too harsh or too weak, then the results may prove ineffective. Also note that the situation normally has a greater effect on a leader's action than his or her traits. This is because while traits may have an impressive stability over a period of time, they have little consistency across situations. This is why a number of leadership scholars think theProcessTheoryofLeadershipisamoreaccuratethantheTraitTheoryofLeadershipvariousforceswillaffect these four factors. Examples of forces are the leader's relationship with his seniors, the skill of his followers, the informal leaders within his organisation, and how his organisation isorganised.

2.4 Characteristics of Leadership

Leadershipcharacteristicsareaninterestingtopicbecausesomepeoplewonderiftheypossessthesecharacteristics withoutcompletelyunderstandingwhattheymightbe.Inotherwords,wehavepeopletryingtofigureoutiftheyare leaders,buttheydonotreallyunderstandwhatdefinesaleader.Letustakeacloselookatsomeofthecharacteristics of aleader.

Characteristics of a Leader

Listed below are eight leadership characteristics:

2.4.1 InterpersonalSkills

The first leadership characteristic is the interpersonal skills. Leaders that have earned the trust and respect of their followerscanusethistrusttomovetheorganisationtowardstheachievementsofitsgoal.Theseleadersareableto usetheirinterpersonalskillstoworkthroughdifficultrelationships,andkeepthepeaceintheirdepartments.Thes e individuals are good at listening as well as providing constructivefeedback.

2.4.2 CommunicationSkills

Leaders demonstrating communication skills are both good speakers and listeners. Through their words they can help to keep the workforce motivated and committed. They also listen to their followers, and ask questions when they want to make sure they have a good understanding of what is being expressed.

2.4.3 Values

Leadersmustalsovaluethediversityofaworkforce,andunderstandthatadiversegroupofemployeeswillbringa broaderperspectivetotheorganisation.Theywilltreatfollowerswiththerespecttheydeserve,anddonotdisplay favoritism. They operate with a high level of ethics, which becomes an example for others to follow.

2.4.4 OrganisationalConsciousness

Leadership characteristics sometimes go beyond personal traits, and touch on areas such as organisationalconsciousness or knowledge. These are leaders that understand what the organisation wants to achieve, and know howitcanbeaccomplished.Theycreatenetworkswithintheorganisationtohelptheirgroupsgetworkdone,and are just as adept at breaking down organisational barriers toprogress.

2.4.5 Confidence

Leaders need to carry themselves with confidence, and should not be afraid to take ownership for both popular and unpopular decisions. They must be able to learn from criticisms, and be often acutely aware of their own shortcomings. Confident leaders are able to maintain a calm demeanour even during emergencies, and this can be contagious when it needs to be.

2.4.6 Flexibility

Another important characteristic of leaders are their ability to remain flexible, and adapt their leadership style to meet the demands of the current work environment. They must be able to work with others to meet organisational goals, and shift focus as necessary.

2.4.7 CreativitySkills

Leadersdemonstratingcreativityskillsareabletodevelopinnovativesolutionstooldproblems.Thediversitythe y
buildintheirorganisationshelpsthemtodevelopmorecomprehensiveanswerstoroutinequestions.Creativelea ders are able to translate technical information into solutions that are understood byeveryone.

2.4.8 AchievingResults

Leaders just do not set the example for others to follow. They also play a big role in achieving the goals of the organisation. Through their leadership skills, they maintain a high level of performance in their organisations,and
theyareabletohelpkeeptheirworkforcemotivatedevenwhenfacedwithaseeminglyimpossiblesituation.Since

they have a deep understanding of what an organisation needs to accomplish, they are able to quickly identifyand solve the important objectives of anorganisation.

Leadership is much more complex than merely earning a high-status position in company, and the ability to order peopletodothings.Itisaparticipativejourneythattheleadermustbewillingtowalkwithothers.Itisaskillthat is acquired over a lifetime, and these characteristics are something we can practice about every day of our life. A great leader is one who learns from hismistakes.

2.5 Tasks of Leadership

The principle tasks of leadership are presented below:

- To recognise that people differ in their motivationalpattern.
- To gain an understanding of groupdynamics.

- To create an environment that produces convergence of individual goals and organisationalgoals.
- To stimulate and inspire employees as individuals and group members to make their optimum contributionto organisational efficiency and effectiveness.
- Tomakesenseofchangingenvironment,interpretittoemployeesandredirecttheireffortstoadapttochanging situation.

2.6 Approaches of Leadership

The main approaches of leadership are:

- The trait approach
- Approaches based on the use ofauthority
- Likert'sapproach
- The managerial grid approach
- The path-goal approach
- The contingency approach
- The continuum approach

Let us discuss these aspects one by one as follows:

2.6.1 The TraitApproach

The trait approach aims at identifying some unique qualities that would distinguish more effective managers from less effective managers.

2.6.2 The Use of AuthorityApproach

Oneapproachclassifiedmanagersasdemocratic,authoritarianandlassiez-faire.TheOhioStateUniversitystudies identifiedleadershipontwoorthogonaldimensions,viz.,considerationandinitiation.TheUniversityofMichigan studies distinguished between production oriented and employee oriented leaders on a simpledimension.

2.6.3 Likert SystemApproach

There are mainly four types of approach:

- System I is Exploitative Authoritariansystem
- System II is Benevolent Authoritativesystem
- System III is Consultativeand
- System IV is Participative groupleadership.

The system IV is most effective for employee need satisfaction as well as optimum organisational performance.

2.6.4 Managerial GridApproach

Leadership style is on a grid with 9-point on the horizontal axis and 9-point on vertical axis. Horizontal axis indicates "Concern for production" and vertical axis indicates "concern for people". We can say 1.1 leadership style is impoverished management with minimum concern for production and minimum concern for people; 9.1 style leader indicates maximum concern for production and minimum concern for people. We can further say that
1.9 style indicates minimum concern for production and maximum concern for people. 9.9 style is most effective because it indicates maximum concern for production and maximum concern for people. In this context it can be said that 5.5 style is recognised as mid-of-the-road style.

2.6.5 Path-GoalApproach

Leader'seffectivenessdependsonhisabilitytoprovideopportunitiesforemployeeneedsatisfactionandmakeneed satisfaction contingent on performanceeffectiveness

2.6.6 ContingencyApproach

There are mainly two kinds of behaviour:

- task-oriented
- people and interpersonal-oriented

What kind of leader will succeed depends on the three situations mainly:

- Leader's personal relationship with groupmembers
- Formal authority of the leaderand
- Degree of taskstructure.

Task oriented leaders will be effective when situation is very favourable or very unfavourable. In intermediate situations, people and inter-personal oriented leader will be effective.

2.6.7 ContinuumApproach

There are mainly seven types of leader's behaviour on a continuum. At one end of the continuum, the leader has almost full freedom to make decision and at the other end subordinate group has it. In the middle, both haveequal freedom when leader presents tentative decisions subject to change after non-manager input. Mainly the choice of leadership style depends on the situation. On the other hand, manager consider three following factors,viz.,

- forces withinhimself
- forces in the subordinateand
- forces in thesituation.

An organisation may choose any approach considering the above mentioned leadership approaches.

2.7 Team and Team Building

When group interaction is necessary to job performance, team building can be used to foster team spirit, cooperation
and commitment to group success. Some special features we can say about team.

Performance includes individual efforts and collective work products which are the result of joint and coordinated attempts.

- Indication of shared leadershiproles

- Indication of individual and mutual accountability
- Encourages open-ended active, problem-solving meeting
- Complementary by nature
- Indication of positive action
- Discusses, decides and does real worktogether
- Indication of trust among the group members
- Each and every member of the team supports one anotherwillingly
- If disagreement happens, still team members work to resolve differences and reachconsensus
- Team members offer suggestions and give feed-back to othermembers
- Actually teams create the potential for an organisation to generate greateroutputs

Peopleineveryworkplacetalkaboutbuildingtheteam,workingasateam,andmyteam,butfewunderstandhow to create the experience of team work or how to develop an effective team. Belonging to a team, in the broadest sense, is a result of feeling part of something larger than one's self. It has a lot to do with one's understanding of the mission or objectives of the concernedorganisation.

Inateamorientedenvironment,theindividualscontributetotheoverallsuccessoftheorganisation.Everyemplo yee workswithfellowmembersoftheorganisationtoproducetheseresults.Eventhoughanindividualemployeema y haveaspecificjobfunctionandhebelongstoaspecificdepartment,suchpersonsareunifiedwithotherorganisati on members to accomplish the overall objectives. The bigger picture drives management's actions and themanager's function exists to serve the biggerpicture.

One needs to differentiate this overall sense of teamwork from the task of developing an effective intact team that is formed to accomplish a specific goal. People confuse the two team building objectives. This is why so many team building seminars, meetings, retreats and activities are deemed failures by their participants. Leaders fail to definetheteamtheywanttobuild.Developinganoverallsenseofteamworkisdifferentfrombuildinganeffective , focused work team when the management considers team buildingapproaches.

2.8 Twelve Cs for Team Building

Executives, managers and organisational staff members universally explore ways to improve business results and profitability.Manyviewteam-based,horizontal,organisationstructuresasthebestdesignforinvolvingallemployees increatingbusinesssuccess.Nomatterwhatonecallstheteam-basedimprovementeffort,whetheritiscontinuous improvement,totalquality,leanmanufacturingorselfdirectedworkteams,itisclearlyevidentthatthemanagem ent is striving to improve results for customers. Few organisations, however, are totally pleased with the results and theirteamimprovementeffortsproduce.Ifteamimprovementeffortsarenotlivinguptoone'sexpectations,th is self diagnosing checklist may tell you why. Successful team building, that creates effective, focused work teams, requires attention to each of the following.

2.8.1 ClearExpectations

Hasexecutiveleadershipclearlycommunicateditsexpectationsfortheteam'sperformanceandexpectedoutco mes? Doteammembersunderstandwhytheteamwascreated?Istheorganisationdemonstratingconstancyofpurpose in supportingtheteamwithresourcesofpeople,timeandmoney?Doestheworkoftheteamreceivesufficientemph

asis as a priority in terms of the time, discussion, attention and interest directed its way by executiveleaders?

2.8.2 Context

Doteammembersunderstandwhytheyareparticipatingintheteam?Dotheyunderstandhowthestrategyofusing teams will help the organisation attain its communicated business goals? Can team members define their team's importance to the accomplishment of corporate goals? Does the team understand where its work fits in the total context of the organisation's goals, principles, vision andvalues?

2.8.3 Commitment

Do team members want to participate in the team? Do team members feel the team mission is important? Are members committed to accomplishing the team mission and expected outcomes? Do team members perceivetheir service as valuable to the organisation and to their own careers? Do team members anticipate recognition fortheir contributions? Do team members expect their skills to grow and develop on the team? Are team members excited and challenged by the team opportunity?

2.8.4 Competence

Does the team feel that it has the appropriate people participating? (As an example, in a process improvement, is each step of the process represented on the team?) Does the team feel that its members have the knowledge, skill andcapabilitytoaddresstheissuesforwhichtheteamwasformed?Ifnot,doestheteamhaveaccesstothehelpit needs? Does the team feel it has the resources, strategies and support needed to accomplish itsmission?

2.8.5 Charter

Hastheteamtakenitsassignedareaofresponsibilityanddesigneditsownmission,visionandstrategiestoaccomplish the mission? Has the team defined and communicated its goals; its anticipated outcomes and contributions; its timelines;andhowitwillmeasureboththeoutcomesofitsworkandtheprocessestheteamfollowedtoaccomplish their task? Does the leadership team or other coordinating group support what the team hasdesigned?

2.8.6 Control

Does the team have enough freedom and empowerment to feel the ownership necessary to accomplish itscharter? At the same time, do team members clearly understand their boundaries? How far may members go in pursuit of solutions?Arelimitations(i.e.,monetaryandtimeresources)definedatthebeginningoftheprojectbeforetheteam experiencesbarriersandrework?Istheteam'sreportingrelationshipandaccountabilityunderstoodbyallmembers of the organisation? Has the organisation defined the team's authority? To make recommendations? To implement itsplan?Isthereadefinedreviewprocesssoboththeteamandtheorganisationareconsistentlyalignedindirection andpurpose?Doteammembersholdeachotheraccountableforprojecttimelines,commitmentsandresults?Does the organisation have a plan to increase opportunities for self-management among organisationmembers?

2.8.7 Collaboration

Does the team understand team and group process? Do members understand the stages of group development? Are team members working together effectively interpersonally? Do all team members understand the roles and responsibilities of team members, team leaders, team recorders? Can the team approach problem solving, process improvement,goalsettingandmeasurementjointly?Doteammemberscooperatetoaccomplishtheteamcharte

r? Has the team established group norms or rules of conduct in areas such as conflict resolution, consensus decision making and meeting management? Is the team using an appropriate strategy to accomplish its actionplan?

2.8.8 Communication

Are teams members clear about the priority of their tasks? Is there an established method for the teams to give feedbackandreceivehonestperformancefeedback?Doestheorganisationprovideimportantbusinessinformation regularly?Dotheteamsunderstandthecompletecontextfortheirexistence?Doteammemberscommunicateclearly andhonestlywitheachother?Doteammembersbringdiverseopinionstothetable?Arenecessaryconflictsraised and addressed?

2.8.9 CreativeInnovation

Is the organisation really interested in change? Does it value creative thinking, unique solutions, and new ideas? Doesitrewardpeoplewhotakereasonableriskstomakeimprovements?Ordoesitrewardthepeoplewhofitinand maintainthestatusquo?Doesitprovidethetraining,education,accesstobooksandfilms,andfieldtripsnecessary to stimulate newthinking?

2.8.10 Consequences

Doteammembersfeelresponsibleandaccountableforteamachievements?Arerewardsandrecognitionsupplied when teams are successful? Is reasonable risk respected and encouraged in the organisation? Do team members fearreprisal?Doteammembersspendtheirtimefingerpointingratherthanresolvingproblems?Istheorganisation designing reward systems that recognise both team and individual performance? Is the organisation planning to sharegainsandincreasedprofitabilitywithteamandindividualcontributors?Cancontributorsseetheirimpacton increased organisationsuccess?

2.8.11 Coordination

Are teams coordinated by a central leadership team that assists the groups to obtain what they need for success? Have priorities and resource allocation been planned across departments? Do teams understand the concept of the internal customer—the next process, anyone to whom they provide a product or a service? Are cross-functional andmulti-departmentteamscommonandworkingtogethereffectively?Istheorganisationdevelopingacustomer-focused process-focused orientation and moving away from traditional departmental thinking?

2.8.12 CulturalChange

Doestheorganisationrecognisethattheteam-based,collaborative,empowering,enablingorganisationalcultureof thefutureisdifferentthanthetraditional,hierarchicalorganisationitmaycurrentlybe?Istheorganisationplanning to or in the process of changing how it rewards, recognises, appraises, hires, develops, plans with, motivates and managesthepeopleitemploys?Doestheorganisationplantousefailuresforlearningandsupportreasonablerisk? Doestheorganisationrecognisethatthemoreitcanchangeitsclimatetosupportteams,themoreitwillreceivein

pay back from the work of theteams?

2.9 Development of a Team

We know that in each and every step of our common activity we require to develop a team so that performance level will be increased and effective one considering the existing scenario of the activity. The significant points in this context we can mention here are as follows:

- Have to create a balanced set ofroles.
- Have to develop communication and processawareness.
- Have to understand teampreferences.
- Have to establish reviewmechanism.
- Have to develop facilitation skills for effectivemeetings.
- Have to confront issues andproblems.
- Have to managestress.
- Have to define teamgoal.
- Have to take decisions based onconsensus.
- Have to implement shared leadership and create equality ofcontribution.

According to, Richard Beckhard, team building efforts typically have one or more of the following goals:

- To set team goals andpriorities.
- To analyse or allocate the workperformed.
- To examine the way the group is working, i.e., to examine processes such as norms, decision-making and communications.
- To examine relationships among the people doing thework.

According to Moorhead and Griffin, team building precedes in much the same manner as other change processes: identification of the problem, data gathering, diagnosis, planning, implementing and evaluation. Its distinguishing featureisgroupparticipationateachstepintheprocess.Apermanentteamisgenerallycomposedofmembersfrom severaldepartmentsorworkunitswhomeetregularlyforthepurposeofresolvingproblemsofacommoninterest. Permanent team is similar to a task force and in fact, it has been known to remain in place for severalyears.

Summary

- Asimpledefinitionofleadershipisthatleadershipistheartofmotivatingagroupofpeopletoacttowards achieving a common goal.
- Effectiveleadershipisbaseduponideas,butwillnothappenunlessthoseideascanbecommunicatedtoothers in a way that engagesthem.
- Leadershipisaprocessbywhichapersoninfluencesotherstoaccomplishanobjectiveanddirectstheorganisation in a way that makes it more cohesive and coherent.
- Leadershipfocuseson"people"aspectofmanagementandisbasedontheassumptionthatorganisational effectiveness significantly depends on their motivation, effort and abilities.
- Leadership is an attribute of that person who is an ideal for the other members of thegroup.
- AccordingtoMacIverandPage,Leadershipisthecapacitytopersuadeortodirectmanthatcomesfrompersonal qualities apart from office. It indicates the difference between leadership and office.
- Leadership is the term which denotes the behaviour or functions of theleader.
- The person is appointed by the executive and the leadership stems from the office or post to which theperson is appointed by the executive.
- Therearesomeleaderswhoseauthorityderivesneitherfromtheexecutivenorthegroupbecauseitisnotvested in them by these groups.
- The authoritarian leader is an individual who likes to assert hisauthority.
- The leader is so called because he maintains a relation of authority and dominance with his followers or subordinates.
- Different people require different styles ofleadership.
- The leader leads through two waycommunication.
- Leadershipcharacteristicsareaninterestingtopicbecausesomepeoplewonderiftheypossessthesecharacteristics without completely understanding what they mightbe.
- The first leadership characteristic is the interpersonalskills.
- Leadership characteristics sometimes go beyond personal traits, and touch on areas such as organisational consciousness or knowledge.
- Leaders demonstrating creativity skills are able to develop innovative solutions to oldproblems.
- There are mainly seven types of leader's behaviour on acontinuum.

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Chapter III

Leadership Styles

Aim

The aim of this chapter is to:

- introduce various leadershipstyles
- elucidate theories of leadership
- explain characteristics of an ideal leader

Objectives

The objectives of this chapter are to:

- explain leadership style vis-a-vis educationalinstitution
- enlist the characteristics of good leaders
- defineleadership

Learning outcome

At the end of this chapter, you will be able to:

- distinguish between different styles ofleadership
- understand three forces that led to the leader'saction
- identify dominant leadershipstyle

3.1 Introduction

Leaders are the agents of change, they are equipped with skill sets that enable any institution realise their goals. Teachers as leaders are individuals who are able to channelise the teaching -learning process; to make it more meaningful and interesting. They participate in the decision making process, take initiative, organise resources, monitor progress and help other sustain their growth and progress. They do so by following certain styles and strategies.

3.2 Defining Leadership

In the previous chapter, the concept of leadership has been discussed in detail. Here the focus is on as a linkage in
the context of styles of leadership. Leadership is defined as an "influencing process" where leaders motivate the members of an organisation to get their best efforts and achieve organisational objectives enthusiastically. It isthe critical factor that helps an individual or a group to identify its goals and then motivates and assists in achieving the stated goals. Three important elements in the definition of leadership are influence/ support, voluntary effort and goal achievement.

BolmanandDeal(1991)suggestthatwhenpeopleareasked"whatisleadership",answersseemtofallintooneof these categories:

- ability to get others to do what you want(power)
- motivate people to get things done-mostly through persuasion
- provide a vision
- leadership is facilitation
- empower people to do what theywant

Thereareproblemswithallofthesebutoveralltheyconveythenotionthatweexpectaleadertoinfluencethrough non-coercive means, to produce some degree of cooperative effort, and to pursue goals that transcend his/her own narrow selfinterest.

3.3 Characteristics of an Ideal Leader

The following verses from Gita help us to identify the characteristics of a Leader.

Ahimsa satyamakrodhastyagasshantirapaishunam;
Dayaabhootteshvaloluptwammaardavamhreerachaapalam

(Fearlessness, purity of heart, steadfastness in knowledge and yoga, alms giving, control of senses, sacrifice, study
of scriptures, austerity and straightforwardness)

Tejaskshamaadhritisshauchamadrohonaatimaanitaa;
Bhavanisampadamdaiveemabhijaatasyablzaarata

(Harmlessness, truth, absence of anger, renunciation, peacefulness, absence of crookedness, compassion towards beings, un-covetousness, gentleness, modesty, absence of fickleness).

3.4 Theories of Leadership Style

There are a number of different approaches, or 'styles' to leadership and management that are based on different assumptions and theories. The style that individuals use will be based on a combination of their beliefs, values and preferences, as well as the organisational culture and norms which will encourage some styles and discourage others.

- Charismatic Leadership
- ParticipativeLeadership

- SituationalLeadership
- TransactionalLeadership

- TransformationalLeadership
- The QuietLeader
- ServantLeadership

Additional research

- The Managerial Grid: Blake and Mouton's people-taskbalance.
- Lewin's leadership styles: Three originalstyles.
- Likert's leadership styles: From autocratic toparticipative.
- Six emotional leadership styles: From 'Mr. Emotional Intelligence', Daniel Goleman andfriends.

Negative styles

There are some relatively common styles of management that are anything but models of good leadership.

- Post-hoc Management: A poor, but commonstyle.
- Micromanagement: Controls everydetail.
- Seagull Management: Flying in, pooping on you and flying offagain.
- Mushroom Management: Drop them in the pool and keep them in thedark.
- Kipper management: Two-facedapproach.

3.4.1 CharismaticLeadership

Charismatic leadership is as follows.

Assumptions

- Charm and grace are all that is needed to create followers.
- Self-belief is a fundamental need ofleaders.
- People follow others that they personallyadmire.

Style

The charismatic leader gathers followers through dint of personality and charm, rather than any form of external power or authority.

The searchlight of attention

Itisinterestingtowatchacharismaticleader'workingtheroom'astheymovefrompersontoperson.Theypaymu ch attention to the person they are talking to at any one moment, making that person feel like they are, for that time, the most important person in the world. Charismatic leaders pay a great deal of attention in scanning and reading their environment, and are good at picking up the moods and concerns of both individuals and larger audiences. They then will hone their actions and words to suit thesituation.

Pulling all of the strings

Charismatic leaders use a wide range of methods to manage their image and, if they are not naturally charismatic, may practice assiduously at developing their skills. They may engender trust through visible self-sacrifice and takingpersonalrisksinthenameoftheirbeliefs.Theywillshowgreatconfidenceintheirfollowers.Theyarevery persuasive and make very effective use of body language as well as verballanguage.

Deliberatecharismaisplayedoutinatheatricalsense,wheretheleaderis‘playingtothehouse’tocreateadesired effect.Theyalsomakeeffectiveuseofstorytelling,includingtheuseofsymbolismandmetaphor.Manypoliticia ns use a charismatic style, as they need to gather a large number of followers. If you want to increase your charisma, studying videos of their speeches and the way they interact with others is a great source of learning. Religious leaders, too, may well use charisma, as do cultleaders.

Leading the team

Charismatic leaders, who are building a group, whether it is a political party, a cult or a business team, will often focusstronglyonmakingthegroupveryclearanddistinct,separatingitfromothergroups.Theywillthenbuildthe imageofthegroup,inparticularinthemindsoftheirfollowers,asbeingfarsuperiortoallothers.Thecharismatic leader will typically attach themselves firmly to the identity of the group, such that to join the group is to become one with the leader. In doing so, they create an unchallengeable position forthemselves.

Alternative views

Thedescriptionaboveispurelybasedoncharismaandtakesintoaccountvaryingmoralpositions.Otherdescripti ons tend to assume a more benevolent approach. Conger &Kanungo (1998) describe five behavioral attributes of charismatic leaders that indicate a more transformational viewpoint:

- Vision andarticulation
- Sensitivity to theenvironment
- Sensitivity to memberneeds
- Personal risktaking
- Performing unconventionalbehaviour

Musser(1987)notesthatcharismaticleadersseektoinstillbothcommitmenttoideologicalgoalsandalsodevotio n to themselves. The extent to which either of these two goals is dominant depends on the underlying motivations and needs of the leader. The charismatic leader and the transformational leader can have many similarities, in that the transformational leader may well be charismatic. Their main difference is in their basic focus. Whereas the transformational leader has a basic focus of transforming the organisation and, quite possibly, their followers, the charismatic leader may not want to changeanything.

Despite their charm and apparent concern, the charismatic leader may well be somewhat more concerned with themselves than anyone else. A typical experience with them is that whilst you are talking with them, it is like being bathed in a warm and pleasant glow, in which they are very convincing. Yet afterwards, ask the sunbeam of their attention is moved elsewhere, you may begin to question what they said (or even whether they said anything of significance at all).

The values of the charismatic leader are highly significant. If they are well-intentioned towards others, they can elevateandtransformanentirecompany.IftheyareselfishandMachiavellian,theycancreatecultsforthefollowe rs. Their self-belief is so high, they can easily believe that they are infallible, and hence lead their followers into an abyss,evenwhentheyhavereceivedadequatewarningfromothers.Theself-beliefcanalsoleadthemintopsychotic narcissism, where their self-absorption or need for admiration and worship can lead to their followers questioning theirleadership.Theymayalsobeintolerantofchallengersandtheirirreplaceability(intentionalorotherwise)ca n mean that there are no successors when theyleave.

3.4.2 Participative Leadership

Participative leadership can be explained as follows:

Assumptions

- Involvement in decision-making improves the understanding of the issues involved by those who must carry out the decisions.
- People are more committed to actions where they have involved in the relevant decisionmaking.
- People are less competitive and more collaborative when they are working on jointgoals.
- Whenpeoplemakedecisionstogether,thesocialcommitmenttooneanotherisgreaterandthusincreasestheir commitment to the decision.
- Several people deciding together make better decisions than one personalone.

Style

Aparticipativeleader,ratherthantakingautocraticdecisions,seekstoinvolveotherpeopleintheprocess,possibl y includingsubordinates,peers,superiorsandotherstakeholders.Often,however,asitiswithinthemanagers'whi m to give or deny control to his or her subordinates, most participative activity is within the immediate team. The question of how much influence others are given thus may vary on the manager's preferences and beliefs, and a whole spectrum of participation is possible, as in the table below.

<Notparticipative Highlyparticipative>

Autocratic decision by leader	Leader proposes decision, listens to feedback, then decides	Team proposes decision, leader has finaldecision	Joint decision with team as equals	Full delegation of decision to team

There are many varieties on this spectrum, including stages where the leader sells the idea to the team. Another variantisfortheleadertodescribethe'what'ofobjectivesorgoalsandlettheteamorindividualsdecidethe'how' oftheprocessbywhichthe'how'willbeachieved(thisisoftencalled'ManagementbyObjectives').Thelevelof participation may also depend on the type of decision being made. Decisions on how to implement goals may be highly participative, whilst decisions during subordinate performance evaluations are more likely to be taken by themanager.

Therearemanypotentialbenefitsofparticipativeleadership,asindicatedintheassumptions,above.Thisapproa chis alsoknownasconsultation,empowerment,jointdecision-making,democraticleadership,ManagementbyObjective (MBO)andpower-sharing.Participativeleadershipcanbeashamewhenmanagersaskforopinionsandthenignore them. This is likely to lead to cynicism and feelings ofbetrayal.

3.4.3 SituationalLeadership

Situational leadership is explained in detail in section below.

Assumptions

The best action of the leader depends on a range of situational factors.

Style

Whenadecisionisneeded,aneffectiveleaderdoesnotjustfallintoasinglepreferredstyle,suchasusingtransactional or transformational methods. In practice, as they say, things are not that simple. Factors that affect situational decisions include motivation and capability of followers. This, in turn, is affected by factors within the particular situation. The relationship between followers and the leader may be another factor that affects leader behavior as much as it does followerbehavior.

Theleaders'perceptionofthefollowerandthesituationwillaffectwhattheydoratherthanthetruthofthesituation. The leader's perception of themselves and other factors such as stress and mood will also modify the leaders' behavior. Yukl(1989) seeks to combine other approaches and identifies sixvariables:

- Subordinate effort: the motivation and actual effortexpended.
- Subordinate ability and role clarity: followers knowing what to do and how to doit.
- Organisation of the work: the structure of the work and utilisation ofresources.
- Cooperation and cohesiveness: of the group in workingtogether.
- Resources and support: the availability of tools, materials, people,etc.
- External coordination: the need to collaborate with othergroups.

Leaders here work on such factors as external relationships, acquisition of resources, managing demands on the group and managing the structures and culture of the group. Tannenbaum and Schmidt (1958) identified three forces that led to the leader's action: the forces in the situation, the forces in then follower and also forces in the leader.Thisrecognisesthattheleader'sstyleishighlyvariable,andevensuchdistanteventsasafamilyargument

can lead to the displacement activity of a more aggressive stance in an argument than usual. Maier (1963) noted that leaders not only consider the likelihood of a follower accepting a suggestion, but also the overall importance of getting things done. Thus in critical situations, a leader is more likely to be directive in style simply because of the implications of failure.

3.4.4 TransactionalLeadership

Transactional leadership is also one of the important aspects. We will see this in section below:

Assumptions

- People are motivated by reward andpunishment.
- Social systems work best with a clear chain ofcommand.
- When people have agreed to do a job, a part of the deal is that they cede all authority to theirmanager.
- The prime purpose of a subordinate is to do what their manager tells them todo.

Style

The transactional leader works through creating clear structures whereby it is clear what is required of their subordinates, and the rewards that they get for following orders. Punishments are not always mentioned, but they are also well-understood and formal systems of discipline are usually in place.

Theearlystageoftransactionalleadershipisinnegotiatingthecontractwherebythesubordinateisgivenasalaryand otherbenefits,andthecompany(andbyimplicationthesubordinate'smanager)getsauthorityoverthesubordinate. When the transactional leader allocates work to a subordinate, they are considered to be fully responsible for it, whether or not they have the resources or capability to carry it out. When things go wrong, then the subordinate is considered to be personally at fault, and is punished for their failure (just as they are rewarded forsucceeding).

Thetransactionalleaderoftenusesmanagementbyexception,workingontheprinciplethatifsomethingisoperating to defined (and hence expected) performance then it does not need attention. Exceptions to expectation require praiseandrewardforexceedingexpectation,whilstsomekindofcorrectiveactionisappliedforperformancebelow expectation. Whereas transformational leadership has more of a 'selling' style, transactional leadership, once the contract is in place, takes a 'telling'style.

Transactional leadership is based in contingency, in that reward or punishment is contingent upon performance.
Despitemuchresearchthathighlightsitslimitations;transactionalleadershipisstillapopularapproachwithmany
managers.Indeed,intheleadershipvs.managementspectrum,itisverymuchtowardsthemanagementendofthescale. The main limitation is the assumption of 'rational man', a person who is largely motivated by money and simplereward,andhencewhosebehaviorispredictable.Theunderlyingpsychologyisbehaviorism,includingthe
classicalconditioningofPavlovandskinner'soperantconditioning.Thesetheoriesarelargelybasedoncontrolled laboratory experiments (often with animals) and ignore complex emotional factors and socialvalues.

In practice, there is sufficient truth in behaviorism to sustain transactional approaches. This is reinforced by the supply-and-demand situation of much employment, coupled with the effects of deeper needs, as in Maslow's Hierarchy.WhenthedemandforaskilloutstripsthesupplythenTransactionalLeadershipoftenisinsufficient,and other approaches are moreeffective.

3.4.5 TransformationalLeadership

Transformational leadership is explained below with various aspects:

Assumptions

- People will follow a person who inspiresthem.
- A person with vision and passion can achieve greatthings.
- The way to get things done is by injecting enthusiasm andenergy.

Style

Working for a transformational leader can be a wonderful and uplifting experience. They put passion and energy into everything. They care about you and want you to succeed.

Developing the vision

Transformationalleadershipstartswiththedevelopmentofavision,aviewofthefuturethatwillexciteandconvert potential followers. This vision may be developed by the leader, by the senior team or may emerge from a broad series of discussions. The important factor is the leader buys into it, hook, line andsinker.

Selling the vision

Thenextstep,whichinfactneverstops,istoconstantlysellthevision.Thistakesenergyandcommitment,asfew peoplewillimmediatelybuyintoaradicalvision,andsomewilljointheshowmuchmoreslowlythanothers.The transformational leader thus takes every opportunity and will use whatever works to convince others to climb on board the bandwagon. In order to create followers, the transformational leader has to be very careful in creating trust, and their personal integrity is a critical part of the package that they are selling.

In effect, they are selling themselves as well as thevision.

Finding the way forwards

In parallel with the selling activity is seeking the way forward. Some transformational leaders know the way, and simply want others to follow them. Others do not have a ready strategy, but will happily lead the exploration of possibleroutestothePromisedLand.Therouteforwardsmaynotbeobviousandmaynotbeplottedindetails,but with a clear vision, the direction will always be known. Thus, finding the way forward can be an ongoing process of course correction and the transformational leader will accept that there will be failures and blind canyonsalong the way. As long as they feel progress is being made, they will behappy.

Leading the charge

The final stage is to remain up-front and central during the action. Transformational leaders are always visible and will stand up to be counted rather than hide behind their troops. They show by their attitudes and actions how everyone else should behave. They also make continued efforts to motivate and rally their followers, constantly doingtherounds,listening,soothingandenthusing.Itistheirunswervingcommitmentasmuchasanythingelseth at keepspeoplegoing,particularlythroughthedarkertimeswhensomemayquestionwhetherthevisioncaneverbe achieved.Ifthepeopledonotbelievethattheycansucceed,thentheireffortswillflag.Thetransformationalleader seeks to infect and reinfect their followers with a high level of commitment to thevision.

One of the methods the transformational leader uses to sustain motivation is in the use of ceremonies, rituals and otherculturalsymbolism.Smallchangesgetbighurrahs,pumpinguptheirsignificanceasindicatorsofrealprogr ess. Overall, they balance their attention between action that creates progress and the mental state of their followers. Perhapsmorethanotherapproaches,theyarepeople-orientedandbelievethatsuccesscomesfirstandlastthrough deep and sustainedcommitment.

Whilstthetransformationalleaderseeksovertlytotransformtheorganisation,thereisalsoatacitpromisetofollo wers thattheyalsowillbetransformedinsomeway,perhapstobemorelikethisamazingleader.Insomerespects,then, the followers are the product of the transformation.

Transformationalleadersareoftencharismatic,butarenotasnarcissisticaspurecharismaticleaders,whosuccee d through a belief in themselves rather than a belief in others. One of the traps of transformational leadership is that passion and confidence can easily be mistaken for truth and reality. Whilst it is true that great things have been achievedthroughenthusiasticleadership,itisalsotruethatmanypassionatepeoplehaveledthechargerightovert he cliff and into a bottomless chasm. Just because someone believes they are right, it does not mean they areright.

Paradoxically, the energy that gets people going can also cause them to give up.Transformational leaders often have large amounts of enthusiasm which, if relentlessly applied, can wear out their followers. Transformational leaders also tend to see the big picture, but not the details, where the devil often lurks. If they do not have people

to take care of this level of information, then they are usually doomed to fail. Finally, transformational leaders, by definition, seek to transform. When the organisation does not need transforming and people are happy as theyare, then such a leader will be frustrated. Like wartime leaders, however, given the right situation they come into their own and can be personally responsible for saving entirecompanies.

The quiet leader

The quite leader shows the following characteristics.

Assumptions

- The actions of a leader speak louder than his or herwords.
- People are motivated when you give them credit rather than take ityourself.
- Ego and aggression are neither necessary nor constructive.

Style

The approach of quiet leaders is the antithesis of the classic charismatic (and often transformational) leaders in that they base their success not on ego and force of character but on their thoughts and actions. Although they are strongly task-focused, they are neither bullies nor unnecessarily unkind and may persuade people through rational argument and a form of benevolent transactional leadership.

The 'Level 5' leader

Five levels of effectiveness people can take in organisations. At level four is the merely effective leader, whilst at levelfivetheleadercombinesprofessionalwillwithpersonalhumility.The'professionalwill'indicateshowthe y arefarfrombeingtimidwiltingflowersandwillmarchagainstanyadviceiftheybelieveitistherightthingtodo. In 'personal humility' they put the wellbeing of others before their own personal needs, for example giving others credit after successes but taking personal responsibility forfailures.

Taoist writings

ThequietleaderisnotamoderninventionandLaoTzu,who,intheclassicTaoisttextTaoTeChing,wasdiscussing the same characteristic around 500BC:

- The very highest is barely known by men
- Then comes that which they know andlove
- Then that which isfeared
- Then that which isdespised
- He who does not trust enough will not betrusted
- When actions are performed
- Without unnecessaryspeech
- People say "We didit!"
- Here again, the highest level of leadership is virtuallyinvisible

Tosomeextent,theemphasisonthequietleaderisareactionagainstthelaudingofcharismaticleadersinthepress. Inparticularduringtheheadydaysofthedot-comboomofthe1990s,someveryverballeadersgotmuchcoverage. Meanwhile,thequietleadersweregettingonwiththejob.Beingquiet,ofcourse,isnotthesecretoftheuniverse, and leaders still need to see the way forwards. Their job can be harder when they are faced with people of a more externalcharacter.

3.4.6 ServantLeadership

Servant leadership can be explained as follows:

Assumptions

- The leader has responsibility for the followers.

- Leaders have a responsibility towards society and those who aredisadvantaged.
- People who want to help others best do this by leadingthem.

Style

The servant leader serves others, rather than others serving the leader. Serving others thus comes by helping them to achieve and improve. There are two criteria of servant leadership:

- Thepeopleservedgrowasindividuals,becoming'healthier,wiser,moreautonomousandmorelikelythemselves to become servants' (Greenleaf,1977).
- Theextenttowhichtheleadershipbenefitsthosewhoareleastadvantagedinsociety(oratleastdoesnot disadvantage them).

Principles of servant leadership defined by the alliance for servant leadership are:

- transformation as a vehicle for personal and institutional growth
- personal growth as a route to better serveothers
- enabling environments that empower and encourageservice
- service as a fundamentalgoals
- trusting relationships as a basic platform for collaboration andservice
- creating commitment as a way to collaborativeactivity
- community building as a way to create environments in which people can trust each other and worktogether
- nurturing the spirit as a way to provide joy and fulfillment in meaningfulwork

Spears (2002) lists: listening, empathy, healing, awareness, persuasion, conceptualisation, foresight, stewardship, commitment to growth of people, and building community. An excellent example of a servant leader is Ernest Shackleton, the early 20th century explorer who, after his ship became frozen in the Antarctic life, brought every oneofhis27crewhomealive,includingan800milejourneyinopenboatsacrossthewinterAntarcticseas.Ittook two years, but Shackleton's sense of responsibility towards his men neverwavered.

Greenleafsaysthattrueleadership"emergesfromthosewhoseprimarymotivationisadeepdesiretohelpothers." Servant leadership is a very moral position, putting the wellbeing of the followers before othergoals.

It is easy to dismiss servant leadership as soft and easy, though this is not necessarily so, as individual followers maybeexpectedtomakesacrificesforthegoodofthewhole,inthewayoftheservantleader.Thefocusontheless privileged in society shows the servant leader as serving not just their followers but also the whole ofsociety.

Servant leadership is a natural model for working in the public sector. It requires more careful interpretation in theprivatesectorlesttheneedsoftheshareholdersandcustomersandtherigorsofmarketcompetitionarelost.A challenge to servant leadership is in the assumption of the leader that the followers want to change. There is also the question of what 'better' is and who decides this. Servant leadership aligns closely with religious morals and has been adopted by several Christianorganisations.

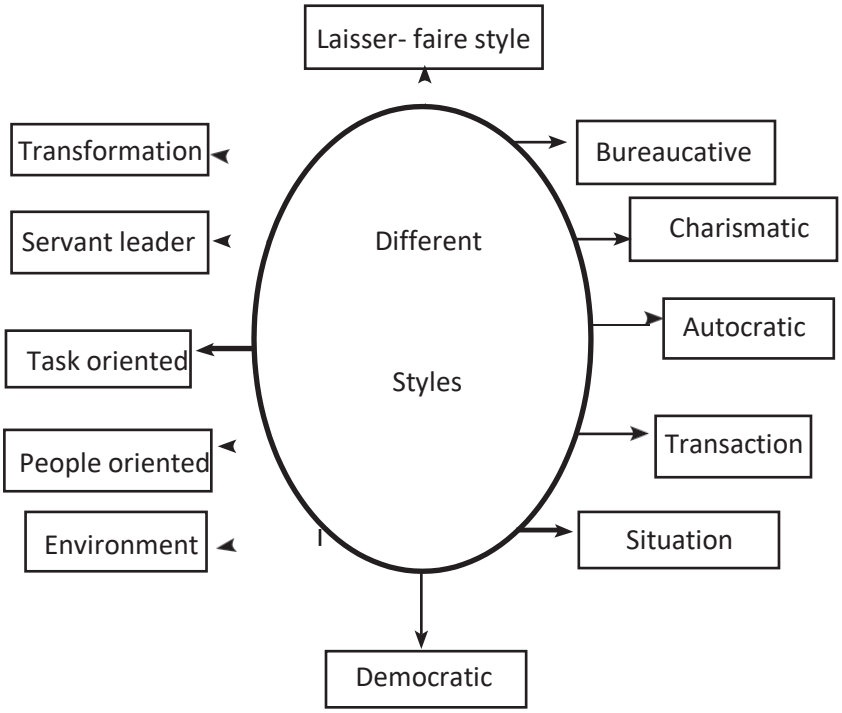

Fig. 3.1 Different leadership styles

3.5 Leadership Style Vis-A-Vis Educational Institution

Leadersintheeducationsystemhavetheabilitytotransformthesystem.Generally,leadersintheeducationsyste m can:

- set the pattern and guide the outcomes of co-operativeaction
- guide educational programs, but rely on shareddecisions
- give common understanding to common purposes and goals
- produce cohesiveness without which co-operation isimpossible
- communicate with all concerned personnel with a sense of mutual understanding and mutual loyalty to the ideals of education
- generate enthusiasm for projects and inspire working towards theircompletion
- resolve the differences which frequently arise in growingorganisations
- lead by example and inspiration
- contribute to the group by advancing usefulsuggestions

Thus, based on the assessment of the needs in the school or any other educational institutions, each leader must decide the leadership style that needs to be opted for the smooth functioning of the educational institution in all circumstances.Itisessentialtorememberthatasinglestylecannotsolveorresolvealltheissuesintheeducational system.Inordertoruntheschoolsuccessfullybygivingadequateimportanceandopportunitiestothemembersof the school, the leadership style followed must be flexible and with a mixedapproach.

Summary

- Leadershipistheprocessofinfluencingandsupportingotherstoworkenthusiasticallytowardsachieving objectives.
- Leaders in the educational system have the ability to transform the educationalinstitution.
- The laissez-faire "leave it be" leadership is the leadership style that gives no continuous feedback or supervision.
- The bureaucratic leader is very structured and follows the procedures as they had beenestablished.
- The charismatic leader leads by infusing energy and eagerness into their teammembers.
- The autocratic leadership takes decisions based on the power that has been given tohim/her.
- The democratic leader takes decisions based on the consensus and consonance of team members.
- Thepeople-orientedleaderistheonethatinordertocomplywitheffectivenessandefficiency,supports,trains and develops his/her personnel increasing job satisfaction and genuine interest to do a good job.
- The task oriented leaders focus on the job, and concentrate in the specific tasks assigned to each individualto reach goal accomplishment.
- Theservantleaderistheleaderthatfacilitatesgoalaccomplishmentbygivingitsteammemberswhattheyneed in order to be productive.
- The transaction leader has the power to perform certain tasks and reward or punish for the team's performance.
- The transformation leader is the one who motivates its team to be effective and efficient using solid communicationsstrategies.
- Theenvironmentleaderistheonewhonurturesthegroupenvironmenttoaffecttheemotionalandpsychological perception of an individual's place in thatgroup.
- The situation leader is the leader that uses different leadership styles depending on the situation and the types of individuals that are underhim/her.

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Chapter IV

Models, Styles and Training of Leadership

Aim

The aim of this chapter is to:

- introduce the meaning of training for leadership
- explain styles ofleadership
- elucidate nursing leadership approaches and behaviour

Objectives

The objectives of this chapter are to:

- explain development program for effective nursingleadership
- explicate models of leadership and its implication in nursing
- define effective nursingleadership

Learning outcome

At the end of this chapter, you will be able to:

- describe the purposes of training of nurses for leadership
- understand the models of leadership
- identify the styles ofleadership

4.1 Introduction

Agoodleadercanbeagoodmanagerbutcanagoodmanagerbeagoodleader?Notnecessarily.Peopledon'twant to be managed, they want to be led. Managers manage but may not lead. Leaders may develop in any discipline, in any place and at any level. But managers are part of an organisational structure. Career growth and leadership developmentdonotalwaysgotogether.Careermovementstakeplaceinaseriesofjumpsfromonepositionorjob toanother.Thenursein-chargeofawardorunitinahospitalisthekey,figureforcoordinatingandimplementing patient care, treatment, and the facilities required to promote recovery. She is known by different names: ward supervisor,headnurseorwardsister.Shecoordinatesthevariousdepartments,personnelendpatients.Herleader ship abilities enable her to train, develop and retain staff in her unit and sustain their interest for anorganisation.

4.2 Models of Leadership

As a nurse administrator, we have come across various models of leadership. We have described here four models.

These are:

- TraitModel
- SituationModel
- Behavioural (Style)Model
- Tridimensional Leader EffectivenessModel

4.2.1 Trait Model

Thereisanoldnotionthat"Leadersareborn,notmade".Earlyleadershipstudiesarefocusedontraitcharacteristic s and qualities. According to this model, leader must have certain traits and qualities; he is gifted with, or develops certain physical, intellectual, or personality characteristics. Some examples of leadership traitare:

- A forcefulpersonality
- Ability to persuade people for a course ofaction
- Efficiency
- Ability to get along withpeople

4.2.2 SituationalModel

According to this approach, a leader is the product of a given situation and his behaviourmay, in fact, vary from onesituationtoanother.Thistheoryincludesthetraitsoftheman(qualitiesandmotivations),theroleexpectation of the group, and the social forces at work (external factors) that bring forth and shape the leadership potential. Combining these three factors, we see the emergence of five kinds ofleaders:

- Natural Leader: He becomes a leader though lie does not seek the role; it is thrust upon him by the group and by the tide of events.
- CharismaticLeader:Heisanauthenticherointheeyesofhisfollowersforhecandonowrong.Heinspires people to make any sacrifice even their lives for this cause.
- Rational Leader: He is consistent andpersistent.
- Consensus Leader: This leader is perceived as acceptable to all. He rises in the absence of the above threeand this leader is in a tenuous position of walking a tightrope forexistence.
- Leaderbyforce:Hispowerspeaksthroughthemuzzleofagun.Hedominatesothersthroughfear.Heisruthless in

suppressing opposition. He does not rule long, as this type of leadership contains within itself the seeds of its own destruction.

The situational theory states that the leader must have insight and flexibility. He must be aware of and assess the

4.2.3 Behavioural (Style) Model

Thisistheclassicresearchdonebyl.ewin,LippittandWhiteoninteractionbetweenleaderandgroup.Accordingto thismodelaleaderbehavesaccordingtocertainroleexpectationsofthegroup.Accordingtotheseroleexpectations, traditional leadership theorists say that every leader can be identified by one of the four basicstyles:

- Democratic: The leader is a catalyst for group decision-making and sharedresponsibility.
- Laissez Faire: The leader leaves all decision-making and responsibility to thegroup.
- Autocratic: Takes all decisions and assigns all responsibility tohimself.
- Benevolent Autocratic: Apaternalistic leader, "You do what one say. One knows what is best for you".

4.2.4 Tridimensional Leader EffectivenessModel

Hersey and Blanchard were greatly influenced by Reddin in their Tri-dimensional leadership effectivenessmodel. This seems to be a further synthesis of all previous work. In Hersey and Blanchard's Model, effectiveness is a continuum.Thedegreeofeffectivenessorineffectivenessismeasurable.Whatisthecrucialsituationalfactor?The maturity level of the followers is the crucial factor in the situation. Hersey and Richard's Situational Leadership Theory(tobehereafterknownasSituationalLeadershipTheory)isacurvilinearrelationshipbetweentaskbehaviour and relationship behaviour and maturity. That is, there is interplayamong:

- The amount of direction (task behaviour) a leader gives.
- The amount of socio-emotional support (relationship behaviour) a lenderprovides.
- Thematuritylevelsthatfollower'sexhibitonaspecifictask,functions,ofobjectivethattheleaderisattempting to accomplish through the individual's or the follower group's own initiative.

Thus,whileallthesituationvariables(leader,follower(s),superior(s),associates,organisation,jobdemands,and time)areimportant,theemphasisinsituationalleadershiptheorywillbeonthebehaviourofaleaderinrelationto followers.Thefollowersarethemostcrucialfactorinanyleadership.Theyarevitalnotonlythattheyindividually accept or reject the leader, but because, as a group, they actually determine whatever personal power their leader may have.

There are four styles of leadership:

- Telling:Onewaycommunication;theleaderdefinestherolesofthefollowersandtellsthemwhat,how,when, and where to do various tasks.
- Selling: Most of the direction is still provided by the leader. He attempts a two way communication and gives socio-emotional support to get the followers psychologically to agree to decisions that have to bemade.
- Participating: The leader and followers share decision making process through two-way communication and highdegreeoffacilitatingbehaviourfromtheleader,sincethefollowershavetheabilityandknowledgetodo the task.
- Delegation: The leader lets the followers run their own show, they direct their ownbehaviour.

Hersey and Blanchard in their model, has defined maturity as the ability to set high by attainable goals, willingness
and ability to take responsibility, and the level of education and experience of an individual or a group.

4.2.5 Maturity and the Leaders Behaviour

Asthelevelofmaturityofthefollowers'increases,leadersshouldbegintoreducetheirtaskbehaviourandincreas e their relationship behaviour, until the individual or the group reaches a moderate level of maturity. As they go above the average level of maturity, the leader decreases not only task behaviour but also relationship behaviour. Nowtheindividualorgroupcanprovidetheirownrewardsandreinforcements.Theyarematurenotonlyinterms of performance of the task, but also psychologically. Thus, they need less supervision and therefore, much more delegation is possible. These variables of maturity should be considered only in relation to a specific task to be performed.Thatistosay,intotalityanindividualoragroupisnotmatureorimmature.Peoplehavevaryingdegrees of maturity depending on the specific task, function or objective that a leader is attempting to accomplish through theirefforts.

4.3 Leadership Style and Nursing Staff Job Satisfaction

Does leadership style affect the behaviour and attitudes of subordinates? In a study of 238 nurses working in 14 neonatal intensive care units, Duxbury and Associates looked at the relationship between job satisfaction, staff burnout, and head nurse leadership style. The sample was drawn from larger national random sample. The head nurses leadership styles were separated into four categories: high structure-high consideration; low structure-low consideration; high structure-low consideration; and low structure-high consideration.

Theresearchersfoundafairlystrongrelationship(r=0.55)betweenstaffnursejobsatisfactionandhighconsidera tion and less relationship to staff burnout (r=0.29). There was little relationship between structure and job satisfaction or burnout except that staff burnout was highest when the head nurse's style was one of high structure and low consideration. The researcher points out that the work environment should also be considered in analysing these results. The head nurse's style could be a reaction to different work environments. It was concluded that neonatal intensive care head nurses can increase satisfaction and reducemodel.

4.4 Styles of Leadership

As a nurse manager you will learn various styles of leadership so that you can judge which is best in nursing profession especially when you are in a clinical field.

- Autocratic: Takes all decisions and assigns all responsibility to himself (Aurangzeb, Tipu, Ashoka, Shah Jahan)
- Democratic: The leader is a catalyst for group decision making and shared responsibility (LalBahadurShastri)
- LaissezFaire:Theleaderleavesalldecisionmakingprocessandresponsibilitytothegroup.Uninvolved(King Farod)
- Charismatic Leadership

4.4.1 Authoritarian or AutocraticLeadership

Authoritarianleadersusetheirpowertoinfluencetheirpowerandtendtobetaskoriented.Suchleadersaredictato rs and do not allow the subordinates to reason. They give orders and assign tasks without taking the subordinates into confidence. Authoritarian leader is found in dictatorship state (one man show). Authoritarian leader has more absolute power. He alone dictates the activities of the members; serve as ultimate judge and purveyor of rewards and punishment. Fate of each individual is in his hands. Group involvement is less and goals are not clear. Inter communication between members is little. Leader is

the keystone; group structure falls with the fall of leader. It causes more frustration, aggression, hostility and conflict. The authoritarian leader maintains strong control over people in the group. This control may be benevolent and considerate (Paternalisticleadership).

Decision of autocratic leader is fast and time saving; one-man show frame work is rigid, more emphasis is on obedience. Authoritarian leaders give orders often and expect group members to obey these orders. Directions are given as commands, not suggestions. Criticism is more common from authoritarian leader. Many authoritarian leaders are also quite punitive. Authoritarian leadership emphasises difference in status. He makes the status of leader higher than the status of group members. This reduces the degree of trust and openness between leader and group members. Productivity is high. Dependency needs are usually met but growth and autonomy needs are not. Authoritarianleadershipisparticularlysuitableincrisissituationswhencleardirectionsarethehighestpriority.It is often referred today as a directive or controlling style of leadership. It is useful when group is not educated or emergency situations are there. There is rigid control over subordinates and one way communication. "Carrot and stick" method is used tomotivate.

4.4.2 DemocraticLeadership

Democraticleaderexerciseshispowerindifferentway.Heseeksmaximuminvolvementandparticipationofevery one in-group activity and in determination of group objectives. He spreads responsibility. He seeks to encourage interpersonal relationship in the group and reduce intra group tension and conflict. Leader has focal importance in the group. All members are inter-related. He serves as the agent of the group, mandate of the group. Group go along withouthim.

Democratic leader is work oriented and group oriented and gives considerable freedom to their followers in their work.Decisionistimeconsumingandmaynotcometoconclusion.Roleofleaderisfacilitativeandcounselling.It is useful when workers are well trained, more responsible, acknowledgeable, and independent. Democratic leader allows members to participate in decision making process. Maintaining good interpersonal relationship with the subordinates, gives a sense of belongingness. There should be concern and consideration for each member as a unique individual.

Leadershipstyleadoptedbymanagerwoulddependonhisvaluessystem;degreeofconfidenceinhissubordinates and his tolerance for ambiguity. It also depends on his perception of his role, his own standing in the group and degree of maturity. Factors influencing the subordinatesare:

- Their need of independence
- Readiness to accept responsibility
- Identification with goals oforganisation
- Interest in their job
- Willingness to work inteam

4.4.3 Laissez-FaireLeadership

Managerexercisesminimumcontroloverthegroupmembers.Thegroupisleftitselftotryforgoalachievement withoutanyinterferencefromtheleaderorifhisassistanceissought.Itallowsthememberstodevelopthemselves bygivingthemanopportunitytotryandfindwaysandmeansofachievinggroupobjectives.Lackofcontrolover the group members lead to non attainment of specific goals and objectives for which the group is created. If there is clash of interest among members of group objectives, it may result in serious group conflict and loss of group cohesiveness. It permits the members of the group to do whatever they like and represents an absence of formal leadership.

	Authoritarian	Democratic	Laissez-faire
Degree of freedom	Little freedom	Moderate freedom	Much freedom
Degree of control	High control	Moderate Control	No control
Decision making	By the leader	Leader and group together	By the group or by no one
Leader Activity Level	High	High	Minimal
Assumption of Responsibility	Primarily	Shared	Abdicated
Output of the group	High quantity, good quality	Creative, high quality	Variable, may be poor quality
Efficiency	Very efficient	Less efficient than Authoritarian	Inefficient

Table 4.1 Comparison of authoritarian, democratic and laissez-fair leadership style

4.4.4 Bureaucratic or Rules-centeredLeadership

This is a style of leadership which fosters workers apathy. The rules serve as a specification of the minimum level acceptable performance. The leader's behaviour is characterised by a high degree of reliance on rules, regulations andprocedurestowhichbothheandhissubordinatessubscribe,asaresult,theprocessofadministrationisreduced to a series of routineactions.

4.4.5 CharismaticLeadership

Thecharismaticleaderisamanof"specificgiftsofthebodyandspirit".Thesegiftsaresupposedtobesupernatural andarenotpossessedbyanyoneelse.Thecharismaticleaderisamanwith"hypnotic"effectonothers.Wellknown examplesofthisformofleadershiparefoundinJesusChrist,Buddha,Gandhi.Inthiskindofleadership,theleader andthefollowersarenotusuallydependent.Theleaderhashis own'innerforce'andlieneedsnobody'sdirection or advice. There are two types ofleadership:

- Transactional
- Transformational

4.5TransactionalandTransformationalLeadership

Leadership theories of the past century were born from the old belief of the world with emphasis on control, a competition, power wielding, and rationality. Further, they were developed by using approaches of the scientific method.Althoughthescientificmethodisresponsibleformajorbreakthroughsforsociety,itisnotthesoleapproa ch toidentifyandsolveproblems.In1978,JamesMacgregorBumscoinedthetermstransformationalandtransactio nal leadership.Bumsgavegeneraldefinitionofleadership:"Leadershipoverhumanbeingsisexercisedwhenperso ns withcertainmotivesandpurposesmobiliseincompetitionorconflictwithothers,institutionalpolitical,psychologi cal, and other resources so as to arouse, engage, and leadership arises in situations of conflict. But the conflict is not between the leader and followers, but rather with others in theenvironment."

J.M.Burnsdefinestwotypesofleadership:transactionalandtransformational.Burnsstatetransactionalleaders hip occurs"Whenonepersontakestheinitiativeinmakingcontactwithothersfortheexchangeofvaluedthings"that may be economic, psychological or political. It is a bargain or contract that aids the individual differences of both the leader and follower. In transformational leadership situations, the leader or followers have the same purpose. Transformational leadership occurs "when one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality".

- Itimplieschangeinwhichthepurposeoftheleaderandfollowerbecomefused,creatingunity,wholeness,and a collective purpose.
- Both the leader and followers grow and develop.
- This type of leadership is in concern and consistent with the new socialparadigm.
- It is moral leadership, a philosophical rather than technical approach to leading.

Characteristics of transformational leader include the following:

- An understanding of the goals and purpose of the nursing organisation by all nursingpersonnel
- People expressing love and joy in theirwork
- Enthusiasm about patients and the care they receive
- A teamspirit
- People expressing a sense ofaccomplishment
- Satisfied patients andfamily

4.5.1 Strategies of Transformational Leadership

Althoughtransformationalleadershipprovidesaphilosophicalviewofmoralleadership,thereareconcretepracti

cal strategies for transformational leadership. Bennis and Nanus propose fourstrategies:

- Creating a vision
- Building a social architecture that provides meaning foremployees
- Sustaining organisationaltrust
- Recognising the importance of buildingself-esteem.

These four strategies are consistent with the new world paradigm. They are, for the most part, strategies to deal with the intangible elements of the organisation and with feelings, values and needs of people in the organisation. Theyembraceandacceptambiguity,theneedfororganisationalandindividualversatility,andhumanrelationship. These are explained in detail as below:

Vision

Writing and widely sharing a realistic, credible, optimistic vision of a nursing organisation is the concrete form of this collective purpose, serving to stimulate the nursing organisation toward its goals.

Social architecture

Itprovidesstructureandprocessessothatvisioncanbeinstitutionalisedandsustained.AccordingtoBennisandNanussocialarchitectureisanintangible,butitgovernsthewaypeopleact,thevaluesandnormsthataresubtlytransmitted togroupsandindividuals,andtheconstructofbindingandbondingwithinacompany."Itprovidesmeaninganda sharedexperienceofcompany".Itprovidesmeaningandsharedexperienceoforganisationaleventssothatpeople know about the expectations as to how they are to act. It also provides informal control versus traditional formal control such as fixed job descriptions, rigid systems of reward and punishment, and budgetaryimplementation.

Organisational trust

Newworldviewplacesanemphasisonhumanrelations,transformationalleadershipthatcannotexistunlessthere isorganisationaltrust.Withouttrust,gameplaying,marksmanship,disharmony,anddysfunctionalconflictwill exist andpreventexcellenceandachievementofgoals.Withtrust,informationissharedmoreaccuratelyandinatimely way.Peoplewillallowthemselvestobepositivelyinfluencedbyothersandfeellessneedtocontrolothers.Thefirst stepinbeginningtobuildandsustainorganisationaltrustisforthetransformationalleadertotrustothers.Onlyby doing so individual and group relationship flourish, leading to creativity, innovation, andempowerment.

Self esteem

The most important, essential trait of successful leaders is having a positive self-regard. This means that one feels good about oneself, has confidence in one's own abilities, and has a sense of self worth and self respect. Because of the result of having high self esteem is having a high regard for others. Effective transformational leaders must havehighself-esteem.Techniquestoincreaseone'sownselfesteemincludetheuseofvisualisations,affirmations, and letting go the need to be perfect. The transformational leader needs to attend to the self-esteem of theothers.

Toachievesuccessforindividualnursesandforthenursingprofession;nursingneedstransformationalleaderswho are moral leaders. These leaders will be able to recognise the values and aspirations of nurses and appeal to them. Theywillbeabletomatchtheneedsofthesociety.Theywillhaveavisionforthefuturewhichwillbebasedonthe tradition of caring and combine this tradition with autonomy. Transformational leadership creates work

condition which is based on the followingideas:

- People can achieve their own potential and will work hard to doso.
- People are honest and trustworthy; they want and deserve to be treated with respect anddignity.
- People understand the purpose of their work and the goals of theorganisation.
- People are accountable andresponsible.
- People are able to identify and correct mistakes and problems before they escalate and are shifted to higher levels of thisorganisation.
- Leaders are responsible for teaching followers, the working of theorganisation.
- Leaders are responsible for assuring that information is shared and communicated in a two-wayprocess.
- Leaders,followers,andtheorganisationhaveresponsibilitytoeachother.Thisresponsibilitytranslatesasense of value, empathy, understanding, caring and mutualsupport.

Thus,transformationalleadershipcreatesleaderswhomanagewiththeheartaswellaswiththehead.Transformation al leaders are capable of translating intention into reality due to ability they have:

- Vision,communicationandalignment:Thecapacitytocommunicateone'svisioninordertogainthesupportto one's constituents.Persistency, consistency, focus and the capacity to maintain the organisationaldirections.
- Empowerment:Thecapacitytocreateanenvironmentinwhichpeopleareencouragedtoworktowardachieving theirpotential.Itisaprocessoffocusingontheneedsofindividualsandencouragingself-responsibility,altering self-limiting beliefs, and encouraging the spiritualself.
- Organisational learning: The capacity to use innovative techniques that enable organisations to monitor their performance, past and present, and the effectiveness of one'sorganisation.

4.6 Training for Leadership

As you know you have qualities of good leader to manage your wards. Now you will learn about training for leadership.

4.6.1 Concept of Training forLeadership

There is an urgent need for well-prepared nurses to participate in national and institutional level to improve the quality of nursing care. If nurses are well prepared during their training period or after training they can prove to begoodleaders.Leadershipistheprojectionofpersonality-thatisthecombinationofpersuasion,compulsionand examplethatmakesotherpeopledowhatyouwantthemtodo.Organisationmustidentifythenaturalleaders,train them and give an opportunity to lead. The central theme of the most definitions is that "leadership is a process of influencing individual and group activities toward goal setting and goalachievement".

Inthefinalanalysis,thesuccessfulleaderisonewhosucceedsingettingotherstofollow.Aleaderinworkingwith followershe/sheisthesparkthatlightsthefireandkeepsitburning.Sothetrainingforleadershipshouldreflecton suchdevelopments.However,adilemmathatprevailsintheteachingofleadershipisthatopportunitiestoimplem ent leadershipbehavioursarerestricted.Nurseleadersinhealthcareagenciescanactaspreceptorsandrolemodelsfo r students, but this alone does not enable the students to develop leadershipskills.

4.6.2 Purposes of Training ofNurses

Purposes of training of nurses in leadership are to:

- preparenursesinleadershippositionsistoparticipatefullyinkeypolicy,planningdecisionsatalllevelsof health care and thus contributes to improvements in quality, efficiency and cost effectiveness
- bring about full cooperation and collaboration among the leaders of the nursing profession, i.e., educationists, administrators, practitioners

- preparenursesandmidwivestostrengthenthestrategicplanninginmanagementofhealthservicesandimprove their quality effectiveness and efficiency
- provide leadership development opportunities for nurses and midwives at all level

4.6.3 Steps andProcess

Steps and process for development of models/methods of training for leadership are:

- Analysing the set objectives indetail
- Understand the effectiveness of alternative methods of training for leadership indetail
- Set yourself mentally, physically and socially of selectedmethod
- Goahead

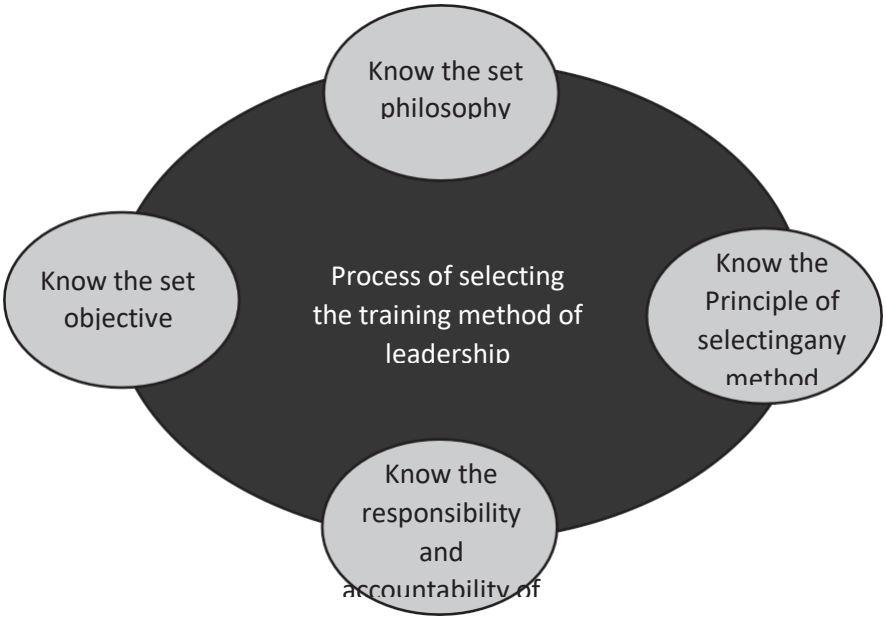

Fig. 4.1 Process of selecting the training method of leadership

4.6.4 Uses of DifferentSettings

We will see different settings in context with different systems:

Educational Institutions

Weintroduceyoutoanyonemethodoftrainingforleadershiptounderstandtherelationtoeducationalinstitutional setting. The training and development of a chain of clinical instructor's, for example, at the beginning of the first clinicalday,theinstructoraskstudentstoidentifyclassmatesthattheydonotknow,andthenintroducesstudentsto therestoftheclass.Tofacilitatearelaxedatmosphere,theinstructoravoidsdirectobservationoftheseinteractions. This exercise serves as an ice breaker and supports students' development of communication skills with both a stranger and a group. This "warm-up" in pre-conference increases students' confidence to go independently to an assigned unit and introduce themselves and their purposes to nurse managers.

Selection and recruitment

- Here you try to post her along with the senior member faculty in educational setting, e.g., clinical setting or classroom setting or in demonstrationrooms.
- Giveheranopportunitytoprovidethefeedbackinwritingsothataconstructiveareaofweaknessandpotentials are identified.
- Provide her an opportunity participates in general presentation or nursing clinical,meeting.
- Develop an ongoing evaluation in consultation withher/him.
- Provide her a full opportunity to read and analyse the policy and her job description of theinstitution.
- Inshort,orientation,sensitisation,feedbackandevaluationarethecomponentsofherroleandwhensheundergoes the same process she is aware of herrole.

Community health set-up

Here only the setting is shifted from the above and the same process is to be adopted in real situations.

Hospital set-up

Start with orientation. Post her on rotation to all departments with her superior. Provide incidental training and guidance to adopt

- inculcate effective readinghabit
- develop negotiation techniques

4.7 Effective Nursing Leadership

In nursing profession effective leadership is required to ensure that their contribution to health and health care aremaximised and their value is fully recognised. Unfortunately, nursing is characterised by a lack of effective leadership.Thenursesneedadequatepreparationforthemanagementandadministrativeresponsibilities.They are expected to be a knowledgeableleader.

4.7.1 Definition

It is a dynamic, adaptive, interaction, social process of influencing and being influenced the behaviour of others and
by factors in the situation towards goal setting.

4.7.2 Techniques of EffectiveLeadership

To be effective leader, the nursing administration needs to know the principles of team leadership, administration and supervision and motivational theory; to identify the personnel needs and their differences as individuals. The following are the techniques which can be applied by the nurse administrators to be effective leaders:

- Planning and organising: These are the foremost principles of administration and very important for effective leadership. For the nurses at every level, it is important to plan and organise the work schedule according to availability of personnel and materials.
- Divisionoflabour:Theworkassignedtothesubordinatemustbedefinedandshouldberecordedbecauseclear-cut directions by the nurse leader enable the subordinates to function properly.

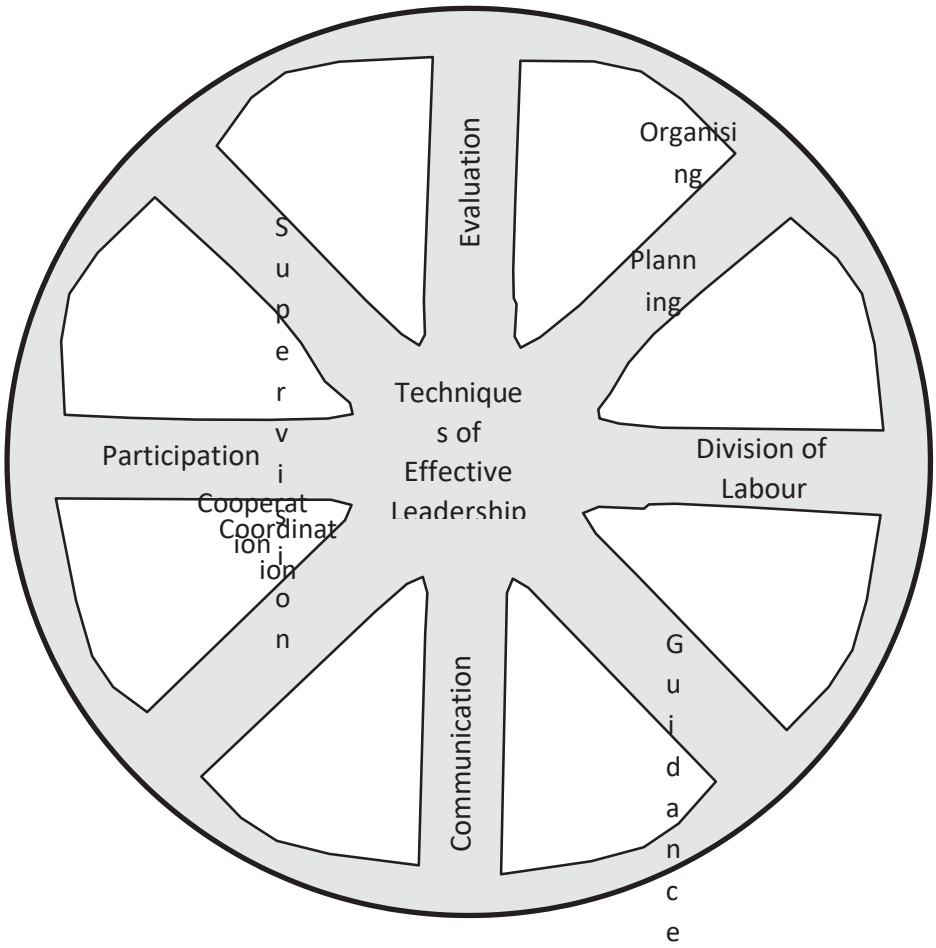

Fig. 4.2 Techniques of effective leadership

- Guidance: Negative criticism should be avoided. Proper teaching and guidance with counselling will help the group to accomplish their objectives.
- Effectivecommunication:Itisveryimportantforaleadertohaveaclearideaaboutwhatshewantstosayand how to say it. Good communication is needed for understanding, cooperation and unified action.
- Cooperationandcoordination:Asapartofeffectiveleadership,cooperationandcoordinationamongtheleaders and the subordinate employees is essential. If the leader keeps the group informed about the various ward and hospital activities the subordinate feel satisfied and also the group will cooperate with theleader.
- Encouragingparticipation:Theeffectiveleaderfirstidentifiestheindividualcapabilitiesofsubordinatesand then provides opportunities to them to participate in decision making.
- Supervision: Democratic supervision may be in the form of observation and is one of the most important responsibilities of an effective leader. It helpsto:
  - identify the individual'scapability
  - oversee the performance
  - improve their skills to give good nursingcare
- Evaluation:Itisacontinuousprocessofassessmentofthepersonnelortheirwork.Italsohelpsthemtoimprove in those areas in which they are weak. Self evaluation by the nurse leader is also amust.

Summary

- Career growth and leadership development do not always gotogether.
- Career movements take place in a series of jumps from one position or job toanother.
- The situational theory states that the leader must have insight andflexibility.
- The leader is a catalyst for group decision-making and sharedresponsibility.
- HerseyandBlanchardweregreatlyinfluencedbyReddinintheirtri-dimensionalleadershipeffectiveness model.
- Thematuritylevelsthatfollower'sexhibitonaspecifictask,functions,ofobjectivethattheleaderisattempting to accomplish through the individual's or the follower group's own initiative.
- Onewaycommunication;theleaderdefinestherolesofthefollowersandtellsthemwhat,how,when,and where to do various tasks.
- HerseyandBlanchardintheirmodel,hasdefinedmaturityastheabilitytosethighbyattainablegoals,willingness and ability to take responsibility, and the level of education and experience of an individual or a group.
- Authoritarianleadersusetheirpowertoinfluencetheirpowerandtendtobetaskoriented.Suchleadersare dictators and do not allow the subordinates to reason.
- Leader is the keystone; group structure falls with the fall ofleader.
- Democratic leader allows members to participate in decision makingprocess.
- The leader's behaviour is characterised by a high degree of reliance on rules, regulations and procedures to which both he and his subordinates subscribe, as a result, the process of administration is reduced to a series of routine actions.
- Leadership theories of the past century were born from the old belief of the world with emphasis on control,a competition, power wielding, andrationality.
- The most important, essential trait of successful leaders is having a positiveself-regard.
- Effective transformational leaders must have highself-esteem.
- In nursing profession effective leadership is required to ensure that their contribution to health and healthcare are maximised and their value is fully recognised.

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1. Match thefollowing

1. Autocratic	A. The leader is a catalyst for group decision making and shared responsibility.
2. Democratic	B. The leader leaves all decision making process and responsibility to the group.
3. Laissez Faire	C. A man of specific gifts of the body and spirit.
4. Charismatic Leadership	D. Takes all decisions and assigns all responsibility to himself.

a. 1-C, 2-B, 3-D,4-A

b. 1-A, 2-D, 3-C,4-B

c. 1-B, 2-C, 3-A,4-D

d. 1-D, 2-A, 3-B,4-C

2. seeksmaximuminvolvementandparticipationofeveryonein-groupactivityandindetermination of group objectives.
   a. Laissez-Faire Leadership
   b. Democraticleadership
   c. Rules-centered Leadership
   d. Charismatic leadership

3. When does transactional leadership occur?
   a. When one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation andmorality.
   b. When it implies change in which the purpose of the leader and follower become fused, creating unity, wholeness, and a collectivepurpose.
   c. When one person takes the initiative in making contact with others for the exchange of valued things that may be economic, psychological or political.
   d. When it provides meaning and a shared experience ofcompany.

4. are the foremost principles of administration and very important for effectiveleadership.
   a. Planning andOrganising
   b. Division ofLabour
   c. Guidance
   d. EncouragingParticipation

5. is a continuous process of assessment of the personnel or theirwork.
   a. Cooperation
   b. Guidance
   c. Supervision
   d. Evaluation

Chapter V

Team Management

Aim

The aim of this chapter is to:

- introduce the modern concept of team management
- elucidate the 12 Cs of team building
- explain some ground rules creating a teammission

Objectives

The objectives of this chapter are to:

- explain team building
- describe the nature of the team
- defineteam

Learning outcome

At the end of this chapter, you will be able to:

- identify how to create an effectiveteam
- enlist the characteristics of an effectiveteam
- recogniseorganisational culture, structure and teammanagement

5.1 Introduction

A group of people with a full set of complementary skills required to complete a task, job, or project. Team members:

- Operate with a high degree ofinterdependence.
- Share authority and responsibility forself-management.
- Are accountable for the collectiveperformance.
- Work toward a common goal and sharedreward(s).

Anotherdefinitionisthatateamisanygroupofpeopleorganisedtoworktogetherinterdependentlyandcooperatively to meet the needs of their customers by accomplishing a purpose and goals. Teams are created for both long term andshortterminteraction.Aproductdevelopmentteam,anexecutiveleadershipteam,andadepartmentalteamare long lasting planning and operational groups.

Short term teams might include a team to develop an employee on boarding process, a team to plan the annual company party, or a team to respond to a specific customer problem or complaint. Three common types of teams include:

- Functional or departmental teams: Groups of people from the same work area or department, who meet on a regular basis to analyse customer needs, solve problems, provide members with support, promote continuous improvement, and shareinformation.
- Cross-functionalteams:Groupsofpeoplewhoarepulledtogetherfromacrossdepartmentsorjobfunctionsto deal with a specific product, issue, customer, problem, or to improve a particular process.
- Self-managingteams:Groupsofpeoplewhograduallyassumeresponsibilityforself-directioninallaspectsof work.Ateambecomesmorethanjustacollectionofpeoplewhenastrongsenseofmutualcommitmentcreates synergy, thus generating performance greater than the sum of the performance of its individualmembers.

5.2 Methods to Make Teamwork Happen

To make teamwork happen, these powerful actions must occur:

- Executive leaders communicate the clear expectation that teamwork and collaboration are expected.
- Executives model teamwork in their interaction with each other and the rest of theorganisation.
- The organisation members talk about and identify the value of a teamworkculture.
- Teamwork is rewarded andrecognised.

The lone ranger, even if she is an excellent producer, is valued less than the person who achieves results with othersinteamwork.Compensation,bonuses,andrewardsdependoncollaborativepracticesasmuchasindividual contribution and achievement.

- Important stories and folklore that people discuss within the company emphasiseteamwork
- The performance management system places emphasis and value onteamwork
- Form teams to solve real workissues
- Hold department meetings to review projects andprogress
- Build fun and shared occasions into the organisation'sagenda
- Use ice breakers and teamwork exercises atmeetings
- Celebrate team successespublicly

5.3 Methods to Create Effective Team

Howtocreateeffectiveteams,teamwork,andteambuildingisachallengeineveryorganisation?Workenvironments tend to foster rugged individuals working on personal goals for personal gain. Typically, reward, recognition, and pay systems single out the achievements of individual employees. Effective teams can be createdif:

- we practice good communicationskills
- refrain from communication roadblocks
- listenwell
- observe carefully
- give feedback constructively

It is important that we observe communication behaviours in a team so as to make it effective. This would involve observing:

- Who participates and who doesnot?
- How do people take turns and who talks to whom and who responds to whom,etc.?
- How are interruptions handled? Is silence O.K.? Is anyone dominating theconversation?
- How are decisions made? Are they by consensus? Or are they by voting? Or by one person? While doing all this, one should be sure to observe one's own feelings, reactions, andbehaviours.

Allcommunicationtakesplaceonthecontentandrelationshiplevel.Oftentheproblemwithcommunicationisthe assumptionofit.Metacommunicationisveryuseful.Whenthepersonhasbuilttrust,thatmeanshehasactedwith consistency and coherence, demonstrated concern, treated others with a sense of fairness, fulfilled obligationsand commitments,etc.Whenthepersonisengaginginadialogue,thatmeansheorsheisseeingthingsfromtheother person's perspective, really listening, expressing their concerns as one's own concern, and not as anotherperson's problemandgivingothersastakeintheprocessoroutcome.Thethreeconcretetipstofollowincludeusingafacilitator or coordinator, delegating tasks effectively using a work breakdown structure and set some groundrules.

5.4 Work Break Down Structure

Work breakdown structure refers to the way to organise a series of tasks to accomplish a project objective. This consists of following factors:

- Hierarchical diagram oftasks
- Person responsible for executing thetask
- Deadline to have the taskcompleted
- Interdependencies with othertasks
- Each task in a WBS should contribute to the goal of delivering the required material on time and donewell

The function of facilitator / coordinator includes following factors:

- Focus the team toward thetask
- Get all team members toparticipate
- Keep the team to its agreed upon timeframe
- Suggestalternatives
- Help team members confrontproblems

- Summarise teamdecisions

5.4.1 Setting GroundRules

This involves goals and expectations, work norms, facilitator norms, communication norms, meeting norms, and considerationnorms.Theteamsgivetroublewhenindividualsmisbehaveandbecomehighlyegoistic.Theteam can also give trouble when group's interest is sub served under individual interest. It can also happen due to different styles of learning, interaction, expression sub group interest, etc. The group psychology may also play a role in the sense that group behaviours such as defensive routines, us versus them, reluctance to test assumptionpublicly, getting off task, lack of boundaries or ill defined roles and unclear objectives and orexpectations.

Thecommonproblemsinteamsincludetalkingtoomuch(hogging),jumpingfromtopictotopic,gettingstuckon an issue (bogging) and tip toeing around a contentious issue.

5.4.2 Creating a Team MissionStatement

Creating a team mission statement can help you focus your team effort and do a lot of good in bringing your team togetherbehindacommontheme.Thekeytosuccessisnotjustcreatingateammissionstatementbutitislivingthe missionstatement.Amissionstatementidentifiesthemajorpurposethatyourteamfulfilswhenprovidingprodu cts and services to customers. The mission statementshould:

- Include the reason for your team
- Identify your team's unique 'valueadded'
- Reflect your teams core businessactivity
- Provide a focus for yourteam
- Identify the team purpose

Step One: Develop the team mission statement by identifying:

- Stakeholders:Thosepeoplewhoaredirectlyaffectedbytheteam'ssuccessesandfailures.Stakeholderscould be employees, internal customers, organisational customers, externalcustomers.
- Products and services: Items that your team produces for its customers. Products and services might include consulting, training, products or services for individual use, products or services for businessuse.
- Value Added: The key advantage your team provides over the competition. Why would a customer come to your team for service? What makes your teamspecial?

Step Two: Construct a First Draft

The name of the team must meet the needs of stakeholders.

Step Three: Refine the Team Mission Statement

- Whether the mission statement is too wordy, too brief, and to thepoint.
- Whethertheteammemberswillrememberit.Wouldthemissionstatementmakesensetothestakeholders?Is it a true mission statement and not a goal? Does it inspire the organisation team and whether it describes the focus and effort of the team? It is important to know if the mission statement isunique.

Step Four: Make it Visible

Post the mission statement for easy review by all team members and customers.

Step Five. Live it!

- To make a mission statement one must be involved in the entire teamprocess.
- The mission statement must be used as a guide for everything the teamdoes.
- Bounce team goals and activities against it to ensure the organisation is doing the rightthing.
- In order to make the team effective, the organisation must engage the team indialogue.

Employee involvement, teams, and employee empowerment enable people to make decisions about their work. This employee involvement, team building approach, and employee empowerment increases loyalty and fosters ownership.Theseresourcestellyouhowtodoteambuildingandeffectivelyinvolvepeople.Employeeempowerment is a strategy and philosophy that enables employees to make decisions about their jobs. Employee empowerment helps employees own their work and take responsibility for theirresults.

Employee involvement is creating an environment in which people have an impact on decisions and actions that affecttheirjobs.Employeeinvolvementisnotthegoalnorisitatool,aspracticedinmanyorganisations.Employee involvementisamanagementandleadershipphilosophyabouthowpeopleareenabledtocontributetocontinuous improvement and the ongoing success of theirorganisation.

5.4.3 Team Building and Successful Teams

People in every workplace talk about team building, working as a team, and my team, but few understand how to createtheexperienceofteambuildingorhowtodevelopaneffectiveteam.Manyviewteamsasthebestorganisation design for involving all employees in creating business success and profitability. Learn how team building helps enable the success of work teams and teamwork.

Teamisaverywellknownword.Certainlyonehasheardthiswordandoneusesitoffandonundoubtedly.Everyone includingfriendsalsousethisword.Itisverycommonandpopularwordanditisusedinmanyplaces.Thisword "team" is used to describe any routine work group in a workplace expressing a desirable degree of morale during performance.Withintheframeoftraditionallyformalworkgrouplife,throughregularsocialinteraction,interpersonal relationsaredevelopedandinformalgroupsareformedandtheyexpresshighgroupmoralewhenandwherenecessary. Thequalityofcooperation,motivationanddeterminationtoachievegoalswhichareexpressedbytheinformalgroup membersremindsusofagoodteamwork.Butthesaidteamworkhasnoformalrecognition,nostablequality,not premised always on rational ground and it hardly obeys any norms. Thus, it fails to satisfy the requirements and characteristics of a formal "team", the most important group phenomena in the modernworkplace.

Teammanagementreferstotechniques,processesandtoolsfororganisingandcoordinatingagroupofindividuals workingtowardsacommongoal.Heretheteamasawholeworktogethertoreachthecommongoal.Tomaximise the effectiveness of the organisation, managers must be able to work with one another to achieve common goals. There are mainly six principles which are effective one. Accountability is one of the important factors of every initiative. Proper communication which encourages innovation and creativity is also another importantfactor.

Regularperformancediscussionsshouldbescheduledandstrictlyheldtoforbetterment.Performancemanagement andperformancemeasurementarethekeycontributorstoimprovedteammanagement.Itissometimesdifficultfor informationsharingandeffectivecommunication.Teamsmusthaveunrestrictedaccesstoallrelevantinformation. Lastly we can say that the manager's role must be redefined for the team environment and an emphasis on the servantstyleofleadership.Thefeelingofmutualrespect,trustandmaturitybecomesthefoundationforteamwork and problemsolving.

A team is a composite body which functions to yield "collective work-products." It refers to a production of any formalwork-groupandreflectsthejoint,realcontributionofteammembers.Inthisconnectionitmaybementioned that:

- the team has shared leadershiproles
- it has individual and mutual accountability
- has a specific purpose to yield "collectivework-products"
- encourages open-ended, active problem-solving meetings and product centered direct evaluation

Actually the team discusses, decides and does real work together. According to Sandstorm, teams can be formed for any purpose and which may be put under four categories:

- Advice
- Production
- Project
- Action

We mainly have to know about the two types of teams, viz.,

- quality circles and
- autonomous or self-managedteams.

Team effectiveness depends on both individual and organisational factors. Under individual factors, older habits, beliefs,unequalsenseofresponsibilityandinvolvement,aremostsignificant.Organisationalfactorsmaybesocio- cultural and related to terms and conditions for work alone with limitations ofworkplace.

5.5 Steps for Effective Training Approach forTeam

There are mainly ten steps for effective training approach for team. These are:

- Establish credibility
- Ventilation ofemotionality
- Orientation about teambuilding
- Problemidentification
- Setting up groupgoals
- Facilities the groupprocess
- Establish intra-group procedures
- Establish inter-groupprocedure
- Change the active role of the trainer (active to passive)
- Put an end on the trainers' involvement (self-managingteam)

Besides this, team building for organisational development may be structured considering the following six steps:

- Team skills workshop (to unfreeze various teams and get them ready to acceptchange).
- Data collection (questionnaire survey to collect data on work climate, supervisory behaviourand jobcontent).
- Data confrontations (open discussion on the problem areas and know the suggestions to solve theproblems).
- Action planning (develop specific plans forchange).
- Team building (team identities the barriers, develop plans and try to accomplishchange).
- Inter-group buildings (establish collaboration on share goals and problems and generalise the OD effort to the totalorganisation).

On the other hand, we can say that the organisational outcomes of organisational development include increased effectiveness, problem solving and adaptability for the future. Organisational development attempts to provide opportunitiestobe"human"andtoincreaseawareness,participationandinfluence.Anoverridinggoalistointegrate individual and organisational objectives by inculcating values in people to serve the organisational cause sand learningtorecognisevaluablethingsforproperusage.Teammanagementisoneoftheimportantthingswhichwe can mention in this context. The key points are asfollows:

- Change agents should focus on systematic change in work-settings at the starting point and on individual behaviour as the key mediator associated with organisation outcomechange.
- Results for technology interventions indicate that negative behaviour change does not necessarily leads to negative organisational outcomechange.
- Well-developedtheoriesshouldprovideabetterbasisforchoosinginterventionsthansimplythechangeagents' personal preferences values andstyles.

5.6 Techniques of Training Team

Under the broad coverage of training group technique, the most popular techniques over the years are:

- Gridtraining
- Survey feedbackand
- Team building

Blake and Mouton's leadership grid (position 9. 9) indicates a maximum concern for both people and production
andsignifiesanimpliedgoalofgridtraining.Thefollowingsixstepsaregenerallyfollowedundergridtrainingfor organisationaldevelopment:

- Laboratory seminartraining
- Team development
- Inter-groupdevelopment
- Organisational goalsetting
- Goalattainment
- Stabilisation

Organisational program banks on the growth of empathy, improved communication and highly active joint
participationformanagingchangeeffectively.Therearefivekeyareasoftheteamwhichremainsopenformonito ring and evaluation. Theseare:

- Team mission
- Goalachievement
- Empowerment
- Open and honestcommunication
- Positive roles andnorms

In connection with the team management we can further say that the following elements make up the modern organisational development approach to the management of change. These are:

- It would be plannedchange
- Takes the systemperspective
- Has a short and long termobjectives
- Concerned mainly with organisational processes thancontent
- Designed to solve problemsand
- Focused primarily on human and socialrelationship

At any point, team members can slide back to a lower level of effectiveness, if they do not continually work
togetherasateam,listenandcommunicateeffectively,dealwithconflicteffectively,recogniseeachother'suniq ue contribution, provide honest feedback and demonstrate other characteristics of an effectiveteam.

Besidesthis,therearesomepracticalguidelineswhicharenotmeanttodampentheexcitementandenthusiasmfor change efforts but to put realistic expectations into the process. The important points are asfollows:

- Do not promise that all employees undergoing a change effort will bewinner.
- Do not blame those who lose out for their negativeattitudes.
- Do not focus only on the new and forget theold.
- Avoid symbolic participation in the changeeffort.
- Avoid destroying the old culture without building a newone.
- Do not launch HRM programs in the context of a major change without considering the necessary time and resource to supportthem.

5.7 Organisational Culture, Structure and Team Management

Organisationalcultureistheproductoftheentireorganisation'sfeature,viz.,itspeople,objectives,size,technology, unions,policies,itssuccessesandfailures.Itisthesumtotalofsharedvalues,beliefsandhabitswithinanorganisationandinshortmaybecalledtheorganisationalpersonality.Thechallengeforhumanresourceprofessionalsistoadjust positively to the culture of the organisation. They have to choose paths the best reflect the culture of the firm and the attitudes of its people. To carry out tasks, managers generally follow certainsteps:

- Identify the work, delegate it to variouspeople.
- Establish relationship between people and positions.
- Measure and evaluate the work done at variouslevels.

There are three levels of organisations, viz.,

- strategic,
- managerial and
- operating

Atthestrategiclevel,policiesareformulated,goalsareset,andobjectivesareframed.Strategiesarealsodesigned to achievetheobjectivestakingintoconsiderationtoachievetheobjectivestakingintoconsiderationtheenvironmental influences on theorganisation.

At the management level the programs regarding the procurement and allocation of all types of resources are formulated to achieve the strategies and objectives. At the operating level, the programs are implemented, i.e., actual operations are carried out in the process of day to day activities in order to carry out the strategies and achieve the objectives. Basically, there are two types of organisation structures, flat and tall. Tall or pyramid type oforganisationalstructuresaresuitabletothecompanieswhicharelabouroriented.Flatorganisationsaresuitable to the technology-oriented companies.

Since most of the modern organisations are technology based and endowed with capital and highly educated employees they tend to have an organisation structure where the number of employees at the operating level are relatively less. In view of this, personnel management is not only challenging but also significant one in a modern organisation.Moreover,humanresourceshaveaplusvalueinthattheycanconvertthedisorganisedresourcesinto ausefulandproductiveorganisation.Itistruethatthereisacloserelationshipbetweentheorganisationalstructure and culture and the team management.

5.8 Modern Concept

Organisationisthefoundationofmanagement.Iftheorganisation'splanisdesigned,thenmanagementisrendered difficultandineffective.If,ontheotherhand,itislogical,clearcutandstreamlinedtomeetpresent-dayrequirements, then the first requisite of sound management has been achieved. Organisation is the means of multiplying the strength of an individual. It takes his knowledge and uses it as the resource, the motivation and the vision of the other workers. A good organisation facilitates administration, promotes specialisation, encourages growth and stimulates creativity. The work of management proceeds smoothly only if it is well-defined, systemic and certain and appropriate functional groups are provided to help the managers to manage. A sound organisation stimulates

teammanagementindependentcreativethinkingandinitiativebyprovidingwell-definedareasofworkwithbroad latitudeforthedevelopmentofnewandimprovedwaysofdoingthings.Managementdevelopmentisacontinuous process. Team management is a significant factor for the enrichment of managementdevelopment.

5.9 Team Effectiveness Framework

Fig.5.1presentsaheuristicframeworkforanalysingtheeffectivenessofteams.Inthisframework,effectiveness is afunctionofenvironmentalfactors,designfactors,groupprocesses,andgrouppsychosocialtraits.Environmental factors are characteristics of the external environment in which the organisation is embedded, such as industry characteristics or turbulence. Design factors refer to those features of the task, group, and organisation that can bedirectlymanipulatedbymanagerstocreatetheconditionsforeffectiveperformance.Examplesoftaskdesign variables include autonomy and interdependence. Examples of group composition design variables include size, tenure,demographics,anddiversity.Examplesoforganisationalcontextdesignvariablesarerewards,supervision, training, and resources. Processes are interactions such as communication and conflict that occur among group members and external others. Group psycho social traits are shared understandings, beliefs, or emotional tone. Examples include norms, cohesiveness, team mental models, and group affect. Effectiveness outcomes are the performance, attitudinal, and behavioural indicators that we have alreadydiscussed.

Thisframeworkmovesawayfromthe"input-process-output"approachbydepictingdesignfactors,whichhavean indirectimpactonoutcomesviagroupprocessesandpsychosocialtraits,asalsohavingadirectimpactonoutcomes. Itsuggeststhatgrouppsychosocialtraitsarerealgroup-levelphenomena.Thesetraitsdirectlyinfluenceoutcomes; theyalsoindirectlyinfluencethemthroughshapinginternalandexternalprocesses.Theframeworkillustratesthat group processes can become embedded in psychosocial traits which norms, shared mental models, or affective states.

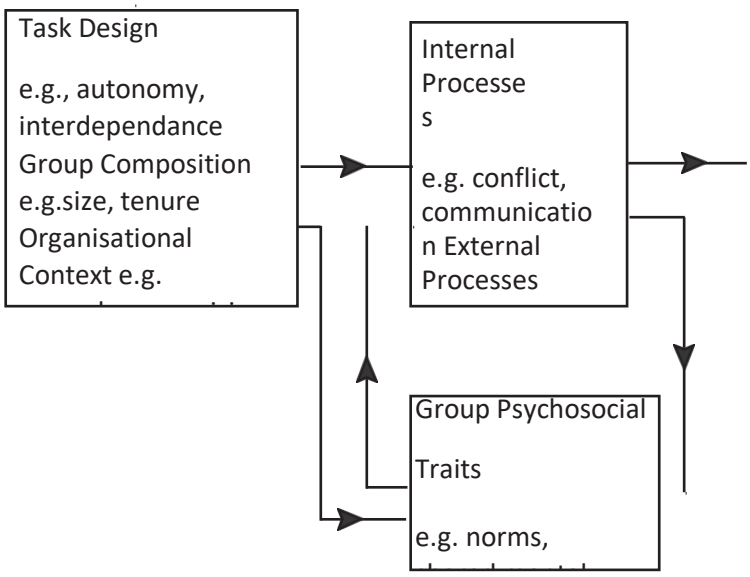



Fig. 5.1 A Heuristic model of group effectiveness

Environmental factors meanwhile, have a direct influence on design factors. Altogether, environmental factors, design factors, internal and external processes, and group psychosocial traits predict effectiveness outcomes. We shouldnotethateffectivenessoutcomescanreciprocallyinfluencegroupprocesses,psychosocialtraitsthatemerge, andevendesignfactors.Forexample,thecompositionofTMTsismorelikelytochangewhenafirmisperforming badly. As we later discuss, most studies still do not address how teams change over time, and subsequently fail to capturetheimpactofthesechangesonteameffectiveness.Forthesakeofsimplicity,andbecausemoststudieswe considerherefailtoobservethereciprocalrelationshipsthatoccurbetweenoutcomesandpredictorsovertime, we do not graphically represent these relationships in Fig.5.1.

This framework is heuristic framework and it helps to make sense out of a complex set of relationships and to suggestdirectionsforfuturework.Thisframeworkdrawsattentiontothedesignfactorswhicharethemajorpoints ofleverageforinfluencingteameffectiveness.Itsuggeststhatcriticalgroupprocessesoccurbothinsideandoutside the group. Recent studies of new product development project teams focused on the impact of external processes. Incontrast,mostpreviousframeworksfocusedexclusivelyoninternalgroupprocesses.Themodeldrawsattention to the group as a social entity that has shared psychosocial traits that influence itsbehaviors.

These include constructs that historically have been studied, such as group norms and cohesiveness, and new constructs,suchasteammentalmodelsorgroupaffect.However,mostpreviousframeworksviewedcohesivenessor normsasgroupprocesses,andhavenotconsideredmorebroadlytheimpactofsharedgroupbeliefs,understandings, oremotionaltoneoneffectiveness.Recentconceptualandempiricalworkhasbeguntoexaminetheimpactofteam mental models and group affect oneffectiveness.

Inthesectionsthatfollow,weorganiseourdiscussionofresearchfindingsbylookingateachtypeofteaminturn: work and parallel teams, project teams, and management teams. Within each team discussion, we group results according to the seven categories from our heuristic group effectivenessframework:

- task design
- group composition design
- organisational contextdesign
- environmental factors,
- internal group processes,
- external group processes, and
- group psycho socialtraits.

Under each category heading, we use subheadings to indicate the particular variable to be examined. Thus, for example,underthegroupcompositioncategoryforworkandparallelteams,weusetwosubheadings:thefirstfor our discussion of studies that investigated diversity, the second for our discussion of those studies that

examinedsize.

Summary

- Team is a composite body, which functions to yield collective workproducts.
- Teammanagementreferstotechniques,processesandtoolsfororganisingandcoordinatingagroupofindividuals working towards a commongoal.
- Team culture is necessary for success. It is not automatic to work togethereffectively.
- Team culture takes a specific effort and the development of a culture that is supported by executive management.
- Knowledge transfer is essential for an organisation togrow.
- Withoutknowledgetransferandthesharingofsuccessitisdifficultforthegrouptoshareanyvisionandwork toward common goals.
- For team management, trust and respect isnecessary.
- Brainstorming must be encouraged to release team innovation.
- Relianceonteameffectivenessminimisesriskbybeingmoreflexibleandadaptivethanrelyingonasingle individual.
- People in every workplace talk about building the team, working as a team, and my team, but few understand how to create the experience of team work or how to develop an effectiveteam.
- Executive leaders communicate the clear expectation that teamwork and collaboration are expected.
- All communication takes place on the content and relationshiplevel.
- A mission statement identifies the major purpose that your team fulfils when providing products andservices to customers.
- Stakeholders could be employees, internal customers, organisational customers, externalcustomers.
- A team is a composite body, which functions to yield "collectivework-products.
- Organisation is the means of multiplying the strength of anindividual.
- At the management level the programs regarding the procurement and allocation of all types of resources are formulated to achieve the strategies andobjectives.
- Work environments tend to foster rugged individuals working on personal goals for personalgain.

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Recommended Reading

- Hayes, N., 2002. *Managing Teams: A Strategy for Success*, 2nd ed., Cengage LearningEMEA.

- *A Manager's Guide to Virtual Teams*, AMACOM Div American MgmtAssn.
- *Building Effective Teams*, KaplanPublishing.

Chapter VI

Resolving Conflicts

Aim

The aim of this chapter is to:

- introduce conflict resolution and resolving work placeconflict
- explain various techniques in conflictresolution
- explicate types ofconflicts

Objectives

The objectives of this chapter are to:

- explain the reasons forconflict
- enlist the types ofconflict
- defineconflict

Learning outcome

At the end of this chapter, you will be able to:

- understand preventive techniques and the positive outcome ofconflicts
- determine positive outcome ofconflicts
- identify the methods to resolveconflict

6.1 Introduction

Conflict is a natural ingredient in every organisation. In every organisation, managers have to learn not only to live with it but also to manage it. So there is a need to resolve conflict. There are various ways to resolve conflict. Bargaining, negotiating, mediating, communication facilitation, etc. are the ways to resolve conflicts considering the existing scenario of the organisation. So, undoubtedly we can say that there is a need to resolve conflict as far aspossiblefortheimprovementoftheorganisation.Inthischapter,wewillbedealingwithconflictsandresolution of conflicts in an organisation. We start with definition of conflicts and types of conflicts. We then move on to the causesofconflictsandsourcesofinterpersonalconflicts.Thisisfollowedbythenextsectionthatdealswithconflict resolutionandresolvingworkplaceconflict.Inthelatterwewillbedealingwiththevarioustechniquesinconflict resolution. We then present the preventive techniques and other techniques and the positive outcome ofconflicts.

6.2 Conflicts and Types of Conflict

We,theindividuals,alwayssufferfromdifferenttypesofconflict.Sometimeswearеableto manageitandsometimes not.Wefeeldisturbanceifweareunabletosolvetheconflict.Conflictcanbedefinedasthedisagreementbetween individualsorgroups.Obviously,itisexpectedingroups,especiallyintheearlystagesofgroupformation.Confli ct has a strong influence on organisational performance. When conflict reaches at the high level, it can be a major disruptive force that reduces organisational effectiveness. Organisational resources may be money, information, materialhumanresourcesetc.Jobboundariesandresponsibilitiessometimesarenotclearatall.Thiscreatesconfl ict.

Notonlythis,communicationmaybedefective,causingmisunderstandingandconflictamonggroup.Besidesth is,

personalityclashesarealsooneoftheimportantfactorsforconflictanditisverycommoninorganisation.Actuall y

personalityconflictsarecausedbyfundamentaldifferencesinvalues,attitudes,behaviourandpersonality.Besi des

this,anotherimportantfactorispowerandstatuswhichcreatesconflict.Conflictoccurswhendifferentpeoplеare pursuing different goals within the same group ororganisation.

6.2.1 Definition ofConflicts

Conflicts occur when people (or other parties) perceive that, as a consequence of a disagreement, there is a threat to their needs, interests or concerns. Although conflict is a normal part of organisation life, providing numerous opportunities for growth through improved understanding and insight, there is a tendency to view conflict as a negativeexperiencecausedbyabnormallydifficultcircumstances.Disputantstendtoperceivelimitedoptionsa nd finite resources available in seeking solutions, rather than multiple possibilities that may exist ‘outside the box’ in which we areproblem-solving.

Workplaceconflictisatimeconsumingandcostlyproblemthatcanhaveasevereimpactonthebottomline.Confli ct in the workplace is generally the result of serious disagreement over needs or goals and can result in behaviour suchasgossip,avoidance,verbalabuse,passivecommunicationandhostility. Wecanconsiderthefollowingsteps to resolve theconflict:

- A conflict is more than a mere disagreement. It is a situation in which people perceive a threat (physical, emotional,power,status,etc.)totheirwellbeing.Assuch,itisameaningfulexperienceinpeople’slives.Itjust does not pass off on its own. It has to beresolved.
- Participantsinconflictstendtorespondonthebasisoftheirperceptionsofthesituation,ratherthananobjective reviewofit.Assuch,peoplefiltertheirperceptionsandreactionsthroughtheirvalues,culture,beliefs,information, experience, gender, and other variables. Conflict responses are both filled with ideas and feelings that can be very strong and powerful guides to our sense of possiblesolutions.
- As in any problem, conflicts contain substantive, procedural, and psychological dimensions to be negotiated.
  Inordertobestunderstandthethreatperceivedbythoseengagedinaconflict,weneedtoconsiderallofthese dimensions.
- Conflictsarenormalexperienceswithintheworkenvironment.Theyarealso,toalargedegree,predictableand expectablesituationsthatnaturallyariseaswegoaboutmanagingcomplexandstressfulprojectsinwhichwe aresignificantlyinvested.Assuch,ifwedevelopproceduresforidentifyingconflictslikelytoarise,aswellas systemsthroughwhichwecanconstructivelymanageconflicts,wemaybeabletodiscovernewopportunities to transform conflict into a productive learningexperience.

- Creative problem solving strategies are essential to positive approaches to conflict management. We need to transform the situation from one in which it is 'my way or the highway' into one in which we entertain new possibilities that have been otherwise elusive.

6.2.2 Types ofConflicts

We generally identify three types of conflict, as follows:

- ApproachApproachConflict:Theindividualismotivatedtoapproachtwoormorepositivebutmutually exclusive goals.
- ApproachAvoidanceConflict:Theindividualismotivatedbyapproachagoalandatthesametimeismotivated to avoid it.
- AvoidanceAvoidanceConflict:Theindividualismotivatedtoavoidtwoormorenegativebutmutuallyexclusive goals.

Besidesthis,thedynamicsofinteractivebehaviourcreateimpactonorganisationalbehaviourandthereseemsto be indication of interpersonal and inter-group conflict. Conflict at the intra-individual level involves frustration, goal conflict,roleconflictandambiguity.Ontheotherhand,goalconflictcancomefromapproach-approach,approach- avoidance and avoidance-avoidanceconflict.

6.2.3 Sources of Inter PersonalConflict

Thereexistsindividualdifferencewhereintelligence,ability,aptitude,motivationvaryfromonepersontoother. In the organisational set up, there seems to be conflict among the managers, subordinates, team members and others also. There are mainly four sources of interpersonalconflict:

- Personaldifferences:Everyoneisunique.Familybackground,culture,socialisation,valuesandsomany indicators vary from one person to another. So, conflict may arise.
- Informationdeficiency:Thereseemstobeindicationofcommunicationgapandalsothereseemstobeindication of misinformation.
- Role incompatibility: This type of interpersonal conflict mainly draws from both intra-individual role conflict and inter-groupconflict.
- Environmental stress: This is mainly due to stressful environmental condition. Here downsizing,competition, uncertainty, etc. are the significant factors.

Besides this there exists inter-group conflict in any organisational set up. The reasons are mainly as follows:

- Competition for resources
- Task interdependence
- Statusstruggle
- Ambiguity

All these factors create impact in the group. There are number of strategies to manage inter-group conflict, viz., avoidance,diffusion,containmentandconfrontation.Notonlythis,theindividualintheorganisationfacesdiffer ent types of conflict considering only the structural aspects. The types aremainly:

- Hierarchicalconflict
- Functionalconflict
- Line-staff conflictand
- Formal-informalconflict

6.2.4 Causes ofConflict

Conflictisanormalandnecessarypartofhealthyrelationships.Afterall,twopeoplecan'tbeexpectedtoagreeon everythingatalltimes.Therefore,learninghowtodealwithconflictratherthanavoidingitiscrucial.Whenconfli ct ismismanaged,itcanharmtherelationship.Butwhenhandledinarespectfulandpositiveway,conflictprovidesa n opportunityforgrowth,ultimatelystrengtheningthebondbetweentwopeople.Bylearningtheskillsyouneedfor successfulconflictresolution,youcanfacedisagreementswithconfidenceandkeepyourpersonalandprofessio nal relationships strong andgrowing.

Conflict arises from differences. It occurs whenever people disagree over their values, motivations, perceptions, ideas, or desires. Sometimes these differences look trivial, but when a conflict triggers strong feelings, a deep personal need is at the core of the problem a need to feel safe and secure, a need to feel respected and valued, or a need for greater closeness and intimacy.

6.2.5 Conflicts Arise from DifferingNeeds

Everyoneneedstofeelunderstood,nurtured,andsupported,butthewaysinwhichtheseneedsaremetvarywidely . Differing needs for feeling comfortable and safe create some of the most severe challenges in our personal and professional relationships.

Thinkabouttheconflictingneedforsafetyandcontinuityversustheneedtoexploreandtakerisks.Youfrequently see this conflict between toddlers and their parents. The child's need is to explore, so the street or the cliff meets a need. But the parents' need is to protect the child's safety, so limiting exploration becomes a bone of contention betweenthem.Itisimportanttoacknowledgethatbothparties'needstoplayimportantrolesinthelong-termsuccess ofmostrelationships,andeachdeserverespectandconsideration.Inpersonalrelationships,alackofunderstandi ng about differing needs can result in distance, arguments, and break-ups. In workplace conflicts, differing needs are oftenattheheartofbitterdisputes.Whenyoucanrecognisethelegitimacyofconflictingneedsandbecomewillin g toexaminetheminanenvironmentofcompassionateunderstanding,itopenspathwaystocreativeproblemsolvi ng, team building, and improved relationships.

- Aconflictismorethanjustadisagreement.Itisasituationinwhichoneorbothpartiesperceiveathreatwhether or not the threat is real.
- Conflictscontinuetofesterwhenignored.Becauseconflictsinvolveperceivedthreatstoourwell-beingand survival, they stay with us until we face and resolve them.
- Werespondtoconflictsbasedonourperceptionsofthesituation,notnecessarilytoanobjectivereviewofthe facts. Our perceptions are influenced by our life experiences, culture, values, andbeliefs.
- Conflictstriggerstrongemotions.Ifyouaren'tcomfortablewithyouremotionsorabletomanagethemintimes of stress, you won't be able to resolve conflictsuccessfully.
- Conflictsareanopportunityforgrowth. Whenyou'reabletoresolveconflictinarelationship,itbuildstrust. You can feel secure, knowing your relationship can survive challenges and disagreements.

6.3 Conflict Resolution

Conflict in the work place is a very common phenomenon that occurs almost daily. People generally work in different situations.Thegoalsandneedsalsovaryfromonesettingtoanother.Sometimesitisadjustableandsometimesnot .

Soconflictmayhappen.Inmanycaseseffectiveconflictresolutionskillscanmakethedifferencebetweenpositive and negative outcomes. You can solve many problems considering the following three main points. Theseare:

- Increasedunderstanding:Sometimesdiscussionisneededtoresolvetheconflictandultimatelyitimprovesthe awareness level. It also helps to achieve the goal.
- Increasedgroupcohesion:Teammemberscandevelopmutualrespectandrenewedfaithintheirabilitytowork together.
- Improved self-knowledge: Conflict helps individuals to sharpen their focus and enhance theireffectiveness.

Kenneth Thomas and Ralph Kilman (1970) identified five main styles of dealing with conflict. These are:

- Competitive: Individuals who tend towards a competitive style take a firm stand and they know what they want. This style is useful when there is an emergency and decision needs to be made fast, when the decision isunpopular.
- Collaborative: Individuals is tending towards a collaborative style because he or she is willing to meet the needs involving all the other people. They are highly assertive; they cooperate effectively and acknowledge that everyone is important.
- Compromising:Hereeveryoneisexpectedtogiveupsomethingandwanttosolvetheproblemasearlyas possible. It is useful when the cost of conflict is higher than the cost of losing ground.
- Accommodating: This style indicates a willingness to meet the needs of others at the expense of the person's own needs. Accommodation is appropriate when the issues matter more than the other. People may get return from this.
- Avoiding:Thisstyleistypifiedbydelegatingcontroversialdecisions,acceptingdefaultdecisions,andnot wanting to hurt anyone's feelings.

Another important theory we can mention here is the Interest Based Relational Approach. This approach indicates the following points in connection with resolving conflict.

- We have to make sure that good relationships are the firstpriority.
- We have to keep people and problemsseparately.
- We have to pay attention to the interests that are beingpresented.
- We have to listen first and thentalk..
- We have to set out thefacts.
- We have to explore optionstogether.

Considering the above points we can resolve our conflicts and it will be positive and constructive one.

6.3.1 Principles of Conflict Resolution

We can further say that there are some common principles which we can apply to resolve conflicts, whether it is within individuals, or group or communities or nations. The salient points are as follows:

- We may be calm: It may help to resolve theconflict.
- Wemaybemagnanimous:Hereonecanconcentrateontheimportantissuesofdifferenceratherthanthesmaller one.
- Needfordiscussionordebate:Sometimesithappensthatconflictiscreatedandmaintainedbecausethereis no real discussion or debate.

- Need to apply rationality: It is true that there is some conflict which is not about substance butperception.
- Wehavetoacknowledgeemotions:Inonesidethereisfactandthisisrationalandwecannotresolvemuch conflict because how people perceive those facts is coloured by their emotions.
- Need to think creatively: If we think the incidence or the matter creatively, sometimes we can easily solve the problem.
- Needtochangetheenvironment:Wecaneasilyobserveitthatifwechangetheexistingenvironmentalcondition, sometimes conflict may resolve.
- Compromise: Compromise is another important factor to resolve theconflict.
- Need to change the wording: Agreement or any settlement helps to resolve the conflict in manysituations.
- Have to accept the situation: There is not always a solution waiting to be found and if there is a solution, it is unlikely to be the only one.

Besides,abovementionedtenpointstherearesomanyfactorsbywhichwecanresolveconflict.Itcanalsobesaid thatconflictcannotalwaysbeavoided,especiallywhenfundamentaldifferences,asopposedtoperceiveddiffere nces, are involved; not all conflict isnegative.

6.4 Resolving Workplace Conflict

Generally there are two parties to a conflict due to one being unable to agree with the other. While the disagreeing partiesmayresolvetheirdifferencesthemselvesincertaininstanceswiththeirownconflictresolutionmethods,t he intervention of a third party with good conflict resolution strategies may be required in other cases. The best way to resolve a conflict is by facing it, analysing and acting in a fair and equitable manner by both parties; and not by ignoring or pushing it under the carpet. Here are some good conflict resolution techniques to resolveconflicts.

6.4.1 Conflict ResolutionTechniques

Following are the conflict resolution techniques.

- Good self-control: This is an important prerequisite in resolving conflicts. Though one may be highly tensed up and unwilling to listen to anybody other than having their own way during a conflict, once it is history, the person will find that there was a good lesson to learn from that experience, if not alreadylearnt.
- Patientlistener:Anothergoodqualificationistobeapatientlistenerandassesstheproblemrealisticallywithout getting emotional or biased. Ask appropriate questions for further clarification, but if you go to talk toomuch, you could get carried away, and off the track. This is true of all conflict resolutiontechniques.
- To have a give and take attitude: If you are really interested in resolving a conflict and having lasting peace, do not expect to have the final solution fully in your favour and 100% according to your way of thinking. Everybody involved in the dispute must adopt a “give and take” attitude, as happens with all good conflict resolution strategies. One has to give up a less important part in order to retain a more important part. When everybody thinks and acts like that, the earlier dislodged jig saw puzzle pieces will start falling into their groovestogiveaunitaryundividedwholesomepicture.Thiswholesomenesscomesofusingefficientconflict resolution techniques.

Tosumupthesеconflictresolutionmethods,firstidentifytheconflictinitsproperperspective.Onceitisdone,we hopetheforegoingconflictresolutionstrategieswillbeofhelptothepersoninresolvinganyconflicttoeverybody ’s satisfaction.

6.4.2 Confront theConflict

We can call meeting and discuss about the facts:

- Confront the possible negative issues in the relationship.

- Have to encourage both people to look at the possible positive sides to theirrelationship.
- Have to search various options and you can start gaining greater commitment fromthem.
- To achieve the listed aspiration adequate strategies areneeded.
- We have to set supporting structure to accomplish the aspirations and selected directions.
- To know the feedback and cost ofnon-compliance.
- Need evaluation andre-evaluation.
- Need forsummarisation.

Identification of the problem properly and need for ability to manage the problem properly at all levels. Conflict in organisation is inevitable. Managers cannot avoid conflict problems and need to have the skills to resolve them appropriately.

6.4.3 Techniques of ConflictResolution

There are the numbers of techniques for conflict resolution:

- Bargaining/Negotiating: Bargaining means of reaching agreement or settlement through give and take, often synonymous with negotiation. Lulofs (1994) makes the distinction that bargaining refers to business contexts, usually involving money, and negotiation refers to all othercontexts.
- Bargaining range/Settlement range: In a single issue negotiation, the range of overlap in solutions where both partieswouldpreferasettlementtonosettlement.Forexample,PartyAhasacartosellandisasking$5,000, butwillactuallybesatisfiedwithaslittleas$4,300.PartyBwishestopurchasethecarandhasaninitialdesire to pay no more than $4,000, but is willing to pay as much as$4,600.
- Negotiatedrulemaking(NEG-REG):Representativesofagenciesandprivatestakeholdersarebroughttogether to negotiate new government rules or regulations.
- Negotiator'sdilemma/Claimingvalue:Claimingvalueisthetakingofresourcesduringaconflictornegotiation; the opposite of creating value which is the discovery or invention of options or resources. The negotiator's dilemma knows when to create value and when to takevalue.

Mediation,asusedinlaw,isaformofalternativedisputeresolution(ADR),isawayofresolvingdisputesbetween two or more parties. A third party, the mediator assists the parties to negotiate their own settlement (facilitative
mediation).Insomecases,mediatorsmayexpressaviewonwhatmightbeafairorreasonablesettlement,generall y
whereallthepartiesagreethatthemediatormaydoso(evaluativemediation).Mediationhasastructure,timetable anddynamicsthat"ordinary"negotiationlacks.Theprocessisprivateandconfidential.Thepresenceofamediat or is the key distinguishing feature of the process. There may be no obligation to go to mediation, but in some cases, any settlement agreement signed by the parties to a dispute will be binding onthem.

6.4.4 Ten Steps in ConflictResolution

Here are the ten steps with a few thoughts on each:

- Set a time and place for discussion: In most cases blogging conflict happens in posts and comments between bloggers. This is something which one actually enjoy (if done well) but is also something of a problem for constructive resolution (due to its public nature and the fact that conflict rarely stays between two people). If a comment thread is becoming destructive ,one generally attempts to take the discussion to a more private setting either via email or IM. Doing this tends to take some of the sting out of the interaction. Also to set up a discussion for some point in the future helps to give each party a little space to calm down and approach the interaction morereasonably.
- Define the problem or issue of disagreement: Many online conflicts tend to spill out into related topics to the pointwherepartiesendupnotreallyknowingwhatthey'refightingaboutatall.Attemptingtokeepadiscussion to one main point (at a time) can mean you're more likely to move through it and then tackle another issue.
- How do you each contribute to the problem?: Conflict is rarely a result of one person solely being at fault in a situation. Communicating to each other not only what the other person has done wrong but identifying your own failings can be a humbling experience and usually brings you a long way closer to resolving theissue.
- Listpastattemptstoresolvetheissuethatwasnotsuccessful:Asbloggingconflictsdon'tusuallycomeoutof longer term relationships this might not be as relevant. However, there are occasions where the same issues surfaceagainandagainanditcanbehelpfultoidentifypreviousoccasionsandlookatwhattheresolutionwas.
  Identifying patterns of conflict can be quite illuminating (you might just learn a thing or two about yourself when doingit).
- Brainstorm; list all possible solutions: When people fight they generally push one argument or solution upon

othersandarenotwillingtoentertaintheideathattheremightbeotherpossiblesolutions.Listingthealternative opinions and solutions can help both parties to findcompromise.

- Discussandevaluatethesepossiblesolutions:Talkingoverthealternativesinaneutralandobjectivewayhelps both parties to see the pros and cons of different ways of thinking. This is where the assertiveness and active listening skills that we unpacked yesterday come to thefore.
- Agreeononesolutiontotry:Insomecasesthereisno'solution'needed(otherthantoagreetodisagreeandto moveon)howeverinsomecasestheremightbemore.Agreeinghowandwhentofinishtheconflictisimportant andstopsthoselingeringflamewarswhereneitherpartyiswillingtolettheotheronehavethefinalword.
  ②Agree on how each individual will work toward this solution: If there's some sort of agreement on the resolution to agree to how each person will contribute to it is important so that there is accountability around it.
- Set up another meeting. Discuss your progress: Find that when you've had a blog conflict with someone and havemovedtosomepointofresolutionthatitcanbehelpfultoprivatelycontactthepersonlaterontodebrief on it and to see if there is any further resolutionneeded.
- Reward each other as you each contribute toward thesolution

6.4.5 Components of ConflictResolution

There are some components for conflict resolution, some of them are explained below:

Get in touch with your feelings

Animportantcomponentofconflictresolutioninvolvesonlyyouknowinghowyoufeelandwhyyoufeelthatway. It may seem you're feelings should already be obvious to you, but this isn't always the case. Sometimes we feel angry or resentful, but don't know why. Other times, we feel that the other person isn't doing what they 'should,' but we aren't aware of exactly what we want from them, or if it's even reasonable. Journaling can be an effective waytogetintouchwithourownfeelings,thoughtsandexpectationssowearebetterabletocommunicatethemto the other person. Sometimes this process brings up some pretty heavy issues, and psychotherapy can behelpful.

Hone your listening skills

Whenitcomestoeffectiveconflictresolution,howeffectivelywelistenisatleastasimportantashoweffectively we
expressourselves.It'svitaltounderstandtheotherperson'sperspective,ratherthanjustourown,ifwearetocome to a resolution.. Good listening also helps for you to be able to bridge the gap between the two of you, understand wherethedisconnectlies,etc.Unfortunately,activelisteningisaskillthatnoteverybodyknows,and it'scommon for people to think they're listening, while in their heads they're actually formulating their next response,thinking to themselves how wrong the other person is, or doing things other than trying to understand the other person's perspective. It's also common to be so defensive and entrenched in your own perspective that you literally can't hear the other person's point ofview.

Practice assertive communication

Communicatingyourfeelingsandneedsclearlyisalsoanimportantaspectofconflictresolution.Asyouprobabl y know, saying the wrong thing can be like throwing fuel on a fire, and make a conflict worse. The important thing toremberistosaywhat's onyourmindinawaythatisclearandassertive,withoutbeingaggressiveorputting
theotherpersononthedefensive.Oneeffectiveconflictresolutionstrategyistoputthingsintermsofhowyoufeel rather than what you think the other person is doing wrong, using 'I feel'statements.

Seek a solution

Onceyouunderstandtheotherperson'sperspective,andtheyunderstandyours, it'stimetofindaresolutiontothe conflict a solution you both can live with. Sometimes a simple and obvious answer comes up once both parties understandtheotherperson'sperspective.Incaseswheretheconflictwasbasedonamisunderstandingoralackof insight to the other's point of view, a simple apology can work wonders, and an open discussion can bring people closertogether.

Other times, there is a little more work required. In cases where there's a conflict about an issue and both people don'tagree,youhaveafewoptions:Sometimesyoucanagreetodisagree,othertimesyoucanfindacompromise ormiddleground,andinothercasesthepersonwhofeelsmorestronglyaboutanissuemaygettheir way,withthe understandingthattheywillconcedethenexttime.Theimportantthingistocometoaplaceofunderstanding,and try to work things out in a way that's respectful to all involved.

Know when it's not working

In case you find that the things are not working, it's advisable to put some distance in the relationship, or cut ties completely. In cases of abuse, for example, simple conflict resolution techniques can only take you so far, and personalsafetyneedstotakepriority.Whendealingwithdifficultfamilymembers,ontheotherhand,addingafew boundariesandacceptingtheotherperson'slimitationsintherelationshipcanbringsomepeace.Infriendshipsth at are unsupportive or characterised by ongoing conflict, letting go may be a great source of stress relief. Only you can decide if a relationship can be improved, or should be letgo.

Unhealthy responses to conflict	**Healthy responses to conflict**
An inability to recognise and respond to the things that matter to the other person	The capacity to recognise and respond to the things that matter to the other person
Explosive, angry, hurtful, and resentful reactions	Calm, non-defensive, and respectful reactions
The withdrawal of love, resulting in rejection, isolation, shaming, and fear of abandonment	A readiness to forgive and forget, and to move past the conflict without holding resentments or anger
An inability to compromise or see the other person's side.	The ability to seek compromise and avoid punishing
The fear and avoidance of conflict; the expectation of bad outcomes	A belief that facing conflict head is the best thing for both sides

Table 6.1 Healthy and unhealthy ways of managing and resolving conflict

Conflict triggers strong emotions and can lead to hurt feelings, disappointment, and discomfort. When handled in an unhealthy manner, it can cause irreparable rifts, resentments, and break-ups. But when conflict is resolved in a healthy way, it increases our understanding of one another, builds trust, and strengthens our relationship bonds.

If you are out of touch with your feelings or so stressed that you can only pay attention to a limited number of emotions, you won't be able to understand your own needs. If you don't understand your needs, you will have a hardtimecommunicatingwithothersandstayingintouchwithwhatisreallytroublingyou.Forexample,couples oftenargueaboutpettydifferencesthewayshehangsthetowels,thewayhepartshishairratherthanwhatisreally

bothering them. The successful resolution of conflict depends on the abilityto:

- Manage stress quickly while remaining alert and calm. By staying calm, you can accurately read andinterpret verbal and nonverbal communication.
- Control your emotions and behaviour. When you are in control of your emotions, you can communicate your needs without threatening, frightening, or punishingothers.
- Pay attention to the feelings being expressed as well as the spoken words ofothers.
- Be aware of and respectful of differences. By avoiding disrespectful words and actions, you can resolve the problemfaster.

In order to do this you will need to learn and practice two core skills:

- The ability to quickly reduce stress in the momentand
- The ability to remain comfortable enough with one's emotions to react in constructive ways even in the midst of an argument or a perceivedattack.

Being able to manage and relieve stress in the moment is the key to staying balanced, focused, and in control, no matterwhatchallengesyouface.Ifyoudonotknowhowtostaycenteredandincontrolofyourself,youwillbecome overwhelmed in conflict situations and unable to respond in healthyways.

6.4.6 Stress and Resolution ofConflict

Let's discuss about the stress and resolution of conflict:

- Accurately read another person's nonverbalcommunication
- Hear what someone is reallysaying
- Be aware of your own feelings
- Be in touch with your deep-rootedneeds
- Communicate your needs clearly

Thebestwaytorapidlyandreliablyrelievestress(ifyoudon'thavesomeonecloseathandtotalkto)isthroughthe senses: sight, sound, touch, taste, and smell. But each person responds differently to sensory input, so you need to find things that are soothing to you. The most important information exchanged during conflicts and arguments is oftencommunicatednonverbally.Nonverbalcommunicationisconveyedbyemotionally-drivenfacialexpressions, posture, gesture, pace, tone and intensity of voice.

The most important communication is wordless

Whenpeopleareupset,thewordstheyuserarelyconveytheissuesandneedsattheheartoftheproblem.Whenwe listenforwhatisfeltaswellassaid,weconnectmoredeeplytoourownneedsandemotions,andtothoseofother people. Listening in this way also strengthens us, informs us, and makes it easier for others to hearus.

When you're in the middle of a conflict, paying close attention to the other person's nonverbal signals may help you figure out what the other person is really saying, respond in a way that builds trust, and get to the root of the problem. Simple nonverbal signals such as a calm tone of voice, a reassuring touch, or an interested or concerned facial expression can go a long way towards relaxing a tense exchange.

Yourabilitytoaccuratelyreadanotherpersondependsonyourownemotionalawareness.Themoreawareyouare of yourownemotions,theeasieritwillbeforyoutopickuponthewordlessCluesthatrevealwhatothersarefeeling.

Oncestressandemotionarebroughtintobalance,yourcapacityforjoy,pleasureandplayfulnessisunleashed.Joy isadeceptivelypowerfulresource.Studiesshowthatyoucansurmountadversity,aslongasyoucontinuetohave moments of joy. Humour plays a similar role when the challenge you're facing isconflict.

You can avoid many confrontations and resolve arguments and disagreements by communicating in a playful or humorousway.Humourcanhelpyousaythingsthatmightotherwisebedifficulttoexpresswithoutcreatingaflap. However,it'simportantthatyoulaughwiththeotherperson,notatthem.Whenhumourandplayisusedtoreduce tension and anger, reframe problems, and put the situation into perspective, the conflict can actually become an opportunity for greater connection andintimacy.

Managingandresolvingconflictrequirestheabilitytoquicklyreducestressandbringyouremotionsintobalance . It is possible to ensure that the process is as positive as possible by sticking to the following conflict resolution guidelines: Listen for what is felt as well as said. When we listen we connect more deeply to our own needs and emotions, and to those of other people. Listening in this way also strengthens us, informs us, and makes it easier for others to hear us.

Make conflict resolution the priority rather than winning or "being right". Maintaining and strengthening the relationship, rather than "winning" the argument, should always be your first priority. Be respectful of the other personandhisorherviewpoint.Focusonthepresent.Ifyou'reholdingontooldhurtsandresentments,yourability toseetherealityofthecurrentsituationwillbeimpaired.Ratherthanlookingtothepastandassigningblame,focus on what you can do in the here and how to solve theproblem.

Pickyourbattles.Conflictscanbedraining,soit'simportanttoconsiderwhethertheissueisreallyworthyofyour time and energy. Maybe you don't want to surrender a parking space if you've been circling for 15 minutes. But if there are dozens of spots, arguing over a single space isn't worth it. Be willing to forgive. Resolving conflict is impossibleifyou'reunwillingorunabletoforgive.Resolutionliesinreleasingtheurgetopunish,whichcannever compensate for our losses and only adds to our injury by further depleting and draining our lives.

Know when to let something go. If you can't come to an agreement, agree to disagree. It takes two people to keep anargumentgoing.Ifaconflictisgoingnowhere,youcanchoosetodisengageandmoveon.Whethertheconflict is a classroom real-life simulation exercise or an on-going emotional experience, learning ways to resolve issues andcollaborativelyworkthroughresponsesandsolutionswillteachyouskillsthatcanbeappliedinothersettings. It can help you:

- acceptdifferences
- recognise mutual interests
- improve persuasionskills
- improve listeningskills
- break the re-active cycle or routine
- learn to disagree withoutanimosity
- build confidence in recognising win-winsolutions
- recognise/admit to/process anger and other emotions
- solveproblems

In groups of people with various temperaments, philosophies and personalities, there is bound to be interpersonal conflicts. An interpersonal conflict may be any form of confrontation or interaction between groups that hinders the achievement of group goals. In a school setting where persons work closely and where job functions demand constant communication, some relationships will inevitably be wrought with conflicts. Conflicts can:

- causestress
- cause frustration
- cause hostility
- result in impaired or bad judgment
- restrict freedom
- use valuableenergy
- influence other workersnegatively
- result in lack of confidence in principal oradministrator
- detract from the attainment of goals and objectives

Some reasons for conflicts include:

- Cognitive dissonance: A conflict between convergent and divergentthinking.
- Status: When there is a need for status, such as the "wrong" person beingpromoted.
- Economics: Insufficientremuneration.
- Leadership styles: Differences in leadership styles inadministration.
- Stress: Conflicts from stress from external sources; i.e., functional or dysfunctionalsituations.
- Power struggle: Conflict from power struggle when all want to lead and none want tofollow.
- Inappropriateassignmentofadministrativeleadership:Conflictresultingfromsomeoneoflessstatureleading a more qualified and experiencedworker.
- The application and interpretation of rules and policies.
- Assessment of employeeperformance.
- Allocation of resources andprivileges.

There are two types of conflict:

- Substantiveconflict
- Affectiveconflict

A substantive conflict is associated with the job, not individuals, while an affective conflict is drawn from emotions

6.5 Conflict Resolution Techniques

The choice of an appropriate conflict resolution technique depends on a number of factors including:

- Why the conflictoccurred?
- The relation between the conflictingparties
- The relationship between the principal and the conflictingparties

Most of these techniques rest on one model which consists of four steps:

- Identify or clarify the issues
- Search for sharedvalues
- Explore possiblesolutions

- Select the solution that satisfies those who have theconflict

6.5.1 PreventativeTechniques

Several techniques fall within this category: Personal qualifications of the principal, promoting and becoming involved in morale-boosting social events for staff, students, and parents promotingeffectiveup-downanddown-upcommunicationalteringbehaviourthroughmotivationalseminars,peer evaluation, mentoring, etc.

The principal must possess the qualities that enhance good working relationships among staff members. These qualitiesincludeknowledgeofgroupdynamics,motivationalskills,persuasiveness,organisationalsensitivity, ethnic and cultural awareness, and objectivity, a sense of humour, listening skills, and compassion. The principal must showahighdegreeofloyaltyandrespecttoallconcerned.Shemustbeabletomakewiseandintelligentdecisions and possess some analyticalskills.

6.5.2 OtherTechniques

These techniques include but are not limited to:

- Integration
- Consensus management
- Expansion of resources
- Compromise
- Negotiation
- Changing the formal structure of thegroup
- Identification of similar goals andobjectives
- Changing the formal structure of thegroup
- Problemsolving
- Super-ordinategoals
- Smoothing
- Authoritativecommand
- Altering of the humanvariable

Authoritative command

This is based on the formal authority vested in the leader and the tendency of subordinates to obey the leader's command.Itisverysuccessfulinachievingshort-termreducedlevelsofconflict.Itsmajorweaknessisthatitdoes not treat the cause of theconflict.

Altering the human variable

Thisisverydifficulttoachieve.Thegoalistochangethebehaviouroftheconflictingparties.Ithasadualpotential effectofalleviatingthesourceoftheconflictandendingtheconflictitself.Thisisachievedthroughhumanrelatio ns training, sensitivity and awareness training. A third party is usuallyinvolved.

Altering the structural variable

Thisisthemostsuccessfulresolutiontechnique.Itisassumedtobesobecauseleadershaveauthoritytochangethe organisational structure or at least to have an input into such changes. This is accomplished by exchanging group members, creating or coordinating positions, developing an appeal system, expanding the boundaries of thegroup or theorganisation.

Integration

It is the most effective technique in cases when different goals or ideals are being sought. Integration is achieved through face-to-face dialogue and brainstorming in order to understand the conflict and evaluate the worth of suggestions. This technique is useful, for example, when two department heads are at odds over the use of the facilities that one has jurisdiction over.

Consensus management

Theprincipalseeksgroupinputinthedecisionmakingprocess,especiallyintheformationandprioritisingofgoals. This technique is useful, for instance, when a school administration must decide on the best day to begin internal examinations.

Compromise

Compromise sends a message of tolerance, understanding, and sympathy for both parties leaving integrity and dignity
intact. This is especially applicable in teacher-parent, teacher-student, or teacher-teacher conflicts.

Negotiation

Time should be taken to understand both sides through questioning, to evaluate what is being said, and to make decisions without being subjective. Choices should be offered after pointing out disadvantages and benefits of suggestions.Thisisasuitablestrategywhendealingwithparentsofadisruptivestudentandwhenconvincingirate teachers to tolerate and "accept" a difficult student back in school after a severe disciplinaryinfraction.

Problem solving

This is also known as confrontation. It seeks resolution of disagreements through face-to-face confrontation ofthe conflicting parties. Rather than accommodating various points of view, this approach aims at solving theproblem. It does not determine who is right, who is wrong, who wins, or who loses. Conflict stemming from semantic misunderstanding can be quickly and effectively alleviated in thismanner.

Super-ordinate goal

Commongoalsthattwoormoreconflictingpartieseachdesireandthatcannotbereachedwithoutthecooperation ofthoseinvolvedarecalledsuper-
ordinategoals.Thesegoalsmustbehighlyvalued,unattainablewithoutthehelp
ofallpartiesinvolvedintheconflict,andcommonlysought.Aunion-
managementdisputeillustratesthefunctioning of the super-ordinate goal. In times of economic, plenty unions are frequently adamant in their demands. But in numerouscaseswhereanorganisation'ssurvivalhasbeenseriouslythreatenedowingtoeconomicpressures,aunion has accepted pay reductions to keep the organisation in business. A compelling and highly valued goal, survival, has preceded other, individual objectives, and temporarily resolved the labourconflict.

Smoothing

Smoothing can be described as the process of playing down differences that exist between individuals or groups while emphasising common interests. Differences are suppressed in smoothing, and similarities are accentuated. When we recognise that all conflict situations have within them points of commonality, we further recognise that smoothing represents a way in which one minimises differences.

6.5.3 Positive Outcomes ofConflicts

Conflicts can have constructive outcomes when they are properly handled. They can:

- Provide greater interest in the topic ofdiscussion
- Stimulate greater feelings ofidentity
- Cause attention to be drawn to the existing problems
- Cause diffusion of ideas for the solution for otherproblems
- Promoteunderstanding
- Motivate one to work moreefficiently

Inmanyorganisations,amanagermustbepreparedtomanageawidevarietyoforganisationalsubunits.Committees are one of the most common subunits found in modern organisations. Ad hoc committee and standing committee aretheimportantone.Taskforceissimilartoanadhoccommittee.Ithasuniquefeatures.Taskforcesaregenerally associated with the coordination and integration of activities between or among work units. Secondly, task force membership may change often as new skills or inputs are needed. They also solve the conflict considering the relevant factors in connection with theconflict.

6.6 Personality Conflict and Resolution

Interpersonalrelationshipsbetweenco-workersareoneofthemostimportantfactorsinanyworkenvironmentand thepersonalityconflictsarealeadingcauseofproblemsintheworkplace.Inthiscontext,wecansaythatthereare some basic management skills by which conflict can be resolved. The salient points are asfollows:

- Need to be professional andcalm
- Need to learn to work as ateam
- Need propercommunication
- Need workrelationship
- Need to know about proper chain ofcommand

Summary

- Conflict can occur at the individual, interpersonal, group and organisationallevels.
- Intra-individual conflict is mainly related tostress.
- Anothercommonsourceofconflictforanindividualisagoalthathaspositiveornegativefeaturesortwoor more competing goals.
- Intra-individualaspectsofconflict,theinter-personalaspectsofconflictarealsoanimportantdynamicof interactivebehaviour.
- Thestrategiesforinter-personalresolutionincludeaproblem-solvingcollaborativeapproach,movementtoward an open self,etc.
- Negotiation is one of the important factors for conflictresolution.
- Committee, task force, work group may help to resolve the conflict in the workplaceenvironment.
- There are so many mechanisms by which we can try to resolve the conflict in any organisational setup.
- Conflict is a natural ingredient in everyorganisation.

- Bargaining,negotiating,mediating,communicationfacilitation,etc.arethewaystoresolveconflictsconsidering the existing scenario of the organisation.
- Conflictsoccurwhenpeople(orotherparties)perceivethat,asaconsequenceofadisagreement,thereisathreat to their needs, interests or concerns.
- Participantsinconflictstendtorespondonthebasisoftheirperceptionsofthesituation,ratherthananobjective review of it.
- Conflict is a normal and necessary part of healthyrelationships.
- Everyone needs to feel understood, nurtured, and supported, but the ways in which these needs are met vary widely.
- Individuals who tend towards a competitive style take a firm stand and they know what theywant.
- Bargaining means of reaching agreement or settlement through give and take, often synonymous with negotiation.
- Interpersonalrelationshipsbetweenco-workersareoneofthemostimportantfactorsinanyworkenvironment and the personality conflicts are a leading cause of problems in the workplace.
- Commongoalsthattwoormoreconflictingpartieseachdesireandthatcannotbereachedwithoutthecooperation of those involved are called super-ordinate goals.

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Chapter VII

Change Management

Aim

The aim of this chapter is to:

- introduce change management
- elucidate the approaches to management
- explain the principles of change management

Objectives

The objectives of this chapter are to:

- explain the concept of management
- describe the characteristics of management
- define changemanagement

Learning outcome

At the end of this chapter, you will be ableto:

- determine the management functions
- understand psychological contract and people-organisationalrelationship
- identify change management and principles of change management

7.1 Introduction

Human beings, from the very beginning of their existence on this planet, have engaged themselves in activities, whichhaveprovidedthemabetterwayofliving.Whenpeoplefounditdifficulttoperformvariousactivitiesalone, theysoughtco-operationofotherswhichlaterontooktheshapeofanorganisation.Thetechnologicalinnovation, greaterdegreeofspecialisationanddivisionoflabourresultedinlargenumberofindividualsworkingtogetheran d getting the collective objectives accomplished through their integrated efforts. However in this process, anagency to integrate these efforts was needed and that gave rise tomanagement.

Managementistheintegratingforceinallkindsoforganisedactivity.Itisnotuniquetobusinessorganisations,but common to all kinds of social organisations. Management is the social process of planning, organising, staffing, directing, coordinating and controlling for the determination and achievement of organisational objectives in a dynamic environment.

7.2 Definition of Management

There are various definitions about management, which are as given below:

- Management is the function of executive leadershipeverywhere.
- Managementistheprocessofgettingthingsdonethroughtheagencyofacommunity.Thefunctionsof management are handling a community to fulfill the purposes for which it exists.
- Managementisatechniquebymeansofwhichthepurposesandobjectivesofaparticularhumangroupare determined, clarified and affected.
- Thesixessentialfunctionsofmanagementareplanning,organising,directing,staffing,coordinatingand controlling.
- Management embraces all duties and functions that pertain to the initiation of an enterprise, its financing,the establishment of all major policies.
- Management entails the coordination of human efforts and material resources towards the achievement of organisationalobjectives.
- Management is the art of directing and inspiringpeople.
- Management is the art of getting things done through the efforts of otherpeople.
- Management is the art and science of organising and directing human efforts applied to control the forcesand utilise the materials of nature for the benefit of man.

7.3 Approaches of Management

The three approaches in which management can be defined are as follows:

- Management as a field of study: It includes principles, techniques, functions andproblems.
- Management as a team or class of people: It includes individuals who perform the managerial activities in the organisation and the actions performed by them which come under managerialactivities.
- Management as a process: In studying the management process, various managerial activities take place as a basis for defining management. There are two ways of identifying managerial activities. One is inductive and other is deductive.
- Inductive method means management is what manager does. Under deductive method, we can classify total activities of the organisation as managerial or non-managerial oroperative.

7.4 Nature of Management

The concept of management is universal. The nature we can analyse in the context of it being:

- an economic resource,
- a system ofauthority,
- a class of team,
- a science or art,and
- a profession.

7.4.1 Management: An EconomicResource

There are five factors of production, viz., land, labour, capital, management and entrepreneur. These factors are classified as human and non-human factors in organisation.

7.4.2 Management: A System ofAuthority

Management is a system of authority. A system can be defined as a set of things can be defined as a set of things connected or interrelated and interdependent so as to form a complex unity. The authority may be defined as the legal right to command others to act or not to act in a prescribed manner.

7.4.3 Management: A Class, Team orGroup

Here,werefermanagementasindividualsorgroupofindividualsoccupyingmanagerialpositionsandperformin g managerial functions. Theseare:

- paternal or family management,
- political management, and
- professional management.

7.4.4 Management: Science orArt

Itissaidthatmanagementistheoldestofartandtheyoungestofscience.Itisasciencebecauseitevolvesanduses certain principles. It is an art because it requires continuous practice to get the desired results in the bestway.

7.4.5 Management: AProfession

Managementisacomparativelynewfieldofknowledgeandhasbeendevelopedasaresultofrapidindustrialisati on. It is increasingly being treated as a profession because of the need for acquiring management skills to solve the complex problems oforganisations.

7.5 Management Principles

Management has been defined as science, though an inexact science. It means that managerial functions are based on certain principles. Principles are fundamental truths which establish cause and effect relationship of a function andtheoryisasystematicgroupingofinter-relatedprinciples.Thesignificantpointsinthiscontextwecanmention are as follows:

- To increaseefficiency
- To crystallise the nature ofmanagement
- To carry onresearches
- To attain socialobjectives

7.6 The Management Functions

The main functions are planning, organising, staffing, directing, coordinating and controlling.

7.6.1 Planning

Planning is the most fundamental and the most pervasive of all the managerial functions. It includes:

- determination of long and short-rangeobjectives,
- development of strategies and courses of actions for the achievement of these objectives,and
- formulation of policies, procedures, rules etc., for the implementation of strategies andplans

7.6.2 Organising

Organising involves the following list:

- identification of activities required for the achievement of objectives and implementation ofplans,
- grouping of activities so as to create self-containedjobs,
- assignment of jobs to employees,
- delegation of authority,and
- establishment of coordinating relationships.

Organising process results in a structure of the organisation. It comprises organisational positions, accompanying tasks and responsibilities and a network of roles and authority-responsibility relationships.

7.6.3 Staffing

Staffing process comprisesof:

- man-power planning
- recruitment
- selection, induction andorientation
- transfer, promotion and terminationand
- employee training and development

7.6.4 Directing

It is the function of leading the employees to perform efficiently and effectively and contribute their optimum to the
achievement of organisational goals. It includes the sub-function of leadership, motivation and communication.

7.6.5 Coordinating

Coordinating is the integrating function. It is the process of tying together all the parts of the organisation so that they all pull in the direction of organisational goals. It includes the following sub-function:

- keeping authority and responsibility relationships clearlydefined
- unity of direction
- unity of command and
- effective communication and effectiveleadership

7.6.6 Control

Control involves:

- measurement of performance against predetermined goals
- identification of deviation from these goalsand
- corrective action to rectify deviation

Management performs all these functions in interaction with its environment. In the course of performing these functions, it is influenced by as well as it influences its environment. Management theory and principles have universal applicability to all kinds of organisations, operating in differing socio-cultural environments. They are transferable from developed to underdeveloped countries. Without people there can be no organisation and no meaningful activity.

Organisations can only achieve their aims and objectives through the coordinated efforts of other members. It is thejobofmanagementtogetthingsdonethroughotherpeople.Thisinvolvestheeffectivemanagementofhuman resources.Itispeoplewhoarebeingmanagedandpeopleshouldbeconsideredinhumanterms.Humanbehaviour is the end result of a multiplicity of influences, many of which are hard to identify, so they need to be measured scientifically under experimentalcontrol.

7.7 Change Management

Change management is a structured approach to transitioning individuals, teams as well as organisations from current state to a desired future state. In this context, we can consider organisational change. The important types of organisational changes are mainly,

- strategicchanges

- technological changes
- structural changesand
- changes in the attitudes and behaviours of personnel.

Aneffectivechangemanagementplanneedstoaddressallthedimensionsofchange.Organisationsconsistofpeople whoareunitedbyacommonpurpose.Tomeettheobjectivesofanorganisation,astructureiscreated,maintained and used. Generally, there are three levels of organisations, whichare:

- strategic
- managerial and
- operating

Atthestrategiclevel,policiesareformulated,goalsaresetandobjectivesareformed.Strategiesarealsodesignedto achievetheobjectivestakingintoconsiderationtheenvironmentalinfluencesontheorganisation.Atthemanagement level, the programs regarding the procurement and allocation of all types of resources are formulated to achieve the strategies and objectives. At the operating level, the programs are implemented, i.e., the actual operations are carried out in the process of day-to-day activities in order to carry out the strategies and achieve the objectives. Human resources have a plus value in that they can convert the disorganised resources into a useful, productive organisation.Forsmoothrunningoftheorganisationandalsofororganisationaldevelopment,effectivemanagement is desirable.

7.8 Issues about Change Management

Change management entails thoughtful planning and sensitive implementation, and above all, consultation with, and involvement of, the people affected by the changes. If change is forced on people, normally problems arise. Change must be realistic, achievable and measurable. These aspects are especially relevant to managing personal changes.Beforestartingorganisationalchange,themanagershouldaskhimselfwhatisitonewantstoachievewith thischange, why, andhowwillweknowthatthechangehasbeenachieved?Also,theotherquestiontobeaskedis whoareaffectedbythischange?andhowwilltheyreacttoit?Andwhethertheamountofchangebeingvisualised could be achieved by the organisation and what parts of the change would the organisation need help with? These aspects also relate strongly to the management of personal as well as organisationalchange.

Changeshouldnotbesoldtopeopleasawayofaccelerating‘agreement’andimplementation.‘Selling’changeto peopleisnotasustainablestrategyforsuccess,unlesstheaimoftheorganisationistofaceproblemsatsometime in the future when least expected. Instead, change needs to be understood and managed in a way that people can cope effectively with it. Change can be unsettling, so the manager logically needs to be a settlinginfluence.

Itisimportanttofindoutifpeopleaffectedbythechangeagreewith,oratleastunderstand,theneedforchange,and have a chance to decide how the change will be managed, and to be involved in the planning and implementation ofthechange.Forthis,face-to-facecommunicationmustbeused,sothatsensitiveaspectsoforganisationalchange management could be handled effectively. The managers in the organisation must be encouraged to communicate face-to-face with their people when one has to manage an organisational change. E-mail and written notices are extremely weak at conveying and developingunderstanding.

Wherethereisaneedtomakeachangequickly,probethereasonsandaskthequestioniftheurgencyisreal. Will theeffectsofagreeingamoresensibletimeframereallybemoredisastrousthanpresidingoveradisastrouschange ? Quick changes prevent proper consultation and involvement, which lead to difficulties that take time toresolve.

Forcomplexchanges,theorganisationmustensurethattheyaugmentthischangewithconsultativecommunicat ions soastomakethepeopleagreeandgainsupportforthereasonsforthechange.Involvingandinformingpeoplealso createopportunitiesforotherstoparticipateinplanningandimplementingthechanges,whichlightenstheburde n, spreads the organisational load, and creates a sense of ownership and familiarity among the people affected. For organisationalchangethatentailsnewactions,objectivesandprocessesforagrouporteamofpeople,theorganisat ionmustuseworkshopstoachieveunderstanding,involvement,plans,measurableaims,actionsandcommitme nt.The managementteamshouldbeencouragedtouseworkshopswiththeirpeopletooiftheyarehelpingthemtomanage the change.

Theorganisationshouldevenapplytheseprinciplestoverytoughchanges,likemakingpeopleredundant,closur es and integrating merged or acquired organisations. Bad news needs even more careful management than routine change.Hidingbehindmemosandmiddlemanagerswillmakemattersworse.Consultingwithpeople,andhelpi ng them to understand does not weaken the management's position, rather it would strengthen it. Leaders who fail to consult and involve their people in managing bad news are perceived as weak and lacking in integrity. If the management must treat people with humanity and respect and they willreciprocate.

Itmustberememberedthatthechiefinsecurityofmoststaffischangeitself.Seniormanagersanddirectorsresponsib le formanagingorganisationalchangedonot,asarule,fearchange.Theygenerallythriveonit.Sothemanagement mustrememberthatitspeopledonotrelishchange,andtheyfinditdeeplydisturbingandthreatening.Thepeople' s fear of change is as great as one's own fear offailure.

7.8.1 Responsibility for ManagingChange

Theemployeedoesnothavearesponsibilitytomanagechange.Theresponsibilityoftheemployeeisactuallytod o their best, which is different for every person and depends on a wide variety of factors (health, maturity, stability, experience, personality, motivation, etc.) Responsibility for managing change is with management and executives of the organisation. They must manage the change in a way that employees can cope with it. The manager has a responsibility to facilitate and enable change. The management must help people to understand reasons, aims,and waysofrespondingpositivelyaccordingtoemployees'ownsituationsandcapabilities.Increasinglythemanage r's role is to interpret, communicate and enable. He should not instruct and impose, which nobody really responds to well.

7.8.2 Change must Involve thePeople

Inotherwords,changemustnotbeimposedonpeople.Ifpeoplearenotapproachingtheirtasksortheorganisation effectively,thentheorganisationhasthewrongmindset,notthepeople.Changes,suchasnewstructures,policies , targets,acquisitions,disposals,re-locations,etc.,allcreatenewsystemsandenvironments,whichneedtobeexplained to people as early as possible, so that people's involvement in validating and refining the changes themselves can be obtained. Whenever an organisation imposes new things on people, there will be difficulties. Participation, involvement and open, early, full communication are the importantfactors.

Staffsurveysareahelpfulwaytorepairdamageandmistrustamongstaffprovidedthemanagementallowspeople tocompletethemanonymously,andpublishandactonthefindings.Managementtraining,empathyandfacilitati ve capabilityareprioryareas-managersarecrucialtothechangeprocess-theymustenableandfacilitate,notmerely convey and implement policy from above, which does not work. Change cannot be imposed. In fact people and teamsneedtobeempoweredtofindtheirownsolutionsandresponses,withfacilitationandsupportfrommanager s, and tolerance and compassion from the leaders and executives.

Management and leadership style and behaviour are more important than clever process and policy. Employees needtobeabletotrusttheorganisation.Theleadermustagreeandworkwiththeseideas,orchangeislikelytobe very painful, and the best people will be lost in theprocess.

7.8.3 Change ManagementPrinciples

These are as follows:

- At all times involve and agree support from people within system (system = environment, processes, culture, relationships, behaviours, etc., whether personal ororganisational).
- Understand where the organisation is at themoment.
- Understand where the management wants to be, when, why, and what the measures will be for having got there.
- Communicate, involve, enable and facilitate involvement from people, as early and openly and as fully as is possible.

There are mainly ten principles of change management. These are as follows:

- Address the human sidesystematically
- Start at thetop
- Involve every layer
- Make the formalcase
- Create ownership
- Communicate the message
- Assess the culturallandscape
- Address cultureexplicitly
- Prepare for theunexpected
- Speak to theindividual

Actuallychangemanagementgrewfromtherecognitionthatorganisationsarecomposedofpeopleandthebehav iour of people make up the outputs of anorganisation.

7.8.4 John P Kotter's 'Eight Steps to SuccessfulChange'

American John P Kotter is a Harvard Business School professor and leading thinker and author on organisational changemanagement.EachstageacknowledgesakeyprincipleidentifiedbyKotterrelatingtopeople'sresponse and approachtochange,inwhichpeoplesee,feelandthenchange.Kotter'seight-stepchangemodelcanbesummarised as:

- Increase urgency: Inspire people to move, make objectives real andrelevant.

- Build the guiding team: Get the right people in place with the right emotional commitment, and the right mix of skills andlevels.
- Getthevisionright:Gettheteamtoestablishasimplevisionandstrategyfocusonemotionalandcreative aspects necessary to drive service and efficiency.
- Communicateforbuy-in:Involveasmanypeopleaspossible,communicatetheessentials,simply,andtoappeal and respond to people'sneeds.
- De-clutter communications: Make technology work for you rather thanagainst.
- Empower action: Remove obstacles, enable constructive feedback and lots of support from leaders - reward and recognise progress and achievements.
- Createshort-termwins:Setaimsthatareeasytoachieveinbite-sizechunks.Manageablenumbersofinitiatives. Finish current stages before starting newones.
- Don'tletup:Fosterandencouragedeterminationandpersistence–ongoingchange-encourageongoingprogress reporting - highlight achieved and future milestones.
- Make change stick: Reinforce the value of successful change via recruitment, promotion, and new change leaders. Weave change intoculture.

7.8.5 Organisational Change, Training andLearning

Here are some modern principles for organisational change management and effective employee training and development.Theseprinciplesareforforwardthinkingemotionallymatureorganisations,whovalueintegrityabove results, and people above profit. Do you train or do you facilitate learning? There is a bigdifference:

- 'Training'impliesputtingskillsintopeople,whenactuallyweshouldbedevelopingpeoplefromtheinsideout, beyond skills, i.e., facilitatinglearning.
- So, focus on facilitating learning, not imposingtraining.
- Emotional maturity, integrity, and compassion are more important than skills and processes. If you are in any doubt,analysetherootcausesofyourorganisation'ssuccessesandyourfailures-theywillneverbeskillsand processes.
- Enable and encourage the development of the person - in any way that youcan.
- Givepeoplechoice:wealllearnindifferentways,andweallhaveourownstrengthsandpotential,waitingto be fulfilled.

Talkaboutlearning,nottraining.Focusontheperson,fromtheinsideout,nottheoutsidein;andofferopportunities for people to develop as people in as many ways youcan.

7.8.6 Organisational Change, Training and Development and'Motivation'

Conventional organisational change, which typically encompasses training and development, and 'motivation', mostlyfails,becausepeoplelookatthingsinadifferentway.Bossesandorganisationsstilltendtothinkthatpeoplewhoaremanagedandemployedandpaidtodoajobshoulddowhatthey'retoldtodo.We areconditionedfromanearlyagetobelievethatthewaytoteachandtrain,andtomotivatepeopletowardschangingwhattheydo,istotellthem,orpersuadethem.Fromourexperiencesatschool,weareconditionedtobelievethatskills,knowledge,and expectations are imposed on or 'put into' people by teachers, and later, by managers and bosses in theworkplace.

Butjustbecausethebosssaysso,doesn'tmakeitso.Peopletodayhaveadifferentperspective.Imposingnewskills and change on people doesn't workbecause:

- Itassumesthatpeople'spersonalaimsandwishesandneedsarecompletelyalignedwiththoseoftheorganisation,

or that there is no need for suchalignment.

- It assumes that people want, and can assimilate into their lives, given all their other priorities, the type of development or change that the organisation deems appropriate forthem.

7.9 Consent to Change

Itisnoteasytogettheemployeesconsenttochange.Instead,organisations,managers,bossesandbusinessowners wouldd obettertothinkfirstaboutexploringwaystoaligntheaimsofthebusinesswiththeneedsoftheirpeople. The following facts must be kept in mind.

7.9.1 Fact 1

People will never align with bad aims. Executive greed, exploitation, environmental damage, inequality, betrayal, falsepromisesaretransparentforalldecentpersonstosee.Re-assessandre-aligntheorganisation'saims,beliefs, integrity - all of it – with those of people's. Then, they might begin to be interested in helping with new skills and change, etc.

7.9.2 Fact 2

People can't just drop everything and 'change', or learn new skills, just because the management says so. Even if theywanttochangeandlearnnewskills,theyhaveawholerangeofissuesthatkeepthemfullyoccupiedformost of their wakinghours.

Thereasonwhyconsultingwithpeopleisratheragoodideaisthatitsavesthemanagementfromitselfandfromits own wrong assumptions. Consulting with people does not mean that the management hands over theorganisation.

Consulting with people gives the management and workers a chance to understand the implications and feasibilityofwhatthemanagementthinksneedsdoing.Andasidefromthis,consultingwithpeople,andhelpingt hem toseethingsfrombothsidesgenerallythrowsupsomeverygoodideasfordoingthingsbetterthanthemanagemen t could have dreamt of by itself. It helps the management to see from both sidestoo.

7.9.3 Fact 3

Organisations commonly say they do not have time to reassess and realign their aims and values, etc., or do not havetimetoconsultwithpeopleproperly,becausetheorganisationisontheedgeofacrisis.Organisationsgetinto crisis because they ignore facts one and two. Ignoring these facts again will only deepen thecrisis.

Crisis is no excuse for compromising integrity. Crisis is the best reason to realign management aims and consult with people. Crisis is indicative of wake-up and changes the organisation and its purpose and not change the people. When an organisation is in crisis, the people are almost always okay. So, whatever way one looks at the organisational change, one is deceiving oneself that one can come up with a plan for change and then simply tell or persuade people to implement it.

Instead,theymuststartbylookingattheirorganisation'saimsandvaluesandpurposes.Whatdoestheorganisatio n actually seek to do? Whom does the organisation benefit? And whom does it exploit? Who are the winners, and who are the losers? Does the organisation have real integrity? Is the management proud of the consequences and implicationsofwhattheirorganisationdoes?Willthemanagementberememberedforthegoodthattheydid?An d what do people in the organisation say to themselves about the way they are managingchange?

7.10 Five Basic Principles and How to Apply Them forChange?

Change management is a basic skill in which most leaders and managers need to be competent. There are very fewworkingenvironmentswherechangemanagementisnotimportant.Whenleadersormanagersareplanningto manage change, there are five key principles that need to be keeping inmind:

- Different people react differently tochange
- Everyone has fundamental needs that have to be met
- Change often involves a loss, and people go through the 'loss curve'
- Expectations need to be managed realistically
- Fears have to be dealtwith

Here are some tips to apply the above principles when managing change:

- Give people information. That is, they have to be open and honest about the facts, but at the same time need not give over-optimistic speculation. It is important to meet their openness needs, but in a way that does not set unrealisticexpectations.
- For large groups, the management must produce a communication strategy that ensures information is disseminated efficiently and comprehensively to everyone. It must be ensured that the grapevine does not take over. For example, the management must tell everyone at the same time. However, follow this up with individual interviews to produce a personal strategy for dealing with the change. This helps to recognise and deal appropriately with the individual reaction tochange.
- Peopleshouldbegivenchoicestomake,andthemanagementmustbehonestaboutthepossibleconsequences of those choices. They must be given enough time to express their views, and support their decision-making, provide coaching, counseling or information as appropriate, to help them through the losses.
- Wherethechangeinvolvesaloss,themanagementmustidentifywhatwillormightreplacethatloss.Theloss is easier to cope with, if there is something to replace it. This will help in assuaging potentialfears.
- Whereitispossibletodoso,theindividualsmustbegivenanopportunitytoexpresstheirconcernsandprovide reassurances. This would help in assuaging potentialfears.
- Themanagementshouldkeepobservinggoodmanagementpractice,suchasmakingtimeforinformaldiscussion andfeedback(eventhoughthepressuremightseemthatitisreasonabletoletsuchthingsslip.Duringdifficult times, such practices are even moreimportant.

Where management is embarking on a large change programs, the change program should be treated as a project. That means, the management should apply the entire rigors of project management to the change process. Inother words,theyshouldproduceplans,allocateresources,appointasteeringboardand/orprojectsponsor,etc.Thefiv e principles above should form part of the project objectives. When leaders or managers are planning to manage change, there are five key principles that need to be kept inmind:

7.10.1 Principle 1: Different People React Differently toChange

The stability and change can be considered on a continuum with stability at one extreme and change at another extreme. Different people have different preferences for where they like to be on this spectrum. Some people like tobeatthestabilityendofthespectrum.Theylikethingstobethewaytheyhavealwaysbeen.Otherpeopleliketo beatthechangeendofthespectrum.Suchpersonsarealwayslookingforsomethingdifferentandnew.Problems arise when the individual's preferences differ from the situation they find themselves in. That is,if:

- a stability-oriented person finds that circumstances are changing quite rapidly,or
- a change-oriented person finds that everything is the same and there is nothingnew.

In these situations, the individuals involved can experience:

- strongdissatisfaction,
- stress,
- negative attitudes towards individuals with preferences at the other end of the spectrum (e.g., distrust, dislike),
- resistance (to change, or to the statusquo),
- intense emotions, and
- loss of rational judgement.

7.10.2 Principle 2: Everyone has Fundamental Needs that have to beMet

A famous psychologist called Will Schutz identified three basic needs that people have in interpersonal relations. These basic needs are also of fundamental importance in people's reaction to change:

- The need for control
- The need for inclusion
- The need for openness

Whilst the need for these can vary between people, in any change process there is always some degree of needfor control over one's environment/destiny, some degree of need to be included in the process of forming the change that is taking place, and some degree of need for managers/leaders to be open with theirinformation.

If a change program fails to meet the control, inclusion and openness needs of the individuals affected by it, then that program is likely to encounter a range of negative reactions, ranging from ambivalence through resistance to outright opposition.

7.10.3 Principle 3: Change Often Involves a Loss, and People go through the 'LossCurve'

Therelevanceofthe'losscurve'toachangemanagementprogramdependsonthenatureandextentoftheloss.If someoneispromotedtoamoreseniorposition,the'loss'oftheformerpositionisrarelyanissuebecauseithasbeen replacedbysomethingbetter.But,ifsomeoneismaderedundantwithlittleprospectofgettinganewjob,thereare manylosses(income,security,workingrelationships)thatcanhaveadevastatingeffect.Therearemanyvariatio ns of the 'loss curve'. One is known as 'Sarah' - that is, the individual experiences (in thisorder):

- S-hock
- A-nger
- R-ejection
- A-cceptance
- H-ealing

The common factors amongst all 'loss curves' are:

- that there can be an initial period, where the change does not sink in; for example, feelings may be kept high by the individual convincing themselves that the change is not going to happen
- that when the loss is realised, the individual hits a deep low; the depth of this 'low' is deepened if the loss is

sudden/unexpected

- that the period of adjustment to the new situation can be very uncomfortable and take a longtime

7.10.4 Principle 4: Expectations Need to be ManagedRealistically

The relationship between expectations and reality is very important. One can see this in customer relations, as for example,ifasupplierfailstomeetexpectations,thenthecustomerisunhappy.Ifthesupplierexceedsexpectations, thenthecustomerishappy.Tosomeextent,thesameprincipleappliestostaffandchange.Iftheirexpectationsare not met, they are unhappy. If their expectations are exceeded, they are happy.

Sometimes,enforcedchangeinevitablyinvolvesthefailuretomeetexpectations.Thatis,therehadbeenanexpectation of job security, which has now been taken away. What leaders/managers have to do, however, is make sure they don't aggravate the situation by making promises that cannot or will not be kept. Expectations have to be set at a realistic level, and then exceeded.

7.10.5 Principle 5: Fears have to be DealtWith

In times of significant changes, rational thoughts do not seem to function. This means that people often fear the worst, that is, they fear far more than the worst, because their subconscious minds suddenly become illogical and see irrational consequences. Given below are a few examples of this type of situation.

- Our company is reducing staff, whichmeans...
- They will make people redundant,and...
- I'll be the first to be kicked out,and...
- I'll have no hope of getting another job, and...
- I won't be able to pay the mortgage,so...
- I'll lose the house,so...
- My family won't have anywhere to live,and...
- My wife won't be able to cope,so...
- She'll leave me,and...
- I'll be so disgraced the children won't speak to me everagain.

Such fears need to be addressed, by helping people to recognise that most people who are made redundant find a betterjobwithbetterpayandhaveahugelumpsumintheirpocket.Or,whereappropriate,byexplaininghowthe reductions in staff numbers are going to be achieved (by natural wastage or voluntaryredundancy).

7.11 Psychological Contract and People OrganisationalRelationship

Many problems in the people-organisational relationship arise not so much from what management does, but the manner in which it is done. Often, it is not so much the intent but the manner of implementation that is the root cause of staff unrest and dissatisfaction. Accordingly, how managers exercise the responsibility for, and duties of, management is important. Management should, therefore, endeavour to create the right balance among the inter-relatedelementswhichmakeupthetotalorganisation.So,attentionshouldbegivenonpsychologicalcontractand the people-organisationalrelationship.

7.11.1 PsychologicalContract

The psychological contract covers a range of expectations of rights and privileges, duties and obligations, which do
not form part of a formal agreement but still have an important influence on people's behaviour.

The psychological contract is a useful concept in examining the socialisation of new members of staff to the
organisation.Earlyorientationsorinductionsaboutthecontractualobligationshaveamajoreffectonanindividual's
subsequentcareerinorganisation,andinfluencejobsatisfaction,attitudeandlevelofproductivity.Thenatureand
extentofindividual'sexpectationsvarysowidelythatitisnotpossibletofinaliseanexhaustivelistwithallinclusive variables. The employermust:

- provide safe and hygienic workingconditions,
- make every possible effort to provide job security,
- attempt to provide challenging and satisfyingjobs,
- allow staff genuine participation in decisions which affectthem,
- provide opportunity for personal development and career progression,
- treat members or staff with respect,and
- demonstrate an understanding and considerate attitude towards personal problems ofstaff.

Ontheotherhand,theorganisationsalsohavesomeexpectations.Theorganisationalexpectationsshowalsowide variations in their requirements and conflicting areas with employee expectations. The important points in this context we can mention here are thefollowing:

- Achieving organisationalgoals
- Sufficient involvement, commitment andinitiative
- Requiring high interest towards role and responsibility
- Specific task performance effectively (withloyalty)
- Having high regards to policies, rules andprocedure
- Having high responsiveness toleadership
- Having high interest for the viability of theorganisation

7.11.2 The People OrganisationRelationship

The classical schools of management were mainly concerned with managing organising without caring much about the human factors or people participating in 'man-machine' system of production. Findings of Hawthorne experiments made management cautious about the importance of human factors. Practically, Hawthorne effect on increasingproductionratelaiddownthefoundationsofhumanrelationsapproachinindustrialmanagementwhere a harmonious interpersonal relation in work supervision was given priorityattention.

Human relations could not think of any dynamic organisational life without lively people in organisational set up. Ofcourse,therearecertainshortcomingsinputtingexclusiveimportanceontheclassicalhumanrelationsapproach in public and private sector undertakings with equal emphasis. Acknowledging the importance of human factor, organisationallifewasstudiedintermsoftherelationshipbetweentechnicalandsocialvariableswithinthesystem. Where, changes in our part, technical or social, would affect other parts and thus the wholesystem.

Thus, the socio-cultural system is concerned with the interactions between the psychological and social

factors and the needs and demands of the human part of the organisation and its befitting structural and technological requirements. Thus, due importance was given on effective decision-making and communication processes.There is a need for cooperative action in organisations. People's ability to communicate and their commitment and contribution to the achievement of a common purpose, were necessary for the existence of a cooperative system. Without proper infrastructure, democratic leadership style cannot grow to achieve finally the goals of industrial democracywhere:

- the role, responsibility and dignity of each people is duly respected and recognised,
- cooperation is the core spirit of team work,and
- continuous learning opportunities are available for human resource development and for conflictresolution.

Modern organisations are composed of competing sub-groups and work teams with their own loyalties, goals and leaders are working for a common cause – the viability of the organisation by overcoming conflicts. This view is widely acceptable and trade unions get a legitimate access to intervene into an increasing range of managerial prerogative areas.

Summary

- Effective management is at the heart of organisational development and improved performance and the contribution to economic and social needs ofsociety.
- The quality of management is one of the most important factors in the success of anyorganisation.
- There is continual need for managerial development to ensure the development of both present and future managers.
- Manager can be seen to draw plans, set-up goals and objectives and subsequentactions.
- Manager organises the program of job analysis, decision-making and forms work groups and controls human relationship in supervisorypractices.
- Managersmotivateandtrainworkgroupsandleadthegroup(teams)andidentifytheneedsofbothpeopleand organisation.
- Manager conducts performance evaluation of the staff andself.
- Manager's role is mainly inter-personal, informational and decisional. On the other hand, behaviour stylesare mainly authoritative, benevolent authoritative, consultative and participativestyle.
- The process of management development should be related to the nature, objectives and requirements of the organisation as awhole.
- Anessentialfeatureofmanagementdevelopmentisperformancereview–relatedtoknowledgeacquired,skills developed and qualification and experience of the people concerned.
- An effective system of performance review will help to identify individual strength and weaknesses, potential for promotion and training and development needs.
- Performance review provides a framework for measuring results, identifying training needs, personal career planning, agreeing objectives and standards of performance and organisational succession planning. All these are under the category of change management.

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Chapter VIII

Leadership and Coordination

Aim

The aim of this chapter is to:

- introduce leadership
- elucidate various leadershipstyles
- explain team coordination

Objectives

The objectives of this chapter are to:

- explain leadership concept andsignificance
- determine relationship between explicit and implicit coordination
- explicate co-ordination concept andsignificance

Learning outcome

At the end of this chapter, you will be able to:

- understand principles and techniques of coordination
- differentiate between implicit and explicit teamcoordination
- identify the qualities of a leader

8.1 Introduction

Leadershiphasaprominentandpowerfulroleinsocietyandinfluencesallaspectsoflifeinnormalaswellascrisis situations.Leaderscanemergefromwithinagroupandcanalsobeformallyappointedorelected.Therearemany qualities that a leader should have such as intelligence, quick comprehension, decisiveness, courage, strength,
confidence,education,knowledge,personality,charismaandaboveallintegrity.Theremaybealonglistofleader ship traits but the following five attributes have strong correlation with the leadership. Thereare:

- Dominance(Personality)
- Intelligence
- Self-confidence
- High energylevel
- Task related knowledge (political ororganisational)

8.2 Leadership in Disaster Situations: Concept and Significance

Leadership is defined as a ability to influence or motivate a group or community towards achievement of certain goals. In normal circumstances, leadership is entirely different as all decisions are taken after enough thinking, after a process of consideration and reconsideration as well as with the thought ful advice of experts in the area. There is a framework of legislation to provide formalised support and confirmation. On the other hand in crisis situations or under unstable and disruptive conditions or in disasters, tasks of leaders usually become difficult. The leadership from local level, district level, state level and LIP to national level is affected by a number of factors such as the following:

- Many of the designated local leaders are themselves affected by the disaster. They could get isolated due to sudden breakdown of communications or become ineffective under traumatic condition due to the suddenness and severity of the situation.
- During disaster, many of the relatives and friends of the leaders could be affected. Their attention could get diverted to them instead of taking decision, or action for relief and recovery of the community.
- Lack of information and disruption of communication become serious factors hampering decision making.
- Loss or delayed availability of human resources, equipment, transport and other relief commodities delays action and creates a sense of helplessness.

In the resulting confusion, community feels insecure and could lose confidence in the leadership. There may be many other factors depending on the type of disaster and the affected people. In a crisis situation requiring relief and rehabilitation of disaster affected people, administration and political leadership could have different goals.

8.2.1 District Administration

In a district, the district magistrate or district collector is chairman of the disaster relief committee. The officers' main aim is to mount effective rescue operations for the affected people, provide immediate reliefin terms of food, medicine, drinking water, clothes and temporary shelter. It depends on the leadership qualities of an administrator, how he or she gets the job done. There could be two approaches:

- "Boss-Approach" in which one passes orders and expects that the subordinates will act according to the orders.
- "Team-Approach" in which full cooperation of all concerned officers and people is taken. In this case the leader will take all concerned officers into confidence, involve them in the decision making, monitor their work and guide them from time to time for effective relief operations. In disaster situation, the latter approach will be more effective and give better results.

8.2.2 Local Leadership

Local leaders would like to make their presence felt. They may or may not be having any experience of disaster management. In many cases, their intervention may sometime hinder the process of relief but may give political advantage to the local leaders. Secondly, they may openly criticise the disaster management officials with or without justification.

8.2.3 State and National Level Leadership

State and national level leadership will try to provide funds and mobilise effective relief within the available resources but this leadership initiative from top will be based on an overall appreciation of the disaster situation. For the state and national level leadership to be effective, they should have accurate arid up to date information from the disaster area through the district leadership and leave detailed implementation to the local established administrative system.

8.3 Leadership Styles

Before dealing with the leadership styles, it is important to know the attributes and desirable qualities of a leader. Leadershipqualitiescannotbelearntfromabook;for'example,'courage'cannotbelearntfromanywhereexcept perhapsfromworthyrolemodels.Secondly, noleadercanbeanallrounderoridealinallaspects.Therearesome goodqualitiesthateverypersonhasinsomemeasure,suchassenseofhumour,endurance,cheerfulness,dedicati on, enthusiasm, courage, quick decision, identification of problem, etc. But combinations of a large number of these desirablequalitiesinapersoncanmakehimorherbetterleader.Someofthemoredesirablequalitiesofleadership in disaster management are briefly discussedbelow:

8.3.1 Personal Qualities andSelf-confidence

Asmentionedabove,everypersonhassomeleadershipqualities.Oneshouldidentifythemandtrytodevelopand upgradethemtothebestcapability.Selfconfidenceisanimportantcharacteristicofaleaderwhichcanbedevelop ed by increasing his own professional competence and inter-personalabilities.

8.3.2 ProfessionalCompetence

Thiscompetencemeansknowingwhattodoandhowtodoit.Thiscanbedevelopedbyacquiringahighstandard ofknowledge,skillandabilityappropriatetothetaskandcircumstances.Highertheprofessionalcompetencemo re is the respect and trust that the leader wouldreceive.

8.3.3 Sound Judgment and Appropriate DecisionMaking

These are very much related to the professional competence and experience of a person. A leader with these two qualities will emerge successful with his team of co-workers in ally disaster situation.

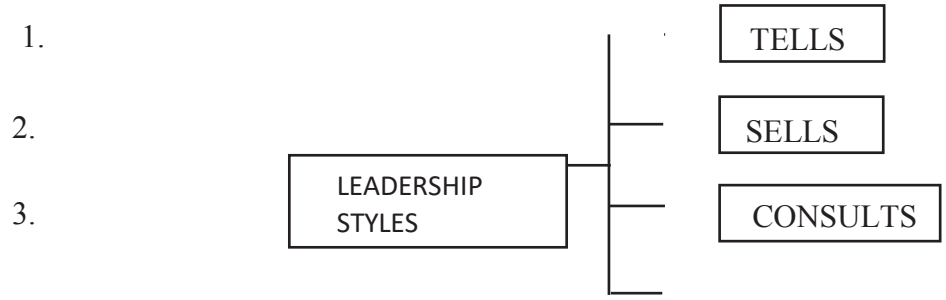
8.3.4 Ability toCommunicate

Clearandconcisecommunicationwithpeopleworkingwiththeleaderisverymuchessentialforproperfunctioni ng.
Infact,thisisanessentialingredient,indevelopinggoodinterpersonalrelationsthatgenerategoodwillandloyalt y to the leader leading to a high level of discipline in the team.

8.3.5 Appropriate Style ofLeadership

Alwaysdifferenttasksrequiredifferentstylesofleadership.Itisimportantforasuccessfulleadertounderstandth e dimensions and requirements of the given task and adjust the leadership style to achieve the desired results. The leadership styles appropriate to disaster management work are of four types asfollows:

- Tells: The leader orders the team and waits for results and action while keeping an eye on the progress. He does not expect his subordinates to ask questions or give suggestions. This style is adopted when the matter is urgent and there is no time tolose.
- Sells: Convinces the team about the decisions taken and analyses the positive and negative points. It is like selling ideas to the teammembers.
- Consults: Leader consults the team and allows them to participate in the decision making with the view to makingsmalladjustmentsbutthemainthrustofthedecisionsoftheleaderaremoreorlessfinal.Thisstyleis somewhat less time consuming than the Sellsstyle.
- Joins:Theleaderdiscussesthoroughlytheproblemandthelikelycourseofaction.Everymemberoftheteam is involved in the discussion and finally the consensus decision prevails. This style consumes most time but later work issmooth.



4. JOINS

Fig. 8.1 Styles of leadership

Sometimes a multi-style or mixed-style approach is more useful in disaster situation. There are various different tasks such as distribution of food, medicines, temporary shelter, and rescue work. If each of such tasks is assigned to a different person instead of all the tasks to one, there can be better results. In other words, delegation of authority and work is also an important aspect of leadership style. Of course, the leader has to continue to monitor and coordinate with his colleagues.

Another useful factor in the development of disaster management is the strong and positive link between leadership and training. A high standard of training can upgrade the professionalism in the leadership. This is the reason that the Government of India (through its nodal ministries and departments) and the various institutes of public administration (through their faculties of disaster management) are giving more emphasis on 'Human Resource Development' in the area of disaster management. They want to provide training to various levels of government officers, NGOs and to the community leaders so that they have more knowledge, skill and confidence to tackle the likely disasters situations.

8.4 Co-Ordination: Concept and Significance

Coordination can be defined as combined efforts of various related organisations and agencies to achieve the goal/ target of a task and is therefore very essential. In fact, there is always scope for improvement in coordination between various agencies/organisations working for relief and rehabilitation. There are three main bodies involved in disaster management:

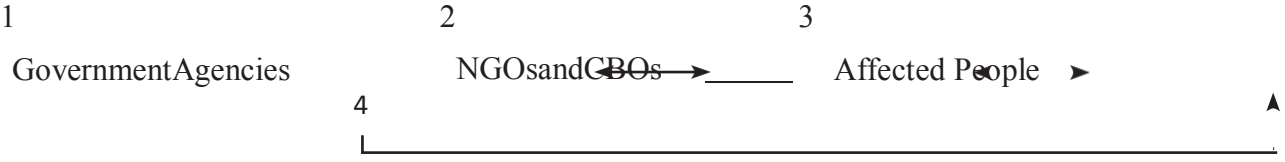


Fig. 8.2 Coordination

NCO= Non-Government Organisation CBO= Community Based Organisation

At all stages of disaster management, viz., preparedness, mitigation efforts as well as relief or response, there is need for proper coordination. Thus the role of coordinator/leader in disaster situation becomes very significant. In Government of India, the Ministry of Agriculture was the Nodal Ministry for disaster management. The natural disaster management division dealing with natural disaster was earlier with the ministry of agriculture, government of India but now it is under the Ministry of Home Affairs, government of India. However, drought as a natural disaster is still being managed by the Ministry of Agriculture, Government of India.

There are many other ministries and specialist departments and organisations involved in the disaster preparedness and response operations.

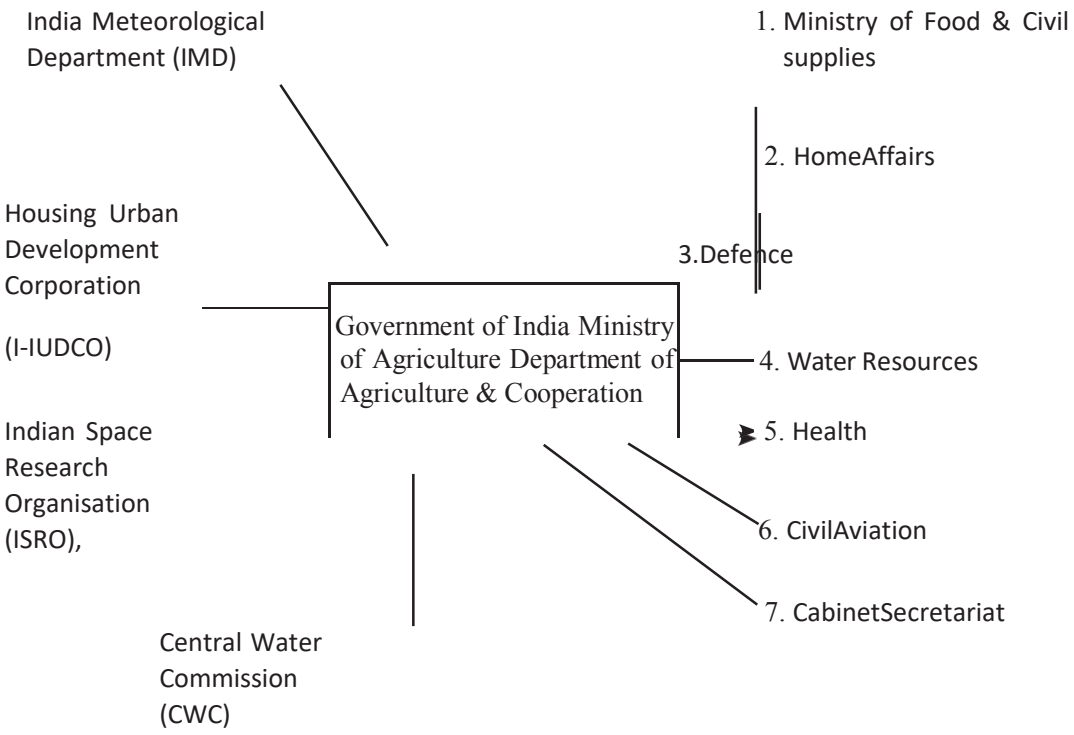
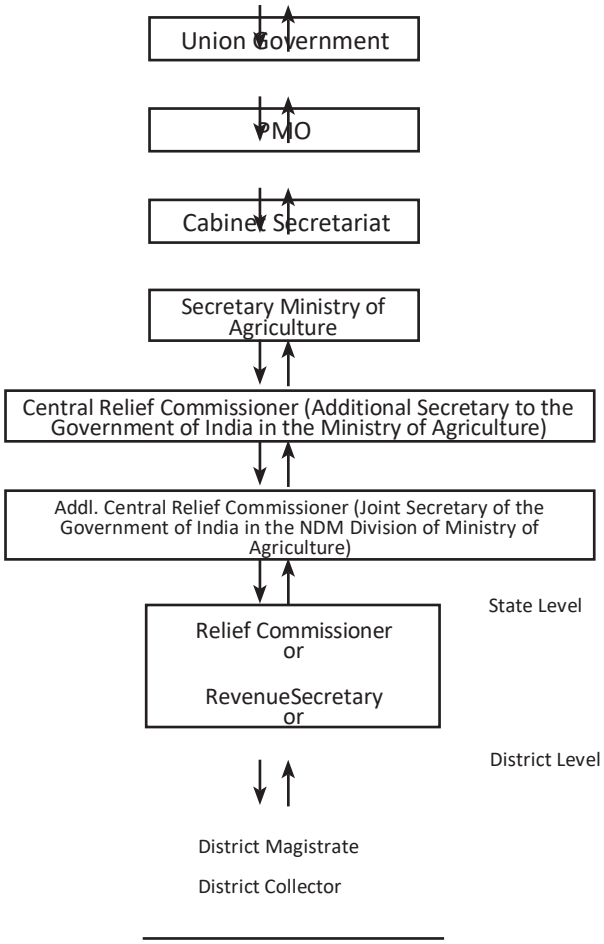

India Meteorological Department (IMD)
1. Ministry of Food & Civil supplies
2. HomeAffairs
3.Defence
Housing Urban Development Corporation
(I-IUDCO)
Government of India Ministry of Agriculture Department of Agriculture & Cooperation
4. Water Resources
5. Health
Indian Space Research Organisation (ISRO),
6. CivilAviation
7. CabinetSecretariat
Central Water Commission (CWC)

Fig. 8.3 Preparedness and response operations

Similarly,thestategovernmentshavetheiragenciesinvolvedindisastermanagementwork.Thecentralgovern ment
isinregularcontactwithstategovernments.Inthecentralgovernment,thecentralreliefcommissioneristhefocal point and the finance/revenue secretary or the state relief commissioner is the focal point in the states. They work in close contact with each other. The following diagram explains the coordination arrangements between central state and district administration for disastermanagement.



8.5 Principles and Techniques of Coordination

In disaster management, all the concerned organisations, agencies, and the public have common goals as discussed below.

- Pre-disastersituation:Itisconsideredfordisasterprevention,mitigationandpreparednesstominimiselossof life and property from natural disasters.
- Disaster situation- To provide effective relief, rehabilitation or affected people' and recovery of the community.

Therearenosetprinciplesorrigidtechniquesforcoordinationindisastersituationbecauseeachdisastersituation isuniqueinitsownway.But,coordinationismoreeffectiveifwefollowthebasicprinciplesofcoordinationgiven below.

8.5.1 Clear RoleAllocation

Thereshouldbeclarityinrolesofdifferentparticipantorganisations.Theyshouldknowtheirauthorityandlimitatio

ns. There should not be duplication ofroles.

8.5.2 Networking

Allconcernedorganisationsshouldhavepropernetworking.Thiswillprovidethembetterunderstandingofstrengths and weaknesses of each other and will also ensure proper coordination of efforts besides avoidingduplication.

AproperNetworkingofNGOswillgivethemideaaboutthecapacityandcapabilitiesofeachother.Thisknowledge is very essential for coordination amongNGOs.

- Practicing coordination duringexercises
- Knowledge of professional competence of individualorganisation
- Knowledge of available resources including financialresources
- Transparency in the action of various organisations involved inmanagement

8.6 Role of Leader and Coordinator

A good leader or coordinator can make the task simple and more effective. He can serve the affected people within
limited resources and be cost-effective. Role of a leader starts from pre-disaster situation. He has a very important role during and after the disaster. Roles of leader/coordinator are almost same and are given below:

- Identification of safe places or protected areas when disaster impactoccurs.
- Heshouldbeabletoconvincethecommunitythattheyshouldreachthesesaferplacesatthetimeofpre-warning. Normally, peopledonotwanttoleavetheirhousesandbelongingsevenafterseveralwarningandevenpolice intervention. But a good leader can persuade them to move to safeplaces.
- In cyclones and floods, such evaluation of people can save lots of human lives andcattle's.
- Leaders take decision concerning post-impact priorities for rescue, temporary evacuation, shelter, immediate needs of the community crucial to the lines and livelihood of the affectedpeople.
- Leadersimplementself-helpmeasuresandinducespiritofcooperation.Theytakedecisionstoorganiseexternal assistance which can significantly defer or alleviate potential hardship for those who have lost their home and means of livelihood.
- Theyalsoinvolvepeopleandcommunityinthedecisionmaking,implementationofplansandtheirparticipation at every step of relief or rehabilitation process by keeping completetransparency.

8.7 Team Coordination

In this section we will see two types of team coordination explicit coordination and implicit coordination. Both are explained separately in detail below.

8.7.1 ExplicitCoordination

Partisans of explicit coordination explain that process modeling:

- already exists
- has proved efficiency in workcoordination
- is an efficient way for enterprise to capitalise their know-how and to resist to marketevolution
- allows enterprises to interoperate by interconnecting their processes
- issupportedbyworkflowsystemsthatallowforgraphicalprocessmodelingprocessenactmentandprocess tracking

Reciprocally, they pointed out that auto-coordination cannot allow:

- a good knowledge of the work in progress and an effective processtracking
- effective capitalisation of theknow-how

8.7.2 ImplicitCoordination

Partisans of implicit, or auto- coordination had also some good arguments. Implicit coordination approach:

- doesnotallowanimportantinvestmentinmodeling,evenifcriticalevents,onwhichawarenessisbased,have to be described
- is dynamic and flexible (as process are not really modeled, they can be changedeasily)
- better fits the current way peoplework
- does not request an enterprise to make visible its know-how to cooperate withanother
- is a good anti-stress for the SME responsible managers connected to Internet, especially if awareness is based on group communication

Reciprocally, they argued that process modeling approach:

- requests a priori an important modelingeffort
- isnotcurrentlyefficienttomanagethesubtletyofinteractionsastheyoccurincreativeapplications,hencerisks to lead to rigid processes which either will be rejected, or break the synergy existing, on building sites
- is not currently efficient to support interoperability ofprocesses
- can be felt as “Big Brother” and increases the stress ofpeople
- imposes SME to make “public” their processes what they cannot accept due to the competitive context of the market: two enterprises cooperating in a project can be in competition in another at the same time or in the future

8.8 Evolution of Positions

Finally,partisansofexplicitcoordinationacceptedsomecriticismofpartisansofimplicitcoordinationandrecognised somequalitiestothisapproach.Andreciprocallybothpartiesagreeontheideathatnoapproachalonecanfulfillthe requirements of good coordination: a good coordination is a subtle mixture of explicit and implicitcoordination.

8.8.1 Requirements and Design for ExplicitCoordination

The process must be seen as a combination of process fragments. Each fragment corresponding to a

point of view and/oraroleandtoprovidemeanstocombinesuchfragmentsinacoherentglobalprocess.Thesefragmentsrepresent adaptive and cooperative processes to manage different variants of the same initial process and to allow activities of the processes to exchange information during execution.

The fragments come from abstract workflows. This is important in the context of virtual enterprises where some partnersaccepttomakevisibleonlysomeaspectsoftheirprocesses.Thisarguesalsofortheabilitytogeneralisea concrete process into an abstract one.

State of the art

Lotworkflowproductsexistonthemarket.Theyarewidelyusedinalotofapplications,especiallyproductionand administrative application. However, we have to notice that current systems do not apply efficiently for creative application in general and co-design and co-engineering applications in particular. This is due to the needs wejust introduce above, the study of which is still in the domain of research: need ofadaptability.

8.8.2 Requirements and Design Criteria for ImplicitCoordination

Events and information to be notified must be structured. This is not only a problem of confidentiality as it can appear;thisismainlyaproblemofselectivityandqualityofinformation:therightinformationmustbetransmitted torightpersonattherighttime.Participantsmustbestructuredincommunicationandinformationgroups.Thisis directly related to the above issue. It is necessary to partition the set of participants in groups, based on their roles and their space ofintervention.

Divergencebetweenparticipantsmustmeasureandcontrolled.Itisnecessarytocontrolthedisorder,whichmay be introduced by the permissiveness of the approach, and to maintain this disorder under an agreed limit.

State of the art

Implicit coordination is mainly based on awareness. Currently, a lot of tools provide awareness (typically tele- presence and a limited form of group management as in ICQ), but it is specific to the embedding tools. Some experimental toolkits exist but they are still in the domain of research and new research topics start, as example concerning divergence measurement.

8.9 Relationship Between Explicit and ImplicitCoordination

We think that a good coordination is a subtle mixture of explicit and implicit coordination. This implies to deepen howtotakeadvantageofintegratingthesetwodimensions,i.e.,howtouseoneapproachtofillthedeficienciesof and to enhance the other?

8.9.1 Requirements and DesignCriteria

Implicit coordination can be seen as the minimum mechanism to integrate process fragments. Especially, multi- membership communication groups can apply efficiently in this objective, one participant having the ability to participatetoseveralgroupscorrespondingtoseveralprocesses.Communicationgroupscanbedefinedtoexplain process monitoring decisions to performers, and to inform administrator on the degree of acceptance of current processes.

Theprocessesmustbeusedasthebasistostructureinformationandcommunicationgroups.Communicationgroups can be organised based on activities, process fragments, roles as defined in workflow. Implicit coordination must restonprocessawareness.Theprocessknowledgewillbeusedforimprovingtheinformationquality.Inparticular, the information concerning the state of an executed process will be of some help, on the ground, and limit any divergence.

State of the art

In some way, most of GroupWare tools yet integrate these dimensions, but in a very limited and specific way. As example, process awareness in workflow systems thanks to "to_do_list". At the level of research, we think that the study of the relationship between explicit and implicit coordination needs some specific and enthusiastic new research. The Orbit demonstration is good illustration of the interest of the approach.

Summary

- Leadership has a prominent and powerful role in society and influences all aspects of life in normal as wellas crisis situations.
- Therearemanyqualitiesthataleadershouldhavesuchasintelligence,quickcomprehension,decisiveness, courage, strength, confidence, education, knowledge, personality, charisma and above all integrity.
- Leadershipisdefinedasabilitytoinfluenceormotivateagrouporcommunitytowardsachievementofcertain goals.
- Many of the designated local leaders are themselves affected by the disaster. They could get isolated due to suddenbreakdownofcommunicationsorbecomeineffectiveundertraumaticconditionduetothesuddenness and severity of thesituation.
- "Boss-Approach" in which one passes orders and expects that the subordinates will act according to the orders.
- State and national level leadership will try to provide funds and mobilise effective relief within the available resources but this leadership initiative from top will be based on an overall appreciation of the disaster situation.
- Before dealing with the leadership styles, it is important to know the attributes and desirable qualities of a leader.
- Coordinationcanbedefinedascombinedeffortsofvariousrelatedorganisationsandagenciestoachievethe goal/target of a task and is therefore very essential.
- Pre-disastersituationisconsideredfordisasterprevention,mitigationandpreparednesstominimiselossoflife and property from natural disasters.
- A good leader or coordinator can make the task simple and moreeffective.
- The Orbit demonstration is good illustration of the interest of theapproach.
- Communicationgroupscanbedefinedtoexplainprocessmonitoringdecisionstoperformers,andtoinform administrator on the degree of acceptance of current processes.
- Participants must be structured in communication and informationgroups.
- Leaders implement self-help measures and induce spirit ofcooperation.
- There are no set principles or rigid techniques for coordination in disaster situation because each disaster situation is unique in its ownway.
- In the central government, the central relief commissioner is the focal point and the finance/revenue secretary or the state relief commissioner is the focal point in the states.
- A high standard of training can upgrade the professionalism in theleadership.

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Improving Communication with the Team Management Profile

The Problem

AnissuewithcommunicationhadarisenwithaSeniorDivisionalManagementteamofamid-sizedmanufacturing company.Specifically,tensionshadbeengrowingbetweenseveraloftheregionalmanagersandthetwocorporate services managers from head office. The problem had existed for several years although due to recent structural changes,ithadbecomeincreasinglycriticaltoensurethesmoothflowofinformationbetweenheadofficeandthe regions.

Action taken

InconjunctionwiththeLearningandDevelopmentManager,theregionalmanagersallocatedtwo,3-hoursessions withintheirquarterlymeetingtousetheTeamManagementProfile(TMP)tolookattheirdifferencesandtogenerate discussion on possible solutions. The purpose of the first 3-hour session was to overview the theories and models behind Team Management Systems and to give back the profiles with some time to read and discuss. At the end of this session, the group plotted their results on the Team Management Wheel. This activity led to some lively discussion over the lunch break with many of the team members swapping and comparing theirprofiles.

Thesecond3-hoursessionwasarrangedtodiscusstheimplicationsofthegroupcompositiononboththeprocesses and the

communications within the team. Two further activities were implemented to assist in furthering this program.Firstly,theLearning&DevelopmentManagerspentaroundanhourwitheachRegionalManagerwithi n two weeks of the Profile feedback session, to clarify learning's and discuss individual next steps and action plans. Additionally, the team scheduled a 1/2 hour component at all subsequent monthly meetings to check on progress with theirdevelopment.

Outcomes

Two key outcomes came out of using the team management profile:

- Firstly,themanagersdevelopedanappreciationoftheverydifferentstyles.Teammemberspreferredtoworkin, andhowthishadimpactedoninteractionsandattitudesinthepast.Theteamwasabletoformulateguidelines to improve communication between the managers.
- Secondly, the composition of the group showed clearly why information flow had been neglected. A lack of preference in both the advising and promoting tasks helped the team focus their review of past processes and formulate strategies for sharing information moreefficiently.

Fourteen months after the first introduction of the Team Management Profile at the monthly meeting, the team performance has improved markedly. A number of initiatives have been introduced as a direct result of improved relationsbetweenmanagers– programsthatwouldnothaveevenbeenconsideredtwoyearsago.Finally,following thesuccessoftheirownprogram,severalofthemanagershavealsorunsimilarprogramsfortheirteamsandTMS is starting to provide a common language for appreciating individual differences within thedivision.

(Source: *TEAM MANAGEMENT SYSTEMS CASE STUDIES* [Pdf] Available at: <http://www.tms-americas.com/

pdfs/TMP_Profile_Overview.pdf> [Accessed 22 July 2013]).

Questions

1. What was the purpose of the first 3-hour sessionhere?

   Answer

   The purpose of the first 3-hour session was to overview the theories and models behind Team Management Systems and to give back the Profiles with some time to read and discuss. What was the purpose to arrange the second 3-hoursession?

   Answer

   The second 3-hour session was arranged to discuss the implications of the group composition on both the processes and the communications within the team.

2. Write the outcomes of using the team managementprofile?

   Answer

   Two key outcomes came out of using the team management profile:

   - Firstly, the managers developed an appreciation of the very different styles. T eam members preferred to workin,andhowthishadimpactedoninteractionsandattitudesinthepast.Theteamwasabletoformulate guidelines to improve communication between the managers.
   - Secondly, the composition of the group showed clearly why information flow had been neglected. A lack ofpreferenceinboththeadvisingandpromotingtaskshelpedtheteamfocustheirreviewofpastprocesses and formulate strategies for sharing information moreefficiently.

Case Study II

Management Development

The Company

XYZ,aresearchdivisionofapharmaceuticalindustry,wantedtohavetheirscientistsunderstandtheneedtodevelop theirteamstofocusonachievementoftheexponentialgrowthandachievetheprojectedgrowthbykeepingtimelines in research and API and overall cost reduction through improvedteamwork.

The challenge

In order to meet the challenges of the future, the Company is constantly augmenting its manufacturing capacities includinggreenfieldspecialisedprojects.Attheheartofeverysuccessfulorganisation,liesitspeopleandXYZis proudtohaveefficientandcommittedmulticulturalworkforce.SincetheorganisationwasfocusedonR&Dthemajor challengesfacedwerepeoplemanagement,assumeleadershipresponsibility,managebygoals,getresultsthrough time management, empower other people, understanding authority and power productively, develop a written and specific plan of action forsuccess.

The Solution

The LMI model of facilitation -the change process through the Effective Management Development Program:

- Becoming an effectivemanager
- Achieving success through goalsetting
- Getting results through timemanagement
- Maximising personalproductivity
- Empowering other people
- Balancing authority and power productively
- Improving communicationskills
- Coping constructively with change andstress
- Developing a dynamic decision makingstrategy
- Commitment to the management challenge

The Result

The facilitation and coaching resulted in confidence building amongst the participants, ability to make the change process smooth. Set aside a certain block of time several times a week for uninterrupted creative activity. While delegatingajob,giveadequateinstruction(alongwithempowerment)sothatitisdonewell,betterdelegationand empowerment to handle challenges, identifying and coaching people for promotion. Updating project-monitoring folderasperpreschedule timelines,revisingchecklistdailyasforfocusgoalsisimportant.Creationofamotivational climatethathelpedtodelegatedandempoweredteammemberstousetheirpreviouslyuntappedtalentandabilities. Creating a better learning environment helped in sharing of ideas, increased positive attitudes and training new members.

(Source: *Management Development*. [Pdf] Available at: <http://www.lmi-india.com/html/case_studies.aspx> [Accessed 24 July2013]).

Questions

1. Explain the challenges faced by thecompany.
2. What are the strategies used by thecompany?
3. What result did the company get at the end?

Case Study III

Leadership Development using Personality Assessments

Introduction

ThiscasestudyshowshowHarrisonAssessmentscombinedwithcoachingcancreatedramaticshiftsinbehaviour through increasing the subject's self-awareness and designing behaviour and attitude changes that work with their personality and preferences.

The problem

The coaching client, June (not her real name), was experiencing frustration in leading her team of 6 subordinates. She saw that they were not taking initiative. She felt all the responsibility for the quality of their work fell to her. Consequentlyshewastakingonmoreorganisationaldutiesthanshedesiredandshedidnothavetimetofocuson the bigger picture issues that her leadership role demanded.

June knew that she had to let her subordinates take initiative for the tasks within their roles, but she was not able toeffectivelymakethischange.Everytimesheletgoofherusualresponsibility,thesubordinatesstilldidnotstep forward and the team's resultssuffered.

The root cause

OneofthecausesofJune'sfrustrationwasthatshewastryingtostopdoingsomethingratherthandoingsomething. When she stopped herself from solving her subordinate's problems, she had nothing else do to and felt she was merely holding back and not contributing. With her experience, she could see many problems arising and found it very difficult to hold back and leave it to the team. The solution was to find some way to be active but without taking responsibility for other'sroles.

The insight

June's coach suggested a new strategy of focusing her attention on positive actions that would contribute to the solutionwithouttakingresponsibilityawayfromthesubordinates.UsingtheHarrisonTraitsandDefinitionsReport and the Paradox Report, June realised that she could use her strengths in 'enlisting cooperation' and 'forthright diplomacy' to move the team forward without taking over theirroles.

The solution

With this insight, June experienced an immediate shift in her attitude towards the team and her leadership role. Since the actions she chose to focus on were her preferred traits, the change was easy for her and enjoyable. Her team responded immediately to her requests for cooperation and her clear communication about their behaviors and results. By continuing to focus on her strengths, June was confident she could move her team to learn how to do their jobs, while still retaining control of the results.

It is more effective to focus on taking positive actions, rather than on stopping behaviors. People can more easily begin actions that rely on their preferred traits. Different preferred traits can be used in different situations to get the desired results. Therefore it is possible to customise behavioral solutions for different personalities, based on their personal preferences, as identified by Harrison Assessments.

(Source: *Leadership Development using Personality Assessments.* [Online] Available at: <http://www.spaxman.com.hk/case1.html> [Accessed 25 July 2013]).

Questions

1. What was the root cause of theproblem?
2. Write the strategy used to solve theproblem.
3. What was the reason that June was confident she could move her team to learn how to do theirjobs?

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Annexure – II

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
TOPIC: TEAM MANAGEMENT

SL.NO	NAME OF THE STUDENTS	SIGNATURE
1	AASHIK MUKESH. M. S	
2	ABEETHA.M	
3	ABHINAV. S	
4	ABINAYA. M	
5	ABISHEK. R	
6	ABIRAMI. S	
7	AGALYA. S	
8	AJAY PANDIAN. V	
9	AJEETH. R	
10	AJITH KUMAR. M.K.	
11	AKSHAI. S	
12	ALLEN DANIEL XAVIER.J	
13	ALTHAF AHMED	
14	AMARA LOKESH	
15	AMRESH. K	

Annexure – III

MULTIPLE CHOICE QUESTIONS

Course Code: PSM01

ANSWER ALL THE QUESTIONS

1.Because leading is one of the four basic managerial functions, _____ leaders.
A) all managers are
B) all managers should be
C) some managers are
D) some managers should be

2.Early Leadership trait research looked to find characteristics that might ___
A) distinguish ordinary leaders from great leaders
B) define charisma
C) identify the physical traits of leaders
D) differentiate leaders from non leaders

3.Leaders are___.
A) Individual people, while leadership is a process.
B) the first step in the leadership process
C) individual people who study the leadership process
D) the final step in the leadership process

4.If a trait theory of leadership were true, then all leaders would possess _____.
A) Charisma
B) the same traits
C) Different traits
D) Seven traits

5.The most successful early trait theories focused on_____.
A) traits of famous leaders
B) traits of followers
C) traits associated with leadership
D) traits with distinguish leaders from nonleaders

6.Trait theory helps explain why ____.
A) Some people are leaders
B) Some people are not leaders
C) Successful leaders are effective
D) Leadership involves extraversion

7.Behavioral theories of leadership focused on_____.
A) who effective leaders
B) what characteristics effective leaders had
C) how to identify effective leaders
D) what effective leaders did

8.The promise of behavioral theories of leadership held that this would be possible.
A) picking a leader out of the crowd
B) being able to train a person to be a leader
C) explaining why successful leaders are so successful
D) Eliminating ineffective leaders

9.The University of Iowa studies discussed all of the following leadership styles except
A) laissez-faire
B) democratic
C) Benelovent
D) Autocratic

10.Which leadership style tends to centralize authority and make unilateral decisions?
A) cultural style
B) autocratic style
C) democratic style
D) laissez-faire

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

TEAM MANAGEMENT

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B) being able to train a person to be a leader
C) explaining why successful leaders are so successful
D) Eliminating ineffective leaders

9.The University of Iowa studies discussed all of the following leadership styles except
A) laissez-faire
B) democratic
C) Benelovent
D) Autocratic

10.Which leadership style tends to centralize authority and make unilateral decisions?
A) cultural style
B) autocratic style
C) democratic style
D) laissez-faire

Annexure – IV

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that ABHINAV.S has actively participated in the Value Added Course on **TEAM MANAGEMENT** held during March 2019 – Aug 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Kannan.K, MD	Dr.Rajini.S.MD	Dr.K.Balagurunathan, MS
Resource Person	**Professor & HOD**	**Dean, SLIMS**
	Department of Community Medicine	

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that ABEETHA.M has actively participated in the Value Added Course on **TEAM MANAGEMENT** held during March 2019 – Aug 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Kannan.K, MD	Dr.Rajini.S.MD	Dr.K.Balagurunathan, MS
Resource Person	**Professor & HOD**	**Dean, SLIMS**
	Department of Community Medicine	

ANNEXURE V

Student Feedback Form

Course Name: **TEAM MANAGEMENT**

Subject Code: **PSM01**

Name of Student: Abeetha Roll No.: 2

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful			✓	✓	
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

The Course was useful & encouraging

Abeetha
Signature

Date: 7-8-19

Student Feedback Form

Course Name: **TEAM MANAGEMENT**

Subject Code: **PSM01**

Name of Student: Aashik Mukesh. M.S Roll No.: 1

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective				✓	✓
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

good & needs to be more phonetic duration.

Aashik Mukesh
Signature

Date: 7/8/19

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,

PUDUCHERRY – 605 502

Date : 08.08.19

From
Dr.S.Rajini
Professor and Head,
Department of Community Medicine,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Team management & Leadership

Respected ,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Team Management from March 2019 – Aug 2019 for Pre-final year students . We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.
Kind Regards,

Enclosure: Photograph

PROFESSOR & HOD
DEPARTMENT OF COMMUNITY MEDICINE
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502.



SRI LAKSIIMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSUDU, AGARAM VILLAGE, KUDAPAKKAM POST, PUDUCHERRY-605502.

Date: 31.3.19

From
DR.BALAJI SUBRAMANIYAN.R,
Professor and Head,
DEPARTMENT OF DENTISTRY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: VIRTUAL ARTICULATOR

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **VIRTUAL ARTICULATOR** on 5.4.19. We solicit your kind permission for the same.

Kind Regards

DR.BALAJI SUBRAMANIYAN.R,

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: DR.JAYALAKSHMI

The HOD:DR.BALAJI SUBRAMANIYAN

The Expert: DR.AMUTHAVALLI.V

The committee has discussed about the course and is approved.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Subject Expert

Dr. V. AMUTHAVALLI, MDS.,
Reg. No. [illegible]
Sri Lak[illegible]
Osu[illegible]

HOD

Dr. BALAJI SUBRAMANIAN, MDS.,
Reg. No. [illegible]
Professor HOD Dental
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, [illegible] 605 502

OFFICE OF THE DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affiliated to Bharath University, Chennai - TN]

Circular

1.5.19

Sub: Organising Value-added Course: VIRTUAL ARTICULATOR

With reference to the above mentioned subject, it is to bring to your notice that SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES, **Bharath Institute of Higher Education and Research**, is organising **"VIRTUAL ARTICULATOR ON 5.4.19"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 3.4.19. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr.G.JAYALAKSHMI,BSc.,MBS.,DRD.,M.S.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502

Dean

Encl: Copy of Course content and Registration form.

COURSE PROPOSAL

Course Title: VIRTUAL ARTICULATOR

Course Objective: To enlighten students about significance of VIRTUAL ARTICULATOR

Course Outcome: In depth knowledge regarding virtual articulator

Course Audience: MBBS STUDENTS

Course Coordinator: DR. JAYALAKSHMI

Course Faculties with Qualification and Designation:

1. **DR.AMUTHAVALLI.V M.D.S & ASSISTANT PROFESSOR**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1	5.4.19	articulators	4PM-6PM	3 hrs
2	11.4.19	Uses of semi adjustable articulators	4pm-7 pm	3hrs
3	17.4.19	Difference between mechanical and virtual articulator	5pm-8pm	3 hrs
4	26.4.19	Semi adjustable articulator	4pm-7pm	3hrs
5	2.5.19	Uses of virtual articulator	5pm-8pm	3 hrs
6	11.5.19	Limitations of virtual articulator	5pm-8pm	3 hrs
7	21.5.19	CAD/CAM in teeth replacement	4pm-7pm	3 hrs
8	3.6.19	Different types of articulators	5pm-8pm	3 hrs
9	10.6.19	Recent applications in replacement of tooth	5pm-8pm	3 hrs
10	18.6.19	Treatment modalities in complete denture pts	4pm-7pm	3 hrs
			Total Hours	30

REFERENCE BOOKS: (Minimum 2)

1. **KUMAR.P.KHATTER –TEXTBOOK OF VIRTUAL ARTICULATOR**
2. **SZENTPETERY-TEXT BOOK OF VIRTUAL ARTICULATOR**

Annexure- II

VALUE ADDED COURSE

VIRTUALARTICULATOR

DI-10

List of Students Enrolled Sep 2017 – Jan- 2018

MBBS Student		
Sl. No	**Name of the Student**	**Roll No**
1	SUNITHA .A	U16MB383
2	SURENDAR RAJ .S	U16MB384
3	SUSMITHA .V	U16MB385
4	SWATI GUPTA	U16MB386
5	SWATI KUMARI	U16MB387
6	THAMARAIK KANNAN	U16MB388

Dr. Amuthavalli. V
RESOURCE PERSON

Dr. Jayalakshmi
COORDINATOR

Bharath Institute of Higher Education and Research

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Participant list of Value added course: **VIRTUAL ARTICULATOR**

Sl.No	Reg.No	Name of the candidate	Signature
1	U16MB383	SUNITHA .A	
2	U16MB384	SURENDAR RAJ .S	
3	U16MB385	SUSMITHA .V	
4	U16MB386	SWATI GUPTA	
5	U16MB387	SWATI KUMARI	
6	U16MB388	THAMARAIK KANNAN	

VIRTUAL ARTICULATOR

ABSTRACT

Virtual reality is a computer based technology linked with the future of dentistry and dental practice. The virtual articulator is one such application in prosthetic and restorative dentistry based on virtual reality that will significantly reduce the limitations of the mechanical articulator, and by simulation of real patient data, allow analyses with regard to static and dynamic occlusion as well as to jaw relation. It is the purpose of this article to present the concepts and strategies for a future replacement of the mechanical articulator by a virtual one. Also, a brief note on virtual reality haptic system has been highlighted along with newly developed touch enabled virtual articulator.

The future of dental practice is closely linked to the utilization of computer-based technology, specifically virtual reality, which allows the dental surgeon to simulate true life situations in patients. The virtual articulator has been designed for the exhaustive analysis of static and dynamic occlusion, with the purpose of substituting mechanical articulators and avoiding their errors. These tools will help both odontologists and dental prosthetists to provide the best individualized treatment for each patient. The review analyzes and the studies published in the literature on the design, functioning and applications of virtual articulators. The virtual articulator can simulate the specific masticatory movement of the patient.

During mandibular animation, the program calculates the sites where the opposing teeth come into contact. The studies made to assess the reliability of the virtual articulator show good correspondence in visualization of the number and position of the dynamic contacts. The virtual articulator is a precise tool for the full analysis of occlusion in a real patient.

VIRTUAL ARTICULATOR

Introduction:

The future of dentistry is linked strongly to the use of computer technology. If dentists and dental technicians succeed in obtaining qualifications in areas of information technology, dentistry will be able to keep up with the highly networked information society. Virtual reality (VR) technologies have a strong impact on research, development, and industrial production. VR technologies in dentistry will be used to provide better education and training by simulating complex contexts and enhancing procedures that are traditionally limited, such as work with the mechanical articulator. The diagnosis of dysfunction and dysmorphology demands advanced skills with regard to optimizing occlusal conditions. Decision support for dentists, orthodontists, and dental technicians supplied by a computer tool such as the ''virtual articulator'' could improve the clinical outcome the further discussion focuses on concepts and developments, the advantages and clinical consequences of using such tools.

Articulator:

Articulator is defined as, a mechanical device that represents the temporomandibular joints and jaw members to which maxillary and mandibular casts may be attached to simulate jaw movement – GPT 8

Mechanical dental articulators

Mechanical dental articulators are tools that simulate the movements of the human lower jaw and the temporo mandibular Joints (TMJ-s). They have been used for more than 100 years for different purposes in dentistry. They have become indispensable instruments for dentists in their diagnostic activity as they simulate

specific patients for dental technicians in their laboratory work. They enable technicians to carry out a study of occlusal relations between dental arches and to detect harmful occlusal interferences on models before more sophisticated occlusal equilibration procedures are performed on the patient. This equilibration of partial and full dentures is also carried out in dental articulators.

Over the last 120 years, hundreds of different articulators have been constructed. Throughout these years there has been no remarkable development on articulators. Today's articulators are handy, functional and more precise in both construction and operation. In order to reproduce the individual parameters of the patient the articulator must be adjustable. The setting data are measured on the patient and, using the face bow, the relative location of the occlusal plane is transferred from the patient to the mechanical dental articulator.[7]

VIRTUAL RELATION:

Virtual technologies in dentistry will be used to provide better education and training by simulating complex contexts and enhancing procedures that are traditionally limited, such as work with mechanical articulator. The virtual articulator is intended to use as a tool for the analysis of the complex static and dynamic occlusal relations.

Limitations of semi-adjustable articulators:

Commonly used semi adjustable articulators, however have major limitations,

- The movements of the mandible cannot be reproduced exactly
- Cannot simulate the mobility ofteeth when using plaster casts in it.
- Cannot simulate the distortion and deformation of the mandible during loading conditions. (the mandible bends in maximal opening position on the inner side, which entails problems when making impression of teeth during wide opening.)

- Cannot simulate the complexity of movement patterns. This is because the movements of the mechanical articulator follow border structures of mechanical joints which never represents the effects of resilience of the soft tissue
- They do not provide time related information on jaw movement. These problems can be solved by replacing the mechanical articulator by a digital simulation i.e., "Virtual Articulator.

Need of Virtual Articulator: The main goal of the virtual articulator is to improve the design of dental prosthesis, adding kinematic analysis to the design process.

The mechanical articulator which is currently used in the fabrication of fixed dental prosthesis has numerous limitations as mentioned. Also many often problems regarding the technical procedures and dental materials decreases the accuracy of reproduction as

- the deformation of registering material (Eg. Wax, which is susceptible to heat),
- repositioning the cast into bite impression without leaving any space.
- the correct orientation of the casts
- the use of rigid and expanded plaster material
- maintenance of the mechanical articulator.
- Stability of the articulator itself

Because of these problems, the reproduction of dynamic, excessive contact seems to lower the reliability. Replacement of the mechanical articulator with the virtual articulator will solve these problems.

Applications of virtual articulators:

- The VR tools enable three-dimensional navigation through the occlusion based on every point of view while the mandible moves along predefined

pathways (as the mechanical articulator would do) or reproduce movement patterns of mastication that never can be simulated in mechanical systems.

- The digitizing of tooth surfaces opens possibilities in manipulation procedures to improve the occlusion.
- Computer aided design/computer aided manufacturing (CAD/ CAM) techniques or tools for a virtual set-up of the teeth could be linked.
- Currently, the virtual articulator is concerned with better visualization of details and supports the use of mechanical tools, but it will replace them in the future.
- Can be used to provide better education and training by simulating complex contexts.
- Importantly, it would influence the quality of the networking communication between dental practice and laboratory, helping to produce the best-fitted occlusal restorations possible. The VR articulator will be affordable and economical in private practice, with costs perhaps depending on demands for use.
- One of the most interesting options offered by the virtual tools is the ability to ''move'' and navigate through enlargeable occlusal surfaces to explore the details of functional occlusion that cannot be visualized using casts alone.
- To study the impact of joint determinants (eg, Bennett angle, slope of condylar guidance, side shift) on occlusal movement patterns, the virtual articulator requires virtual tools for joint-constraint adjustment and collision detection, which simulate the stops of static and dynamic occlusion. Such collision detection is implemented in the most recent version of the VR

articulator, which has been developed in cooperation with the Fraunhofer Institute for Computer Graphics.[3]

Need for virtual articulators in CAD/CAM systems:

With the advent of the digital impression and dental CAM/CAM system, today's dentistry has become dentistry of single visit. Patient can receive crown in single appointment. There is no doubt as to these high-tech instruments taking over dentistry in the future. In a few minutes, the dentist is able to obtain the necessary electronic impression with a scanner and then, it will take him/her about 20 minutes to have the tooth designed in a computer and afterwards, He/she will have it milled from one ceramic block in less than an hour.

But even the latest CAD/CAM system has its own limitations. Main disadvantage of the system is limited accuracy of the occlusal surface. This is because it acts as simple mechanical occludators and cannot take into consideration the functional movements of the mandible. So the occlusal surface of new tooth has to be trimmed manually after in patient's mouth, at the cost of valuable chair side time, and if we are not considering the mandibular movements and placing the restoration as it is, we are creating problems for the patient's TMJ. So for accurate occlusal surface construction there is need to use kinematic method i.e. virtual articulator along with CAD/CAM system.

However, considering the limited accuracy of the occlusal surface, this type of restoration can only match the possibilities offered by simple occludators (static design). The system cannot take into consideration functional movements, so the occlusal surface of the new tooth has to be manually trimmed to these movements in the mouth or in an articulator. Even a really high-tech-system such as the Cerec3

[5-7], the latest CAD/CAM development, presents this severe handicap despite being able to make an occlusal surface fit the antagonists in intercuspal position. This shortcoming is common to nearly all laboratory CAD/CAM systems. Unfortunately, in order to take these movements into account, it is not possible to integrate any mechanical dental articulator in such systems.

For accurate occlusal surface construction there were two ways.

a) The use of fully adjustable articulator which simulates mandibular movements with high degree of precision and is time consuming and expensive.

b) Use of virtual articulators with CAD/CAM system. The prosthodontics applications of virtual articulators are to fabricate the best fitted occlusal restoration possible, to help students to understand the function of dental articulator, different excursive movement and their influence on the occlusal surface and to improve the quality of communication between the dentist and dental technician. As a consequence, all dental CAD/CAM systems aim to deliver similarly precise occlusal surfaces analogous to the occlusal surfaces obtained when working with adjustable mechanical dental articulators. These systems should use kinematic methods for occlusal surface construction or correction.

Preliminary and matching procedures for adjusting the VR articulator:

The use of a three-dimensional laser scanner for digitizing data is the prerequisite to visualizing the tooth on the screen. The three-dimensional laser scanner automatically digitizes a single tooth, complete denture models, or centric relations referred to previously. For digitizing dental arches and bite records, the three-dimensional scanner ''Scan 3D'' by Willytec (Munich) is used. The reproducibility is 2 um with the standard objective, and the accuracy after matching is 10 um. Between 8000 and 14,000 points per second are digitized.

Afterward, the data are available for any computerized presentation, manipulation, or navigation. The ultrasonic measurement system Jaw Motion Analyzer is used to record and implement the movement pattern. This system is based on measuring the velocity of ultrasonic impulses emitted from three transmitters attached to the lower sensor. Four receivers are attached to a face bow opposite them. This positioning enables the detection of all rotative and translative components in all degrees of freedom. Asp ecial digitizing sensor is used to determine the reference plane, which is composed of the hinge axis infraorbital plane and special points of interest (eg, on the occlusal surface).

Subsequently, the movement data finally can be calculated in relation to the digitized points. Silicon-based jaw relation registrations are used to reproduce the best occlusion in the position of intercuspidation. It is important
that the registration remain attached to the upper teeth during opening. The registration then should be stabilized with impression plaster on a metal carrier plate. The digitizing sensor is attached to detect three main reference points on the rear of this metal plate. These three points are used to combine movement data and the digitized dental arches.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

VIRTUAL ARTICULATOR

QUESTIONS

Course Code: DI-10

I. ANSWER ALL THE QUESTIONS

1.Uses of virtual articulator?

2. Difference between mechanical articulator and virtual articulator?

3. Limitations of semi- adjustable articulator?

4.need for virtual articulator in CAD/CAM system?

5. Disadvantages of semi-adjustable articulator?

NAME: SONITHA M
Roll No: U16MB323

Virtual articulator.

343

Articulator: virtual refer to as immersive, interactive, multi-sensory viewer-centered and three dimensional (3D) generation environment.

- Mean-value articulator
- Hanau articulator.
- Whip-Mix articulator
- Denar articulator
- TMJ articulator.

Incisal guidepin

- anterior reference point
- The incisal edge of the maxillary incisor at the midline of the occlusal rim should touch the tip of incisal during articulation

Four different facebow.

- facial facebow
- Earpiece facebow
- Twist-facebow
- Adjustable axis facebow.

Adjustable.

Semi-adjustable articulation.

Virtual articulation

Virtual articulation are also called software articulators. Areon clipping is a handy way to collect important slides you.

Fully adjustable type included Stuart Instrument.

Gnathotor, Denar- D 5 A H.O Dech.

Virtual articulator provides virtual reality application to the world of dental practice which is used for occlusal relation.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SUNITHA.A has actively participated in the Value Added Course on *VIRTUAL ARTICULATOR* held during APR 2019 – JUNE 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Amuthavalli.V
RESOURCE PERSON

Dr. BALAJI
COORDINATOR

Student Feedback Form

Course Name: VIRTUAL ARTICULATORS

Subject Code: DI - 10

Name of Student: SUSHMITHA. V Roll No.: U16MA385

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear		✓			
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand		✓			
5	Teaching aids were effective		✓			
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 31.3.15

Signature

COURSE COMPLETION

Date 20.6.19

From
DR.BALAJI SUBRAMANIYAN.R
DEPARTMENT OF DENTISTRY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: VIRTUAL ARTICLUATOR

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **VIRTUAL ARTICULATOR** on 18.6.19. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

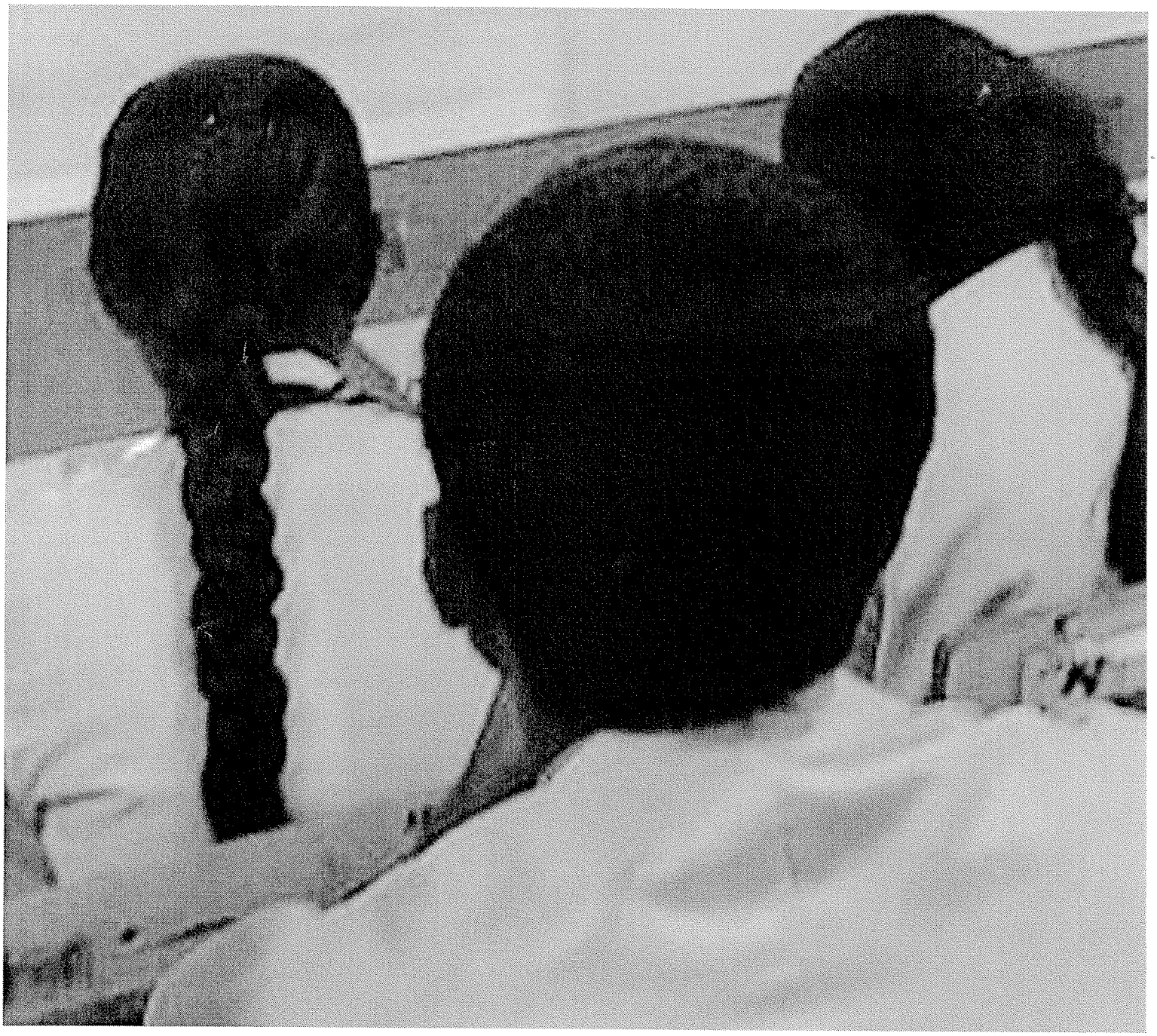
Kind Regards

DR. BALAJI SUBRAMANIYAN.R

Dr. BALAJI SUBRAMANIYAN, MDS.
Reg. No. 4545
Professor HOD Dental
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudeparl am, Puducherry-605 502.

Encl: Certificates

Photographs



Sri Lakshmi Narayana Institute of Medical Sciences

Date 02/05/2019

From
Dr.R.Venkataramanan,
Professor and Head,
otorhinolaryngology,
SLIMS
Bharath Institute of Higher Education and Research,
Puducherry.

To
The Dean,
SLIMS
Bharath Institute of Higher Education and Research,
Puducherry.

Sub: Permission to conduct value-added course: : Preventing Medical Errors in Audiology reg.

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Simulation Based Training In Audiology on May 2019 to Aug 2019. We solicit your kind permission for the same.

Kind Regards

Dr.R.Venkataramanan

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:
The Dean:
The HOD:
The Expert:

The committee has discussed about the course and is approved.

Dean

(Sign&Seal)

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

SUBJECT EXPERT
(Sign &Seal)

Dr. R. VENKATARAMANAN, MS.,
Reg. No: 72549
Professor ENT
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

HOD (SIGN AND SEAL)

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Ref. No. SLIMS/Dean Off/VAC/024 **Date:03/05/19**

From
The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

To
The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

Respected Sir

Sub: Request for permission and approval of Syllabus for certificate course (Value Added course) for the academic year 2018-19 - Reg
Ref: Requesting letter received from Departments

*****

With reference to the above, herewith forwarding the proposed list of Value-added courses for necessary permission and approval of syllabus to conduct the same.

This is for your kind information and needful action.

Thankingyou

Yours faithfully

[DEAN]

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl's:

1. Requesting letter received from department
2. Syllabus of thecourse
3. Details of faculty handlingcourse

Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

VALUE ADDED COURSE : Preventing Medical Errors in Audiology

COURSE CO-ORDINATOR DETAILS

Faculty Name: Dr.S.Ganesh

Email ID:e n t s l i m s @ g m a i l . c o m

Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)

Ref. No. BHIER/ VAC/B-02 **Date:05.05.2019**

From

The Registrar,
Bharath Institute of Higher Education and Research,
Chennai - 600073.

To

The Dean
Sri Lakshmi Narayana Institute of Medical sciences,
Pondicherry – 605502

Sir / Madam,

Sub: Approval of Syllabus to conduct certificate course (Value Added course) for the academic year 2018-2019 – Reg.

Ref: Ref. No. SLIMS/Dean Off/VAC /024 Dated: 03.05.2019

*****

With reference to the above, it is to inform that the proposal submitted to conduct Value Added Course has been accepted and approved by BIHER, council meeting. List of the VAC are mentioned below for the academic year 2018– 2019. The abstract of the VAC course completion detail should be submitted to the Registrar office.

Thanking you

Yours faithfully

REGISTRAR

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

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07/05/2019

Sub: Organising Value-added Course: Preventing Medical Errors in Audiology **reg.**

With reference to the above mentioned subject, it is to bring to your notice that SLIMS,**Bharath Institute of Higher Education and Research**, is organising **"Preventing Medical Errors in Audiology"**. The course content and registration form is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 15/05/2019. Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU PONDICHERRY

Encl: Copy of Course content

VALUE ADDED COURSE

1. Name of the programme &Code

Preventing Medical Errors in Audiology – A value added course for the medical students.
& **ENT 10**

2. Duration &Period

30 hrs & May 2019-Aug 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Pre test and post test which includes 10 mcqs - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 time May 2019- Aug 2019

8. Year of discontinuation:2019

9. Summary report of each program year-wise

Value Added Course- May 2019- Aug 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	ENT 10	Preventing Medical Errors in Audiology	1.Dr.Venkataramanm 2. Dr. Nithish Thimothy.R	3rd year MBBS students	13 students & 2019

10. Course FeedBack

Enclosed as Annexure- V





RESOURCE PERSON
1. **Dr.R. VENKATARAMANAN**
2. **Dr.R.NITHISH TIMOTHY**

COORDINATOR
Dr.S. GANESH

COURSE PROPOSAL

1. NAME OF THE PROGRAMME

Preventing Medical Errors in Audiology – A value added course for the medical students.

2. AIM

Training the students to prevent medical errors in audiology

3. OBJECTIVES

a) To teach the students how to Prevent Medical Errors in Audiology and how to manage it

4. METHODOLOGY

Students who are interested in participating in value added course are enrolled and the course is conducted for them during the non college hours for a period of 30 hours from May 2019 – Aug 2019 . This course is conducted every 6 months.

Course Audience: 3rd year MBBS students

Course Coordinator: Dr. S.Ganesh

Course Faculties with Qualification and Designation:

1.Dr. R. Venkataramanan

2.Dr. R.Nithish Thimothy

Schedule followed during the course

No	Topic	Title	Duration	Date and time
1	Preventing Medical Errors in Audiology	Introduction & Learning outcomes-Errors and Liability overview	6hrs	4pm-6pm(3/5/19),4pm-6pm(9/5/19),4pm-6pm(16/5/19)
		Administrative Errors	6hrs	4pm-6pm(24/5/19),4pm-6pm(30/5/19),4pm-6pm(4/6/19),
		Clinical Errors	6hrs	4pm-6pm(6/6/19),4pm-6pm(11/6/19),4pm-6pm(14/6/19)
		Treatment Errors	6hrs	4pm-6pm(20/6/19),4pm-6pm(10/7/19),4pm-6pm(18/7/19)
		Preventive errors and Risk Management	6hrs	4pm-6pm(24/7/19),4pm-6pm(8/8/19),4pm-6pm(14/8/19)
		TOTAL	30HRS	

REFERENCE BOOKS: 1) SCOTT BROWN 7th edition

2) ANIRBAN BISWAS 4th edition

Medical Errors for Audiologists to Avoid

- Historical perspective
- Definitions of important terms
- Standard of care
- General steps for preventing errors and minimizing liability
- Professional responsibility, professional liability, and risk management in audiology
- Patient tips to prevent medical errors
- Guidelines for patient referral to physicians (otolaryngology)
- Questions and answers

Medical Records:

Reasons for Demise on Actual Death Certificates

- **"Went to bed feeling well … woke up dead."**
- **"Don't know … never fatally ill before."**
- **"Nothing seriously wrong."**
- **"Blow to head. (Contributory cause was another man's wife.)"**
- **"Don't know … died without the aid of a doctor."**

St. Louis Genealogical Society

Types of Medical Errors: Early Published Paper

Leape, Lawthers, Brennan et al. (1993) Preventing Medical Injury, Quality Review Bulletin, 19, 144-149

- **Diagnostic Errors**
  - **Error or delay in diagnosis**
  - **Failure to employ indicated tests**
  - **Use of outmoded tests or therapy**
  - **Failure to act on results of monitoring or testing**
- **Treatment Errors**
  - **Error in the performance of an operation, procedure, or test**
  - **Error in administering the treatment**
  - **Error in the dose or method of using a drug**
  - **Avoidable delay in treatment or in responding to an abnormal test**

Types of Medical Errors: Early Published Paper

(From: Leape, Lawthers, Brennan et al. (1993) Preventing Medical Injury, Quality Review Bulletin, 19, 144-149)

- **Preventive Errors**
  - **Failure to provide prophylactic treatment**
  - **Inadequate monitoring or follow-up of treatment**
- **Other Errors**
  - **Failure of communication**
  - **Equipment failure**
  - **Other system failure**

Types of Medical Errors: Widespread Recognition

1999 Institute of Medicine Report

November 1999

INSTITUTE OF MEDICINE

Shaping the Future for Health



TO ERR IS HUMAN:
BUILDING A SAFER HEALTH SYSTEM

Health care in the United States is not as safe as it should be--and can be. At least 44,000 people, and perhaps as many as 98,000 people, die in hospitals each year as a result of medical errors that could have been prevented, according to estimates from two major studies. Even using the lower estimate, preventable medical errors in hospitals exceed attributable deaths to such feared threats as motor-vehicle wrecks, breast cancer, and AIDS.

Medical errors can be defined as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. Among the problems that commonly occur during the course of providing health care are adverse drug events and improper transfusions, surgical injuries and wrong-site surgery, suicides, restraint-related injuries or death, falls, burns, pressure ulcers, and mistaken patient identities. High error rates with serious consequences are most likely to occur in intensive care units, operating rooms, and emergency departments.

Beyond their cost in human lives, preventable medical errors exact other significant tolls. They have been estimated to result in total costs (including the expense of additional care necessitated by the errors, lost income and household productivity, and disability) of between $17 billion and $29 billion per year in hospitals nationwide. Errors also are costly in terms of loss of trust in the health care system by patients and diminished satisfaction by both patients and health professionals. Patients who experience a long hospital stay or disability as a result of errors pay with physical and psychological discomfort. Health professionals pay with loss of morale and frustration at not being able to provide the best care possible. Society bears the cost of errors as well, in terms of lost worker productivity, reduced school attendance by children, and lower levels of population health status.

A variety of factors have contributed to the nation's epidemic of medical errors. One oft-cited problem arises from the decentralized and fragmented nature of the health care delivery system--or "nonsystem," to some observers. When patients see multiple providers in different settings, none of whom has access to complete information, it becomes easier for things to go

Errors...are costly in terms of loss of trust in the health care system by patients and diminished satisfaction by both patients and health professionals.

Medical Errors Is A Serious Problem in Health Care: Influential Publication of Meta-Analysis in the New England Journal of Medicine (2009)

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population

Alex B. Haynes, M.D., M.P.H., Thomas G. Weiser, M.D., M.P.H., William R. Berry, M.D., M.P.H., Stuart R. Lipsitz, Sc.D., Abdel-Hadi S. Breizat, M.D., Ph.D., E. Patchen Dellinger, M.D., Teodoro Herbosa, M.D., Sudhir Joseph, M.S., Pascience L. Kibatala, M.D., Marie Carmela M. Lapitan, M.D., Alan F. Merry, M.B., Ch.B., F.A.N.Z.C.A., F.R.C.A., Krishna Moorthy, M.D., F.R.C.S., Richard K. Reznick, M.D., M.Ed., Bryce Taylor, M.D., and Atul A. Gawande, M.D., M.P.H., for the Safe Surgery Saves Lives Study Group*

ABSTRACT

BACKGROUND

Surgery has become an integral part of global health care, with an estimated 234 million operations performed yearly. Surgical complications are common and often preventable. We hypothesized that a program to implement a 19-item surgical safety checklist designed to improve team communication and consistency of care would reduce complications and deaths associated with surgery.

METHODS

Between October 2007 and September 2008, eight hospitals in eight cities (Toronto, Canada; New Delhi, India; Amman, Jordan; Auckland, New Zealand; Manila, Philippines; Ifakara, Tanzania; London, England; and Seattle, WA) representing a variety of economic circumstances and diverse populations of patients participated in the World Health Organization's Safe Surgery Saves Lives program. We prospectively collected data on clinical processes and outcomes from 3733 consecutively enrolled patients 16 years of age or older who were undergoing noncardiac surgery. We subsequently collected data on 3955 consecutively enrolled patients after the introduction of the Surgical Safety Checklist. The primary end point was the rate of complications, including death, during hospitalization within the first 30 days after the operation.

RESULTS

The rate of death was 1.5% before the checklist was introduced and declined to 0.8% afterward (P=0.003). Inpatient complications occurred in 11.0% of patients at baseline and in 7.0% after introduction of the checklist (P<0.001).

CONCLUSIONS

Implementation of the checklist was associated with concomitant reductions in the rates of death and complications among patients at least 16 years of age who were undergoing noncardiac surgery in a diverse group of hospitals.

From the Harvard School of Public Health (A.B.H., T.G.W., W.R.B., A.A.G.), Massachusetts General Hospital (A.B.H.), and Brigham and Women's Hospital (S.R.L., A.A.G.) — all in Boston; University of California–Davis, Sacramento (T.G.W.); Prince Hamzah Hospital, Ministry of Health, Amman, Jordan (A.-H.S.B.); University of Washington, Seattle (E.P.D.); College of Medicine, University of the Philippines, Manila (T.H.); St. Stephen's Hospital, New Delhi, India (S.J.); St. Francis Designated District Hospital, Ifakara, Tanzania (P.L.K.); National Institute of Health–University of the Philippines, Manila (M.C.M.L.); University of Auckland and Auckland City Hospital, Auckland, New Zealand (A.F.M.); Imperial College Healthcare National Health Service Trust, London (K.M.); and University Health Network, University of Toronto, Toronto (R.K.R., B.T.). Address reprint requests to Dr. Gawande at the Department of Surgery, Brigham and Women's Hospital, 75 Francis St., Boston, MA 02115, or at safesurgery@hsph.harvard.edu.

*Members of the Safe Surgery Saves Lives Study Group are listed in the Appendix.

This article (10.1056/NEJMsa0810119) was published at NEJM.org on January 14, 2009.

N Engl J Med 2009;360:491-8.

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The New England Journal of Medicine
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Medical Errors for Audiologists to Avoid:

10 Medical Errors That Changed Standard of Care (Barry Bialek, MD)

- **Trauma Care: introduction of Advanced Trauma Life Support (1980)**
- **Anesthesia Monitoring (1982)**
- **Fetal Heart Monitoring (1980)**
- **Wrong Site Amputation (JCAHO)**
- **Sponge Counts**
- **Fatal Allergies**
- **Potassium Mishaps**
- **Decubitus Ulcers**
- **Lifting Techniques**
- **Breast Exams**

Medical Errors for Audiologists to Avoid:

10 Medical Errors That Changed Standard of Care
(www.hospitalsafetyscore.org)

Hospital Errors are the Third Leading Cause of Death in U.S., and New Hospital Safety Scores Show Improvements Are Too Slow

Washington, D.C., October 23, 2013 – New research estimates up to 440,000 Americans are dying annually from preventable hospital errors. This puts medical errors as the third leading cause of death in the United States, underscoring the need for patients to protect themselves and their families from harm, and for hospitals to make patient safety a priority.

Press Inquires

We are happy to help members of the press inform the public about the Hospital Safety Score. For interview requests or additional information for print, electronic and broadcast journalists, please contact:

Ashley Duvall
(908) 325-3865

If you are a hospital looking for a template press release to announce your Hospital

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Health » ProPublica 19 :: Email :: Print

How Many Die from Medical Mistakes in U.S. Hospitals?

An updated estimate says it could be at least 210,000 patients a year, more than twice the number in a frequently quoted Institute of Medicine report

By Marshall Allen and ProPublica | September 20, 2013

It seems that every time researchers estimate how often a medical mistake contributes to a hospital patient's death, the numbers come out worse.



Flickr/U.S. Naval Forces Central Command/U.S.

In 1999, the Institute of Medicine published the famous "To Err Is Human" report, which dropped a bombshell on the medical community by reporting that up to 98,000 people a year die because of mistakes in hospitals. The number was initially disputed, but is now widely accepted by doctors and hospital officials 2014 and quoted ubiquitously in the media.

Ongoing Concern About Medical Errors:
The Problem Is Not Going Away

Get the new BostonGlobe iPhone app today - enjoy a 1 month FREE trial and stay informed on the go!

The Boston Globe Metro

Brigham and Women's airing medical mistakes

Hospital reports errors to staff in drive for improvement

By Liz Kowalczyk | GLOBE STAFF APRIL 09, 2013



PAT GREENHOUSE/GLOBE STAFF

From left, Courtney Moller, Bridget Soullion, Dr. Kathy Selvaggi, who was involved in a flawed case, and Amy Fang.

The patient, dying of metastatic cancer, had arrived at the hospital several weeks earlier in agony. But doctors at Brigham and Women's Hospital fashioned a medication regimen that at last eased her suffering, and on the day she was transferred to a rehabilitation hospital, they recalled seeing her smile.

Hours later, the patient was back in the Brigham emergency department, and once again in excruciating pain. Delays in transferring her, a language barrier, and a communications breakdown between doctors meant she did not get her medications on time.

Get the new BostonGlobe iPhone app today - enjoy a 1 month FREE trial and stay informed on the go!

The Boston Globe Metro

Surgical errors rise in Mass. despite new controls

Many preventable mistakes cited, but few of them caused serious harm

By Liz Kowalczyk | GLOBE STAFF JULY 07, 2013

Massachusetts hospitals are reporting more errors during surgery and invasive procedures, even after an intensive, decade-long campaign to reduce these mistakes — called "never events" because they're preventable and, with reasonable precautions, simply shouldn't happen.

Errors disclosed to state health officials since 2011 included anesthesia injected into the wrong leg, a guidewire left inside a patient's vein, and a catheter threaded into a patient who didn't need one, according to hospital safety leaders.

Several of them said the reported number of such incidents is rising as more care shifts to outpatient clinics, procedure rooms, and physicians' offices, where administrators and caregivers generally have been less vigilant about implementing safety protocols of the sort required in most hospital operating rooms. Hospital leaders said they are doing a better job recognizing and reporting these errors and training staff.

Many of the errors driving the increase are the sort which some caregivers view as less serious — improperly inserting medication tubing or administering local anesthesia, for example, and not removing the wrong kidney or cutting into the wrong side of the brain. But these less harmful mistakes still can cause pain and anxiety for patients.

Medical Errors are the Third Most Common Cause of Death: *The Latest Statistics (May 2016)*

The Washington Post

To Your Health

Researchers: Medical errors now third leading cause of death in United States

By Ariana Eunjung Cha May 3

Nightmare stories of nurses giving potent drugs meant for one patient to another and surgeons removing the wrong body parts have dominated recent headlines about medical care. Lest you assume those cases are the exceptions, a new study by patient-safety researchers provides some context.

Their analysis, published in the BMJ on Tuesday, shows that "medical errors" in hospitals and other health-care facilities are incredibly common and may now be the third-leading cause of death in the United States — claiming 251,000 lives every year, more than respiratory disease, accidents, stroke and Alzheimer's.



Medical errors rank behind heart disease and cancer as the third leading cause of death in the U.S., Johns Hopkins researchers say.

iStockphoto

A study by researchers at Johns Hopkins Medicine says medical errors should rank as the third leading cause of death in the United States — and highlights how shortcomings in tracking vital statistics may hinder research and keep the problem out of the public eye.

The authors, led by Johns Hopkins surgeon Dr. Martin Makary, call for changes in death certificates to better tabulate fatal lapses in care. In an open letter, they urge the Centers for Disease Control and Prevention to immediately add medical errors to its annual list reporting the top causes of death.

Medical Errors for Audiologists to Avoid:

Changing Attitudes About Preventing Medical Errors

- **System approach**
  - **Introduce systems to prevent errors and promote safety**
  - **Medical checklists**
  - **Computerized systems for medications**
  - **Regular training and "in-services"**
  - **No fault, no blame approach to encourage disclosure of errors**
- **Add accountability and blame for health care workers who don't** follow rules (e.g., hand-washing or pre-surgery "time out")
  - **Mandatory training for health care workers**
  - **Loss of patient care privileges**
  - **Loss of operating room time**
  - **Loss of pay for defined periods**

Medical Errors for Audiologists to Avoid:

Ongoing Weaknesses in Preventing Medical Errorts

- **Most patients who suffer harm do not file formal complaints**
  - **1 in 7 Medicare patients harmed each month**
  - **15,000 Medicare patients (1.5%) are victims of an event that leads to death per month**
- **Hospital failure to report unexpected harm to patients, or** "sentinel adverse events"
  - **States report only 12% of harmful events reported to HHS inspector general**
  - **Hospitals report only 1% of harmful events**
- **A few "rotten apples" are the cause of most medical errors**
  - **Physicians almost never lose hospital privileges**
  - **Physicians almost never lose license to practice**

Medical Errors for Audiologists to Avoid:

Historical Perspective

- **Five common preventable medical errors**
  - **Medication error**
  - **Too many blood transfusions**
  - **Too much oxygen for premature babies**
  - **Health care-associated infections**
  - **Infections from central lines**
  - **The impact of culture (safety is #1 priority)**
- **What are the most common audiology errors**
  - **?**
  - **?**
  - **?**
  - **?**

Medical Errors for Audiologists to Avoid

- **Historical perspective**
- **Definitions of important terms**
- **Standard of care**
- **General steps for preventing errors and minimizing liability**
- **Professional responsibility, professional liability, and risk** management in audiology
- **Patient scenarios … Errors and steps to prevent them (You make the call!)**
- **Guidelines for patient referral to physicians** (otolaryngology)
- **Questions and answers**

Medical Errors for Audiologists to Avoid:

Defining Professional Liability

"An individual who causes injury to another either intentionally or unintentionally can be held liable for the action. By virtue of advanced knowledge, training, and skill, a professional has a responsibility to conform to certain standards of conduct to protect the public from unreasonable risks.

… The responsibility of licensed and/or certified professionals to conform to those standards may be referred to collectively as professional liability."

ASHA Technical Report (1994). ***Professional Liability and Risk Management for the Audiology and Speech-Language Pathology Professions***

Medical Errors for Audiologists to Avoid: Definitions of Important Terms

- **Civil professional liability**
  - **Tort *from Latin for twisted or distorted*): Any wrongful** act, damage, or injury done willfully or negligently
  - **Action in tort is a private legal action in which**
    - ✓ **A plaintiff seeks a remedy (generally monetary) for damages to health, property, peace of mind, or reputation**
    - ✓ **The defendant is the health care provider to provided services to the plaintiff**
    - ✓ **Plaintiff must prove defendant fault before payments are required from defendant**

Medical Errors for Audiologists to Avoid: Definitions of Important Terms

- **Civil professional liability**
  - **Intentional tort**
    - ✓ **Illegal actions were intentional**
    - ✓ **A reasonable person would conclude that the alleged result was substantially certain to follow the action, e.g.,**
      - **Assault (attempt to do violence)**
      - **Battery (unauthorized physical contact), e.g. failure to obtain consent to treat**
      - **Defamation of character**
      - **Violation of confidentiality, e.g., unauthorized release of PHI**

Medical Errors for Audiologists to Avoid: Definitions of Important Terms (2)

- **Unintentional tort**
  - **Most common form of negligence in civil litigation**
  - **Defendant failed to exercise standard degree of care,**

  e.g.,
  - ✓**Negligence**
  - ✓**Misdiagnosis**
  - ✓**Incorrect or inadequate treatment**
  - ✓**Injuries from equipment or premises**

Medical Errors for Audiologists to Avoid: Definitions of Important Terms (2)

- **Unintentional tort**
  - **Four elements of unintentional tort**
    - ✓ **A legal duty, that is, a practitioner/patient** relationship, exists between audiologist and plaintiff
    - ✓ **Breach of legal duty exists (e.g., Improper diagnosis)**
    - ✓ **Cause and effect established ("proximate cause")** between breach of duty and injury
    - ✓ **Injury results in actual loss or damage**

Medical Errors For Audiologists to Avoid: Definitions of Important Terms (3)

- **Criminal (versus civil) liability**
  - **Commission of misdemeanors or felonies during conduct of professional activities, e.g.,**
    - ✓ **Battery**
    - ✓ **Fraud**
    - ✓ **Grand larceny**
    - ✓ **HIPAA violations**
  - **Often criminal liability reflects ignorance of regulations, e.g.,**
    - ✓ **Medicare and Medicaid law**
    - ✓ **State insurance codes**
  - **Audiologist is subject to fines and incarceration**

Medical Errors for Audiologists to Avoid: Definitions of Important Terms (4)

- **Employer liability**
  - ✓ **Employer has "vicarious" responsibility ("respondeat superior") for those who work for them**
  - ✓ **Unlicensed person inadequately supervised by licensed** audiologist
  - ✓ **Support staff under supervision of an audiologist**
- **Product liability**
  - ✓ **Audiologist drawn into third party liability litigation following dispensing of a product or device, e.g.,**
    - **Ingestion of hearing aid battery by a child**
    - **Allergic reaction an ear mold or to electrode paste**
    - **Malfunctioning FM systems**
    - **Defective cochlear implants**

Medical Errors for Audiologists to Avoid

- Historical perspective
- Definitions of important terms
- Standard of care
  - Definition
  - Practice guidelines for audiologists
  - State rules and regulations
- General steps for preventing errors and minimizing liability
- Professional responsibility, professional liability, and risk management in audiology
- Patient scenarios … Errors and steps to prevent them
- Guidelines for patient referral to physicians (otolaryngology)
- Questions and answers

Medical Errors or Audiologists to Avoid:
Evidence Based Clinical Practice

"Those who fall in love with practice without science are like a sailor who steers a ship without a rudder or compass, and who can never be certain whither he is going."

Leonardo Da Vinci (1452-1519)

Medical Errors for Audiologists to Avoid:

Standard of Care

- **Consistent with local, regional or national clinical practice**
- **Follows guidelines or recommendations on clinical practice approved by national multi-disciplinary professional committees or panels, e.g., Joint Committee on Infant Hearing**
- **Follows guidelines or recommendations on clinical practice approved by national professional organizations, e.g., AAA or ASHA**
- **Is consistent with statements of**
  - **Scope of Practice**
  - **Code of Ethics**
- **Is in compliance with Federal guidelines for clinical practice and services, e.g., Joint Committee on Accreditation of Healthcare Organizations (JCAHO)**

Medical Errors for Audiologists to Avoid:

A Sample of Legal Definitions of Standard of Care

- **In tort law, the standard of care is the degree of prudence and caution required of an individual who is under a duty of care.**
  (en.wikipedia.org/wiki/Standard of_care)
- **In tort law, the degree of caution that a reasonable person should exercise in a given situation so as to avoid causinginjury**
  (en.wiktionary.org/wiki/standard_of_care)
- **The degree or level of service, attention, care and protection that a person owes another person according to the law (see also Dutyof care).**
  (www.ibc.ca/en/need_more_info/glossary/S.asp)
- **It's the level of care, which an average practitioner would practice. Or in other words how a similar qualified practitioner would manage their patient's care under similar circumstances. Medical Malpractice claims must establish the standard of care and show that the standard has been breached.**
  (www.gmlaw.com/medical-malpractice-resources-terms.cfm)

Common Evidence Grading System: Four Categories

- **Grade 1**
  - **1a: Well-designed meta-analysis of randomized controlled trials**
  - **1b: Well-designed randomized controlled trials**
- **Grade 2**
  - **2a: Well-designed controlled studies without randomization**
  - **2b: Well-designed quasi-experimental studies**
- **Grade 3: Well-designed non-experimental studies, i.e.,**
  - **Correlational studies**
  - **Case studies**
- **Grade 4:**
  - **Expert committee reports, consensus conferences and clinical experience**

Examples of Current Practice Guidelines in Audiology

(More are coming)

- **2007 Joint Committee on Infant Hearing (JCIH) Position Statement**
- **2008 Guidelines on Identification, Diagnosis, and Management of Auditory Neuropathy Spectrum Disorder in Infants and Young Children**
- **2010 American Academy of Audiology Clinical Practice Guidelines: Diagnosis, Treatment, and Management of Children and Adults with Central Auditory Processing Disorders**
- **2010 American Academy of Audiology Clinical Practice Guidelines: Childhood Hearing Screening**
- **2012 American Academy of Audiology: Audiologic Guidelines for the Assessment of Hearing in Infants and Young Children**
- **2013 American Academy of Audiology Clinical Practice Guidelines: Pediatric Amplification**
- **American Academy of Audiology Clinical Practice Guidelines: Otoacoustic Emissions (in progress)**

Example of A Practice Guideline in Audiology: Year 2007 JCIH Position Statement Protocol for Evaluation for Hearing Loss In Infants and Toddlers from Birth to 6 months

- Child and family history
- Evaluation of risk factors for congenital hearing loss
- Parental report of infant's responses to sound
- Audiological assessment
  - Auditory brainstem response (ABR)
    - ✓ Click-evoked ABR with rarefaction and condensation stimulation if there are risk factors for auditory neuropathy
    - ✓ Frequency-specific ABR with air-conduction tone bursts
    - ✓ Bone-conduction stimulation (as indicated)
    - ✓ Auditory steady state response (ASSR) is optional
  - Otoacoustic emissions (distortion product or transient OAEs)
  - Tympanometry with 1000 Hz probe tone
  - "Clinical observation of infant's auditory behavior. *Behavioral observation alone is not adequate for determining whether hearing loss is present in this age group …*"

Example of A Practice Guideline in Audiology: Year 2007 JCIH Position Statement Risk Indicators Associated with Permanent Congenital, Delayed-Onset, or Progressive Hearing Loss in Childhood (1)

- **Caregiver concern regarding hearing, speech, language, or developmental delay.**
- **Family history of permanent childhood hearing loss**
- **NICU stay of > 5 days or**
  - **ECMO**
  - **Assisted ventilation**
  - **Exposure to ototoxic medicines**
  - **Hyperbilirubinemia requiring exchange transfusion**
- **In utero infections, e.g.,**
  - **CMV**
  - **Herpes**
  - **Rubella**
  - **Syphillis**
  - **Toxoplasmosis**
- **Craniofacial anomalies, including involvement of the**
  - **Pinna**
  - **Ear canals**
  - **Ear tags and pits**
  - **Temporal bone anomalies**

Example of A Practice Guideline in Audiology: Year 2007 JCIH Position Statement Risk Indicators Associated with Permanent Congenital, Delayed-Onset, or Progressive Hearing Loss in Childhood (2)

- Physical findings associated with a syndrome, e.g., white forelock
- Syndromes associated with hearing loss, e.g.,
  - Neurofibromatosis
  - Osteopetrosis
  - Usher syndrome
  - Waardenburg
  - Alport
  - Pendred
  - Jervell
  - Lange-Nielson
- Neuro-degenerative disorders, e.g.,
  - Hunter syndrome
  - Sensory motor neuropathies
    - ✓ Friedreich ataxia
    - ✓ Charcot-Marie-Tooth syndrome
- Culture positive post-natal infections associated with sensorineural hearing loss, e.g., Confirmed bacterial and viral meningitis
- Head trauma requiring hospitalization
- Chemotherapy

Example of A Practice Guideline in Audiology: Year 2007 JCIH Position Statement Recommendations for Audiologic Follow up for Infants with Risk Indicators Associated with Permanent Congenital, Delayed-Onset, or Progressive Hearing Loss

- Prior (2000 JCIH) recommendations for follow up at 6-month intervals of all NICU graduates (approximately 400,000 babies annually) placed an excessive burden on audiologists
- 2007 JCIH shifts responsibility for surveillance of all infants to the primary care provider who will refer to audiologists as needed, e.g.,:
  - Concerns or findings consistent with hearing loss
  - Risk factors for delayed/late onset or progressive hearing loss
- 2007 JCIH recommends at least one audiologic referral for low risk infants by age 24 to 30 months
- Early and more frequent referral (every 6 months) to audiologists for risk factors associated with delayed onset/progressive hearing loss:
  - Family history
  - CMV
  - ECMO therapy
  - Potentially ototoxic chemotherapy (e.g., cisplatin)
  - Neurodegenerative disorders

Medical Errors for Audiologists to Avoid

- **Historical perspective**
- **Definitions of important terms**
- **Standard of care**
- **General steps for preventing errors and minimizing liability**
- **Professional responsibility, professional liability, and risk** management in audiology
- **Patient scenarios … Errors and steps to prevent them (You make the call!)**
- **Guidelines for patient referral to physicians** (otolaryngology)
- **Questions and answers**

Medical Errors for Audiology to Avoid

"An ounce of prevention is worth a pound of cure."

Benjamin Franklin (1706-1790)



Medical Errors for Audiologists to Avoid:
General Preventive Strategies and Steps (1)

- **Awareness and education of the audiologist**
  - **Identify potential risks**
  - **Reduce risks by providing accepted standard of care**
  - **Practice within the scope of audiology**
  - **Remain up to date with professional developments** through formal and informal continuing education
  - **Know**
    - ✓ **State licensing laws**
    - ✓ **Code of ethics**
    - ✓ **Patient Bill of Rights**
    - ✓ **Policies and procedures of your institution**

Medical Errors for Audiologists to Avoid:
General Preventive Strategies and Steps (2)

- **Make appropriate patient referrals**
  - **Refer when you do not have knowledge, expertise, or** credentials to provide a service the patient needs
  - **Verify licensure, certification, and other qualifications of professionals you refer patients to**
  - **"When in doubt … refer out!"**
    - **Maintain professional credentials in audiology, e.g.**
      - **State license with required continuing education**
  - **ABA certification with required continuation education**
  - **ABA specialty certification**

Medical Errors for Audiologists to Avoid:
General Preventive Strategies and Steps (3)

- **Effective communication with patient and family, e.g.,**
  - **Establish positive relationship with patient and family**
  - **Explain all test findings, treatment options, and treatment** goals
  - **Fully disclose fees, billing schedules, etc**
  - **Provide written warranties and warnings**
  - **Secure patient signature on informed consent, release of information, and other documents**
  - **Maintain adequate verbal and written communication with** patient and family

Medical Errors for Audiologists to Avoid:
General Preventive Strategies and Steps (4)

- **Documentation, record keeping, and reporting**
  - **Written documentation in official medical or clinic records**
  - **Documentation is legible and thorough**
  - **Make corrections appropriately**
  - **Document all contacts with patient and family (face to** face, telephone, email)
  - **Document all contacts with professionals regarding the patient**
  - **Retain all correspondence between audiologist with or** about the patient
  - **Remember … if it's not documented in writing, then it didn't happen**

Medical Errors for Audiologists to Avoid:
General Preventive Strategies and Steps (5)

- **Compliance with state and federal privacy and security regulations, e.g.,**
  - **Health Insurance Portability and Accountability Act (HIPAA)** of 1996
- **Follow accepted policies for infection control, e.g.,**
  - **Compliance with Joint Commission**
  - **Institutional policies**
- **Equipment calibration**
  - **Periodic physical calibration with documentation**
  - **Daily biological checks**
- **Meet or exceed national standards of care for audiology**

Medical Errors for Audiologists to Avoid

- **Historical perspective**
- **Definitions of important terms**
- **Standard of care**
- **General steps for preventing errors and minimizing liability**
- **Professional responsibility, professional liability, and risk** management in audiology
- **Guidelines for patient referral to physicians (usually an otolaryngologist)**
- **Questions and answers**

Medical Errors for Audiologists to Avoid

- Historical perspective
- Definitions of important terms
- Standard of care
- General steps for preventing errors and minimizing liability
- Professional responsibility, professional liability, and risk management in audiology
- Patient tips to prevent medical errors
- Guidelines for patient referral to physicians (mostly to otolaryngologists)
- Questions and answers

20 Patient Tips to Help Prevent Medical Errors

Agency for Healthcare Research and Quality (www.ahrq.gov/)

The term "Doctor" is used for a health care provider … like an audiologist.

- **Medicine (9 questions), e.g.,**
  - **Make sure your doctors know about every medicine you are taking**
  - **Bring all of your medicines and supplements to your** doctor visits
  - **Make sure your doctor knows about any allergies and adverse reactions you have had to medicines (or ear molds, electrode gel, etc)**
  - **When your doctor writes prescription for you, make sure you can read it**
  - **Ask for information about your medicine in terms you can understand …**

20 Patient Tips to Help Prevent Medical Errors

Agency for Healthcare Research and Quality (www.ahrq.gov/)

The term "Doctor" is used for a health care provider … like an audiologist.

- ❑ **Hospital Stays (2 questions)**
- ❑ **Surgery (2 questions)**
- ❑ **Other Steps**
  - **Speak up if you have questions or concerns**
  - **Make sure someone coordinates your care**
  - **Make sure your doctor has all important health information**
  - **Ask a family member or friend to go to appointments with you**
  - **Know that more is not always better (may be better off without treatment)**
  - **If you have a test, don't assume no news is good news**
  - **Learn about your condition and treatments … ask your doctor and use other reliable sources**

Medical Errors for Audiologists to Avoid

"I will use treatment to help the sick according to my ability and judgment, but never with a view to injury and wrongdoing."

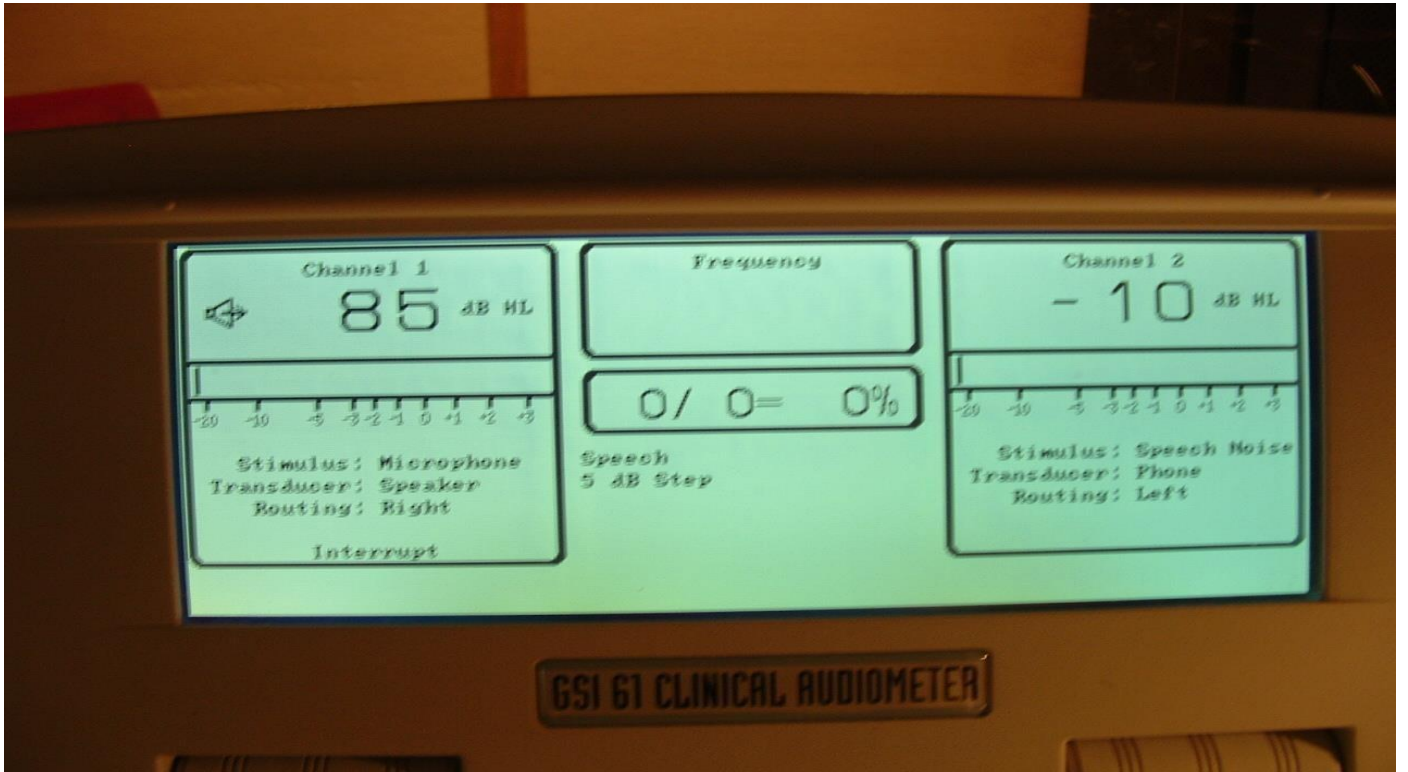
Hippocratic Oath (c. 460-400 B.C.)

"…I will keep pure and holy both my life and art …"

You've just stepped into the control room to begin a hearing assessment, and you see these audiometer settings. What's wrong with this picture?



You've just stepped into the control room to begin an audiologic assessment, and you see this audiometer screen. What's wrong with this picture?



Medical Errors for Audiologists to Avoid

- **Historical perspective**
- **Definitions of important terms**
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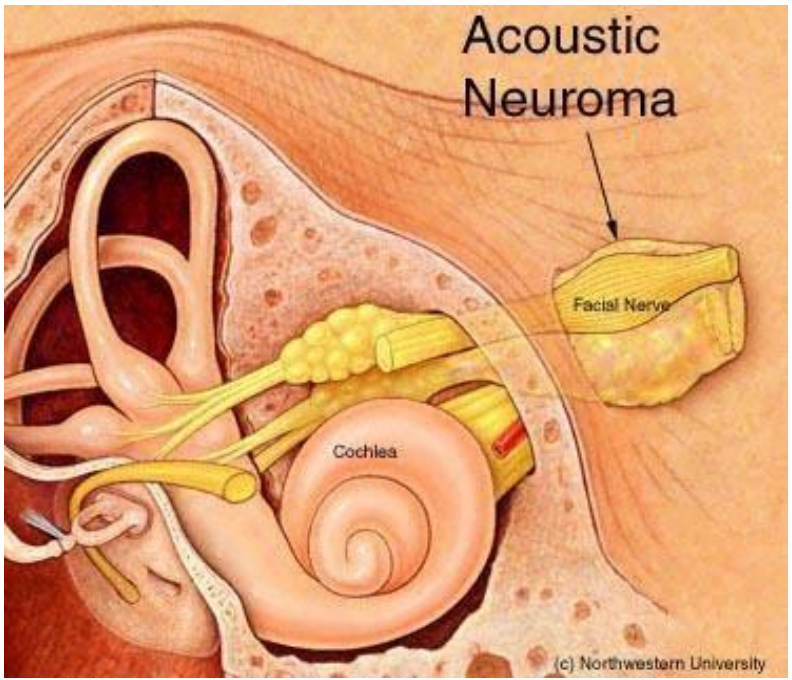
- **Professional responsibility, professional liability, and risk** management in audiology
- **Patient scenarios … Errors and steps to prevent them (You make the call!)**
- **Guidelines for patient referral to physicians (mostly to** otolaryngologists)
- **Questions and answers**

Retrocochlear Auditory Dysfunction: A High Risk Patient Population



85% of tumors in CPA are acoustic tumors

Another 10% are meningiomas

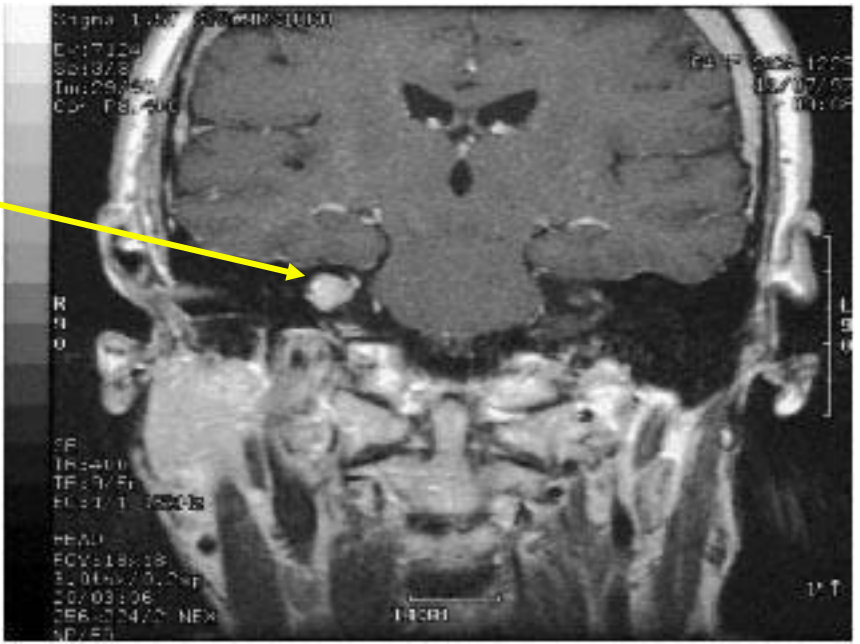
Chance of an acoustic tumor in a lifetime is 1/1000

Medical Errors for Audiologists to Avoid: Two Legal Cases Involving "Failure to Diagnose an Acoustic Tumor"

- **Each of two plaintiffs (two separate cases) were adults with vestibular schwannoma**
  - **Tumors were suspected \after second visit to otolaryngologist**
  - **MRI confirmed tumor**
  - **Tumors were removed surgically**
  - **Plaintiffs claimed hearing would have been spared with earlier diagnosis and/or tinnitus would have been avoided**
- **Defendants were general otolaryngologists**
  - **Conducted complete history and physical examination**
  - **Only performed (automated) screening audiometry**
  - **Questions: What is standard of care *for physicians?***
  - **What are the guidelines for physicians for referral of patients for MRI to rule out vestibular schwannoma?**

Detection of an Acoustic Tumor with MRI

Tumor



Medical Errors for Audiologists to Avoid:

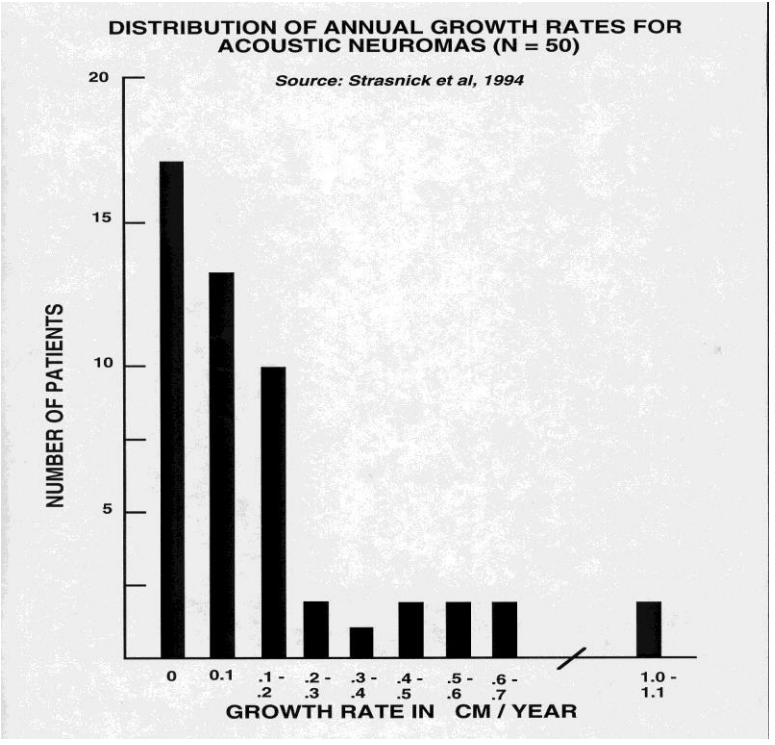
AAO-HSN Criteria for Identifying Candidates for MRI to Rule Out Vestibular Schwannomas*

- **Asymmetric pure-tone air-conduction sensorineural thresholds**
  - **Asymmetric SNHL of 25 dB or more at any two consecutive test frequencies**
  - **Unilateral or asymmetric hearing impairment by AAO-HNS criteria**
    - ✓ **Average difference in air-conduction thresholds between ears of 15 dB or greater at 500, 1000, 2000, and 3000 Hz**
- **Asymmetric word recognition scores**
  - **Statistically significant difference in word recognition scores (WRS) between ears using Thornton & Raffin (1978) data and NU6 word lists**
- **Persistent unilateral or asymmetric tinnitus**

**** Same guidelines should be used by audiologists for referral of patients to otolaryngologists to rule out vestibular schwannomas***

Tumor Growth Rate is *Very* Slow:

"Growth Spurts" are Alleged by Plaintiffs



Medical Errors for Audiologists to Avoid:

*AAO-HSN Criteria for Audiologist Referral to a Physician**

- **History of active drainage from the ear within the previous 6 months**
- **History of sudden or rapidly progressing hearing loss within the previous 6 months**
- **FDA rules for unilateral or asymmetrical hearing loss**
  - **Air-conduction PTA (500, 1000, 2000, 3000 Hz) difference of > 15 dB**
- **Sudden or recent onset within the previous 6 months**
- **Bilateral hearing loss greater than 90 dB**
- **Complain of hearing impairment with positive history of:**
  - **Tuberculosis**
  - **HIV**
  - **Auto-immune disease**
  - **Von Recklinghausen's NF**
  - **Syphilis**
  - **Meniere's disease**
  - **Otosclerosis**
  - **Paget's disease of the bone**

Medical Errors for Audiologists to Avoid:

FDA (1977) Criteria for Audiologist Referral to a Physician for Hearing Aid Use

- **Visible congenital or traumatic deformity of the ear**
- **History of active drainage from the ear within the previous 90 days**
- **History of sudden/rapidly progressing hearing loss within previous 90 days**
- **Acute or chronic dizziness**
- **Unilateral hearing loss of sudden/recent onset within the previous 90 days**
- **Audiometric air-bone gap > than 15 dB at 500, 1000, and 2000 Hz**
- **Pain or discomfort in the ear**
- **Child under 18 years of age**
- **Visible evidence of significant cerumen accumulation or a foreign body in the ear canal**
  - **NOTE: Cerumen, including cerumen impaction, is *not* a criterion as cerumen management is within the scope of practice of audiology in the state of Florida**

Annexure 2

Bharath Institute of Higher Education and Research

SLIMS

1	U16MB267	ARIVUMATHI .R
2	U16MB268	ARJUN.S
3	U16MB269	ASHVANTH KUMAR .A
4	U16MB270	ASMITHA S.V
5	U16MB271	AVIDI. VENKATA SAISUSHMA
6	U16MB272	AVIRAL PATPATIA
7	U16MB273	BALACHANDRAN
8	U16MB274	BALAJI .S
9	U16MB275	BHASKARAN .K.C
10	U16MB276	BHAVANI . K.M
11	U16MB277	BLESSY AMALA RISHA .J
12	U16MB278	CAREENA DANIEL
13	U16MB279	CHANDRA PRAKASH.M

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES PUDUCHERRY

TOPIC: Medical errors in audiology (ENT10)
STUDENT NAME:
UNIVERSITY NO:

1. According to the presenter, which of the following statements is NOT true?
   a. Considering the number of procedures and the progress that has been made, healthcare is as safe as could be expected.
   b. More people die from medical errors than from auto accidents or AIDS.
   c. The fostering of a culture where people discuss near misses, speak up about risks and problems and express a genuine interest in quality of care is crucial to improving patient outcomes and safety.
   d. Patient empowerment through education of treatment options and plans is a key part of improving quality.

2. According to the presenter, root cause analysis:
   a. Helps us understand how and why something happened
   b. Helps us problem solve and improve safety
   c. Both A and B
   d. None of the above

3. The development of established standards of care:
   a. Establishes uniformity across individuals in an organization & sets expectations for acceptable performance
   b. Takes away from the unique individual skill set
   c. Is not needed in audiology since we are a doctorate-level profession
   d. None of the above

4. A precaution for earmold impressions include:
   a. Appropriate bracing b. Examination of the ear canal pre block placement
   c. Examination of the ear canal post block placement d. All of the above

5. The first step in improving patient safety is to:
   a. Find out how much it costs
   b. Understand why it happened and get the evidence
   c. Discuss with your legal team if it should be reported or ignored
   d. Ask the patient what type of compensation they are seeking

6. According to the presenter, the most common adverse incident in this presentation was:
   a. Dome dislodgements
   b. Patient falls related to ENG techniques
   c. Occurrences related to ear impressions
   d. Transient hearing loss related to acoustic reflex testing

7. A common errors in cerumen removal is:
   a. Ignoring contraindications b. Neglecting to clean and disinfect cerumen tools
   c. Canal abrasions d. All of the above

8. Proper infection control protocols include:
   a. Handwashing between patients and after handling hearing aids
   b. Disinfecting hearing aids, tools and patient contact surfaces after every contact
   c. Changing disinfectant solution daily and proper storage of tips
   d. All of the above

9. Which of the following is true about hearing aid verification procedures?
   a. If the patient likes the sound quality, probe mic measures arenâ€™t important.
   b. The first fit algorithm is scientifically proven to be the best approach.
   c. Many licensed providers neglect to perform any type of fitting verification.
   d. Digital hearing aids cannot be tested with probe microphones.

10. What is an important step in improving patient safety in audiology?
   a. Find out how and why it happened
   b. Provide quality oversight
   c. Foster a culture of transparency and education
   d. All of the above

PRE TEST

5. The first step in improving patient safety is to:
   a. Find out how much it costs
   b. Understand why it happened and get the evidence
   c. Discuss with your legal team if it should be reported or ignored
   d. Ask the patient what type of compensation they are seeking

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ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

(1)

TOPIC: Medical errors in audiology (ENT10)

STUDENT NAME: Arjun .S

UNIVERSITY NO: U16MB268

1. According to the presenter, which of the following statements is NOT true?

a. Considering the number of procedures and the progress that has been made, healthcare is as safe as could be expected.

b. More people die from medical errors than from auto accidents or AIDS.

c. The fostering of a culture where people discuss near misses, speak up about risks and problems and express a genuine interest in quality of care is crucial to improving patient outcomes and safety.

d. Patient empowerment through education of treatment options and plans is a key part of improving quality.

2. According to the presenter, root cause analysis:

a. Helps us understand how and why something happened

b. Helps us problem solve and improve safety

X c. Both A and B

d. None of the above

3. The development of established standards of care:

a. Establishes uniformity across individuals in an organization & sets expectations for acceptable performance

X b. Takes away from the unique individual skill set

c. Is not needed in audiology since we are a doctorate-level profession

d. None of the above

4. A precaution for earmold impressions include:

a. Appropriate bracing

b. Examination of the ear canal pre block placement

V c. Examination of the ear canal post block placement

d. All of the above

5. The first step in improving patient safety is to:

a. Find out how much it costs

b. Understand why it happened and get the evidence

X c. Discuss with your legal team if it should be reported or ignored

d. Ask the patient what type of compensation they are seeking

6. According to the presenter, the most common adverse incident in this presentation was:

a. Dome dislodgements

b. Patient falls related to ENG techniques

X c. Occurrences related to ear impressions

d. Transient hearing loss related to acoustic reflex testing

7. A common errors in cerumen removal is:

a. Ignoring contraindications b. Neglecting to clean and disinfect cerumen tools

X c. Canal abrasions d. All of the above

8. Proper infection control protocols include:

a. Handwashing between patients and after handling hearing aids

b. Disinfecting hearing aids, tools and patient contact surfaces after every contact

X c. Changing disinfectant solution daily and proper storage of tips

d. All of the above

9. Which of the following is true about hearing aid verification procedures?

a. If the patient likes the sound quality, probe mic measures arenâ€™t important.

b. The first fit algorithm is scientifically proven to be the best approach.

X c. Many licensed providers neglect to perform any type of fitting verification.

d. Digital hearing aids cannot be tested with probe microphones.

10. What is an important step in improving patient safety in audiology?

a. Find out how and why it happened b. Provide quality oversight

c. Foster a culture of transparency and education d. All of the above

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Medical errors in audiology (ENT10)

2

STUDENT NAME: Balaji. S

UNIVERSITY NO: U16MB274.

1. According to the presenter, which of the following statements is NOT true?

a. Considering the number of procedures and the progress that has been made, healthcare is as safe as could be expected.

b. More people die from medical errors than from auto accidents or AIDS.

c. The fostering of a culture where people discuss near misses, speak up about risks and problems and express a genuine interest in quality of care is crucial to improving patient outcomes and safety.

d. Patient empowerment through education of treatment options and plans is a key part of improving quality.

2. According to the presenter, root cause analysis:

a. Helps us understand how and why something happened

b. Helps us problem solve and improve safety

X c. Both A and B

d. None of the above

3. The development of established standards of care:

a. Establishes uniformity across individuals in an organization & sets expectations for acceptable performance

b. Takes away from the unique individual skill set

c. Is not needed in audiology since we are a doctorate-level profession

X d. None of the above

4. A precaution for earmold impressions include:

a. Appropriate bracing

b. Examination of the ear canal pre block placement

X c. Examination of the ear canal post block placement

d. All of the above

POST TEST

5. The first step in improving patient safety is to:

a. Find out how much it costs

b. Understand why it happened and get the evidence

c. Discuss with your legal team if it should be reported or ignored

d. Ask the patient what type of compensation they are seeking

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b. Patient falls related to ENG techniques

c. Occurrences related to ear impressions

d. Transient hearing loss related to acoustic reflex testing

7. A common errors in cerumen removal is:

a. Ignoring contraindications b. Neglecting to clean and disinfect cerumen tools

c. Canal abrasions d. All of the above

8. Proper infection control protocols include:

a. Handwashing between patients and after handling hearing aids

b. Disinfecting hearing aids, tools and patient contact surfaces after every contact

c. Changing disinfectant solution daily and proper storage of tips

d. All of the above

9. Which of the following is true about hearing aid verification procedures?

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b. The first fit algorithm is scientifically proven to be the best approach.

c. Many licensed providers neglect to perform any type of fitting verification.

d. Digital hearing aids cannot be tested with probe microphones.

10. What is an important step in improving patient safety in audiology?

a. Find out how and why it happened b. Provide quality oversight

c. Foster a culture of transparency and education d. All of the above

(9)

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Medical errors in audiology (ENT10)

STUDENT NAME: Balaji. S

UNIVERSITY NO: U16MB214.

1. According to the presenter, which of the following statements is NOT true?

a. Considering the number of procedures and the progress that has been made, healthcare is as safe as could be expected.

b. More people die from medical errors than from auto accidents or AIDS.

c. The fostering of a culture where people discuss near misses, speak up about risks and problems and express a genuine interest in quality of care is crucial to improving patient outcomes and safety.

d. Patient empowerment through education of treatment options and plans is a key part of improving quality.

2. According to the presenter, root cause analysis:

a. Helps us understand how and why something happened

b. Helps us problem solve and improve safety

c. Both A and B

d. None of the above

3. The development of established standards of care:

a. Establishes uniformity across individuals in an organization & sets expectations for acceptable performance

b. Takes away from the unique individual skill set

c. Is not needed in audiology since we are a doctorate-level profession

d. None of the above

4. A precaution for earmold impressions include:

X

a. Appropriate bracing

b. Examination of the ear canal pre block placement

c. Examination of the ear canal post block placement

d. All of the above

5. The first step in improving patient safety is to:

   a. Find out how much it costs

   b. Understand why it happened and get the evidence

   c. Discuss with your legal team if it should be reported or ignored

   d. Ask the patient what type of compensation they are seeking

6. According to the presenter, the most common adverse incident in this presentation was:

   a. Dome dislodgements

   b. Patient falls related to ENG techniques

   c. Occurrences related to ear impressions

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   b. The first fit algorithm is scientifically proven to be the best approach.

   c. Many licensed providers neglect to perform any type of fitting verification.

   d. Digital hearing aids cannot be tested with probe microphones.

10. What is an important step in improving patient safety in audiology?

    a. Find out how and why it happened b. Provide quality oversight

    c. Foster a culture of transparency and education d. All of the above

8

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Medical errors in audiology (ENT10)

STUDENT NAME: Ayun .S

UNIVERSITY NO: U16MB268 .

1. According to the presenter, which of the following statements is NOT true?

a. Considering the number of procedures and the progress that has been made, healthcare is as safe as could be expected.

b. More people die from medical errors than from auto accidents or AIDS.

c. The fostering of a culture where people discuss near misses, speak up about risks and problems and express a genuine interest in quality of care is crucial to improving patient outcomes and safety.

d. Patient empowerment through education of treatment options and plans is a key part of improving quality.

2. According to the presenter, root cause analysis:

a. Helps us understand how and why something happened

b. Helps us problem solve and improve safety

c. Both A and B

d. None of the above

3. The development of established standards of care:

a. Establishes uniformity across individuals in an organization & sets expectations for acceptable performance

b. Takes away from the unique individual skill set

c. Is not needed in audiology since we are a doctorate-level profession

d. None of the above

4. A precaution for earmold impressions include:

a. Appropriate bracing

b. Examination of the ear canal pre block placement

c. Examination of the ear canal post block placement

d. All of the above

ANNEXURE 4

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _____has actively participated in the Value Added Course on Preventing Medical Errors in Audiology held during May 2019 – Aug 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.R.Venkataramanan
RESOURCE PERSON

Dr.S.Ganesh
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Dr.Balaji.S (U16MB274) has actively participated in the Value Added Course on Preventing Medical Errors in Audiology held during May 2019 – Aug 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry-605 502, India.

Dr.R.Venkataramanan
RESOURCE PERSON

Dr.S.Ganesh
COORDINATOR

Annexure 5

Course/Training Feedback Form

Student Feedback Form

Course Name: Preventing Medical Errors in Audiology

Subject Code: **ENT10**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Annexure 5

Course/Training Feedback Form

Student Feedback Form

Course Name: Preventing Medical Errors in Audiology

Subject Code: **ENT10**

Name of Student: BALAJI S Roll No.: U16HB274

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear	✓				
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned	✓				
4	Lectures were clear and easy to understand	✓	✓			
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

good

Annexure 5

Course/Training Feedback Form

Student Feedback Form

Course Name: Preventing Medical Errors in Audiology

Subject Code: **ENT10**

Name of Student: CAREENA PAIEL Roll No.: U16YB276

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear	✓				
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand	✓				
5	Teaching aids were effective		✓			
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course		✓			
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

good

ANNEXURE 6

Date : 15/8/2019

From
Dr.Venkataramanan.R,
Dept of Otorhinolaryngology,
SLIMS
Bharath Institute of Higher Education and Research,
Puducherry.

Through Proper Channel

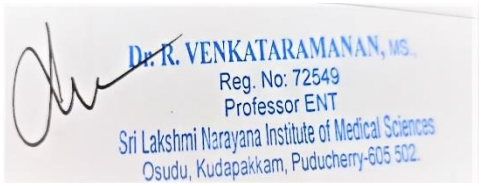
To
The Dean,
SLIMS,
Bharath Institute of Higher Education and Research,
Puducherry.

Sub: Completion of value-added course: Preventing Medical Errors In Audiology reg.

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled:**Preventing Medical Errors in Audiology**on May 2019 to Aug 2019. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards
Dr.R.Venkataramanan





Sri Lakshmi Narayana Institute of Medical Sciences

Date:02.1.2019

From
DR.V.R Sridhar
Professor and Head,
Department of Psychiatry,
Sri Lakshmi narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi narayana institute of medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: ALCOHOL DEPENDANCE AND DEADDICTION

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled:**ALCOHOL DEPENDANCE AND DEADDICTION** on 1/03/2019 . We solicit your kind permission for the same.

Kind Regards

Dr.V.R. Sridhar

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. Jayalakshmi**

The HOD: **Dr. Sridhar**

The Expert: **Dr. Arun Seetharaman.**The committee has discussed about the course and is approved.

Dean	Subject Expert	HOD
(Sign & Seal)	(Sign & Seal)	(Sign & Seal)

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Dr. ARUN SEETHARAMAN, MD.,
Reg. No: 91440
Associate Professor, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. V. R. SRIDHAR, MD.,D.P.M.,
Reg. No: 30995
Professor & HOD, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affiliated to Bharath University, Chennai - TN]

Circular

15/.01/.2019

Sub: Organising Value-added Course: ALCOHOL DEPENDANCE AND DEADDICTION.

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"ALCOHOL DEPENDANCE AND DEADDICTION"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 30/01/2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Encl: Copy of Course content

Course Proposal

Course Title: **Alcohol dependence and de-addiction**

Course Objective:

Awareness on the importance of Alcohol use disorders
Awareness On The Contributing Factors To Alcohol abuse and Bio-psychosocial Model Of Approach
Identify, classify and diagnostic criteria and management of Alcohol dependance

Course Outcome:

Course Audience: FINAL YEAR STUDENTS of 2019 Batch
Course Coordinator: Dr.V.R. Shridhar
Course Faculties with Qualification and Designation:
1.Dr.V.R.SHRIDHAR, Professor & HOD
2.Dr.Arun, Assistant Professor
Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Resource persons	Time	Hours
1.	14.05.2019	SUBSTANCE USE -ALCOHOL USE	Dr.Arun	4-5p.m	1
2.	15.05.2019	INTRODUCTION	Dr.Arun	2-3p.m	1
3.	16.05.2019	PREVALENCE	Dr.Arun	4-6p.m	2
4.	18.05.2019	NEUROBIOLOGY AND NEURAL CIRCUITS	Dr.Arun	4-6p.m	2
5.	19.05.2019	BIOPSYCHOSOCIAL APPROACH	Dr.Arun	4-6p.m	2
6.	20.05.2019	CLINICAL SUBTYPES OF ALCOHOL USE	Dr.Arun	4-5p.m	2
7.	21.05.2019	ALCOHOL DEPENDANCE	Dr.Arun	4-5P.M	1
8.	22.05.2019	ALCOHOL WITHDRAWAL	Dr.Arun	4-5p.m	1
9.	23.05.2019	ALCOHOL AND CO-MORBIDITIES	Dr. Shridhar	4-5p.m	1
10.	27.05.2019	ALCOHOL AND PHYSICAL CONDITIONS	Dr.Arun	4-6p.m	2
11.	28.05.2019	MANAGEMENT	Dr.Arun	4-6p.m	1
12.	29.05.2019	REHBALITATION AND GROUPS	Dr.Arun	4-6p.m	2
13.	30.05.2019	Pre course and Post Course evaluation, Feedback analysis from Likert scale	Dr.Arun	2-5p.m	3

		Practical Class I	Dr. Shridhar		
13.	02.06.2019	History Taking	Dr. Shridhar	2-3 PM	1
14.	03.06.2019	Mental Status Examination	Dr. Shridhar	2-3 PM	1
15.	04.06.2019	Alcohol Breath Analyzer-Demo	Dr. Shridhar	2-4 PM	2
16.	05.06.2019	Alcohol Withdrawal Case Presentation	Dr. Shridhar	2-4 PM	2
17.	06.06.2019	Alcoholic Anonymous	Dr. Shridhar	2-4p.m	2
		Total			30 hrs

REFERENCE BOOKS:

1.Comprehensive textbook of PSYCHIATRY by Kaplan and Saddocks.

2. OXFORD TEXTBOOK OF PSYCHIATRY

3. DSM 5 AND ICD 10

4.SYNOPSIS OF PSYCHIATRY BY PSYCHIATRY

VALUE ADDED COURSE

1. Name of the programme & Code

Alcohol dependence and de-addiction

2. Duration & Period

April –June 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Alcohol dependence and de-addiction - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 Time - April –June 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- APRIL –JUNE 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PSYC09	**Alcohol dependence and de-addiction**	Dr. SRIDHAR Dr. Arun	FINAL YEAR	15 students APRIL - JUNE 2019

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON
1. **Dr..SRIDHAR**
2. **Dr.Arun**

COORDINATOR
Dr.G. Jayalakshmi

ALCOHOL DEADDICTION



PARTICIPANT HAND BOOK

BIHER SLIMS

COURSE DETAILS

Particulars	**Description**
Course Title	Alcohol deaddiction
Course Code	PSYC09
Objective	1. Introduction 2. Prevalence 3. Diagnostic Criteria 4. Subtypes 5. Co-Morbidities 6. Dependence 7. Intoxication 8. Withdrawal 9. Delirium 10. Treatment And Rehabilitation 11. Alcoholic Anonymous
Further learning opportunities	Alcohol deaddiction
Key Competencies	On successful completion of the course the students will have knowledge on deaddiction
Target Student	Final year MBBS Students
Duration	30hrs Every February – May 2019
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Multiple choice questions

Men and women with higher education and income are most likely to imbibe, and, among religious denominations, Jews have the highest proportion who consume alcohol but among the lowest rates of alcohol dependence. Other ethnicities, such as the Irish, have higher rates of severe alcohol problems, but they also have significantly higher rates of abstentions. Some estimates show that more than 60 percent of men and women in some Native American and Inuit tribes have been alcohol dependent at some time. In the United States, the average adult consumes 2.2 gallons of absolute alcohol a year, a decrease from 2.7 gallons per capita in 1981.

Drinking alcohol-containing beverages is generally considered an acceptable habit in the United States. About 90 percent of all US residents have had an alcohol-containing drink at least once in their lives, and about 51 percent of all US adults are current users of alcohol.

After heart disease and cancer, alcohol-related disorders constitute the third largest health problem in the United States today. Beer accounts for about one half of all alcohol consumption, liquor for about one third, and wine for about one sixth. About 30 to 45 percent of all adults in the United States have had at least one transient episode of an alcohol-related problem, usually an alcohol-induced amnestic episode (e.g., a blackout), driving a motor vehicle while intoxicated, or missing school or work because of excessive drinking. About 10 percent of women and 20 percent of men have met the diagnostic criteria for alcohol abuse during their lifetimes, and 3 to 5 percent of women and 10 percent of men have met the diagnostic criteria for the more serious diagnosis of alcohol dependence during their lifetimes. About 200,000 deaths each year are directly related to alcohol abuse. The common causes of death among persons with the alcohol-related disorders are suicide, cancer, heart disease, and hepatic disease. Although persons involved in automotive fatalities do not always meet the diagnostic criteria for an alcohol-related disorder, drunk drivers are involved in about 50 percent of all automotive fatalities, and this percentage increases to about 75 percent when only accidents occurring in the late evening are considered. Alcohol use and alcohol-related disorders are associated with about 50 percent of all homicides and 25 percent of all suicides. Alcohol abuse reduces life expectancy by about 10 years, and alcohol leads all other substances in substance-related deaths. Table 20.2-2 lists other epidemiological data about alcohol use.

Table 20.2-2
Epidemiological Data for Alcohol-Related Disorders
COMORBIDITY
The psychiatric diagnoses most commonly associated with the alcohol-related disorders are other substance-related disorders, antisocial personality disorder, mood disorders, and anxiety disorders. Although the data are somewhat controversial, most suggest that persons with alcohol-related disorders have a markedly higher suicide rate than the general population.

Antisocial Personality Disorder
A relation between antisocial personality disorder and alcohol-related disorders has frequently been reported. Some studies suggest that antisocial personality disorder is particularly common in men with an alcohol-related disorder and can precede the development of the alcohol-related disorder. Other studies, however, suggest that antisocial personality disorder and alcohol-related disorders are completely distinct entities that are not causally related.

Mood Disorders
About 30 to 40 percent of persons with an alcohol-related disorder meet the diagnostic criteria for major depressive disorder sometime during their lifetimes. Depression is more common in women than in men with these disorders. Several studies reported that depression is likely to occur in patients with alcohol-related disorders who have a high daily consumption of alcohol and a family history of alcohol abuse. Persons with alcohol-related disorders and major depressive disorder are at great risk for attempting suicide and are likely to have other substance-related disorder diagnoses. Some clinicians recommend antidepressant drug therapy for depressive symptoms that remain after 2 to 3 weeks of sobriety. Patients with bipolar I disorder are thought to be at risk for developing an alcohol-related disorder; they may use alcohol to self-medicate their manic episodes. Some studies have shown that persons with both alcohol-related disorder and depressive disorder diagnoses have concentrations of dopamine metabolites (homovanillic acid) and γ-aminobutyric acid (GABA) in their cerebrospinal fluid (CSF).

Anxiety Disorders
Many persons use alcohol for its e□cacy in alleviating anxiety. Although the comorbidity between alcohol-related disorders and mood disorders is fairly widely recognized, it is less

well known that perhaps 25 to 50 percent of all persons with alcohol-related disorders also meet the diagnostic criteria for an anxiety disorder. Phobias and panic disorder are
particularly frequent comorbid diagnoses in these patients. Some data indicate that alcohol may be used in an attempt to self-medicate symptoms of agoraphobia or social phobia,
but an alcohol-related disorder is likely to precede the development of panic disorder or generalized anxiety disorder.

Suicide

Most estimates of the prevalence of suicide among persons with alcohol-related disorders range from 10 to 15 percent, although alcohol use itself may be involved in a much higher
percentage of suicides. Some investigators have questioned whether the suicide rate among persons with alcohol-related disorders is as high as the numbers suggest. Factors that
have been associated with suicide among persons with alcohol-related disorders include the presence of a major depressive episode, weak psychosocial support systems, a serious
coexisting medical condition, unemployment, and living alone.

ETIOLOGY

Many factors a□ect the decision to drink, the development of temporary alcohol-related di□culties in the teenage years and the 20s, and the
development of alcohol dependence. The initiation of alcohol intake probably depends largely on social, religious, and psychological
factors, although genetic characteristics might also contribute. The factors that in□uence the decision to drink or those that contribute to
temporary problems might differ, however, from those that add to the risk for the severe, recurring problems of alcohol dependence.

A similar interplay between genetic and environmental in□uences contributes to many medical and psychiatric conditions, and, thus, a
review of these factors in alcoholism o□ers information about complex genetic disorders overall. Dominant or recessive genes, although
important, explain only relatively rare conditions. Most disorders have some level of genetic predisposition that usually relates to a series of
different genetically influenced characteristics, each of which increases or decreases the risk for the disorder.

It is likely that a series of genetic in□uences combine to explain approximately 60 percent of the proportion of risk for alcoholism, with
environment responsible for the remaining proportion of the variance. The divisions o□ered in this section, therefore, are more heuristic
than real, because it is the combination of a series of psychological, sociocultural, biological, and other factors that are responsible for the
development of severe, repetitive alcohol-related life problems.

Psychological Theories

A variety of theories relate to the use of alcohol to reduce tension, increase feelings of power, and decrease the e□ects of psychological pain. Perhaps the greatest interest has been paid to the observation that people with alcohol-related problems often report that alcohol decreases their feelings of nervousness and helps them cope with the day-to-day stresses of life. The psychological theories are built, in part, on the observation among nonalcoholic people that the intake of low doses of alcohol in a tense social setting or after a di□cult day can be associated with an enhanced feeling of well-being and an improved ease of interactions. In high doses, especially at falling blood alcohol levels, however, most measures of muscle tension and psychological feelings of nervousness and tension are increased. Thus, tension-reducing e□ects of this drug might have an impact most on light to moderate drinkers or add to the relief of withdrawal symptoms, but play a minor role in causing alcoholism. The theories that focus on alcohol's potential to enhance feelings of being powerful and sexually attractive and to decrease the effects of psychological pain are difficult to evaluate definitively.

Psychodynamic Theories

Perhaps related to the disinhibiting or anxiety-lowering e□ects of lower doses of alcohol is the hypothesis that some people may use this drug to help them deal with self-punitive harsh superegos and to decrease unconscious stress levels. In addition, classic psychoanalytical theory hypothesizes that at least some alcoholic people may have become □xated at the oral stage of development and use alcohol to relieve their frustrations by taking the substance by mouth. Hypotheses regarding arrested phases of psychosexual development, although heuristically useful, have had little e□ect on the usual treatment approaches and are not the focus of extensive ongoing research. Similarly, most studies have not been able to document an "addictive personality" present in most alcoholics and associated with a propensity to lack control of intake of a wide range of substances and foods. Although pathological scores on personality tests are often seen during intoxication, withdrawal, and early recovery, many of these characteristics are not found to predate alcoholism, and most disappear with abstinence. Similarly, prospective studies of children of alcoholics who themselves have no co-occurring disorders usually document high risks mostly for

alcoholism. As is described later in this text, one partial exception occurs with the extreme levels of impulsivity seen in the 15 to 20 percent of alcoholic men with antisocial
personality disorder, because they have high risks for criminality, violence, and multiple substance dependencies.

Behavioral Theories

Expectations about the rewarding e□ects of drinking, cognitive attitudes toward responsibility for one's behavior, and subsequent reinforcement after alcohol intake all contribute to
the decision to drink again after the □rst experience with alcohol and to continue to imbibe despite problems. These issues are important in e□orts to modify drinking behaviors in
the general population, and they contribute to some important aspects of alcoholic rehabilitation.

Sociocultural Theories

Sociocultural theories are often based on extrapolations from social groups that have high and low rates of alcoholism. Theorists hypothesize that ethnic groups, such as Jews, who
introduce children to modest levels of drinking in a family atmosphere and eschew drunkenness have low rates of alcoholism. Some other groups, such as Irish men or some
American Indian tribes with high rates of abstention but a tradition of drinking to the point of drunkenness among drinkers, are believed to have high rates of alcoholism. These
theories, however, often depend on stereotypes that tend to be erroneous, and prominent exceptions to these rules exist. For example, some theories based on observations of the
Irish and the French have incorrectly predicted high rates of alcoholism among the Italians.

Yet, environmental events, presumably including cultural factors, account for as much as 40 percent of the alcoholism risk. Thus, although these are di□cult to study, it is likely
that cultural attitudes toward drinking, drunkenness, and personal responsibility for consequences are important contributors to the rates of alcohol-related problems in a society. In
the □nal analysis, social and psychological theories are probably highly relevant, because they outline factors that contribute to the onset of drinking, the development of temporary
alcohol-related life difficulties, and even alcoholism. The problem is how to gather relatively definitive data to support or refute the theories.

Childhood History

Researchers have identi□ed several factors in the childhood histories of persons with later alcohol-related disorders and in children at high

risk for having an alcohol-related disorder because one or both of their parents are a□ected. In experimental studies, children at high risk for alcohol-related disorders have been found to possess, on average, a range of de□cits on neurocognitive testing, low amplitude of the P300 wave on evoked potential testing, and a variety of abnormalities on electroencephalography (EEG) recordings. Studies of high-risk o□spring in their 20s have also shown a generally blunted e□ect of alcohol compared with that seen in persons whose parents have not been diagnosed with alcohol-related disorder. These □ndings suggest that a heritable biological brain function may predispose a person to an alcohol-related disorder. A childhood history of attention-deficit/hyperactivity disorder (ADHD), conduct disorder, or both, increases a child's risk for an alcohol-related disorder as an adult. Personality disorders, especially antisocial personality disorder, as noted earlier, also predispose a person to an alcohol-related disorder.

Genetic Theories

Importance of Genetic Influences. Four lines of evidence support the conclusion that alcoholism is genetically influenced. First, a threefold to fourfold increased risk for severe alcohol problems is seen in close relatives of alcoholic people. The rate of alcohol problems increases with the number of alcoholic relatives, the severity of their illness, and the closeness of their genetic relationship to the person under study. The family investigations do little to separate the importance of genetics and environment, and the second approach, twin studies, takes the data a step further. The rate of similarity, or concordance, for severe alcohol-related problems is significantly higher in identical twins of alcoholic individuals than in fraternal twins in most investigations, which estimate that genes explain 60 percent of the variance, with the remainder relating to nonshared, probably adult environmental influences. Third, the adoption-type studies have all revealed a significantly enhanced risk for alcoholism in the offspring of alcoholic parents, even when the children had been separated from their biological parents close to birth and raised without any knowledge of the problems within the biological family. The risk for severe alcohol-related difficulties is not further enhanced by being raised by an alcoholic adoptive family. Finally, studies in animals support the importance of a variety of yet-to-be-identified genes in the free-choice use of alcohol, subsequent levels of intoxication, and some consequences.

EFFECTS OF ALCOHOL

The term *alcohol* refers to a large group of organic molecules that have a hydroxyl group (-OH) attached to a saturated carbon atom. Ethyl

alcohol, also called *ethanol,* is the common form of alcohol; sometimes referred to as *beverage alcohol,* ethyl alcohol is used for drinking.
The chemical formula for ethanol is CH3-CH2-OH.
The characteristic tastes and □avors of alcohol-containing beverages result from their methods of production, which produce various congeners in the □nal product, including
methanol, butanol, aldehydes, phenols, tannins, and trace amounts of various metals. Although the congeners may confer some di□erential psychoactive e□ects on the various
alcohol-containing beverages, these di□erences are minimal compared with the e□ects of ethanol itself. A single drink is usually considered to contain about 12 g of ethanol, which
is the content of 12 ounces of beer (7.2 proof, 3.6 percent ethanol in the United States), one 4-ounce glass of nonforti□ed wine, or 1 to 1.5 ounces of an 80-proof (40 percent
ethanol) liquor (e.g., whiskey or gin). In calculating patients' alcohol intake, however, clinicians should be aware that beers vary in their alcohol content, that beers are available in
small and large cans and mugs, that glasses of wine range from 2 to 6 ounces, and that mixed drinks at some bars and in most homes contain 2 to 3 ounces of liquor. Nonetheless,
using the moderate sizes of drinks, clinicians can estimate that a single drink increases the blood alcohol level of a 150-pound man by 15 to 20 mg/dL, which is about the
concentration of alcohol that an average person can metabolize in 1 hour.
The possible bene□cial e□ects of alcohol have been publicized, especially by the makers and the distributors of alcohol. Most attention has been focused on some epidemiological
data that suggest that one or two glasses of red wine each day lower the incidence of cardiovascular disease; these findings, however, are highly controversial.

Absorption

About 10 percent of consumed alcohol is absorbed from the stomach, and the remainder from the small intestine. Peak blood concentration of alcohol is reached in 30 to 90
minutes and usually in 45 to 60 minutes, depending on whether the alcohol was ingested on an empty stomach (which enhances absorption) or with food (which delays absorption).
The time to peak blood concentration also depends on the time during which the alcohol was consumed; rapid drinking reduces the time to peak concentration, slower drinking

increases it. Absorption is most rapid with beverages containing 15 to 30 percent alcohol (30 to 60 proof). There is some dispute about whether carbonation (e.g., in champagne
and in drinks mixed with seltzer) enhances the absorption of alcohol.
The body has protective devices against inundation by alcohol. For example, if the concentration of alcohol in the stomach becomes too high, mucus is secreted and the pyloric
valve closes. These actions slow the absorption and keep the alcohol from passing into the small intestine, where there are no signi□cant restraints on absorption. Thus, a large
amount of alcohol can remain unabsorbed in the stomach for hours. Furthermore, pylorospasm often results in nausea and vomiting.
Once alcohol is absorbed into the bloodstream, it is distributed to all body tissues. Because alcohol is uniformly dissolved in the body's water, tissues containing a high
proportion of water receive a high concentration of alcohol. The intoxicating e□ects are greater when the blood alcohol concentration is rising than when it is falling (the Mellanby
effects). For this reason, the rate of absorption bears directly on the intoxication response.

Metabolism

About 90 percent of absorbed alcohol is metabolized through oxidation in the liver; the remaining 10 percent is excreted unchanged by the kidneys and lungs. The rate of oxidation
by the liver is constant and independent of the body's energy requirements. The body can metabolize about 15 mg/dL per hour, with a range of 10 to 34 mg/dL per hour. That is, the
average person oxidizes three fourths of an ounce of 40 percent (80 proof) alcohol in an hour. In persons with a history of excessive alcohol consumption, upregulation of the
necessary enzymes results in rapid alcohol metabolism.
Alcohol is metabolized by two enzymes: alcohol dehydrogenase (ADH) and aldehyde dehydrogenase. ADH catalyzes the conversion of alcohol into acetaldehyde, which is a toxic
compound; aldehyde dehydrogenase catalyzes the conversion of acetaldehyde into acetic acid. Aldehyde dehydrogenase is inhibited by disul□ram (Antabuse), often used in the
treatment of alcohol-related disorders. Some studies have shown that women have a lower ADH blood content than men; this fact may account for woman's tendency to become
more intoxicated than men after drinking the same amount of alcohol. The decreased function of alcohol-metabolizing enzymes in some Asian persons can also lead to easy

intoxication and toxic symptoms.

Effects on the Brain

Biochemistry. In contrast to most other substances of abuse with identified receptor targets—such as the *N*-methyl-D-aspartate (NMDA) receptor of phencyclidine (PCP)—no single molecular target has been identified as the mediator for the effects of alcohol. The longstanding theory about the biochemical effects of alcohol concerns its effects on the membranes of neurons. Data support the hypothesis that alcohol produces its effects by intercalating itself into membranes and, thus, increasing fluidity of the membranes with short-term use. With longterm use, however, the theory hypothesizes that the membranes become rigid or stiff. The fluidity of the membranes is critical to normal functioning of receptors, ion channels, and other membrane-bound functional proteins. In recent studies, researchers have attempted to identify specific molecular targets for the effects of alcohol. Most attention has been focused on the effects of alcohol at ion channels.

Specifically, studies have found that alcohol ion channel activities associated with the nicotinic acetylcholine, serotonin 5-hydroxytryptamine3 (5-HT3), and GABA type A (GABAA) receptors are enhanced by alcohol, whereas ion channel activities associated with glutamate receptors and voltage-gated calcium channels are inhibited.

Behavioral Effects. As the net result of the molecular activities, alcohol functions as a depressant much like the barbiturates and the benzodiazepines, with which alcohol has some cross-tolerance and cross-dependence. At a level of 0.05 percent alcohol in the blood, thought, judgment, and restraint are loosened and sometimes disrupted. At a concentration of 0.1 percent, voluntary motor actions usually become perceptibly clumsy. In most states, legal intoxication ranges from 0.1 to 0.15 percent blood alcohol level. At 0.2 percent, the function of the entire motor area of the brain is measurably depressed, and the parts of the brain that control emotional behavior are also affected. At 0.3 percent, a person is commonly confused or may become stuporous; at 0.4 to 0.5 percent, the person falls into a coma. At higher levels, the primitive centers of the brain that control breathing and heart rate are affected, and death ensues secondary to direct respiratory depression or the aspiration of vomitus. Persons with long-term histories of alcohol abuse, however, can tolerate much higher concentrations of alcohol than can alcohol-naïve persons; their alcohol tolerance may cause them to falsely appear less intoxicated than they really are.

Sleep Effects. Although alcohol consumed in the evening usually increases the ease of falling asleep (decreased sleep latency), alcohol

also has adverse effects on sleep architecture. Specifically, alcohol use is associated with a decrease in rapid eye movement sleep (REM or dream sleep) and deep sleep (stage 4) and more sleep fragmentation, with more and longer episodes of awakening. Therefore, the idea that drinking alcohol helps persons fall asleep is a myth.

Other Physiological Effects

Liver. The major adverse effects of alcohol use are related to liver damage. Alcohol use, even as short as week-long episodes of increased drinking, can result in an accumulation of fats and proteins, which produce the appearance of a fatty liver, sometimes found on physical examination as an enlarged liver. The association between fatty infiltration of the liver and serious liver damage remains unclear. Alcohol use, however, is associated with the development of alcoholic hepatitis and hepatic cirrhosis.

Gastrointestinal System. Long-term heavy drinking is associated with developing esophagitis, gastritis, achlorhydria, and gastric ulcers. The development of esophageal varices can accompany particularly heavy alcohol abuse; the rupture of the varices is a medical emergency often resulting in death by exsanguination. Disorders of the small intestine occasionally occur, and pancreatitis, pancreatic insufficiency, and pancreatic cancer are also associated with heavy alcohol use. Heavy alcohol intake can interfere with the normal processes of food digestion and absorption; as a result, consumed food is inadequately digested. Alcohol abuse also appears to inhibit the intestine's capacity to absorb various nutrients, such as vitamins and amino acids. This effect, coupled with the often poor dietary habits of those with alcohol-related disorders, can cause serious vitamin deficiencies, particularly of the B vitamins.

Other Bodily Systems. Significant intake of alcohol has been associated with increased blood pressure, dysregulation of lipoprotein and triglyceride metabolism, and increased risk for myocardial infarction and cerebrovascular disease. Alcohol has been shown to affect the hearts of nonalcoholic persons who do not usually drink, increasing the resting cardiac output, the heart rate, and the myocardial oxygen consumption. Evidence indicates that alcohol intake can adversely affect the hematopoietic system and can increase the incidence of cancer, particularly head, neck, esophageal, stomach, hepatic, colonic, and lung cancer. Acute intoxication may also be associated with hypoglycemia, which, when unrecognized, may be responsible for some of the sudden deaths of persons who are intoxicated. Muscle weakness is another side effect of alcoholism. Recent evidence shows that alcohol intake raises the blood concentration of estradiol in women. The increase in estradiol correlates with the blood alcohol level.

Laboratory Tests. The adverse effects of alcohol appear in common laboratory tests, which can be useful diagnostic aids in identifying persons with alcohol-related disorders. The γ-glutamyl transpeptidase levels are high in about 80 percent of those with alcohol-related disorders, and the mean corpuscular volume (MCV) is high in about 60 percent, more so in women than in men. Other laboratory test values that may be high in association with alcohol abuse are those of uric acid, triglycerides, aspartate aminotransferase (AST), and alanine aminotransferase (ALT).

Drug Interactions

The interaction between alcohol and other substances can be dangerous, even fatal. Certain substances, such as alcohol and phenobarbital (Luminal), are metabolized by the liver, and their prolonged use can lead to acceleration of their metabolism. When persons with alcoholrelated disorders are sober, this accelerated metabolism makes them unusually tolerant to many drugs such as sedatives and hypnotics; when they are intoxicated, however, these drugs compete with the alcohol for the same detoxi□cation mechanisms, and potentially toxic concentrations of all involved substances can accumulate in the blood.

The e□ects of alcohol and other central nervous system (CNS) depressants are usually synergistic. Sedatives, hypnotics, and drugs that relieve pain, motion sickness, head colds, and allergy symptoms must be used with caution by persons with alcohol-related disorders.

Narcotics depress the sensory areas of the cerebral cortex and can produce pain relief, sedation, apathy, drowsiness, and sleep; high doses can result in respiratory failure and death. Increasing the dosages of sedative-hypnotic drugs, such as chloral hydrate (Noctec) and benzodiazepines, especially when they are combined with alcohol, produces a range of e□ects from sedation to motor and intellectual impairment to stupor, coma, and death. Because sedatives and other psychotropic drugs can potentiate the e□ects of alcohol, patients should be instructed about the dangers of combining CNS depressants and alcohol, particularly when they are driving or operating machinery.

DISORDERS

Alcohol Use Disorder

Diagnosis and Clinical Features. In the fifth edition of *Diagnostic and Statistical Manual of Mental* Disorders (DSM-5), all substance use disorders use the same general criteria for dependence and abuse (see Section 20.1). A need for daily use of large amounts of alcohol for adequate functioning, a regular pattern of heavy drinking limited to weekends, and long periods of sobriety interspersed with binges of heavy alcohol intake lasting for weeks or months strongly suggest alcohol dependence and alcohol abuse. The drinking patterns are often

associated with certain behaviors: the inability to cut down or stop drinking; repeated efforts to control or reduce excessive drinking by
"going on the wagon" (periods of temporary abstinence) or by restricting drinking to certain times of the day; binges (remaining intoxicated
throughout the day for at least 2 days); occasional consumption of a fifth of spirits (or its equivalent in wine or beer); amnestic periods for
events occurring while intoxicated (blackouts); the continuation of drinking despite a serious physical disorder that the person knows is
exacerbated by alcohol use; and drinking nonbeverage alcohol, such as fuel and commercial products containing alcohol. In addition,
persons with alcohol dependence and alcohol abuse show impaired social or occupational functioning because of alcohol use (e.g., violence
while intoxicated, absence from work, job loss), legal difficulties (e.g., arrest for intoxicated behavior and traffic accidents while intoxicated),
and arguments or difficulties with family members or friends about excessive alcohol consumption.
Mark, a 45-year-old divorced man, was examined in a hospital emergency room because he had been confused and unable to care for
himself of the preceding 3 days. His brother, who brought him to the hospital, reported that the patient has consumed large quantities of
beer and wine daily for more than 5 years. His home and job lives were reasonably stable until his divorce 5 years prior. The brother
indicated that Mark's drinking pattern since the divorce has been approximately 5 beers and a fourth of wine a day. Mark often
experienced blackouts from drinking and missed days of work frequently. As a result, Mark has lost several jobs in the past 5 years.
Although he usually provides for himself marginally with small jobs, 3 days earlier he ran out of money and alcohol and resorted to
panhandling on the streets for cash to buy food. Mark had been poorly nourished, having one meal per day at best and was evidently
relying on beer as his prime source of nourishment.
On examination, Mark alternates between apprehension and chatty, super□cial warmth. He is pretty keyed up and talks constantly in a
rambling and unfocused manner. His recognition of the physician varies; at times he recognizes him and other times he becomes confused
and believes the doctor to be his other brother who lives in another state. On two occasions he referred to the physician by said brother's
name and asked when he arrived in town, evidently having lost track of the interview up to that point. He has a gross hand tremor at rest
and is disoriented to time. He believes he's in a parking lot rather than a hospital. E□orts at memory and calculation testing fail because
Mark's attention shifts so rapidly.

Subtypes of Alcohol Dependence. Various researchers have attempted to divide alcohol dependence into subtypes based primarily on phenomenological characteristics. One recent classification notes that type A alcohol dependence is characterized by late onset, few childhood risk factors, relatively mild dependence, few alcohol-related problems, and little psychopathology. Type B alcohol dependence is characterized by many childhood risk factors, severe dependence, an early onset of alcohol-related problems, much psychopathology, a strong family history of alcohol abuse, frequent polysubstance abuse, a long history of alcohol treatment, and a lot of severe life stresses.

Some researchers have found that type A persons who are alcohol dependent may respond to interactional psychotherapies, whereas type B persons who are alcohol dependent may respond to training in coping skills.

Other subtyping schemes of alcohol dependence have received fairly wide recognition in the literature. One group of investigators proposed three subtypes: earlystage problem drinkers, who do not yet have complete alcohol dependence syndromes; a□liative drinkers, who tend to drink daily in moderate amounts in social settings; and schizoid-isolated drinkers, who have severe dependence and tend to drink in binges and often alone.

Another investigator described gamma alcohol dependence, which is thought to be common in the United States and represents the alcohol dependence seen in those who are active in Alcoholics Anonymous (AA). This variant concerns control problems in which persons are unable to stop drinking once they start. When drinking is terminated as a result of ill health or lack of money, these persons can abstain for varying periods. In delta alcohol dependence, perhaps more common in Europe than in the United States, persons who are alcohol dependent must drink a certain amount each day but are unaware of a lack of control. The alcohol use disorder may not be discovered until a person who must stop drinking for some reason exhibits withdrawal symptoms.

Another researcher has suggested a *type I, male-limited* variety of alcohol dependence, characterized by late onset, more evidence of psychological than of physical dependence, and the presence of guilt feelings. *Type II, male-limited* alcohol dependence is characterized by onset at an early age, spontaneous seeking of alcohol for consumption, and a socially disruptive set of behaviors when intoxicated.

Four subtypes of alcoholism were postulated by still another investigator. The □rst is *antisocial alcoholism,* typically with a predominance in men, a poor prognosis, early onset of alcohol-related problems, and a close association with antisocial personality disorder. The second is

developmentally cumulative alcoholism, with a primary tendency for alcohol abuse that is exacerbated with time as cultural expectations foster increased opportunities to drink. The third is *negative-a□ect alcoholism,* which is more common in women than in men; according to this hypothesis, women are likely to use alcohol for mood regulation and to help ease social relationships. The fourth is *developmentally limited alcoholism,* with frequent bouts of consuming large amounts of alcohol; the bouts become less frequent as persons age and respond to the increased expectations of society about their jobs and families.

Alcohol Intoxication

The DSM-5 diagnostic criteria for alcohol intoxication (also called simple drunkenness) are based on evidence of recent ingestion of ethanol, maladaptive behavior, and at least one of several possible physiological correlates of intoxication (Table 20.2-3). As a conservative approach to identifying blood levels that are likely to have major e□ects on driving abilities, the legal de□nition of intoxication in most states in the United States requires a blood concentration of 80 or 100 mg ethanol per deciliter of blood (mg/dL), which is the same as 0.08 to 0.10 g/dL. The following is an outline of the rough estimates of the levels of impairment likely to be seen at various blood alcohol concentrations, for most people. Evidence of behavioral changes, a slowing in motor performance, and a decrease in the ability to think clearly occurs at doses as low as 20 to 30 mg/dL, as shown in Table 20.2-4. Blood concentrations between 100 and 200 mg/dL are likely to increase the impairment in coordination and judgment to severe problems with coordination (ataxia), increasing lability of mood, and progressively greater levels of cognitive deterioration. Anyone who does not show signi□cant levels of impairment in motor and mental performance at approximately 150 mg/dL probably has signi□cant pharmacodynamic tolerance. In that range, most people without signi□cant tolerance also experience relatively severe nausea and vomiting. With blood alcohol concentrations in the 200 to 300 mg/dL range, the slurring of speech is likely to become more intense, and memory impairment (*anterograde amnesia* or *alcoholic blackouts*) becomes pronounced. Further increases in blood alcohol concentration result in the □rst level of anesthesia, and the nontolerant person who reaches 400 mg/dL or more risks respiratory failure, coma, and death.

Table 20.2-3

Signs of Alcohol Intoxication

Table 20.2-4

Impairment Likely to be Seen at Different Blood Alcohol Concentrations

Alcohol Withdrawal

Alcohol withdrawal, even without delirium, can be serious; it can include seizures and autonomic hyperactivity. Conditions that may predispose to, or aggravate, withdrawal symptoms include fatigue, malnutrition, physical illness, and depression. The DSM-5 criteria for alcohol withdrawal require the cessation or reduction of alcohol use that was heavy and prolonged as well as the presence of speci□c physical or neuropsychiatric symptoms. The diagnosis also allows for the speci□cation "with perceptual disturbances." One positron emission tomography (PET) study of blood □ow during alcohol withdrawal in otherwise healthy persons with alcohol dependence reported a globally low rate of metabolic activity, although, with further inspection of the data, the authors concluded that activity was especially low in the left parietal and right frontal areas.

The classic sign of alcohol withdrawal is tremulousness, although the spectrum of symptoms can expand to include psychotic and perceptual symptoms (e.g., delusions and hallucinations), seizures, and the symptoms of delirium tremens (DTs), called alcohol delirium in DSM-5. Tremulousness (commonly called the "shakes" or the "jitters") develops 6 to 8 hours after the cessation of drinking, the psychotic and perceptual symptoms begin in 8 to 12 hours, seizures in 12 to 24 hours, and DTs anytime during the □rst 72 hours, although physicians should watch for the development of DTs for the □rst week of withdrawal. The syndrome of withdrawal sometimes skips the usual progression and, for example, goes directly to DTs.

The tremor of alcohol withdrawal can be similar to either physiological tremor, with a continuous tremor of great amplitude and of more than 8 Hz, or familial tremor, with bursts of tremor activity slower than 8 Hz. Other symptoms of withdrawal include general irritability, gastrointestinal symptoms (e.g., nausea and vomiting), and sympathetic autonomic hyperactivity, including anxiety, arousal, sweating, facial flushing, mydriasis, tachycardia, and mild hypertension. Patients experiencing alcohol withdrawal are generally alert but may startle easily.

Twenty-nine-year-old Mr. F had been a heavy drinker for 8 years. One evening after work, he started drinking with friends and drank throughout the evening. He fell asleep in the early morning hours and upon awakening had a strong desire to drink and decided not to attend work. He had several Bloody Marys instead of food because food did not appeal to him. He went to a local bar in the afternoon and consumed large quantities of beer. That evening he met with some friends and continued to drink.

This drinking pattern continued for the next week. The beginning of the following week he attempted to have a cup of co□ee and

found that he hands were shaking so much that he could not get the cup to his mouth to drink. He eventually managed to pour himself some wine in a glass and drank as much as he could. His hands then became less shaky, but he now felt nauseous and began having dry heaves. He tried to drink repeatedly but he could not keep the alcohol down. He felt very ill and anxious so he contacted his physician who recommended he report to a hospital.

Upon evaluation, Mr. F was alert. He had a marked resting and intention tremor of the hands, and his tongue and eyelids were tremulous. He was oriented and had no memory impairment. When inquired about his drinking, Mr. F admits to drinking several drinks each day for the past 8 years, but claims that his drinking never interfered with his work or his relations with colleagues or friends. He denies having any aftere□ects from his drinking other than mild hangovers. He denies ever having a binge such as this before and denies ever needing to drink daily in order to function adequately. He admits, however, that he has never tried to reduce or stop drinking.

Withdrawal Seizures. Seizures associated with alcohol withdrawal are stereotyped, generalized, and tonic–clonic in character. Patients often have more than one seizure 3 to 6 hours after the first seizure. Status epilepticus is relatively rare and occurs in less than 3 percent of patients. Although anticonvulsant medications are not required in the management of alcohol withdrawal seizures, the cause of the seizures is difficult to establish when a patient is first assessed in the emergency room; thus, many patients with withdrawal seizures receive anticonvulsant medications, which are then discontinued once the cause of the seizures is recognized. Seizure activity in patients with known alcohol abuse histories should still prompt clinicians to consider other causative factors, such as head injuries, CNS infections, CNS neoplasms, and other cerebrovascular diseases; long-term severe alcohol abuse can result in hypoglycemia, hyponatremia, and hypomagnesemia—all of which can also be associated with seizures.

Treatment. The primary medications to control alcohol withdrawal symptoms are the benzodiazepines (Table 20.2-5). Many studies have found that benzodiazepines help control seizure activity, delirium, anxiety, tachycardia, hypertension, diaphoresis, and tremor associated with alcohol withdrawal. Benzodiazepines can be given either orally or parenterally; neither diazepam (Valium) nor chlordiazepoxide (Librium), however, should be given intramuscularly (IM) because of their erratic absorption by this route. Clinicians must titrate the dosage of the benzodiazepine, starting with a high dosage and lowering the dosage as the patient recovers. Sufficient

benzodiazepines should be given to keep patients calm and sedated but not so sedated that they cannot be aroused for clinicians to perform appropriate procedures, including neurological examinations.

Table 20.2-5

Drug Therapy for Alcohol Intoxication and Withdrawal

Although benzodiazepines are the standard treatment for alcohol withdrawal, studies have shown that carbamazepine (Tegretol) in daily doses of 800 mg is as e□ective as benzodiazepines and has the added bene□t of minimal abuse liability. Carbamazepine use is gradually becoming common in the United States and Europe. The β-adrenergic receptor antagonists and clonidine (Catapres) have also been used to block the symptoms of sympathetic hyperactivity, but neither drug is an effective treatment for seizures or delirium.

Delirium

Diagnosis and Clinical Features. Patients with recognized alcohol withdrawal symptoms should be carefully monitored to prevent progression to alcohol withdrawal delirium, the most severe form of the withdrawal syndrome, also known as DTs. Alcohol withdrawal delirium is a medical emergency that can result in significant morbidity and mortality. Patients with delirium are a danger to themselves and to others. Because of the unpredictability of their behavior, patients with delirium may be assaultive or suicidal or may act on hallucinations or delusional thoughts as if they were genuine dangers. Untreated, DTs has a mortality rate of 20 percent, usually as a result of an intercurrent medical illness such as pneumonia, renal disease, hepatic insufficiency, or heart failure. Although withdrawal seizures commonly precede the development of alcohol withdrawal delirium, delirium can also appear unheralded. The essential feature of the syndrome is delirium occurring within 1 week after a person stops drinking or reduces the intake of alcohol. In addition to the symptoms of delirium, the features of alcohol intoxication delirium include autonomic hyperactivity such as tachycardia, diaphoresis, fever, anxiety, insomnia, and hypertension; perceptual distortions, most frequently visual or tactile hallucinations; and fluctuating levels of psychomotor activity, ranging from hyperexcitability to lethargy.

About 5 percent of persons with alcohol-related disorders who are hospitalized have DTs. Because the syndrome usually develops on the third hospital day, a patient admitted for an unrelated condition may unexpectedly have an episode of delirium, the □rst sign of a previously undiagnosed alcohol-related disorder. Episodes of DTs usually begin in a patient's 30s or 40s after 5 to 15 years of heavy drinking, typically of the binge type. Physical illness (e.g., hepatitis or pancreatitis) predisposes to the syndrome; a person in good physical

health rarely has DTs during alcohol withdrawal.

Mr. R, a 40-year-old man, was admitted to the orthopedic department of a general hospital after experiencing a fall down stairs and breaking his leg. On the third day of his hospital stay, he became increasingly nervous and started to tremble. He was unable to sleep at night, talked incoherently, and was obviously very anxious. Mr. R, when asked, denied an alcohol problem other than an occasional glass of wine.

When asked directly, his wife admitted that Mr. R drank large quantities of wine for over 4 years. During the previous year, his drinking would begin every evening when he came home from work and would not end until he fell asleep. On the evening of admittance, the fall occurred before he was able to consume any alcohol.

During the few weeks prior to his admittance, Mr. R had eaten very little. On several occasions, Mrs. R noticed that Mr. R was unable to recall even important events from the previous day. He had a car accident 3 years prior but without major injury. Mr. R had no other major health problems. His relationship with Mrs. R became very di□cult after he began drinking and Mrs. R was seriously contemplating divorce. Mr. R had a tense relationship with his four children and he often argued with them. Recently, the children tried to avoid Mr. R as much as possible.

On examination, Mr. R's speech was rambling and incoherent. He believed that he was still at work and that he had a job to □nish. At times he thought the physicians and nurses were his co-workers. At times he picked at bugs that he could see on his bed sheets. He was disoriented in time and was startled easily by sounds from outside the room. He sweat profusely and could not hold a glass without spilling some of the contents.

Treatment. The best treatment for DTs is prevention. Patients withdrawing from alcohol who exhibit withdrawal phenomena should receive a benzodiazepine, such as 25 to 50 mg of chlordiazepoxide every 2 to 4 hours until they seem to be out of danger. Once the delirium appears, however, 50 to 100 mg of chlordiazepoxide should be given every 4 hours orally, or lorazepam (Ativan) should be given intravenously (IV) if oral medication is not possible (Table 20.2-5). Antipsychotic medications that may reduce the seizure threshold in patients should be avoided. A high-calorie, high-carbohydrate diet supplemented by multivitamins is also important.

Physically restraining patients with the DTs is risky; they may □ght against the restraints to a dangerous level of exhaustion. When patients are disorderly and uncontrollable, a seclusion room can be used. Dehydration, often exacerbated by diaphoresis and fever, can be corrected

with □uids given by mouth or IV. Anorexia, vomiting, and diarrhea often occur during withdrawal. Antipsychotic medications should be avoided because they can reduce the seizure threshold in the patient. The emergence of focal neurological symptoms, lateralizing seizures, increased intracranial pressure, or evidence of skull fractures or other indications of CNS pathology should prompt clinicians to examine a patient for additional neurological disease. Nonbenzodiazepine anticonvulsant medication is not useful in preventing or treating alcohol withdrawal convulsions, although benzodiazepines are generally effective. Warm, supportive psychotherapy in the treatment of DTs is essential. Patients are often bewildered, frightened, and anxious because of their tumultuous symptoms, and skillful verbal support is imperative.

Alcohol-Induced Persisting Dementia

Alcohol-induced persisting dementia is a poorly studied, heterogeneous long-term cognitive problem that can develop in the course of alcoholism. Global decreases in intellectual functioning, cognitive abilities, and memory are observed, but recent memory di□culties are consistent with the global cognitive impairment, an observation that helps to distinguish this from alcohol-induced persisting amnestic disorder. Brain functioning tends to improve with abstinence, but perhaps half of all a□ected patients have long-term and even permanent disabilities in memory and thinking. Approximately 50 to 70 percent of these patients evidence increased size of the brain ventricles and shrinkage of the cerebral sulci, although these changes appear to be partially or completely reversible during the □rst year of complete abstinence.

Alcohol-Induced Persisting Amnestic Disorder

Diagnosis and Clinical Features. The essential feature of alcohol-induced persisting amnestic disorder is a disturbance in shortterm memory caused by prolonged heavy use of alcohol. Because the disorder usually occurs in persons who have been drinking heavily for many years, the disorder is rare in persons younger than age 35.

Wernicke-Korsakoff Syndrome. The classic names for alcohol-induced persisting amnestic disorder are Wernicke's encephalopathy (a set of acute symptoms) and Korsakoff's syndrome (a chronic condition). Whereas Wernicke's encephalopathy is completely reversible with treatment, only about 20 percent of patients with Korsakoff's syndrome recover. The pathophysiological connection between the two syndromes is thiamine deficiency, caused either by poor nutritional habits or by malabsorption problems. Thiamine is a cofactor for several important enzymes and may also be involved in conduction of the axon potential along the axon and in synaptic transmission. The

neuropathological lesions are symmetrical and paraventricular, involving the mammillary bodies, the thalamus, the hypothalamus, the midbrain, the pons, the medulla, the fornix, and the cerebellum.

Wernicke's encephalopathy, also called *alcoholic encephalopathy,* is an acute neurological disorder characterized by ataxia (a□ecting primarily the gait), vestibular dysfunction, confusion, and a variety of ocular motility abnormalities, including horizontal nystagmus, lateral orbital palsy, and gaze palsy. These eye signs are usually bilateral but not necessarily symmetrical. Other eye signs may include a sluggish reaction to light and anisocoria. Wernicke's encephalopathy may clear spontaneously in a few days or weeks or may progress into Korsakoff's syndrome.

Treatment. In the early stages, Wernicke's encephalopathy responds rapidly to large doses of parenteral thiamine, which is believed to be effective in preventing the progression into Korsakoff's syndrome. The dosage of thiamine is usually initiated at 100 mg by mouth two to three times daily and is continued for 1 to 2 weeks. In patients with alcohol-related disorders who are receiving IV administration of glucose solution, it is good practice to include 100 mg of thiamine in each liter of the glucose solution.

Korsako□'s syndrome is the chronic amnestic syndrome that can follow Wernicke's encephalopathy, and the two syndromes are believed to be pathophysiologically related. The cardinal features of Korsako□'s syndrome are impaired mental syndrome (especially recent memory) and anterograde amnesia in an alert and responsive patient. The patient may or may not have the symptom of confabulation. Treatment of Korsako□'s syndrome is also thiamine given 100 mg by mouth two to three times daily; the treatment regimen should continue for 3 to 12 months. Few patients who progress to Korsako□'s syndrome ever fully recover, although many have some improvement in their cognitive abilities with thiamine and nutritional support.

Blackouts. Blackouts are similar to episodes of transient global amnesia in that they are discrete episodes of anterograde amnesia that occur in association with alcohol intoxication. The periods of amnesia can be particularly distressing when persons fear that they have unknowingly harmed someone or behaved imprudently while intoxicated. During a blackout, persons have relatively intact remote memory but experience a specific short-term memory deficit in which they are unable to recall events that happened in the previous 5 or 10 minutes. Because their other intellectual faculties are well preserved, they can perform complicated tasks and appear normal to casual observers. The neurobiological mechanisms for alcoholic blackouts are now known at the molecular level; alcohol blocks the consolidation

of new memories into old memories, a process that is thought to involve the hippocampus and related temporal lobe structures.

Alcohol-Induced Psychotic Disorder

Diagnosis and Clinical Features. Approximately 3 percent of alcoholic persons experience auditory hallucinations or paranoid delusions in the context of heavy drinking or withdrawal. The most common auditory hallucinations are voices, but they are often unstructured. The voices are characteristically maligning, reproachful, or threatening, although some patients report that the voices are pleasant and nondisruptive. The hallucinations usually last less than a week, but during that week impaired reality testing is common. After the episode, most patients realize the hallucinatory nature of the symptoms.

Hallucinations after alcohol withdrawal are considered rare, and the syndrome is distinct from alcohol withdrawal delirium. The hallucinations can occur at any age, but usually appear in persons abusing alcohol for a long time. Although the hallucinations usually resolve within a week, some linger; in these cases, clinicians must consider other psychotic disorders in the di□erential diagnosis. Alcohol withdrawal-related hallucinations are di□erentiated from the hallucinations of schizophrenia by the temporal association with alcohol withdrawal, the absence of a classic history of schizophrenia, and their usually short-lived duration. Alcohol withdrawal-related hallucinations are differentiated from the DTs by the presence of a clear sensorium in patients.

Mr. G was a 40-year-old unemployed man living alone in a studio apartment and was brought to the hospital by the police. He contacted them complaining that he heard voices of men on the street below his window talking about him and threatening to kill him. He stated that every time he looked out the window the men had always disappeared.

Mr. G had a 15-year history of almost daily alcohol use. He was intoxicated each day and often experienced shakes upon awakening in the morning. On the previous day, he had only one glass of beer instead of his usual four because of gastrointestinal problems. He was fully alert and oriented.

Treatment. The treatment of alcohol withdrawal-related hallucinations is much like the treatment of DTs—benzodiazepines, adequate nutrition, and fluids, if necessary. If this regimen fails or for long-term cases, antipsychotics may be used.

Alcohol-Induced Mood Disorder

Heavy intake of alcohol over several days results in many of the symptoms observed in major depressive disorder, but the intense sadness

markedly improves within several days to 1 month of abstinence. Eighty percent of people with alcoholism report histories of intense depression, including 30 to 40 percent who were depressed for 2 or more weeks at a time. However, only 10 to 15 percent of alcoholic persons have ever had depression that meets the criteria for major depressive disorder when they have not been drinking heavily.

Even severe substance-induced depressions are likely to improve fairly rapidly with abstinence, without medication or intensive psychotherapy aimed at the depressive symptoms. A logical approach for these substance-induced conditions is to teach the patient how to best view and deal with the temporary sadness through education and cognitive-behavioral treatment, and to watch and wait at least 2 to 4 weeks before starting antidepressant medications.

A consultation was requested on a 42-year-old woman with alcohol dependence who complained of persisting severe depressive symptoms despite 5 days of abstinence. In the initial stage of the interview, she noted that she had "always been depressed" and felt that she "drank to cope with the depressive symptoms." Her current complaint included a prominent sadness that had persisted for several weeks, di□culties concentrating, initial and terminal insomnia, and a feeling of hopelessness and guilt. In an e□ort to distinguish between an alcohol-induced mood disorder and an independent major depressive episode, a time-line–based history was obtained. This focused on the age of onset of alcohol dependence, periods of abstinence that extended for several months or more since the onset of dependence, and the ages of occurrence of clear major depressive episodes lasting several weeks or more at a time. Despite this patient's original complaints, it became clear that there had been no major depressive episodes prior to her mid-20s when alcohol dependence began, and that during a 1-year period of abstinence related to the gestation and neonatal period of her son, her mood had signi□cantly improved. A provisional diagnosis of an alcohol-induced mood disorder was made. The patient was o□ered education, reassurance, and cognitive therapy to help her to deal with the depressive symptoms, but no antidepressant medications were prescribed. The depressive symptoms remained at their original intensity for several additional days and then began to improve. By approximately 3 weeks abstinent the patient no longer met criteria for a major depressive episode, although she demonstrated mood swings similar to dysphemia for several additional weeks. This case is a fairly typical example of an alcohol-induced mood disorder in an individual with alcohol dependence.

(Courtesy of Marc A. Shuckit, M.D.)

Alcohol-Induced Anxiety Disorder

Anxiety symptoms ful□lling the diagnostic criteria for alcohol-induced anxiety disorder are also common in the context of acute and protracted alcohol withdrawal. Almost 80 percent of alcoholic persons report panic attacks during at least one acute withdrawal episode; their complaints can be su□ciently intense for the clinician to consider diagnosing panic disorder. Similarly, during the □rst 4 weeks or so of abstinence, people with severe alcohol problems are likely to avoid some social situations for fear of being overwhelmed by anxiety (i.e., they have symptoms resembling social phobia); their problems can at times be severe enough to resemble agoraphobia. However, when psychological or physiological symptoms of anxiety are observed in alcoholic persons only in the context of heavy drinking or within the first several weeks or month of abstinence, the symptoms are likely to diminish and subsequently disappear with time alone.

A 48-year-old woman was referred for evaluation and treatment of her recent onset of panic attacks. These episodes occurred two to three times per week over the preceding 6 months, with each lasting typically between 10 and 20 minutes. Panic symptoms occurred regardless of levels of life stress and could not be explained by current medications or medical conditions. The workup included an evaluation of her laboratory test values, which revealed a carbohydrate-de□cient transferrin (CDT) level of 28 U/L, a uric acid level of 7.1 mg, and a γ-glutamyltransferase value of 47. All other blood tests were within normal limits.

The atypical age of onset of the panic attacks, along with the blood results, encouraged the clinician to probe further regarding the pattern of alcohol-related life problems with both the patient and, separately, her spouse. This step documented a history of alcohol dependence with an onset at approximately 35 years of age, with no evidence of panic disorder before that date. Nor did the patient have repetitive panic attacks beyond 2 weeks of abstinence during her frequent periods of nondrinking, which often lasted for 3 or 4 months. A working diagnosis of alcohol dependence with an alcohol-induced anxiety disorder characterized by panic attacks was made, and the patient was encouraged to abstain and was appropriately treated for possible withdrawal symptoms. Over the subsequent 3 weeks after a taper of benzodiazepines used for the treatment of withdrawal, the panic symptoms diminished in intensity and subsequently disappeared. (Courtesy of Marc A. Schuckit, M.D.)

Alcohol-Induced Sexual Dysfunction

The formal diagnosis of symptoms of sexual dysfunction associated with alcohol intoxication is alcohol-induced sexual dysfunction (*see* Section 17.2).

Alcohol-Induced Sleep Disorder

The diagnostic criteria for alcohol-induced sleep disorders with an onset during either alcohol intoxication or alcohol withdrawal are found in the sleep disorders section (see Section 16.2).

Unspecified Alcohol-Related Disorder

The diagnosis of unspeci□ed alcohol-related disorder is used for alcohol-related disorders that do not meet the diagnostic criteria for any of the other diagnoses.

Idiosyncratic Alcohol Intoxication

Whether there is such a diagnostic entity as idiosyncratic alcohol intoxication is under debate. Several well-controlled studies of persons who supposedly have the disorder have raised questions about the validity of the designation. The condition has been variously called pathologic, complicated, atypical, and paranoid alcohol intoxication; all these terms indicate that a severe behavioral syndrome develops rapidly after a person consumes a small amount of alcohol that would have minimal behavioral e□ects on most persons. The diagnosis is important in the forensic arena because alcohol intoxication is not generally accepted as a reason for judging persons not responsible for their activities.

Idiosyncratic alcohol intoxication, however, can be used in a person's defense if a defense lawyer can argue successfully that the defendant has an unexpected, idiosyncratic, pathological reaction to a minimal amount of alcohol.

In anecdotal reports, persons with idiosyncratic alcohol intoxication have been described as confused and disoriented and as experiencing illusions, transitory delusions, and visual hallucinations. Persons may display greatly increased psychomotor activity and impulsive, aggressive behavior. They can be dangerous to others and they may also exhibit suicidal ideation and make suicide attempts. The disorder, usually described as lasting for a few hours, terminates in prolonged sleep, and those a□ected cannot recall the episodes on awakening. The cause of the condition is unknown, but it is reported to be most common in persons with high levels of anxiety. According to one hypothesis, alcohol causes su□cient disorganization and loss of control to release aggressive impulses. Another suggestion is that brain damage, particularly encephalitic or traumatic damage, predisposes some persons to an intolerance for alcohol and thus to abnormal behavior after they ingest only small amounts. Other predisposing factors may include advancing age, using sedative-hypnotic drugs, and feeling fatigued. A person's behavior while intoxicated tends to be atypical; after one weak drink, a quiet, shy person becomes belligerent and aggressive.

In treating idiosyncratic alcohol intoxication, clinicians must help protect patients from harming themselves and others. Physical restraint may be necessary, but is difficult because of the abrupt onset of the condition. Once a patient has been restrained, injection of an antipsychotic drug, such as haloperidol (Haldol), is useful for controlling assaultiveness. This condition must be differentiated from other causes of abrupt behavioral change, such as complex partial epilepsy. Some persons with the disorder reportedly showed temporal lobe spiking on an EEG after ingesting small amounts of alcohol.

Other Alcohol-Related Neurological Disorders

Only the major neuropsychiatric syndromes associated with alcohol use have been discussed here. The complete list of neurological syndromes is lengthy (Table 20.2-6). Alcoholic pellagra encephalopathy is one diagnosis of potential interest to psychiatrists presented with a patient who appears to have Wernicke-Korsakoff syndrome but who does not respond to thiamine treatment. The symptoms of alcoholic pellagra encephalopathy include confusion, clouding of consciousness, myoclonus, oppositional hypertonias, fatigue, apathy, irritability, anorexia, insomnia, and sometimes delirium. Patients have a niacin (nicotinic acid) deficiency, and the specific treatment is 50 mg of niacin by mouth four times daily or 25 mg parenterally two to three times daily.

Table 20.2-6

Neurological and Medical Complications of Alcohol Use

Fetal Alcohol Syndrome. Data indicate that women who are pregnant or are breast-feeding should not drink alcohol. Fetal alcohol syndrome, the leading cause of intellectual disability in the United States, occurs when mothers who drink alcohol expose fetuses to alcohol in utero. The alcohol inhibits intrauterine growth and postnatal development. Microcephaly, craniofacial malformations, and limb and heart defects are common in affected infants. Short adult stature and development of a range of adult maladaptive behaviors have also been associated with fetal alcohol syndrome.

Women with alcohol-related disorders have a 35 percent risk of having a child with defects. Although the precise mechanism of the damage to the fetus is unknown, the damage seems to result from exposure in utero to ethanol or to its metabolites; alcohol may also cause hormone imbalances that increase the risk of abnormalities.

PROGNOSIS

Between 10 and 40 percent of alcoholic persons enter some kind of formal treatment program during the course of their alcohol problems.

A number of prognostic signs are favorable. First is the absence of preexisting antisocial personality disorder or a diagnosis of other

substance abuse or dependence. Second, evidence of general life stability with a job, continuing close family contacts, and the absence of severe legal problems also bodes well for the patient. Third, if the patient stays for the full course of the initial rehabilitation (perhaps 2 to 4 weeks), the chances of maintaining abstinence are good. The combination of these three attributes predicts at least a 60 percent chance for 1 or more years of abstinence. Few studies have documented the long-term course, but researchers agree that 1 year of abstinence is associated with a good chance for continued abstinence over an extended period. Alcoholic persons with severe drug problems (especially intravenous drug use or cocaine or amphetamine dependence) and those who are homeless may have only a 10 to 15 percent chance of achieving 1 year of abstinence, however.

Accurately predicting whether any speci□c person will achieve or maintain abstinence is impossible, but the prognostic factors listed earlier are associated with an increased likelihood of abstinence. The factors re□ecting life stability, however, probably explain only 20 percent or less of the course of alcohol use disorders. Many forces that are di□cult to measure a□ect the clinical course signi□cantly; they are likely to include such intangibles as motivational level and the quality of the patient's social support system.

In general, alcoholic persons with preexisting independent major psychiatric disorders—such as antisocial personality disorder, schizophrenia, and bipolar I disorder—are likely to run the course of their independent psychiatric illness. Thus, for example, clinicians must treat the patient with bipolar I disorder who has secondary alcoholism with appropriate psychotherapy and lithium (Eskalith), use relevant psychological and behavioral techniques for the patient with antisocial personality disorder, and o□er appropriate antipsychotic medications on a long-term basis to the patient with schizophrenia. The goal is to minimize the symptoms of the independent psychiatric disorder in the hope that greater life stability will be associated with a better prognosis for the patient's alcohol problems.

TREATMENT AND REHABILITATION

Three general steps are involved in treating the alcoholic person after the disorder has been diagnosed: intervention, detoxi□cation, and rehabilitation. These approaches assume that all possible e□orts have been made to optimize medical functioning and to address psychiatric emergencies. Thus, for example, an alcoholic person with symptoms of depression su□ciently severe to be suicidal requires inpatient hospitalization for at least several days until the suicidal ideation disappears. Similarly, a person presenting with cardiomyopathy, liver

difficulties, or gastrointestinal bleeding first needs adequate treatment of the medical emergency.

The patient with alcohol abuse or dependence must then be brought face-to-face with the reality of the disorder (intervention), be detoxi□ed if needed, and begin rehabilitation. The essentials of these three steps for an alcoholic person with independent psychiatric syndromes closely resemble the approaches used for the primary alcoholic person without independent psychiatric syndromes. In the former case, however, the treatments are applied after the psychiatric disorder has been stabilized to the extent possible.

Intervention

The goal in the intervention step, which has also been called *confrontation,* is to break through feelings of denial and help the patient recognize the adverse consequences likely to occur if the disorder is not treated. Intervention is a process aimed at maximizing the motivation for treatment and continued abstinence.

This step often involves convincing patients that they are responsible for their own actions while reminding them of how alcohol has created signi□cant life impairments. The psychiatrist often □nds it useful to take advantage of the person's chief presenting complaint, whether it is insomnia, di□culties with sexual performance, an inability to cope with life stresses, depression, anxiety, or psychotic symptoms. The psychiatrist can then explain how alcohol has either created or contributed to these problems and can reassure the patient that abstinence can be achieved with a minimum of discomfort.

JP, a 47-year-old physician, was confronted regarding his alcohol-related behaviors by his wife and 21-year-old daughter. They told him about his slurred speech on several recent occasions when the daughter called home, as well as a large number of wine bottles in the trash each week. JP's wife complained of the hours he spent alone in his study and his practice of staying up after she went to bed, retiring later with alcohol on his breath. She also related her concern about his consumption of about 10 or 12 drinks at a recent party, with the resulting tendency to isolate himself from the other guests. She then reminded him of his need to pack liquor when they go on trips where alcohol may not be readily available, and the tremor of his hands some mornings after being drunk the night before. The family shared their concern directly with JP at a time when he was not actively intoxicated, emphasizing speci□c times and events when his impairment with alcohol occurred. They had also made an appointment with the clinician at an alcohol and drug treatment program so that a next step could be established if the intervention was successful. (Adapted from Marc A. Schuckit, M.D.)

A physician intervening with a patient can use the same nonjudgmental but persistent approach each time an alcohol-related impairment is identi□ed. It is the persistence rather than exceptional interpersonal skills that usually gets results. A single intervention is rarely su□cient.

Most alcoholic persons need a series of reminders of how alcohol contributed to each developing crisis before they seriously consider abstinence as a long-term option.

Family

The family can be of great help in the intervention. Family members must learn not to protect the patient from the problems caused by alcohol; otherwise, the patient may not be able to gather the energy and the motivation necessary to stop drinking. In addition, during the intervention stage, the family can suggest that the patient meet with persons who are recovering from alcoholism, perhaps through AA, and family members can meet with groups, such as Al-Anon, that reach out to family members. Those support groups for families meet many times a week and help family members and friends see that they are not alone in their fears, worry, and feelings of guilt. Participants share coping strategies and help each other □nd community resources. The groups can be most useful in helping family members rebuild their lives, even if the alcoholic person refuses to seek help.

Detoxification

Most persons with alcohol dependence have relatively mild symptoms when they stop drinking. If the patient is in relatively good health, is adequately nourished, and has a good social support system, the depressant withdrawal syndrome usually resembles a mild case of the □u.

Even intense withdrawal syndromes rarely approach the severity of symptoms described by some early textbooks in the field.

The essential □rst step in detoxification is a thorough physical examination. In the absence of a serious medical disorder or combined drug abuse, severe alcohol withdrawal is unlikely. The second step is to o□er rest, adequate nutrition, and multiple vitamins, especially those containing thiamine.

Mild or Moderate Withdrawal. Withdrawal develops because the brain has physically adapted to the presence of a brain depressant and cannot function adequately in the absence of the drug. Giving sufficient brain depressant on the first day to diminish symptoms and then weaning the patient off the drug over the next 5 days offers most patients optimal relief and minimizes the possibility that severe withdrawal will develop. Any depressant—including alcohol, barbiturates, or any of the benzodiazepines—can work, but most clinicians choose a benzodiazepine for its relative safety. Adequate treatment can be given with either short-acting drugs (e.g., lorazepam), or longacting

substances (e.g., chlordiazepoxide and diazepam).
An example of treatment is the administration of 25 mg of chlordiazepoxide by mouth three or four times a day on the □rst day, with a notation to skip a dose if the patient is
asleep or feeling sleepy. An additional one or two 25-mg doses can be given during the □rst 24 hours if the patient is jittery or shows signs of increasing tremor or autonomic
dysfunction. Whatever benzodiazepine dosage is required on the □rst day can be decreased by 20 percent each subsequent day, with a resulting need for no further medication after
4 or 5 days. When giving a long-acting agent, such as chlordiazepoxide, the clinician must avoid producing excessive sleepiness through overmedication; if the patient is sleepy, the
next scheduled dose should be omitted. When taking a short-acting drug, such as lorazepam, the patient must not miss any dose because rapid changes in benzodiazepine
concentrations in the blood can precipitate severe withdrawal.
A social model program of detoxi□cation saves money by avoiding medications while using social supports. This less-expensive regimen can be helpful for mild or moderate
withdrawal syndromes. Some clinicians have also recommended β-adrenergic receptor antagonists (e.g., propranolol [Inderal]) or α-adrenergic receptor agonists (e.g., clonidine),
although these medications do not appear to be superior to the benzodiazepines. Unlike the brain depressants, these other agents do little to decrease the risk of seizures or
delirium.
Severe Withdrawal. For the approximately 1 percent of alcoholic patients with extreme autonomic dysfunction, agitation, and
confusion—that is, those with alcoholic withdrawal delirium, or DTs—no optimal treatment has yet been developed. The first step is to ask
why such a severe and relatively uncommon withdrawal syndrome has occurred; the answer often relates to a severe concomitant medical
problem that needs immediate treatment. The withdrawal symptoms can then be minimized through the use of either benzodiazepines (in
which case high doses are sometimes required) or antipsychotic agents, such as haloperidol. Once again, on the first or second day, doses are
used to control behavior, and the patient can be weaned off the medication by about the fifth day.
Another 1 percent of patients may have a single grand mal convulsion; the rare person has multiple □ts, with the peak incidence on the second day of withdrawal. Such patients

require neurological evaluation, but in the absence of evidence of a seizure disorder, they do not benefit from anticonvulsant drugs.

Protracted Withdrawal. Symptoms of anxiety, insomnia, and mild autonomic overactivity are likely to continue for 2 to 6 months after the acute withdrawal has disappeared. Although no pharmacological treatment for this syndrome appears appropriate, it is possible that some of the medications used for the rehabilitation phase, especially acamprosate (Campral), may work by diminishing some of these symptoms. It is important that the clinician warn the patient that some level of sleep problems or feelings of nervousness might remain after acute withdrawal and discuss cognitive and behavioral approaches that might be appropriate to helping the patient feel more comfortable.

These protracted withdrawal symptoms may enhance the probability of relapse.

Rehabilitation

For most patients, rehabilitation includes three major components: (1) continued e□orts to increase and maintain high levels of motivation for abstinence; (2) work to help the patient readjust to a lifestyle free of alcohol; and (3) relapse prevention. Because these steps are carried out in the context of acute and protracted withdrawal syndromes and life crises, treatment requires repeated presentations of similar materials that remind the patient how important abstinence is and that help the patient develop new day-to-day support systems and coping styles.

No single major life event, traumatic life period, or identi□able psychiatric disorder is known to be a unique cause of alcoholism. In addition, the e□ects of any causes of alcoholism are likely to have been diluted by the e□ects of alcohol on the brain and the years of an altered lifestyle, so that the alcoholism has developed a life of its own. This is true even though many alcoholic persons believe that the cause was depression, anxiety, life stress, or pain syndromes. Research, data from records, and resource persons usually reveal that alcohol contributed to the mood disorder, accident, or life stress, not vice versa.

The same general treatment approach is used in inpatient and outpatient settings. Selection of the more expensive and intensive inpatient mode often depends on evidence of additional severe medical or psychiatric syndromes, the absence of appropriate nearby outpatient groups and facilities, and the patient's history of having failed in outpatient care. The treatment process in either setting involves intervention, optimizing physical and psychological functioning, enhancing motivation, reaching out to family, and using the □rst 2 to 4 weeks of care as an intensive period of help. Those e□orts must be followed by at least 3 to 6 months of less frequent outpatient care.

Outpatient care uses a combination of individual and group counseling, judicious avoidance of psychotropic medications unless needed for independent disorders, and involvement in such self-help groups as AA.

Counseling. Counseling efforts in the first several months should focus on day-to-day life issues to help patients maintain a high level of motivation for abstinence and to enhance their functioning. Psychotherapy techniques that provoke anxiety or that require deep insights have not been shown to be of benefit during the early months of recovery and, at least theoretically, may actually impair efforts at maintaining abstinence. Thus, this discussion focuses on the efforts likely to characterize the first 3 to 6 months of care.

Counseling or therapy can be carried out in an individual or group setting; few data indicate that either approach is superior. The technique used is not likely to matter greatly and usually boils down to simple day-to-day counseling or almost any behavioral or psychotherapeutic approach focusing on the here and now. To optimize motivation, treatment sessions should explore the consequences of drinking, the likely future course of alcohol-related life problems, and the marked improvement that can be expected with abstinence.

Whether in an inpatient or an outpatient setting, individual or group counseling is usually o□ered a minimum of three times a week for the first 2 to 4 weeks, followed by less intense efforts, perhaps once a week, for the subsequent 3 to 6 months.

Much time in counseling deals with how to build a lifestyle free of alcohol. Discussions cover the need for a sober peer group, a plan for social and recreational events without drinking, and approaches for reestablishing communication with family members and friends.

The third major component, relapse prevention, □rst identi□es situations in which the risk for relapse is high. The counselor must help the patient develop modes of coping to be used when the craving for alcohol increases or when any event or emotional state makes a return to drinking likely. An important part of relapse prevention is reminding the patient about the appropriate attitude toward slips. Short-term experiences with alcohol can never be used as an excuse for returning to regular drinking. The e□orts to achieve and maintain a sober lifestyle are not a game in which all bene□ts are lost with that □rst sip. Rather, recovery is a process of trial and error; patients use slips that occur to identify high-risk situations and to develop more appropriate coping techniques.

Most treatment e□orts recognize the e□ects that alcoholism has on the signi□cant persons in the patient's life, and an important aspect of recovery involves helping family members and close friends understand alcoholism and realize that rehabilitation is an ongoing process that

lasts for 6 to 12 or more months. Couples and family counseling and support groups for relatives and friends help the persons involved to rebuild relationships, to learn how to avoid protecting the patient from the consequences of any drinking in the future, and to be as supportive as possible of the alcoholic patient's recovery program.

Medications. If detoxification has been completed and the patient is not one of the 10 to 15 percent of alcoholic persons who have an independent mood disorder, schizophrenia, or anxiety disorder, little evidence favors prescribing psychotropic medications for the treatment of alcoholism. Lingering levels of anxiety and insomnia as part of a reaction to life stresses and protracted abstinence should be treated with behavior modification approaches and reassurance. Medications for these symptoms (including benzodiazepines) are likely to lose their effectiveness much faster than the insomnia disappears; thus, the patient may increase the dose and have subsequent problems. Similarly, sadness and mood swings can linger at low levels for several months. Controlled clinical trials, however, indicate no benefit in prescribing antidepressant medications or lithium to treat the average alcoholic person who has no independent or long-lasting psychiatric disorder. The mood disorder will clear before the medications can take effect, and patients who resume drinking while on the medications face significant potential dangers. With little or no evidence that the medications are effective, the dangers significantly outweigh any potential benefits from their routine use.

One possible exception to the proscription against the use of medications is the alcohol-sensitizing agent disul□ram. Disul□ram is given in daily doses of 250 mg before the patient is discharged from the intensive □rst phase of outpatient rehabilitation or from inpatient care. The goal is to place the patient in a condition in which drinking alcohol precipitates an uncomfortable physical reaction, including nausea, vomiting, and a burning sensation in the face and stomach. Few data prove that disul□ram is more e□ective than a placebo, however, probably because most persons stop taking the disul□ram when they resume drinking. Many clinicians have stopped routinely prescribing the agent, partly in recognition of the dangers associated with the drug itself: mood swings, rare instances of psychosis, the possibility of increased peripheral neuropathies, the relatively rare occurrence of other signi□cant neuropathies, and potentially fatal hepatitis.

Two additional promising pharmacological interventions have recently been studied. The □rst involves the opioid antagonist naltrexone (ReVia), which at least theoretically is believed possibly to decrease the craving for alcohol or blunt the rewarding e□ects of drinking. In any

event, two relatively small (approximately 90 patients on the active drug across the studies) and short-term (3 months of active treatment)
investigations using 50 mg per day of this drug had potentially promising results.
The second medication of interest, acamprosate (Campral), has been tested in more than 5,000 alcohol-dependent patients in Europe.
This drug is not yet available in the United States. Used in dosages of approximately 2,000 mg per day, this medication was associated with
approximately 10 to 20 percent more positive outcomes than placebo when used in the context of the usual psychological and behavioral
treatment regimens for alcoholism. The mechanism of action of acamprosate is not known, but it may act directly or indirectly at GABA
receptors or at NMDA sites, the e□ects of which alter the development of tolerance or physical dependence on alcohol.

Table 20.2-7
Medications for Treating Alcohol Dependence

Another medication with potential promise in the treatment of alcoholism is the non-benzodiazepine antianxiety drug buspirone (BuSpar), although the effect of this drug on alcohol rehabilitation is inconsistent between studies. No evidence exists that antidepressant medications,
such as the selective serotonin reuptake inhibitors (SSRIs), lithium, or antipsychotic medications, are significantly effective in the treatment
of alcoholism.

Alcoholics Anonymous. Clinicians must recognize the potential importance of self-help groups such as AA. Members of AA have
help available 24 hours a day, associate with a sober peer group, learn that it is possible to participate in social functions without drinking,
and are given a model of recovery by observing the accomplishments of sober members of the group.
Learning about AA usually begins during inpatient or outpatient rehabilitation. The clinician can play a major role in helping patients
understand the di□erences between speci□c groups. Some are composed only of men or women, and others are mixed; some meetings are
composed mostly of blue collar men and women, whereas others are mostly for professionals; some groups place great emphasis on
religion, and others are eclectic. Patients with coexisting psychiatric disorders may need some additional education about AA.
should remind them that some members of AA may not understand their special need for medications and should arm the patients with
ways

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VALUE ADDED COURSE STUDENT DETAILS

ALCOHOL DEADDICTION AND ITS MANAGEMENT FOR FINAL YEAR STUDENTS

S.No	Register No	Students List	Department	Signature
1	U15MB360	SELVASRINIVASAN. B	Psychiatry	
2	U15MB361	SENTHILKUMARAN. A	Psychiatry	
3	U15MB362	SHAHARA ZAD .S	Psychiatry	
4	U15MB363	SHAKTHI. K	Psychiatry	
5	U15MB364	SHALINI. A	Psychiatry	
6	U15MB369	SIVA SAKTHI VELAN .A.V	Psychiatry	
7	U15MB370	SIVAKUMAR. S	Psychiatry	
8	U15MB371	SIVANAMBI .S	Psychiatry	
9	U15MB372	SOPHIYA .L	Psychiatry	
10	U15MB373	SOUNDARIYA.M	Psychiatry	
11	U15MB374	SOWMYA LAKSHMI .I	Psychiatry	

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12	U15MB375	SREERAM.M	Psychiatry	
13	U15MB376	SRINIVASAN.R	Psychiatry	
14	U15MB377	SRUTHI .S	Psychiatry	
15	U15MB378	SUBALAKSHMI .C	Psychiatry	

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Alcohol dependence and de-addiction

Candidate Name		Assessor Name	
Date of Assessment		Assessor Position	

MULTIPLE CHOICE QUESTIONS

Course Code: PSYC09

I. ANSWER ALL THE QUESTIONS

1. Consumption of this causes increase in the fat synthesis, dilation of blood vessels, low blood sugar and stomach-inflammation

(a) drug addiction and tobacco

(b) alcohol

(c) tobacco

(d) drug addiction

2. This causes tunnel vision

(a) Smoking

(b) Alcohol

(c) Barbiturates

(d) Vitamin A deficiency

3. After drinking alcohol, consumption of this leads to death

(a) Morphine

(b) Opium

(c) Barbiturate

(d) All of these

4. This drug along with alcohol generates marked drowsiness otherwise does not produce sedative effect

(a) Marijuana

(b) Valium

(c) Antihistamine

(d) Barbiturate

5. Constituent of alcoholic beverage is

(a) Propyl alcohol

(b) Methyl alcohol

(c) Ethyl alcohol

(d) Mix of all of these

6. This is a result of the appearance of the fatty liver syndrome

(a) synthesis of fatty acids, fat and glycerols

(b) synthesis of fat from alcohol

(c) synthesis of fat from amino acids

(d) excessive synthesis of fat from fatty acids

7. Alcoholism causing fatty acid syndrome is called

(a) Cirrhosis

(b) Neuritis

(c) Gastritis

(d) Nephritis

8. This is a withdrawal symptom of alcohol consumption

(a) Delirium

(b) Nausea and vomiting

(c) swollen and patchy face

(d) all of these

9. This causes the maximum accumulation of fat in the liver

(a) meat and egg

(b) alcohol

(c) saturated fat

(d) starch

10. This is a consequence of alcohol addiction

(a) psychosis, hypertension and fatty liver syndrome

(b) cardiovascular diseases, hypertension and fatty liver syndrome

(c) ulcers, all types of mental illness, vitamin deficiency, cardiovascular diseases

(d) all of these

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Alcohol dependence and de-addiction

Candidate Name	Selvasrinivasan.V	Assessor Name	DR. ARUN
Date of Assessment	15.4.2019	Assessor Position	ASSOCIATE PROFESSOR.

UNIVERSITY REG NO:- U1SMB360

10/10

MULTIPLE CHOICE QUESTIONS

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AND RESEARCH

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Alcohol dependence and de-addiction

Candidate Name	Senthilkumaran A	Assessor Name	Dr. ARUN
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UNIVERSITY REG NO: U15MB361

8/10

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Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that SRUTHI .S has actively participated in the Value Added Course on Alcohol dependence and de-addiction held during April - June 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

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Dr.V.R.SRIDHAR

COORDINATOR
Dr. V. R. SRIDHAR, MD.,D.P.M.,
Reg. No: 30995
Professor & HOD, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Student Feedback Form

Course Name: **Alcohol deaddiction**
Subject Code: **PSYC09**

Name of Student: _____ Roll No.: _____

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					
2	Course contents met with your expectations					
3	Lecturer sequence was well planned					
4	Lectures were clear and easy to understand					
5	Teaching aids were effective					
6	Instructors encourage interaction and were helpful					
7	The level of the course					
8	Overall rating of the course	1	2	3	4	5

Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory

Suggestions if any:

Signature

Date:

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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Student Feedback Form

Course Name: ALCOHOL DEADDICTION

Subject Code: PSYC09

Name of Student: SRINIVASAN. R Roll No.: U15MB376

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3 ✓	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

R. Srinivasan

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Student Feedback Form

Course Name: **ALCOHOL DEADDICTION**

Subject Code: **PSYC09**

Name of Student: SREERAM-M Roll No.: U15MB375

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course				✓	
8	Overall rating of the course	1	2	3 ✓	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

M. Sreeram
Signature

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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Date: 30-03-2019

From

Dr.V.R.Shridhar
Professor and Head,
Department of Psychiatry,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course:, Alcohol dependence and de-addiction

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: : **Alcohol dependence and de-addiction**. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr. V. R. SRIDHAR, MD.,D.P.M.,
Reg. No: 30995
Professor & HOD, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Encl: Certificates

Photographs

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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

PSYC09: **Alcohol dependence and de-addiction**

APRIL TO JUNE 2019



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SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Osudu, Agaram Village, Kudapakkam Post, Pondicherry – 605 502.

DEPARTMENT OF PHYSIOLOGY

Date: 4.3.2019

From
Dr.V.Senthil kumar
Professor and Head,
Physiology
Sri Lakshmi Narayana Institute of Medical sciences
Puducherry

To
The Dean,
Sri Lakshmi Narayana institute of Medical sciences
Puducherry

Sub: Permission to conduct value-added course: Certificate course in yoga therapy for respiratory diseases & Code: PHY C11

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Certificate course in yoga therapy for respiratory diseases & Code: PHY C11 from , May 2019– July 2019. We solicit your kind permission for the same.

Kind Regards

Dr.V.Senthil kumar

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean:Dr.G.Jayalakshmi

The HOD: Dr.V.Senthil kumar

The Expert: Dr.V.Anebaracy

The committee has discussed about the course and is approved.

Dean
(Sign &Seal)

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Subject Expert
(Sign &Seal)

HOD
(Sign &Seal)

PROFESSOR & HOD
DEPARTMENT OF PHYSIOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

No. SLIMS/Dean Off/VAC / 308

Circular

Date: 11.3.2019

Sub: Organising Value-added Course: Certificate course in yoga therapy for respiratory diseases & Code: PHY C11

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical sciences, is organizing "Certificate course in yoga therapy for respiratory diseases & Code: PHY C11".The course content and registration form is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before April 2019 Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content.

Course Proposal

Course Title: Certificate course in yoga therapy for respiratory diseases & Code: PHY C11

Course Objective: At the end of the course, the participants should be able to

- Explain normal respiratory anatomy and respiratory muscles
- Normal Mechanics of breathing
- Respiratory reaction
- Differentiate obstructive and restrictive airway diseases
- Yoga for various respiratory diseases
- Pranayama for various respiratory diseases
- Benefits of yoga & Yoga practice

Course Outcome: On successful completion of the course the students will have the knowledge on various lifestyle modification in treatment and prevention of metabolic syndrome.

Course Audience: Ist year M.B.B.S students (2018- 2019)

Course Coordinator: Dr.R.Vijayakumar

Course Faculties with Qualification and Designation

Dr.V.Anebaracy, M.B.B.S,M.D,Assistant Professor,Physiology
Dr.V.Senthilkumar, , M.B.B.S,M.D, Professor& HOD,Physiology

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Faculty	Hours
1	4.5.2019	Explain normal respiratory anatomy and respiratory muscles	1.30 pm to 6.30 pm	Dr.V.Anebaracy	2
2	18/5/2019	Normal Mechanics of breathing Respiratory reaction	2 pm to 6 pm	Dr.V.Senthilkumar	5
3	25/5/2019	Differentiate obstructive and restrictive airway diseases	2 pm to 5 pm	Dr.V.Anebaracy	4

4	8/6/2019	Yoga for various respiratory diseases-I	2 pm to 5 pm	Dr.V.Senthilkumar	3
5	22/6/2019	Pranayama for various respiratory diseases -I	1.30 pm to 6.30 pm	Dr.V.Anebaracy	5
6	29/6/2019	Yoga for various respiratory diseases & Pranayama for various respiratory diseases -II	2 pm to 6 pm	Dr.V.Senthilkumar	4
7	6/7/2019	Benefits of yoga & Yoga practice	1.30 pm to 6.30 pm	Dr.V.Anebaracy	5
			Total Hours		30

REFERENCE BOOKS:

1. The Complete Book of Yoga : Karma Yoga, Bhakti Yoga, Raja Yoga, Jnana by Swami Vivekananda (Author)

2. BKS Iyengar Yoga The Path to Holistic Health: The Definitive Step-by-Step **by** B.K.S Iyengar(Author)

VALUE ADDED COURSE

1. Name of the programme & Code

Certificate course in yoga therapy for respiratory diseases & Code: PHY C11

2. Duration & Period

20 hrs, May 2019– July 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

One time from May 2019– July 2019

8. Year of discontinuation: 2020

9. Summary report of each program year-wise

Value Added Course- May 2019– July 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	PYC011	Certificate course in yoga therapy for respiratory diseases	Dr. V.Anebaracy Dr.V.Senthil kumar	1st MBBS	20 (May 2019– July 2019)

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSONS

Dr.V.Anebaracy

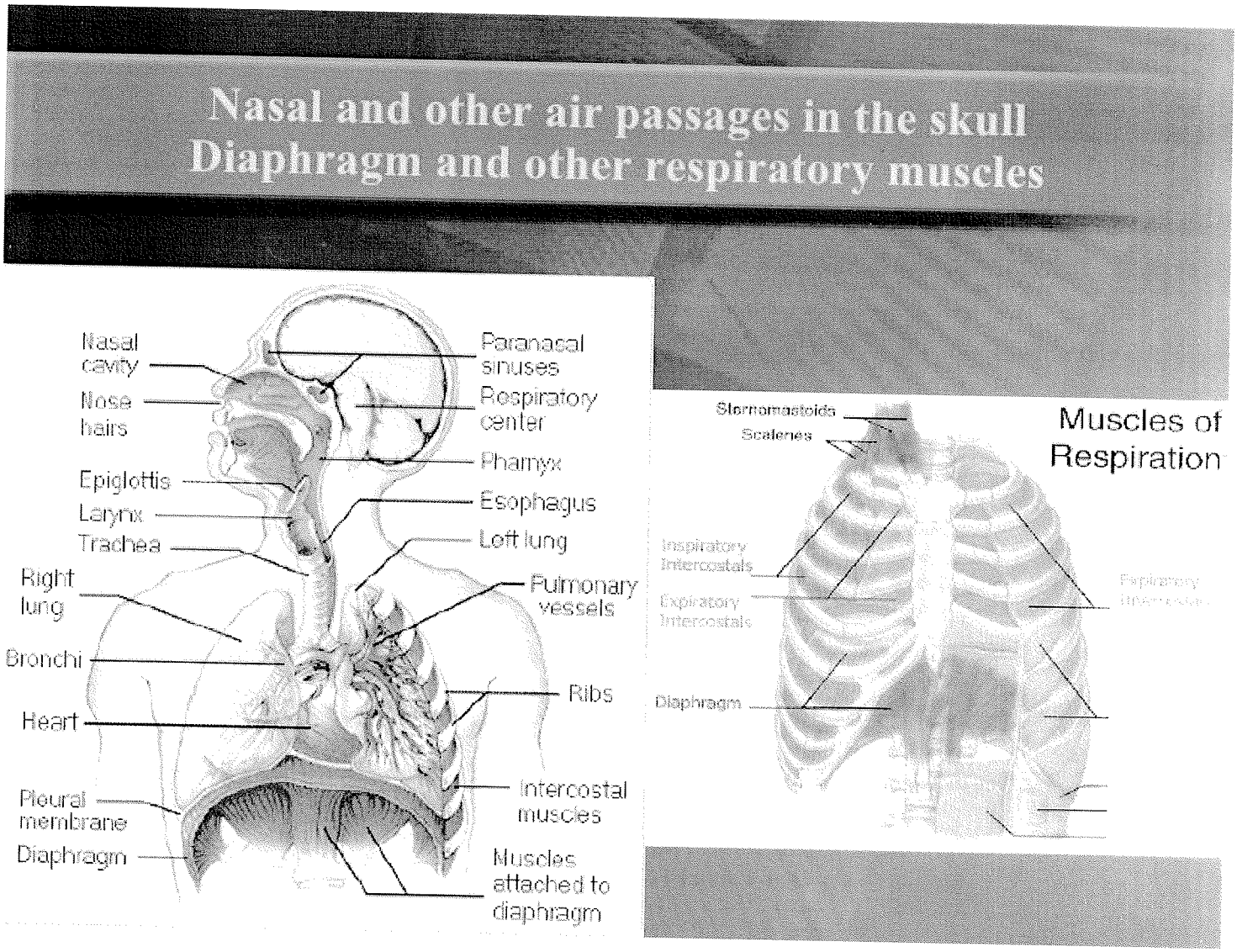
Dr.V.Senthil Kumar

R. Vijayakumar

COORDINATOR

Dr.R.Vijayakumar

Certificate course in yoga therapy for respiratory diseases & Code: PHY C11

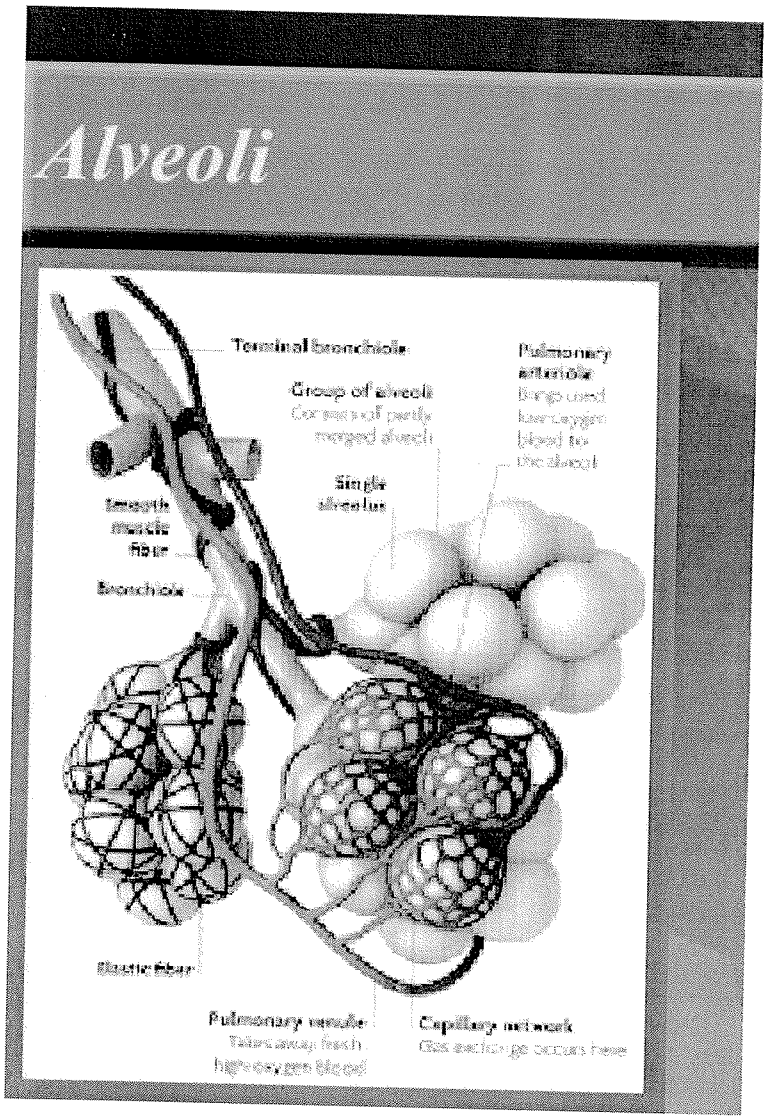


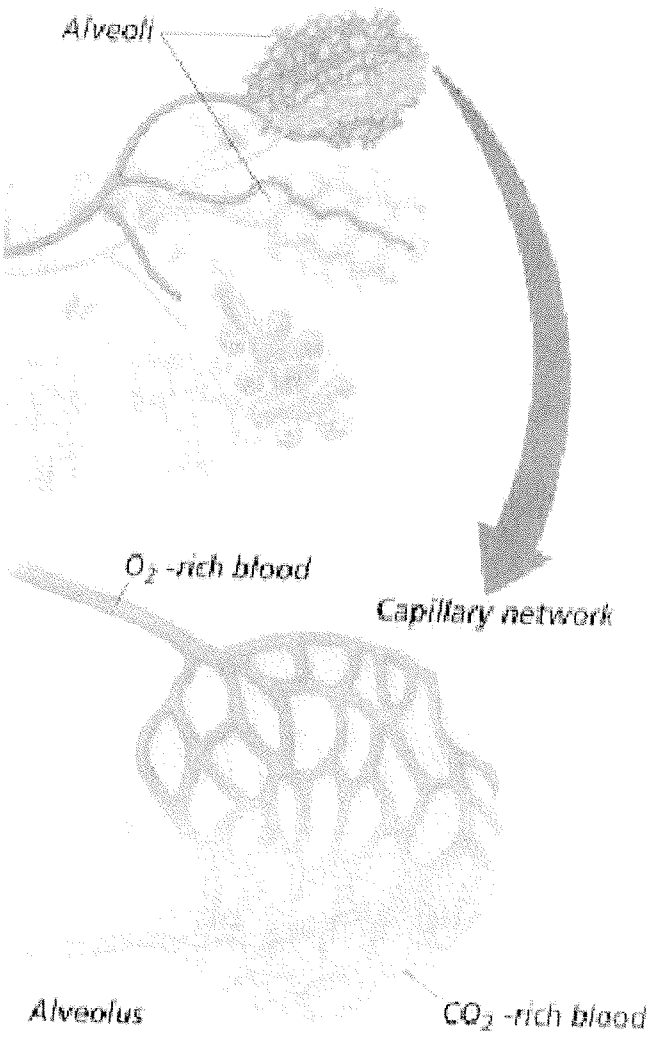
PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	Certificate course in yoga therapy for respiratory diseases
Course Code	Code: PHY C11
Objective	• Explain normal respiratory anatomy and respiratory muscles • Normal Mechanics of breathing • Respiratory reaction • Differentiate obstructive and restrictive airway diseases • Yoga for various respiratory diseases • Pranayama for various respiratory diseases • Benefits of yoga.
Further learning opportunities	Advance course in yoga therapy for respiratory diseases
Key Competencies	• On successful completion of the course the students will have the knowledge on yoga for various respiratory diseases.
Target Student	1st MBBS Students
Duration	20 hrs, May 2019– July 2019
Theory Session	10hrs
Practical Session	10hrs
Assessment Procedure	Long answer questions and Short answer questions

Certificate course in yoga therapy for respiratory diseases & Code: PHY C11.



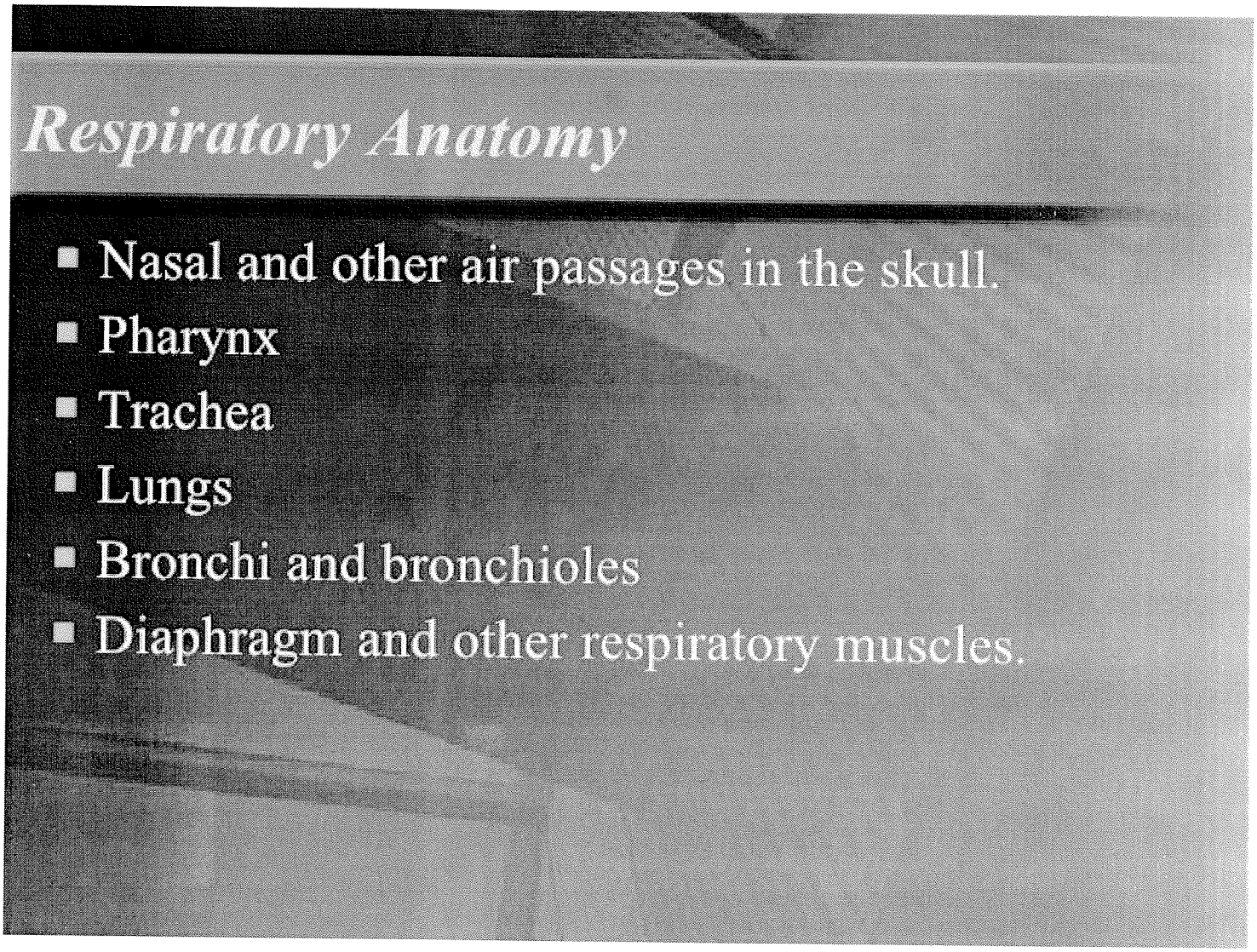


Introduction: Breathing sustains life, natural breathing brings happiness and keep healthy. It clears the mind and calms all the emotions hence it can helps in release of the vitalizing flow of energy within us. Air pollution is responsible for various respiratory diseases such as nasal allergy, asthma, chronic bronchitis and lung cancer. It has been found that Yoga has improved pulmonary parameters in several scientific studies, both in healthy as well as in diseased individuals. It helps in increase in vital capacity, tidal volume, FeV1, Fev1/FVC ratio, expiratory reserve volume, breath holding time and many other pulmonary parameters.

These changes suggest a potential preventive and therapeutic role of yoga in pulmonary diseases.It is a method of learning which aims to attain the unity of mind, body and spirit through three main yoga steps includes exercise, breathing and meditation.

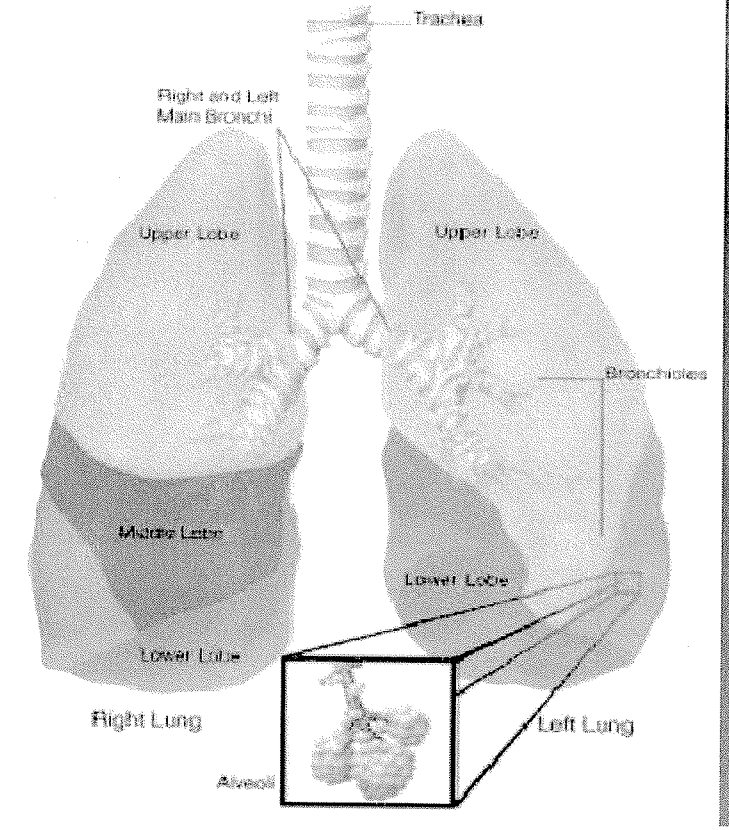
Results of previous research studies report that many people with serious respiratory ailments have found a solution in yoga. It has been proven that theyogic practices help in prevention, control as well as rehabilitation of many respiratory diseases. A vital scientific and therapeutic aspect of yoga is Pranayama. Few exercises of pranayama are like Anulomaviloma, Kapalbhati, Bhramari which are the components of yoga and are the best remedies which can be help to tackle respiratory illness caused by air pollution and other naturally occurring respiratory diseases. air pollutions.Severe air pollution affects human health and cause many diseases. A variety of air pollutants have been found, which causes many diseases like nasal allergy, sore throat wheezes, asthma, chronic bronchitis, allergies and lung cancer. Increasing incidence of respiratory illness in modern times has triggered the studies that how yoga can help in handling and eliminating these problems. It has been found from the various studies that regular practice of yoga can prevent and cure respiratory illness.

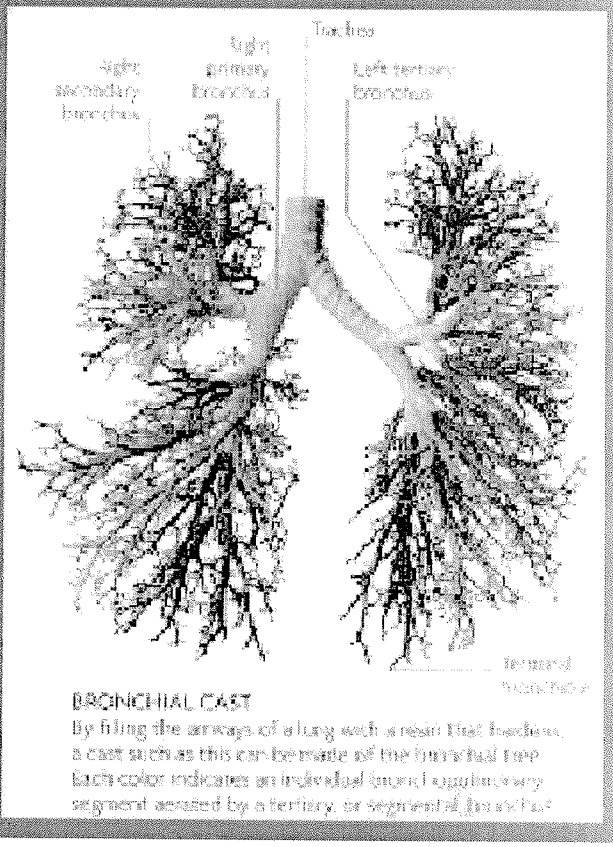
Respiratory diseases are a major health burden on the world population and are the leading causes of death worldwide. Lower respiratory infections such as pneumonia and tuberculosis, lung cancer and chronic obstructive pulmonary disease (COPD) accounted for 9.5 million deaths worldwide during 2008 and amounted to one-sixth of the global death burden. The World Health Organization (WHO) also estimated that these same four diseases accounted for one-tenth of the disability-adjusted life- years lost worldwide in 2008.



India has an embarrassing world ranking in its respiratory disease prevalence and impact. According to latest WHO data, lung disease related deaths in India reached 1,061,863 or 11.97% of total deaths in 2014. The age adjusted death rate was 126.99 per 100,000 of population.It is suggested that Yoga with physical postures, breathing exercises, meditation and relaxation may play an important role in the complementary management of lower respiratory diseases. Results of several emerging trials have supported its modulating effects on the pulmonary function in respiratory diseases.

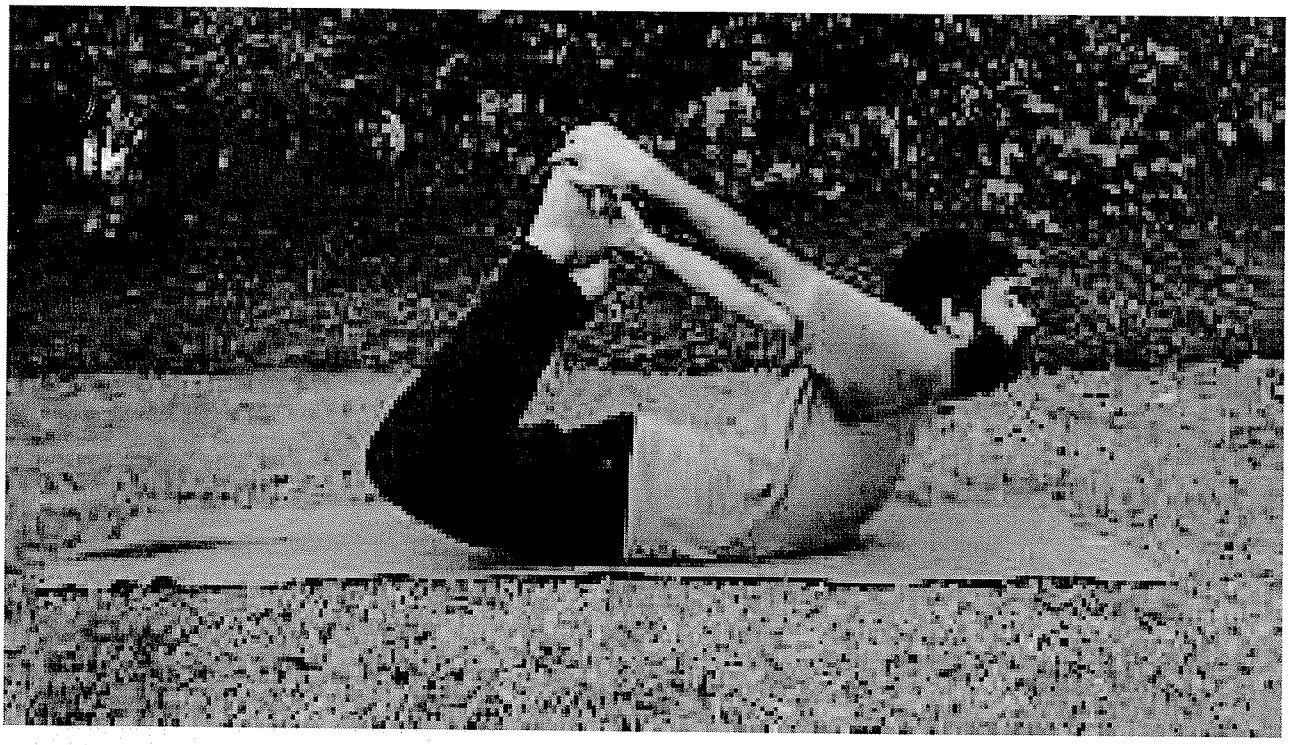
Bronchial tree





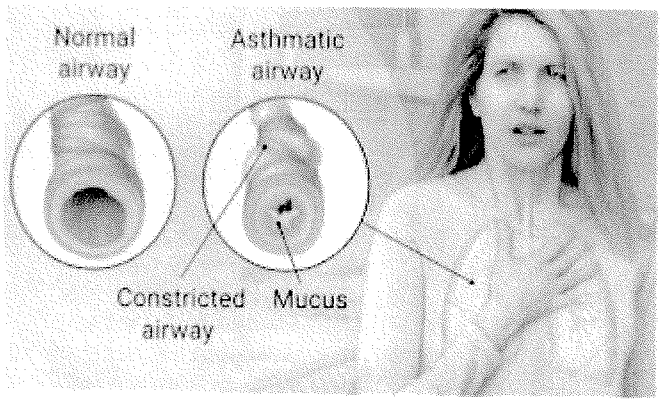
BIHER

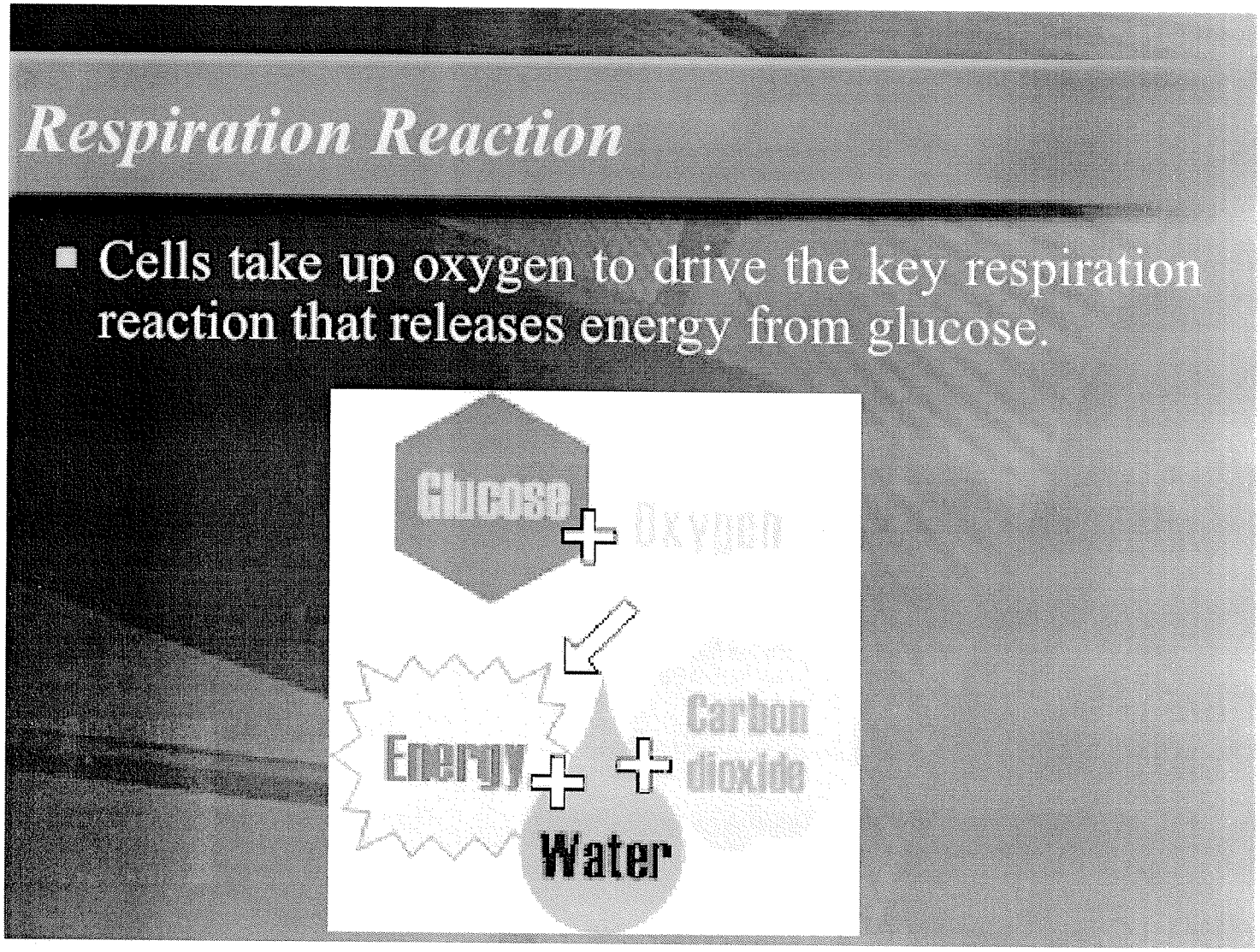
SLIMS



ASTHMA

The airways are persistently inflamed, and may occasionally spasm, causing wheezing and shortness of breath.

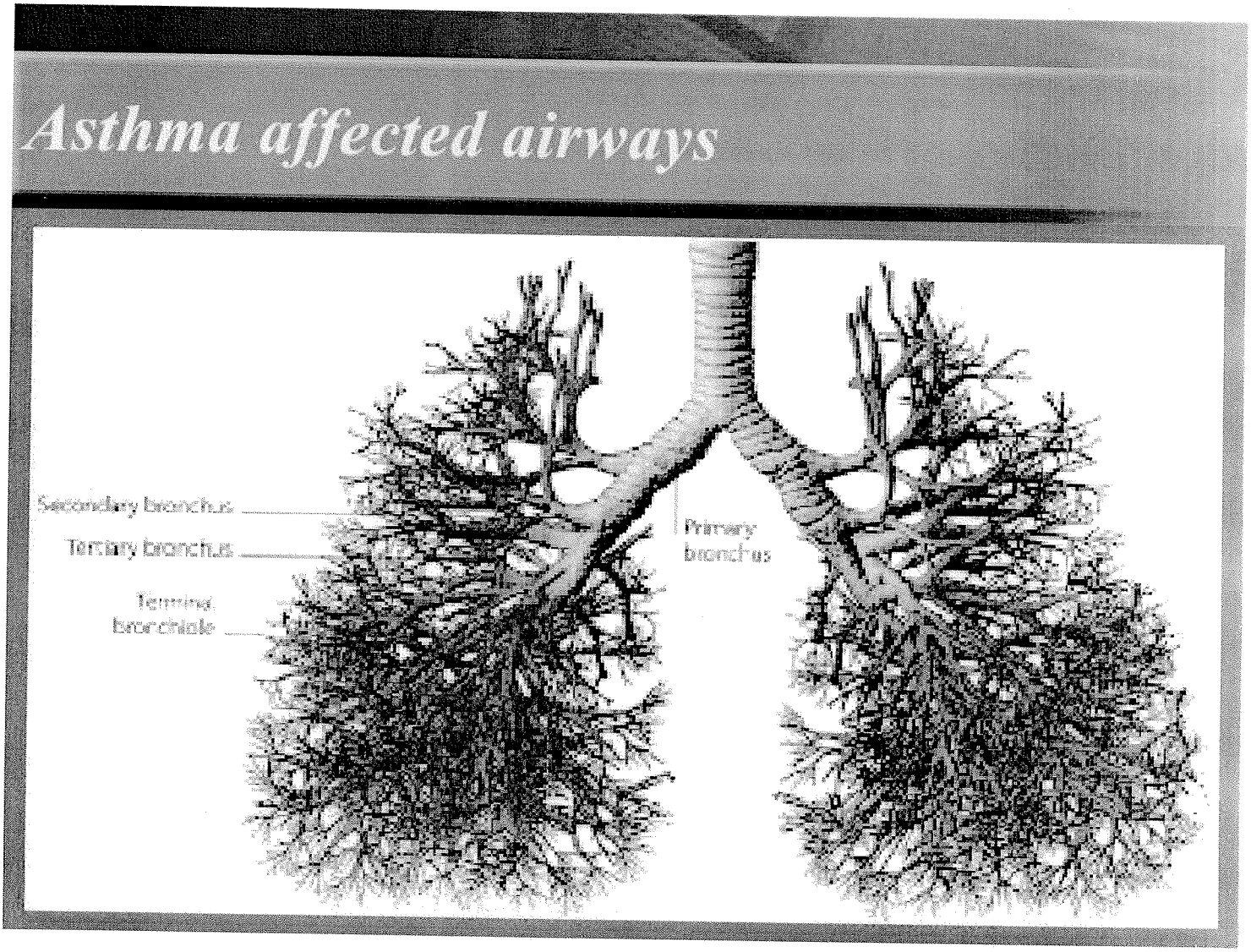


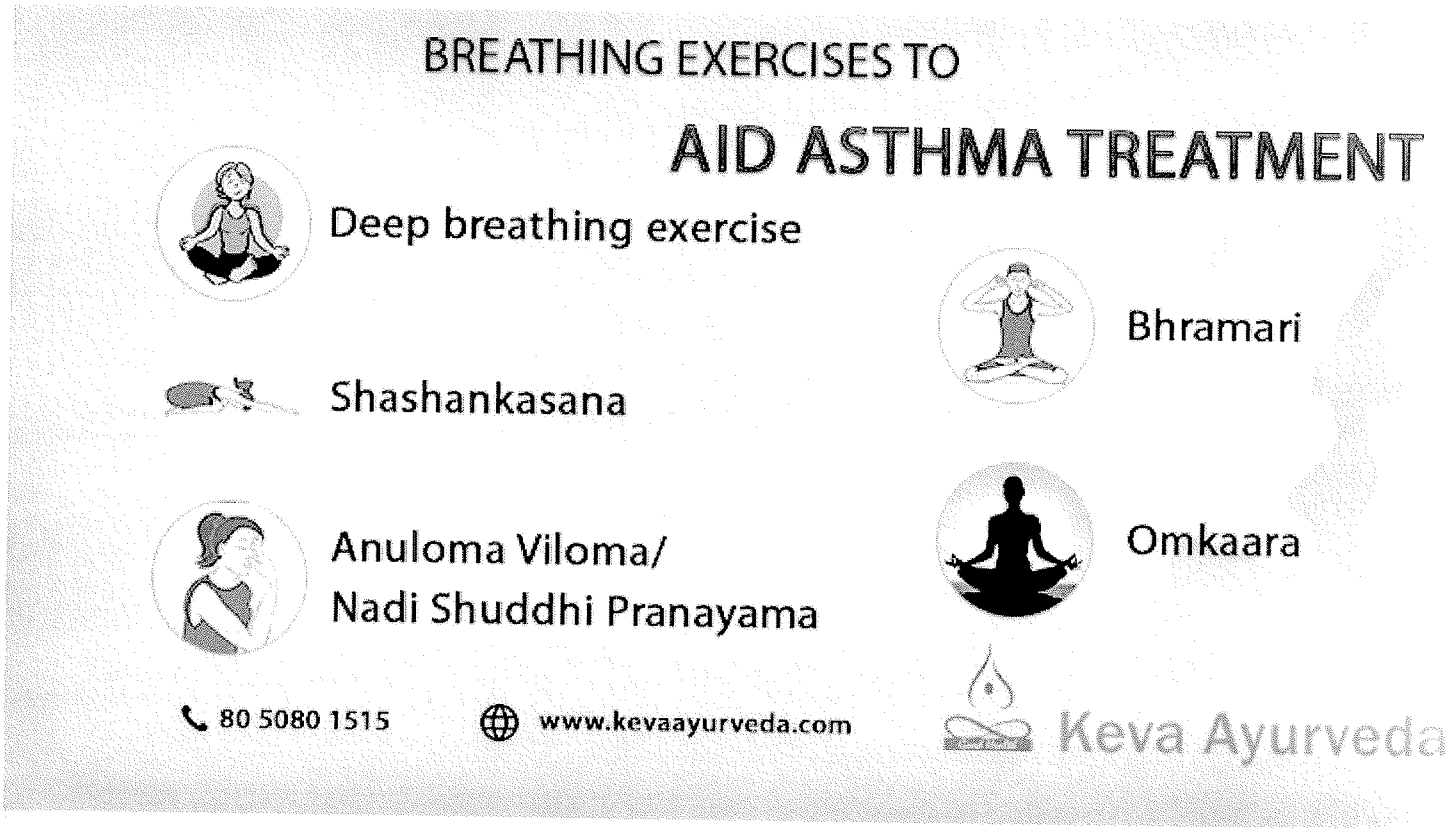


Role of Yoga in Life:

Yoga is a science which has been practiced in India over the thousands of years. The word yoga is derived from the Sanskrit word 'Yuj' which means to join.Yoga practice mainly consists Asana (posture – a particular position of the body which helps to contribute the steadiness of body and mind). Pranayama (help to control the breathing in a superior and extraordinary way and to get maximum benefits and meditation which produces consistent physiological changes). Proper Yoga practice consists of the five-principle which relaxation,

proper breathing, proper diet, positive thinking and meditation.

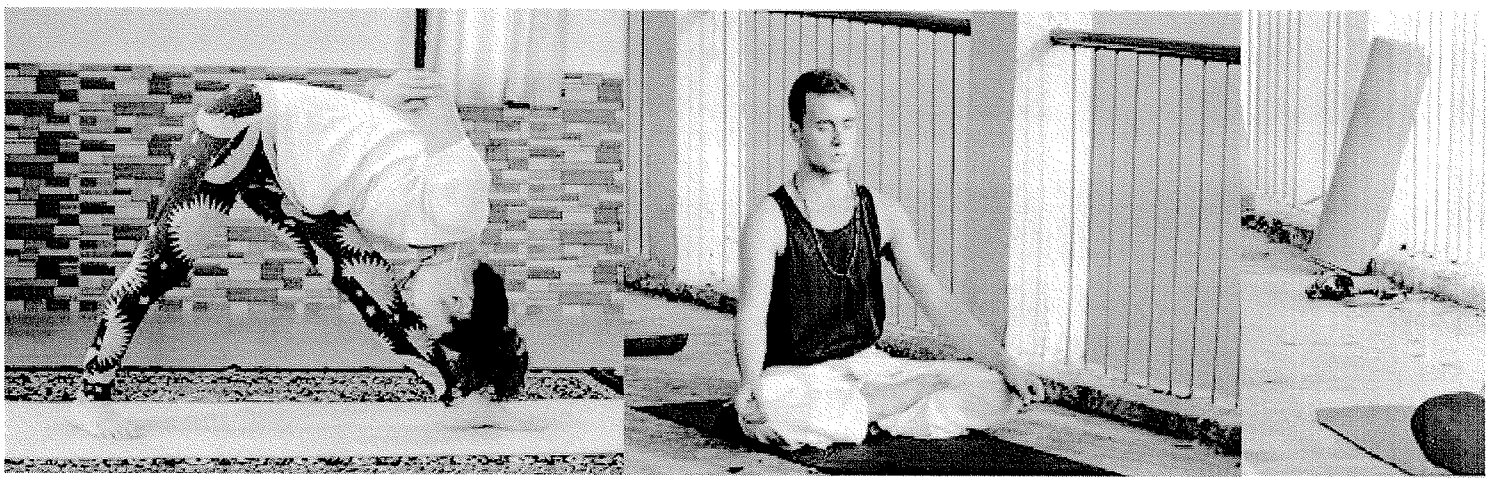




Yoga is an ancient science, which brings harmony in the body as well as in the mind also. Yoga comprises not only of asanas and pranayama for improving the skill of the body, but it also comprises of techniques which acts on the mind and emotions, and provides a complete philosophy for living. In recent times, medical fraternity is much attracted towards beneficial effects of yoga. Yoga aims to treat illness by improving health on all levels simultaneously and restoring the inner harmony.

Yoga contains elements that address problems at every level such as Asanas that relax and tone the muscles and massage the internal organs and Pranayama that slows breathing and regulates the flow of prana. Relaxation and meditation that act to calm the mind and emotions culturing to heal the spirit. The essence of yoga therapy is both preventive and curative and the regular practice of yoga restores natural balance and harmony and also help in bringing

positive good health to the whole body including physical, mental and spiritual health.



Role of Yoga in Respiratory Illness Previous studies report that many people with serious respiratory ailments have found a better solution in yoga. As the mind is calmed the hyper reactivity that causes diseases such as bronchial asthma and nasal allergy is reduced. Yoga is considered to be a good exercise for maintaining proper health and also has a profound effect on the lung functions of the individuals. It is claimed that yogic practices help in prevention, control and rehabilitation of many respiratory diseases.

Role of yoga in COPD: According to the latest WHO estimates, there were 64 million people having COPD and 3 million people died of COPD in 2004. WHO predicts that COPD will become the third leading cause of death worldwide by 2030.The Global Initiative for Chronic Obstructive Lung Disease (GOLD) management including the reduction in symptoms, complications, and exacerbations, improved exercise tolerance, improved health status, and reduced mortality.Some of these goals can be achieved by initiating breathing exercises in these patients. It is found that Yoga has been shown to be beneficial in patients having COPD.Yoga

also improves the diffusion capacity in this group.It has been found that helps in reducing the associated stress and anxiety and help in improving the quality of life.

Role of yoga in Asthma:Asthma is characterized by reversible airway obstruction asthma is a common disease among children and most asthma related deaths occur in low- and lower-middle income countries and about 300 million people are suffering from asthma globally. About 10% of this asthma burden belongs to India.Exercise has shown to have beneficial effects in asthma patients. Also improved Pulmonary function parameters in these patients, some clinical studies have shownthe significant improvement in PEFR, VC, FVC, FEV1, FEV/FEC %, MVV, ESR and absolute eosinophil count. The number of asthmatic attacks is also reduced. There is a reduction in rescue medication use, improvement was also found in symptom scores, exacerbations, spirometrical parameters with improved quality of life and good impact on antioxidant level.

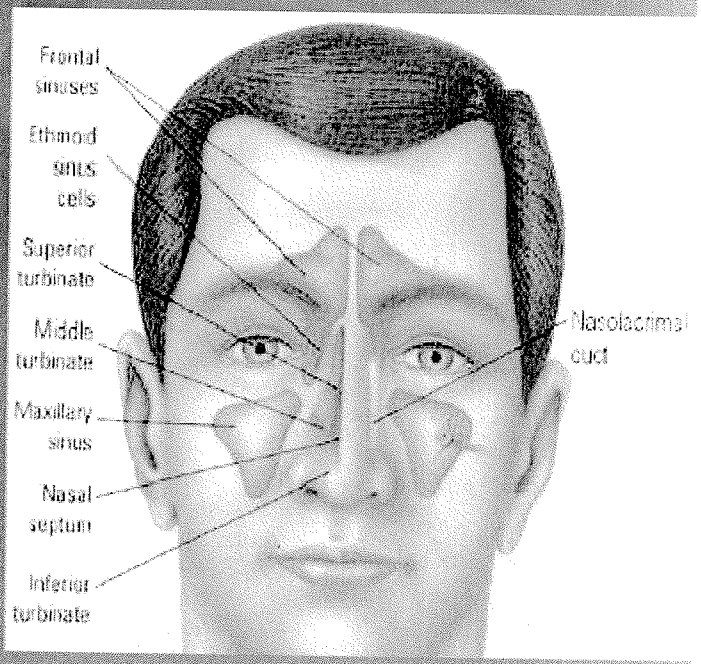
The reduction of medicines is earlier than that achieved with conventional treatment alone. Several studies have documented the use of yoga in relieve of pain, associated stress, anxiety and sleep disorders, both in patients and their caregivers. People with serious respiratory ailments have found a good solution in yoga. If the lungs are permanently damaged as in chronic bronchitis, yoga helps to improve mechanical efficiency of our breathing and make the most of our lung capacity. Yoga has effect on ventilator lung functions, which depend on compliance of lungs and thorax, airway resistance and strength of respiratory muscles. Yoga respiration (Pranayama) consists of very slow, deep breaths with sustained breath hold after each inspiration and expiration so it is considered as a method of breathing and chest expansion exercise. The Global Initiative for

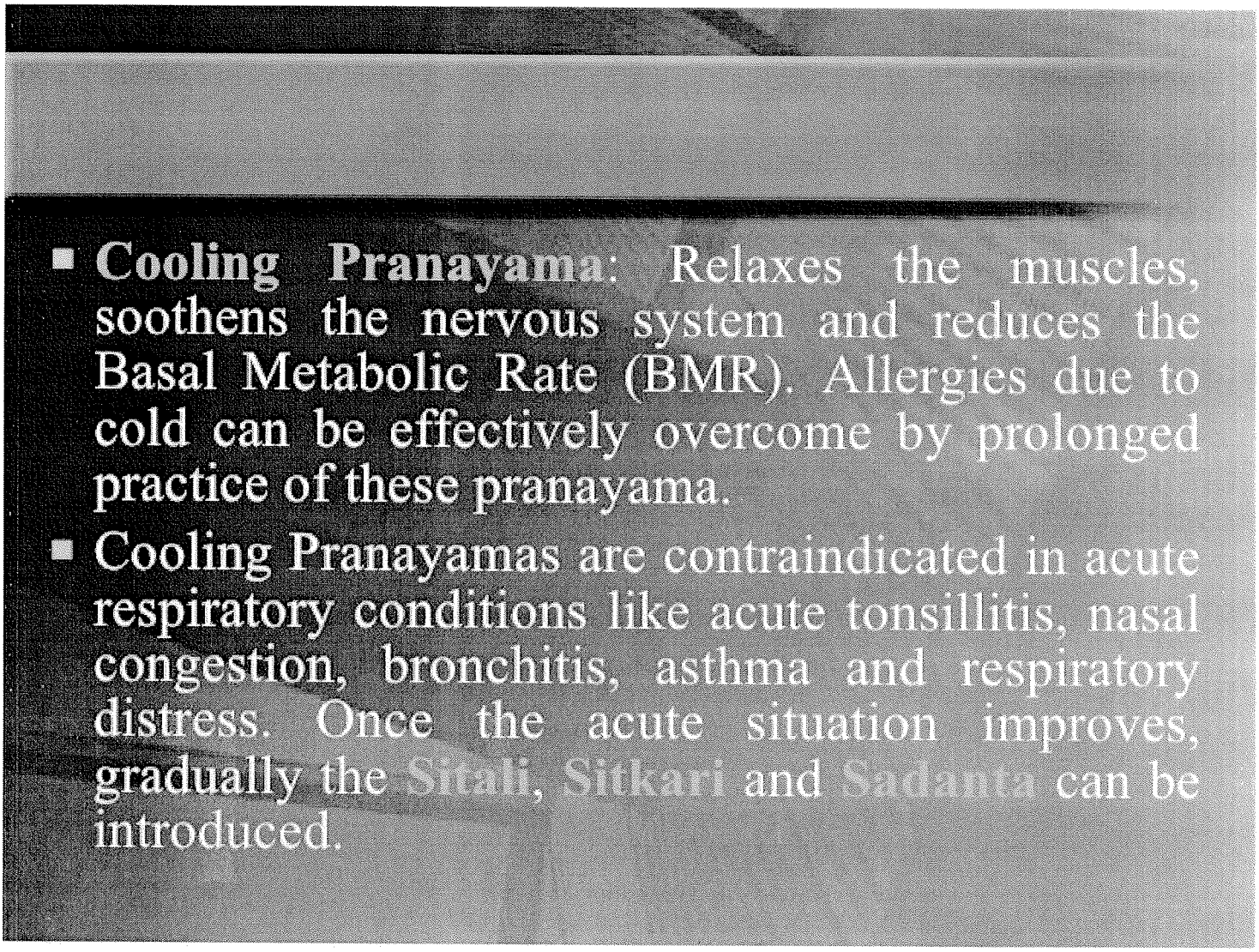
Asthma has also considered beutykoteqniue is helpful in decreasing asthma symptom score and improves pulmonary functions in asthma patients.

TB and Yoga Therapy :Tuberculosis is an epidemic disease, affecting approximately one-third of the world's population. It has been found that this particular condition is prevalent in men rather thanwomen it has been also found in the minorities, socially and economically lower classes. Some of the important yoga poses are helpful in tuberculosis. Bhastrika (Bellows Breath), Kapalbhati (Cleansing Breath), Nadishodhan (Anulone- Vilome) are beneficial pranayamas for TB patients. Forward and backward bending movements, and stretching poses may also good. Yoga enhance the internal stamina and reduces the stress. It has been shown that the positive findings like improved daily basic living skills, maintainance of personal hygiene, self-care, social-interpersonal activities, communication and self-discipline in the yoga group, yoga therapy will be added as a daily discipline which can improve their overall functioning. In Indian cultural environment patients suffering from TB can be more easily motivated for the yoga therapy and interiorize its beneficial effects.

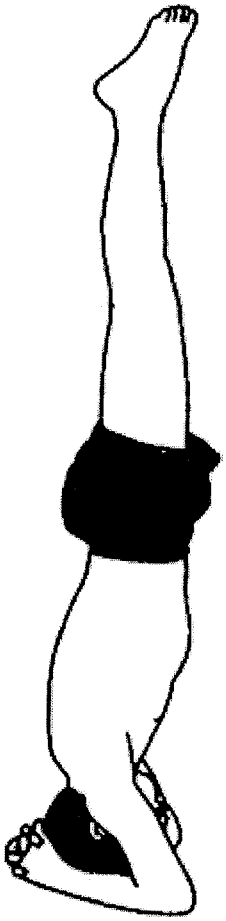
Sinusitis

- Inflammation of the sinus linings produces pain in the forehead or in the cheeks. Severe pain occurs if swelling prevents drainage of the sinuses and pressure builds up.





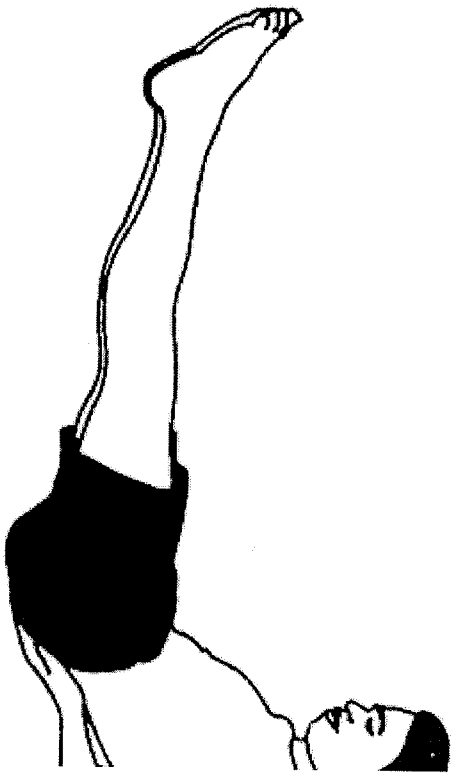
Ultimate Effect of Yoga on Respiratory System :Yoga postures involve an isometric contraction which help to increase the skeletal muscle strength or improves the strength of inspiratory and expiratory muscles.In Kapalbhati – there occurs full use of diaphragm and abdominal muscles for breathing. It helps in removal of secretions from bronchial tree and helps in clearing up respiratory passages. In Nadi Shodhan pranayama, due to efficient use of abdominal and diaphragmatic muscles the respiratory apparatus gets emptied and filled more completely and efficiently.

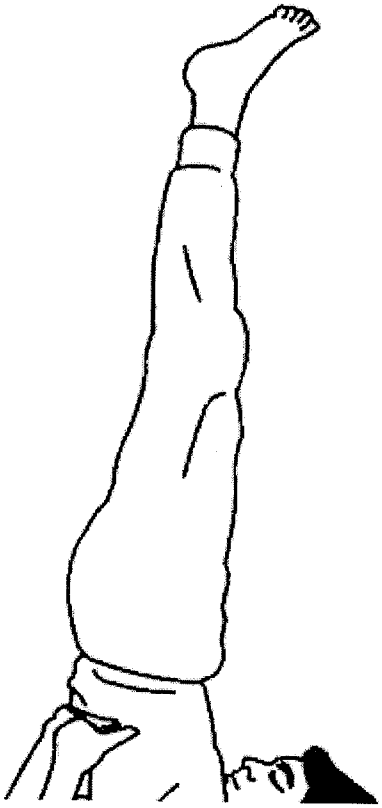


1. Shirshasana

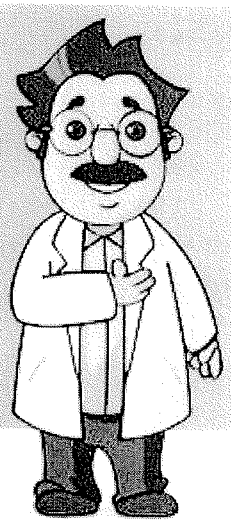


2. Ardhahalasana





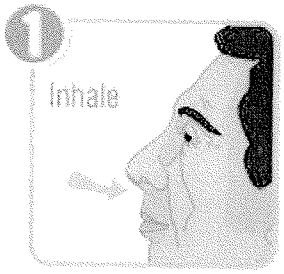
Breathing exercises for COPD



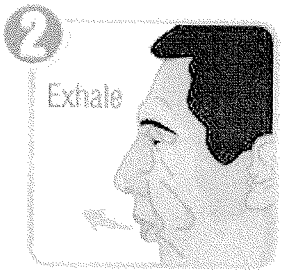
Here are a few ways to help your lungs to get more air:

PURSED-LIP BREATHING

(like breathing out slowly into a straw)



Inhale slowly through your nose until your lungs are full of air.



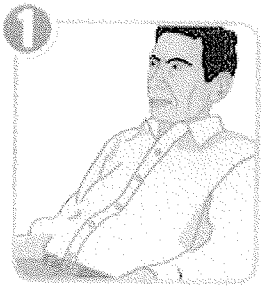
Purse your lips as if you are going to whistle. Now exhale slowly.

Note:

- Breathing out should take twice as long as breathing in.
- Do not force your lungs to become empty.

Pursed-lip breathing will help you control your breathing rate and shortness of breath. It helps to get air into your lungs and thus get the energy required to breathe. It will also help you feel more in control and make it easier for you to do things.

DIAPHRAGMATIC BREATHING



Sit comfortably and relax your shoulders.



Put one hand on your abdomen. Now inhale slowly through your nose. (Push your abdomen out while you breathe in.)



Then push in your abdominal muscles and breathe out using the pursed-lip technique. (You should feel your abdomen go down.)

BIHER

SLIMS

During pranayama there is slow and prolonged inspiration as well as expiration. This stretches elastin and collagen fibres of lung parenchyma and lungs inflated near to total lung capacity. This is a major physiological stimulus for release of lung surfactant into alveolar spaces which increases the lung compliance. Due to lung inflation, there occurs release of prostaglandins which decreases bronchial smooth muscle tone. Ultimately yoga with its calming effect on the mind can reduce and release emotional stresses thereby withdrawing the bronchoconstrictor effect.

Chronic lower respiratory diseases remain incurable and impose tremendous suffering on people and society. There has been an explosion in clinical studies studying the pulmonary health benefits of yoga. The evidence based adjunctive therapeutic efficacy of yoga in COPD and asthma generated by these trials is persuasive. Yoga is easy to learn and practice and is almost free and extremely safe. Yoga is ideally suited for India as a complementary modality in the management of lower respiratory disorders. The ultimate goal of yoga is to find perfection in life. By integrating yoga into our life, we begin with the awareness of ourselves in our present condition and then use the potentials within us to reach a higher awareness in life. Regular yoga practice improves various pulmonary function tests and is beneficial to improve respiratory efficiency.

Pranayama, a component of yoga is one of the best remedies which helps to tackle the respiratory illness caused by the air pollution and other naturally occurring respiratory illness. The effect of these exercises can be best achieved when practiced at the start of each day. Pranayama when practiced in combination with asana and meditation help the body and the mind to meet every situation that arises in life from moment to moment.

VALUE ADDED COURSE

Certificate Course in yoga therapy for respiratory diseases & code PYC11

List of Students Enrolled May 2019– July 2019

1st Year MBBS Student			
Sl. No	Name of the Student	Registration Number	Signature
1	INDU V	U18MB301	
2	INDUKURI SAI AKANKSHA	U18MB302	
3	IPSITA SETHY	U18MB303	
4	JAGADEESAN S.R	U18MB304	
5	JAHNAVI REDDY .M	U18MB305	
6	JAISHREE .S	U18MB306	
7	JANANI V	U18MB307	
8	JASMEET NIRANJAN	U18MB308	
9	JAYALAKSHMI S	U18MB309	
10	JAYAREDDYGARI SAI RUCHITHA	U18MB310	
11	JETESH SINGH	U18MB311	
12	KAMALESH C N	U18MB312	
13	KARTHIYAYINI .G	U18MB313	
14	KEERTHANA P	U18MB314	
15	KEISHAM LUXMIRANI	U18MB315	
16	LAKKAM UMESH KUMAR	U18MB316	
17	LAKSHMI PRIYA E	U18MB317	
18	LEKIWA O PALA	U18MB318	
19	LISHI YAM	U18MB319	
20	MADAN SHUBHAM SANJAY	U18MB320	

Certificate Course in Yoga therapy for Respiratory diseases

(Code: PHYC11)

ANSWER ALL THE QUESTIONS(Total marks=25 marks)

1. Long answer question 1x10=10 marks

1. Explain in detail about different yogas for COPD.

2. Short answer questions: (3x5=15 marks)

a. Different types of Pranayama

b. Benefits of yoga.

c. Pranayama for Bronchial Asthma.

Value added course on Yoga Therapy for Respiratory diseases

Jasmeet Nirani
U18 M.B 30

1. Explain in detail about different types of Yoga for COPD

17/25

1. Shirshasana
2. Ardhohalasana
3. Deep breathing exercise
4. Bhramari
5. Omkaara
6. Nadishuddi pranayama
7. Shashankasana

Yoga practice consists of Asana and pranayama. proper Yoga consists of five principles which relaxation, proper breathing, proper diet, positive thinking and meditation.

In Nadi ~~sho~~ Shuddhi, due to efficient use of abdominal & diaphragmatic muscles, the Respiratory system sets emptied & filled more completely and efficiently.

2. (C) Inhale slowly thro' the nose until

(1) your lungs are full of air

(2) purse your lips as if you are going to whistle. Now inhale slowly.

(3) put one hand on your abdomen. Now inhale slowly thro the nose.

(4) Then push in your abdominal muscles and breath out using the pursed lip technique.

Value added course
On yoga Therapy
For Respiratory diseases

Jetesh Singh
U18MB311

22/25

(1) Explain in detail about the different types of yoga for COPD

* 5 yoga poses for COPD Patients
  - ⇒ Nivana Pranayam [Pursed Lip Breathing]
  - ⇒ Ardha Matsyendrasana [Seated Spinal twist pose]
  - ⇒ Marjaridasana [Cat pose]
  - ⇒ Trikon Aasana [Triangle pose]
  - ⇒ Surya Namaskar [Sun Salutations]

* Yoga is an excellent form of exercise for anyone with COPD. Benefits from the practice of yoga can include: Lowered Blood Pressure.
* It improves our both Physical and Emotional Health.

(C): "Kapal Bhati is a Popular Pranayama which has many benefits like Speeding up the metabolism, improving Blood circulation, energising the nervous System, and Promoting energy flow throughout the body. Bhastrika Pranayama is done along with Kapal Bhati to cleanse the airways of the body.

(b) BENEFITS OF YOGA:-

⇒ Yoga improves Strength, balance and flexibility...

⇒ yoga helps with back pain relief.

⇒ yoga can ease arthritis Symptoms.

⇒ yoga benefits heart Health.

⇒ yoga relaxes you, ~~to~~ help you Sleep.

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Keisham Laxmirani has actively participated in the Value Added Course on Certificate course in yoga therapy for respiratory diseases held during May 2019 - July 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

V.Aneb

Dr.V.Anebaracy
RESOURCE PERSON

R. Vijayakumar

Dr.R.Vijayakumar
COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that Miss. Kavitajayini. G has actively participated in the Value Added Course on Certificate course in yoga therapy for respiratory diseases held during May 2019 - July 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.V.Anebaracy
RESOURCE PERSON

R. Vijayakumar
Dr.R.Vijayakumar
COORDINATOR

Student Feedback Form

Course Name: Certificate course in yoga therapy for respiratory diseases

Subject Code: PHY C11

Name of Student: Lakshmi Poojari Registration Number: U18MB317

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course				✓	
8	Overall rating of the course	1	2	(3)	4	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

We want more value added courses like this. Excellent sessions. Thank you

Lakshmi

Signature

Student Feedback Form

Course Name: Certificate course in yoga therapy for respiratory diseases

Subject Code: PHY C11

Name of Student: S. Jayalakshmi Registration Number: U18MB309

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	(4)	5

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

We want more Practical Sessions

Signature

Date: 11.07.2019

From
Dr.V.Senthil kumar
Professor and Head,
Physiology
Sri Lakshmi Narayana Institute of Medical sciences
Puducherry

To
The Dean,
Sri Lakshmi Narayana Institute of Medical sciences
Puducherry

Through Proper Channel

Sub: Completion of value-added course: Certificate course in yoga therapy for respiratory diseases & Code: PHY C11

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Certificate course in yoga therapy for respiratory diseases & Code: PHY C11 from , May 2019– July 2019.

We solicit your kind action to send certificates for the participants that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

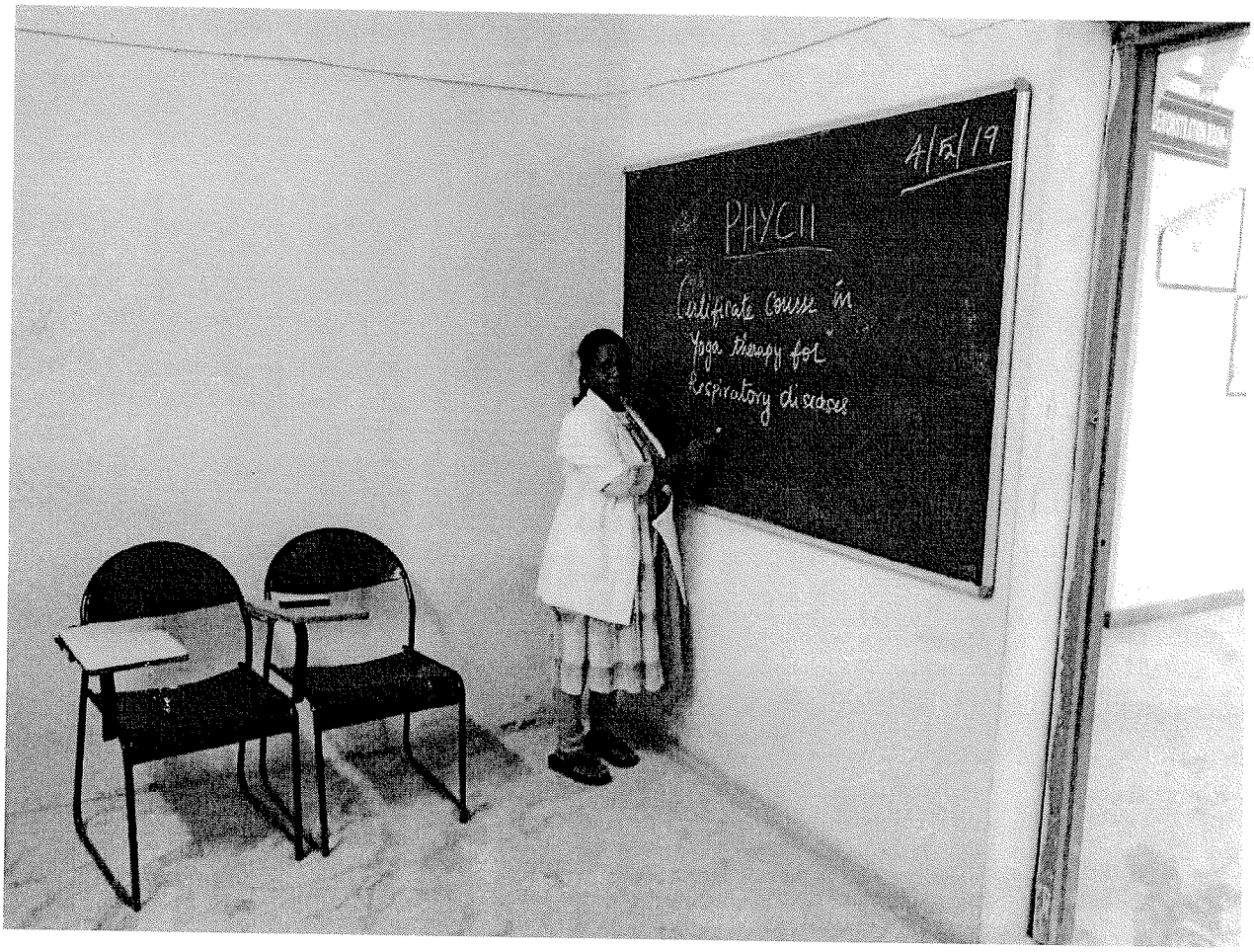
VSK

Dr.V.Senthil kumar
HOD Physiology

PROFESSOR & HOD
DEPARTMENT OF PHYSIOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Encl: **Certificates**

Photographs


4/2/19
PHYCH
Certificate Course in
Yoga therapy for
Respiratory diseases

