7/18/2015

Chennai

From

The Course Coordinator

Certificate Program in Motor Development, Growth, & Form

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 Motor Development, Growth, & Form**

Respected sir,

With reference to subject mentioned above, the Paediatrics proposes to conduct a value-added course titled: Certificate Program in Motor Development, Growth, & Form

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

**SREE BALAJI MEDICAL COLLEGE & HOSPITAL**

**CHROMPET CHENNAI -600044**

**Date:** 7/21/2015

**R. No 111/ SBMCH/2015**

# 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 Motor Development, Growth, & Form from 8/17/2015 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 8/10/2015.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

(1)

## CERTIFICATE PROGRAM IN MOTOR DEVELOPMENT, GROWTH, & FORM

**Course outline:** It covers the fundamentals generally taught in a one-semester introductory course in developmental psychology or human development, including the infancy, childhood, adolescence, adulthood, and aging.

Our goal as creators of this course is to prepare you to pass the College Board's CLEP examination and obtain college credit for free.

"Human Growth and Development" is a completely self-paced course. It has no prerequisites and it is offered entirely for free.

**Course Duration: 30 hours**

**Course Coordinators: Associate Professor / Assistant Professor of Pediatrics**

**Syllabus**

| **Topic** | **Faculty** | **Hours allotted** |
|---|---|---|
| Introduction to course | Assistant Professor of Paediatrics | 2 hours |
| Concepts and Theories of Human Development | Associate Professor of Paediatrics | 2 hours |
| Meaning,Definitions & Principles of Growth and development | Assistant Professor of Paediatrics | 2 hours |
| Development periods in Human life span (Prenatal development,Infancy, Childhood, Adolescence, Adulthood) | Associate Professor of Paediatrics | 2 hours |
| Heredity and environment on | Assistant Professor of | 2 hours |

| | | |
|---|---|---|
| Written test | Associate Professor of Paediatrics | 2 hours |

| | | |
|---|---|---|
| development | Paediatrics | |
| Domains of Human Growth and Development | Associate Professor of Paediatrics | 2 hours |
| Theories of Erikson | Assistant Professor of Paediatrics | 2 hours |
| Pre-natal Development – Conception, Pre-natal Development & Birth | Associate Professor of Paediatrics | 2 hours |
| Sensation ,Sensation: Definition and Sensory Process | Assistant Professor of Paediatrics | 2 hours |
| Attention: Definition and Affecting Factors<br>Perception: Definition and Types | Associate Professor of Paediatrics | 2 hours |
| Memory, Thinking, and Problem Solving | Assistant Professor of Paediatrics | 2 hours |
| Concept of Diversity and type of Diversity<br>Diversity in learning and delivering the diverse learning needs<br>Independent Living skills – Meaning, Importance, components<br>Transition to Adulthood - | Associate Professor of Paediatrics | 2 hours |
| Viva voce | Assistant Professor of Paediatrics | 2 hours |

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

## CERTIFICATE

This is to certify that Mr./Ms. ADIN DAVID has completed the value added course on Certificate Program in Motor Development, Growth, & Form conducted by Paediatrics at Sree Balaji Medical College & Hospital, Chennai held during 8/17/2015.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

**Certificate Program in Motor Development, Growth, & Form**

| 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 |
| 36 | U15MB036 | BRINDHA M |
| 37 | U15MB037 | DAKINI PALA |
| 38 | U15MB038 | DEBBIE AISHWARYA SATHYA |

## COURSE FEEDBACK FORM

Date: 17/08/2015

Course Title: Certificate Programme Motor development, Cerebral palsy

Name: Aarthi. P

RegNo: U15MB001

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:

Aarthi
Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 17/08/2015

Course Title: Certificate Program in Motor development, Growth & Form

Name: Abdul Rahuman. J

RegNo: U15MB002

Department: Paediatric

| 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***

| Short term course on Human Ecology and Health | | |
|---|---|---|
| S. No | Regn. No. | Name |
| 1 | U15MB039 | DEEPAK GAUTAM G |
| 2 | U15MB040 | DEEPAKCHANDAR N |
| 3 | U15MB041 | DESHNA V |
| 4 | U15MB042 | DEVI C |
| 5 | U15MB043 | DHARANPATHY D |
| 6 | U15MB044 | DINEASH V R |
| 7 | U15MB045 | DIVYA KURUP P S |
| 8 | U15MB046 | DOMINIC BABU |
| 9 | U15MB047 | ELANGOVAN I |
| 10 | U15MB048 | ELBICH SONISA L |
| 11 | U15MB049 | ELIZA NONGMAITHEM |
| 12 | U15MB050 | FASALURAHMAN K M |
| 13 | U15MB051 | GADILI LAVANYA |
| 14 | U15MB052 | GANAPATHY S |
| 15 | U15MB053 | GANESH K |
| 16 | U15MB054 | GANUGAPANTA PREM SAI REDDY |
| 17 | U15MB055 | GAUTAM B |
| 18 | U15MB056 | GAUTHAM M |
| 19 | U15MB057 | GAUTHAM N |
| 20 | U15MB058 | GAYATHRI K |
| 21 | U15MB059 | GOKUL G |
| 22 | U15MB060 | GOKUL S |
| 23 | U15MB061 | GOPIKA GIRI |
| 24 | U15MB062 | GOPINATH S |
| 25 | U15MB063 | GOTTAM BHARGAVA SAI SRINIVAS |
| 26 | U15MB064 | GOWSHIK RAJA K S |
| 27 | U15MB065 | GOWTHAMAN K |
| 28 | U15MB066 | GRACELYN SHARON P |
| 29 | U15MB067 | GREESHMI C |
| 30 | U15MB068 | HARIHARAN M |
| 31 | U15MB069 | HARINI G |
| 32 | U15MB070 | HARRIBALAJI M |
| 33 | U15MB071 | HARSHATH KUMAR K N |
| 34 | U15MB072 | HARSHITHA REDDY D |
| 35 | U15MB073 | HOMA SAMANVITHA S |
| 36 | U15MB074 | IMMANUEL ABRAHAM S |
| 37 | U15MB075 | JANANI S |
| 38 | U15MB076 | JASMINE NISHA N |
| 39 | U15MB077 | JAYA KALYANI P S |
| 40 | U15MB078 | JAYAPREETHI S |
| 41 | U15MB079 | JEEVITHA P |
| 42 | U15MB080 | JENISHA THERESA LALICHAN |

7/17/2015

Chennai

From

The Course Coordinator

Short term course on Human Ecology and 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: Short term course on Human Ecology and Health**

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Short term course on Human Ecology and Health

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 7/20/2015

**R. No 129/ SBMCH/2015**

# 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 Human Ecology and Health from 8/17/2015 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 8/10/2015.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

(2)

# SHORT TERM COURSE ON HUMAN ECOLOGY AND HEALTH

## Course Outline

In this course students will be introduced to the principle that health is determined by the relationship between humans and the environment in which they live. The interplay between biological and cultural processes creates implications for health. The human response has been to develop organised systemic approaches to address challenges to health. These responses will be tracked from hunter gatherer societies through to the 21st century societies to demonstrate the development of our current understandings of health, our relationship with the planet, ecological sustainability and the emergence of our current health system.

The course applies the principles of ecosystem sciences to the study of the human environment. The emphasis is on the significance and function of ecosystems, how humans have affected these systems over time, and what are the opportunities of and barriers to making positive changes. Dynamical systems thinking and the concept of coupled social ecological system is introduced as a powerful means of comprehending the behaviour of these complex situations. Field trips allow students to experience first-hand the complexity of these human-ecological interactions and the challenges of managing them sustainably.

In the latter half of the course, human-nature interactions over human history are critically reviewed, including hunter gatherer societies, early agricultural societies and modern globalised urban and industrial societies. Some key contemporary challenges facing humanity in the Anthropocene are presented for critical reflection. Students extend their understanding of one of these challenges in their final research report and presentation.

**Learning Outcomes**

Upon successful completion, students will have the knowledge and skills to:

1. Demonstrate advanced understanding of Human Ecology, including knowledge of the history and background to the topic.
2. Demonstrate advanced understanding of key linkages between ecosystem and social processes and how they relate to human-nature interactions, and to integrate this understanding with knowledge drawn from their own degree backgrounds.
3. Use systems approach to 'get at' an understanding of the complex, multi-scaled, interactions that characterize human-ecological situations, and their associated problems
4. Apply this understanding in to a significant contemporary challenge facing humanity in the Anthropocene.
5. Communicate human ecological systems approaches to social-environmental challenges to a range of audiences in effective written and oral form.

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

**Syllabus**

| Topic | Faculty | Hours allotted |
|---|---|---|
| Introduction to course | Assistant Professor of Community Medicine | 2 hours |
| Human ecology | Associate Professor of Community Medicine | 2 hours |
| Ecosystems | Assistant Professor of Community Medicine | 2 hours |
| Environmental health | Associate Professor of Community Medicine | 2 hours |
| linkages between ecosystem and social processes | Assistant Professor of Community Medicine | 2 hours |
| Social Environmental Challenges | Associate Professor of Community Medicine | 2 hours |
| Recent trends | Assistant Professor of Community Medicine | 2 hours |
| Global Health and its Implications in Ecosystems | Associate Professor of Community Medicine | 2 hours |
| Assignment | Assistant Professor of Community Medicine | 2 hours |
| Biohazards | Assistant Professor of Community Medicine | 2 hours |
| Environmental science | Associate Professor of | 2 hours |

| | | |
|---|---|---|
| industries | Community Medicine | |
| Urban ecology & Conservation Ecology | Assistant Professor of Community Medicine | 2 hours |
| Viva voce | Associate Professor of Community Medicine | 2 hours |
| Written test | Assistant 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. AISHWARYA RAMESH has completed the value added course on Short term course on Human Ecology and Health conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 8/17/2015.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Date: 17/08/15

Course Title: Short term Course on Human Ecology and Health

Name: Gowthaman. T.

RegNo: U15MB065

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:

Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 17/08/2015

Course Title: SHORT TERM COURSE ON HUMAN ECOLOGY AND HEALTH

Name: BLANCHOVAN. I

RegNo: UI5MB047

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:

Signature

***Thank you***



**Short term course on Human Ecology and Health**

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U15MB039 | DEEPAK GAUTAM G |
| 2 | U15MB040 | DEEPAKCHANDAR N |
| 3 | U15MB041 | DESHNA V |
| 4 | U15MB042 | DEVI C |
| 5 | U15MB043 | DHARANPATHY D |
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| 25 | U15MB063 | GOTTAM BHARGAVA SAI SRINIVAS |
| 26 | U15MB064 | GOWSHIK RAJA K S |
| 27 | U15MB065 | GOWTHAMAN K |
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| 32 | U15MB070 | HARRIBALAJI M |
| 33 | U15MB071 | HARSHATH KUMAR K N |
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| 36 | U15MB074 | IMMANUEL ABRAHAM S |
| 37 | U15MB075 | JANANI S |
| 38 | U15MB076 | JASMINE NISHA N |
| 39 | U15MB077 | JAYA KALYANI P S |
| 40 | U15MB078 | JAYAPREETHI S |
| 41 | U15MB079 | JEEVITHA P |
| 42 | U15MB080 | JENISHA THERESA LALICHAN |

7/18/2015

Chennai

From

The Course Coordinator

Certificate Program in Consumer Health Education

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 Program in Consumer Health Education**

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Certificate Program in Consumer Health Education

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 7/21/2015

R. No 129/ SBMCH/2015

# 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 Program in Consumer Health Education from 8/17/2015 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 8/10/2015.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

Scanned by TapScanner

Circular

## CERTIFICATE PROGRAM IN CONSUMER HEALTH EDUCATION

Consumer health information is concerned with obtaining health information that is related to our health. This involves learning about available products and services pertaining to health as well as health facts, principles, ideas, and feelings an individual has and can use to enhance optimal or sound health and practices for his or her well being.

**Course Duration**: 30 Hours

**Course Syllabus**

| **Topic** | **Faculty** | **Hours allotted** |
|---|---|---|
| Introduction | Assistant Professor of Community Medicine | 2 hours |
| Healthcare "system" in India | Associate Professor of Community Medicine | 2 hours |
| Concepts related to health insurance | Assistant Professor of Community Medicine | 2 hours |
| Affordable Care Act a | Associate Professor of Community Medicine | 2 hours |
| Drugs and medical devices production and approval | Assistant Professor of Community Medicine | 2 hours |
| Concept of vulnerable populations and their protection in medical research | Associate Professor of Community Medicine | 2 hours |
| Health equity/health disparities and social determinants of health. | Assistant Professor of Community Medicine | 2 hours |
| Importance of self-responsibility in healthcare. | Associate Professor of Community Medicine | 2 hours |
| Viable and fraudulent types of complementary and alternative medicine. | Assistant Professor of Community Medicine | 2 hours |
| Medical advertising | Associate Professor of Community Medicine | 2 hours |
| Consumer protection laws | Assistant Professor of Community Medicine | 2 hours |
| Group discussion | 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 |

## CERTIFICATE PROGRAM IN AGING AND HEALTH

**Course Outline:**

In Promotion of Healthy Ageing, we will explore key lifestyle-related factors that are modifiable and influential in our well-being in old age, such as diet, physical activity, stress and sleep. By looking closely at the different aspects of lifestyle behaviours and their impact on our health as we get older, we can take action and promote healthy habits in ourselves and those we care for.

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 Coordinator: Associate professor / Assistant Professor of Medicine**

**Course Syllabus**

| **Topic** | **Faculty** | **Hours allotted** |
|---|---|---|
| Introduction course | Assistant Professor of Medicine | 2 hours |
| Health care | Associate Professor of Medicine | 2 hours |
| Common geriatric diseases | Assistant Professor of Medicine | 2 hours |
| Management of geriatric diseases | Associate Professor of Medicine | 2 hours |
| Palliative care | Assistant Professor of Medicine | 2 hours |
| Importance of Nursing in | Associate Professor of | 2 hours |

| | | |
|---|---|---|
| bedridden patients | Medicine | |
| lifestyle-related factors: cognitive and socioemotional aspects | Assistant Professor of Medicine | 2 hours |
| Long-term perspectives in healthy ageing | Associate Professor of Medicine | 2 hours |
| WHO's Global Strategy and Action Plan on Ageing and Health | Assistant Professor of Medicine | 2 hours |
| Environments that are age-friendly as well as improving measurement, monitoring and research on healthy ageing | Associate Professor of Medicine | 2 hours |
| Global course for Healthy Ageing | Assistant Professor of Medicine | 2 hours |
| Group discussion | Associate Professor of Medicine | 2 hours |
| Viva voce | 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, AISHWARYA S has completed the value added course on Certificate Program in Consumer Health Education conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 8/17/2015.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

Certificate Program in Consumer Health Education

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U15MB081 | JESVANTHAN E |
| 2 | U15MB082 | JEYA PRADHA C |
| 3 | U15MB083 | JINU SHIRLEY T |
| 4 | U15MB084 | JOSEPH MARTIN J |
| 5 | U15MB085 | JOTHIRLATHA Y J |
| 6 | U15MB086 | KALAIVANI G |
| 7 | U15MB087 | KAMLESH KANNA A S |
| 8 | U15MB088 | KARTHICK M |
| 9 | U15MB089 | KARTHIKA RAJESWARI R |
| 10 | U15MB090 | KAVIN S |
| 11 | U15MB091 | KAVINKUMAR V |
| 12 | U15MB092 | KAVYA G |
| 13 | U15MB093 | KEERTHANA K |
| 14 | U15MB094 | KEERTHANA SURESH |
| 15 | U15MB095 | KEERTHI RAJ G |
| 16 | U15MB096 | KHAAVYA B |
| 17 | U15MB097 | KISHORE G |
| 18 | U15MB098 | KODURU NAVEEN KUMAR |
| 19 | U15MB099 | KRISHNA PRABA S |
| 20 | U15MB100 | KRISHNAKKUMAR N R |
| 21 | U15MB101 | LAKSHANA D |
| 22 | U15MB102 | LAKSHMI PRASHANTH N |
| 23 | U15MB103 | LOGESHRAJA V M |
| 24 | U15MB104 | MADAN KUMAR S |
| 25 | U15MB105 | MADHANKUMAR M |
| 26 | U15MB106 | MAHALAKSHMI B |
| 27 | U15MB107 | MAHALAKSHMI M |
| 28 | U15MB108 | MALACK MAHMOOD USAMA |
| 29 | U15MB109 | MANEESH P |
| 30 | U15MB110 | MANGAIYARKARASI A |
| 31 | U15MB111 | **MANIKANDAN K (name changed as MANIKANDAN J K)** |
| 32 | U15MB112 | MANISHA V |
| 33 | U15MB113 | MANJUPAARGAVI R |
| 34 | U15MB114 | MARTINA LINDSAY PAUL A |
| 35 | U15MB115 | MATCHA REDDYSRI |
| 36 | U15MB116 | MICHAEL SWETHA J |
| 37 | U15MB117 | MITHUN J |
| 38 | U15MB118 | MOHAMMED AZHERUDDIN M K J |
| 39 | U15MB119 | MOHAMMED JUNAIDH KHAN B |

## COURSE FEEDBACK FORM

Date: 14/08/15

Course Title: Certificate Program in Consumer Health Education

Name: Harisha.V

RegNo: U15MB112

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:

Signature

•••Thank you•••

## COURSE FEEDBACK FORM

Date: 17/08/15

Course Title: Certificate Program in Consumer Health Education.

Name: Jeyasarthan. E

RegNo: U15MB081

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:

Signature

***Thank you***



7/18/2015

Chennai

From

The Course Coordinator

Certificate Program in Aging and 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: Certificate Program in Aging and Health**

Respected sir,

With reference to subject mentioned above, the Physiology proposes to conduct a value-added course titled: Certificate Program in Aging and Health

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

**SREE BALAJI MEDICAL COLLEGE & HOSPITAL**

**CHROMPET CHENNAI -600044**

**Date:** 7/21/2015

**R. No 149/ SBMCH/2015**

# 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 Certificate Program in Aging and Health from 8/17/2015 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 8/10/2015.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

# CERTIFICATE PROGRAM IN AGING AND HEALTH

**Course Outline:**

In Promotion of Healthy Ageing, we will explore key lifestyle-related factors that are modifiable and influential in our well-being in old age, such as diet, physical activity, stress and sleep. By looking closely at the different aspects of lifestyle behaviours and their impact on our health as we get older, we can take action and promote healthy habits in ourselves and those we care for.

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 Coordinator: Associate professor / Assistant Professor of Medicine**

**Course Syllabus**

| **Topic** | **Faculty** | **Hours allotted** |
|---|---|---|
| Introduction course | Assistant Professor of Medicine | 2 hours |
| Health care | Associate Professor of Medicine | 2 hours |
| Common geriatric diseases | Assistant Professor of Medicine | 2 hours |
| Management of geriatric diseases | Associate Professor of Medicine | 2 hours |
| Palliative care | Assistant Professor of Medicine | 2 hours |
| Importance of Nursing in | Associate Professor of | 2 hours |

| | | |
|---|---|---|
| bedridden patients | Medicine | |
| lifestyle-related factors: cognitive and socioemotional aspects | Assistant Professor of Medicine | 2 hours |
| Long-term perspectives in healthy ageing | Associate Professor of Medicine | 2 hours |
| WHO's Global Strategy and Action Plan on Ageing and Health | Assistant Professor of Medicine | 2 hours |
| Environments that are age-friendly as well as improving measurement, monitoring and research on healthy ageing | Associate Professor of Medicine | 2 hours |
| Global course for Healthy Ageing | Assistant Professor of Medicine | 2 hours |
| Group discussion | Associate Professor of Medicine | 2 hours |
| Viva voce | 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. AJAEY S has completed the value added course on Certificate Program in Aging and Health conducted by Physiology at Sree Balaji Medical College & Hospital, Chennai held during 8/17/2015.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH



## COURSE FEEDBACK FORM

Date: 15/08/15

Course Title: Certificate Program in Aging and Health

Name: Sai Vignesh. S

RegNo: U15MB143

Department: Physiology

| 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: 15/08/15

Course Title: CERTIFICATE PROGRAM IN AGING AND HEALTH

Name: RESHMA. P. K

RegNo: U15MB165

Department: Physiology

| 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:

Reshma P.K
Signature

***Thank you***

## Certificate Program in Aging and Health

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U15MB165 | RESHMA P K |
| 2 | U15MB166 | RESMIRAJ SAJINA BABURAJAN |
| 3 | U15MB167 | ROHAN RANJIT |
| 4 | U15MB168 | SABA SAMBANDAM R |
| 5 | U15MB169 | SABARI V |
| 6 | U15MB170 | SAHANA S |
| 7 | U15MB171 | SAI KAVYA D |
| 8 | U15MB172 | SAI LAKSHMI G |
| 9 | U15MB173 | SAI VIGNESH S |
| 10 | U15MB174 | SAIRAM M |
| 11 | U15MB175 | SALSABIEL NIJAMUDEEN |
| 12 | U15MB176 | SANDILYAN V |
| 13 | U15MB177 | SARAVANA KUMAR S |
| 14 | U15MB178 | SARUNYA R |
| 15 | U15MB179 | SATHISHKUMAR S |
| 16 | U15MB180 | SELVARANI V |
| 17 | U15MB181 | SHAIK MOHAMMED AFAAN |
| 18 | U15MB182 | SHANMUGA DEVI N |
| 19 | U15MB183 | SHARMILA J |
| 20 | U15MB184 | SHEIK DHANISH M |
| 21 | U15MB185 | SHERON TUNE J |
| 22 | U15MB186 | SHIRAVANKUMAR S P |
| 23 | U15MB187 | SHONA NELSON |
| 24 | U15MB188 | SHRIVIRUTHAA T |
| 25 | U15MB189 | SHRUTHI SRI R G |
| 26 | U15MB190 | SHRUTI U |
| 27 | U15MB191 | SHUBAVEE R |
| 28 | U15MB192 | SHYJU RAGLAND S R |
| 29 | U15MB193 | SIDDARTH VINCENT RAJ S |
| 30 | U15MB194 | SIDDHARTHANI A |
| 31 | U15MB195 | SIDHITHA S M |
| 32 | U15MB196 | SIVA VIGNESH A |
| 33 | U15MB197 | SIVASURIYAN S |
| 34 | U15MB198 | SMRITHI A |
| 35 | U15MB199 | SNEHA PREETHI E name changed as SAI SNEHA PREETHY E |
| 36 | U15MB200 | SNEKHA S |
| 37 | U15MB201 | SOUMIYA E |
| 38 | U15MB202 | SOWMIYA T |
| 39 | U15MB203 | SOWMYA N |
| 40 | U15MB204 | SOWPACKIA MANIMOZHI S |
| 41 | U15MB205 | SRI DIVYA D |
| 42 | U15MB206 | SRI SAHASARAJITHA S |
| 43 | U15MB207 | SRI SIVA SHYLA R |
| 44 | U15MB208 | SRI VIDVATHA V |
| 45 | U15MB209 | SRIMATHI M |

7/18/2015

Chennai

From

The Course Coordinator

Short term course on Community Health Implications

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 Community Health Implications**

Respected sir,

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

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

**SREE BALAJI MEDICAL COLLEGE & HOSPITAL**

**CHROMPET CHENNAI -600044**

**Date:** 7/21/2015

**R. No 150/ SBMCH/2015**

# 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 Community Health Implications from 8/17/2015 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 8/10/2015.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

## SHORT TERM COURSE ON COMMUNITY HEALTH IMPLICATIONS

**Course outline:**

Rapid social and economic growth in countries of the world has resulted in an increase both in the number of elderly people who are prone to degenerative and chronic diseases, and new patterns of illnesses that are brought on by social and economic factors such as occupational hazards, accidents, and environmental poisonings caused by air pollution, noise and contaminated water. Communities are struggling with a large number of people across the lifespan, who receive minimal or no health care because they cannot afford or access services.

Moreover, public concerns regarding quality, cost, access and fragmentation of health care have contributed to a shift in care from the more traditional acute care settings to the community. Students who concentrate in community health are interested in the health characteristics of populations within a shared geographical area. Students in this field view a healthy life not through individual achievements but through the lens of the community structure – one that supports its constituent members to make healthy choices through public educational resources. In community health, public health professionals try to better understand the foundational blocks of a given community and the role these structures play in promoting a healthy life in a given area – whether it be a neighborhood, a city, or an entire region.

**Course objectives**

By the end of the course the student will be able to describe and discuss on the following

1. Foundations of Community Health
2. Introduction to Public Health and Epidemiology
3. Concepts of Community Health
4. Health Care Planning and Organization of Health Care at various levels
5. Environmental Health and Sanitation
6. Introduction to Epidemiology, Epidemiological Approaches and Processes Demography, Surveillance and Interpretation of data
7. Bio-Medical Waste Management
8. Infection Control
9. Primary Health Care Of Common Communicable and Non¬ Communicable Diseases

**Course Duration:** 30 Hours

**Course Coordinator:** Associate Professor / Assistant professor of Community medicine

**Course Syllabus:**

| Topic | Faculty | Hours allotted |
|---|---|---|
| Introduction | Assistant Professor of | 2 hours |

| | | |
|---|---|---|
| | Community Medicine | |
| Healthcare "system" in India | Associate Professor of Community Medicine | 2 hours |
| Foundations of Community Health | Assistant Professor of Community Medicine | 2 hours |
| Introduction to Public Health and Epidemiology | Associate Professor of Community Medicine | 2 hours |
| Concepts of Community Health | Assistant Professor of Community Medicine | 2 hours |
| Health Care Planning and Organization of Health Care at various levels | Associate Professor of Community Medicine | 2 hours |
| Health Care Planning and Organization of Health Care at various levels | Assistant Professor of Community Medicine | 2 hours |
| Environmental Health and Sanitation | Associate Professor of Community Medicine | 2 hours |
| Introduction to Epidemiology, Epidemiological Approaches and Processes Demography, Surveillance and Interpretation of data | Assistant Professor of Community Medicine | 2 hours |
| Bio-Medical Waste Management | Associate Professor of Community Medicine | 2 hours |
| Primary Health Care Of Common Communicable and Non-Communicable Diseases | Assistant Professor of Community Medicine | 2 hours |
| Group discussion | 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 |

## COURSE FEEDBACK FORM

Date: 13/08/15

Course Title: Short term Course on Community Health Implications

Name: Surya Natarajan

RegNo: U15MBZ15

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:

Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 13/05/15

Course Title: Short term Course on Community Health Implications

Name: Udaya.S

RegNo: U15M231

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:

Udaya.S
Signature

***Thank you***

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

## CERTIFICATE

This is to certify that Mr./Ms. AJAY ANNAMALAI M has completed the value added course on Short term course on Community Health Implications conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 8/17/2015.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH



| Short term course on Community Health Implications | | |
|---|---|---|
| S. No | Regn. No. | Name |
| 1 | U15MB210 | SRINATH M |
| 2 | U15MB211 | SRIVIGNESH R |
| 3 | U15MB212 | SRUSHTI CHOWDARY YALAVARTHI |
| 4 | U15MB213 | SUBASRI R |
| 5 | U15MB214 | SAI AISHWARYA J |
| 6 | U15MB215 | SURYA NATARAJAN |
| 7 | U15MB216 | SUJI BARATHI D |
| 8 | U15MB217 | SUMERA KAUSAR R S |
| 9 | U15MB218 | SURAJ ANTON S |
| 10 | U15MB219 | SURYA KUMAR S |
| 11 | U15MB220 | SURYA PRASATH K |
| 12 | U15MB221 | SURYA R |
| 13 | U15MB222 | SWETHA M |
| 14 | U15MB223 | SYED AFRIDI S |
| 15 | U15MB224 | SYED ALI H F |
| 16 | U15MB225 | TARIQ IBRAHIM |
| 17 | U15MB226 | THALINZAI PRAVEEN KUMAR A |
| 18 | U15MB227 | SAKTHI VIGNESH T |
| 19 | U15MB228 | THILAKESH G |
| 20 | U15MB229 | THRILOK RAM B |
| 21 | U15MB230 | TRUP MOHAMED FASIH MAAZ |
| 22 | U15MB231 | UDAYA S |
| 23 | U15MB232 | UTHAYASURYA K |
| 24 | U15MB233 | VAIBHAVI D |
| 25 | U15MB234 | VAISHNAVI M |
| 26 | U15MB235 | VANI KRISHNA |
| 27 | U15MB236 | VARUN V |
| 28 | U15MB237 | VASANTH S |
| 29 | U15MB238 | VASANTHAKUMAR V S |
| 30 | U15MB239 | VEENA KRISHNA |
| 31 | U15MB240 | VENKATA MANISH REDDY MUNDLA |
| 32 | U15MB241 | VIDHYAPRIYADARSHINI S |
| 33 | U15MB242 | VIGNESH P |
| 34 | U15MB243 | VIGNESH R |

11/18/2015

Chennai

From

The Course Coordinator

Introduction to Medical Terminology

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: Introduction to Medical Terminology**

Respected sir,

With reference to subject mentioned above, the Anatomy proposes to conduct a value-added course titled: Introduction to Medical Terminology

We kindly solicit your kind permission to commence the program.

Warm Regards,



Course Coordinator

**SREE BALAJI MEDICAL COLLEGE & HOSPITAL**

**CHROMPET CHENNAI -600044**

**Date:** 11/22/2015

**R. No 153/ SBMCH/2015**

# 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 Introduction to Medical Terminology from 12/18/2015 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 12/11/2015.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

# INTRODUCTION TO MEDICAL TERMINOLOGY

**Course Outline:** Medical terminology is the study of the rules of medical word building. Receive a thorough grounding in basic medical terminology through a study of root words, prefixes and suffixes.

this medical terminology course is designed to give the learners foundational coursework for undergraduate level programs. With this course, you will **receive thorough instructions on how to develop fluency with medical terms**. You'll learn medical vocabulary with specific emphasis on root, prefixes, abbreviations, and suffixes.

**Course Objectives**

Upon successful completion of the online medical terminology classes, students will be able to:

- Correctly identify the roles of the four types of word parts in forming medical terms
- Analyze unfamiliar medical terms using that knowledge of word parts
- Define anatomy and physiology and use anatomic reference systems to identify the anatomic position for all major organ systems
- Learn medical terms and medical abbreviations for each body system

**Course Duration:** 30 hours

**Course Coordinator:** Associate Professor /Assistant Professor of Anatomy

**Syllabus:**

| **Topic** | **Faculty** | **Hours allotted** |
|---|---|---|
| Introduction course | Assistant Professor of Anatomy | 2 hours |
| **Introduction to Medical Terminology.** | Associate Professor of Anatomy | 2 hours |
| **Disease and Treatment.** | Assistant Professor of Anatomy | 2 hours |
| **Circulation, Blood and Immunity.** | Associate Professor of Anatomy | 2 hours |

| | | |
|---|---|---|
| **Respiration and Digestion.** | Assistant Professor of Anatomy | 2 hours |
| **Urinary and Male Reproductive System.** | Associate Professor of Anatomy | 2 hours |
| | Assistant Professor of Anatomy | 2 hours |
| **Female Reproductive System, Pregnancy and Birth.** | Associate Professor of Anatomy | 2 hours |
| **Endocrine and Nervous Systems, Behavioral Disorders.** | Assistant Professor of Anatomy | 2 hours |
| **The Senses.** | Associate Professor of Anatomy | 2 hours |
| **The Skeleton and Muscular Systems.** | Assistant Professor of Anatomy | 2 hours |
| Group discussion | Associate Professor of Anatomy | 2 hours |
| Viva voce | Assistant Professor of Anatomy | 2 hours |
| Written test | Associate Professor of Anatomy | 2 hours |

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

## CERTIFICATE

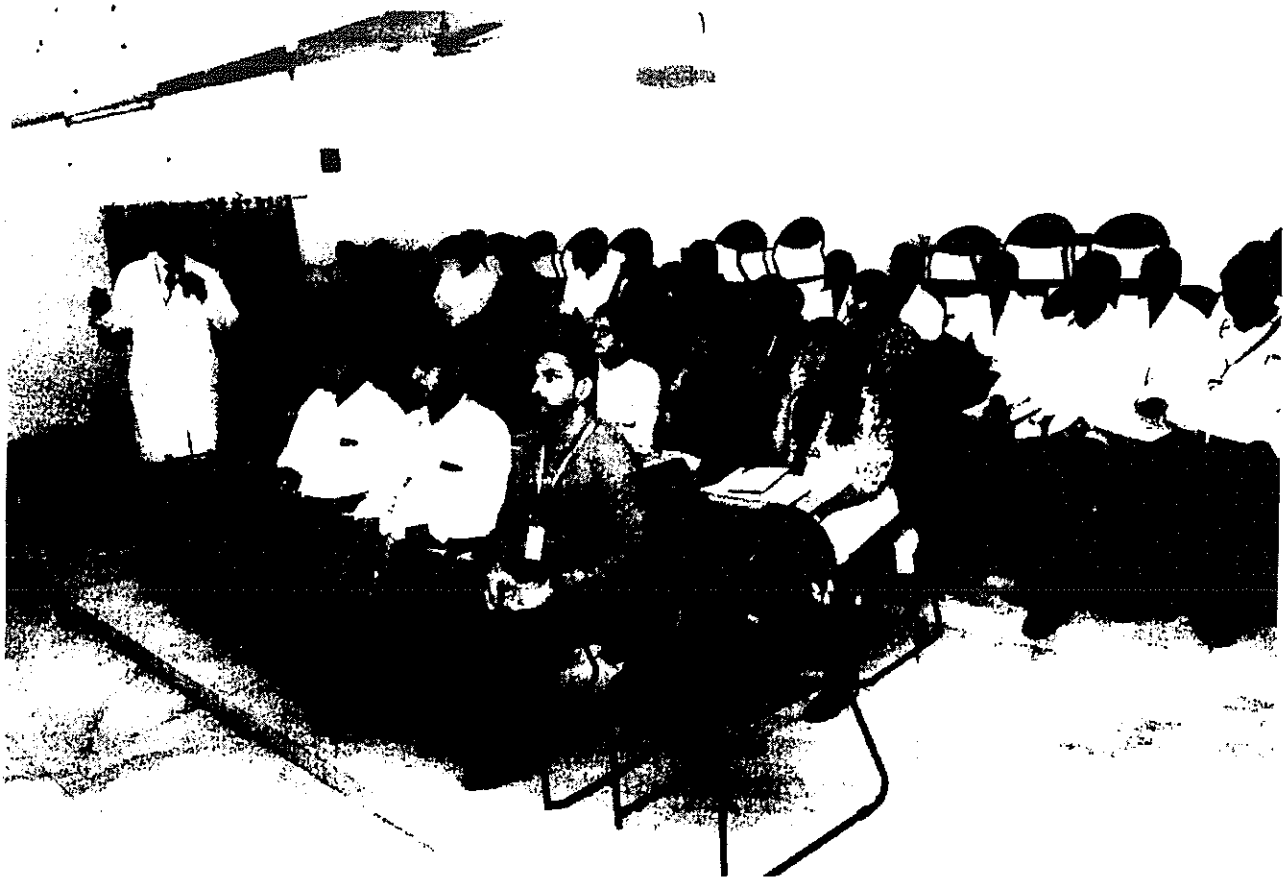
This is to certify that Mr./Ms, AJEY PRASANTH P has completed the value added course on Introduction to Medical Terminology conducted by Anatomy at Sree Balaji Medical College & Hospital, Chennai held during 12/18/2015.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH



**Introduction to Medical Terminology**

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U16MB001 | AATHIRA A |
| 2 | U16MB002 | ABDUL MANNAN MOHAMMAD |
| 3 | U16MB003 | ABIRAMI R |
| 4 | U16MB004 | ABISHEK JOEL KUMAR V |
| 5 | U16MB005 | ADARSH KUMAR A |
| 6 | U16MB006 | ADITYA SESHA SAI UNDAVALLI |
| 7 | U16MB007 | AFRA MARIAM T F |
| 8 | U16MB008 | AFSANA S |
| 9 | U16MB009 | AISHVHARAANI S T |
| 10 | U16MB010 | AISHWARYA D |
| 11 | U16MB011 | AISHWARYA S |
| 12 | U16MB012 | AISHWARYA V |
| 13 | U16MB013 | AISWARYA MOHAN |
| 14 | U16MB014 | AJAY NAYAGAM P |
| 15 | U16MB015 | AJITHA BEGUM A |
| 16 | U16MB016 | AKASH D |
| 17 | U16MB017 | AKASH JAIN |
| 18 | U16MB018 | AKASH KRISHNA |
| 19 | U16MB019 | AKSHAYA R |
| 20 | U16MB020 | ALBERT SHAJI |
| 21 | U16MB021 | ALHEEBA M |
| 22 | U16MB022 | ALINA SAMAN |
| 23 | U16MB023 | AMAN SINGLA |
| 24 | U16MB024 | AMBATI LAKSHMI VAISHALI |
| 25 | U16MB025 | AMEYAARJUN ARUMUGAM |
| 26 | U16MB026 | AMISHA VERMA |
| 27 | U16MB027 | AMITHA HASHIM |
| 28 | U16MB028 | ANAGHA V K |
| 29 | U16MB029 | ANAM HIRANMAYI |
| 30 | U16MB030 | ANGEL CELIN S |
| 31 | U16MB031 | ANGELINE JEMEMA S J |
| 32 | U16MB032 | APPARANJITHA V RAMANA |
| 33 | U16MB033 | ARCHA BALACHANDRAN |
| 34 | U16MB034 | ARJUN UMESH |
| 35 | U16MB035 | ARKAPRAVA CHAKRABORTY |
| 36 | U16MB036 | ASHWIN KUMAR S |
| 37 | U16MB037 | ASHWIN M G |
| 38 | U16MB038 | ASHWIN MUTHURAM T S |
| 39 | U16MB039 | ASWIN SANKAR RAJ O P |
| 40 | U16MB040 | ATMAJITA CHATTERJEE |
| 41 | U16MB041 | ATUL NAIR S S |
| 42 | U16MB042 | AVINASH ESAKKIAPPAN |
| 43 | U16MB043 | AYUSH KASHYAP |
| 44 | U16MB044 | BALLOLI HARI CHANDANA |
| 45 | U16MB045 | BATTULA SREEKRISHNA BHARGAVA |
| 46 | U16MB046 | BAVANI V |
| 47 | U16MB047 | BAVISHNA B |
| 48 | U16MB048 | BRISHA J |
| 49 | U16MB049 | CHAKRAPANI PEGU |
| 50 | U16MB050 | CHAMRIDHA D P |
| 51 | U16MB051 | CHANDIKA SURYA TEJA |

## COURSE FEEDBACK FORM

Date: 18/12/2015

Course Title: Introduction to Medical Terminology

Name: Afsana. S

RegNo: U16MB008

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:

Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 18/12/2015

Course Title: Introduction to Medical Terminology

Name: Atul Nair. S.S

RegNo: U16MB041

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:

S.S

Signature

***Thank you***

11/18/2015

Chennai

From

The Course Coordinator

Certificate Program in Statistical Concepts and Applications

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 Program in Statistical Concepts and Applications**

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Certificate Program in Statistical Concepts and Applications

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** **Date:** 11/21/2015

**R. No 149/ SBMCH/2015**

# 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 Program in Statistical Concepts and Applications from 12/18/2015 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 12/11/2015.

**Eligibility-MBBS STUDENTS**

HOD

Course Coordinator

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

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SREE BALAJI MEDICAL COLLEGE AND SHOSIPITAL

CERTIFICATE PROGRAM IN STATISTICAL CONCEPTS AND APPLICATION

40 HOURS

## LEARNING OBJECTIVES:-

1. General nature and scope of statistical methods
2. Elementary idea of probability
3. Elementary of statistical inference
4. Elementary ideas about statistical populations
5. Statistical methods in Psychology and Education.

| UNIT-1:GENERAL NATURE ANS SCOPE OF STATISTICAL METHODS | | | |
|---|---|---|---|
| S.NO | TOPICS | HOURS | FACULTY |
| 1. | collection and classification of data | 2 | Lecture |
| 2. | Different types of diagrams to represent statistical | 1 | |

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| | | | |
|---|---|---|---|
| | estimate | | |
| 2. | Method of maximum likelihood | 2 | |
| 3. | Tests of significance | 1 | |
| 4. | Application of chi-square , t, F and Z tests | 2 | |
| 5. | Assessment | 1 | Lecture |

| UNIT-4: ELEMENTARY IDEAS ABOUT STATISTICAL POPULATIONS | | | |
|---|---|---|---|
| S.NO | TOPICS | HOURS | FACULTY |
| 1. | Random sampling | 2 | Assistant professor |
| 2. | Simple random sampling and stratified random sampling | 2 | |
| 3. | Estimates of population mean and population and | 2 | |

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| | | | |
|---|---|---|---|
| | their measures | | |
| 5. | Assessment | 2 | Lecture |

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

## CERTIFICATE

This is to certify that Mr./Ms. AKSHARA P ROY has completed the value added course on Certificate Program in Statistical Concepts and Applications conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 12/18/2015.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

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**Certificate Program in Statistical Concepts and Applications**

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U16MB052 | CHELIKANI LAKSHMI APOORVA |
| 2 | U16MB053 | CHERISA MAIBAM |
| 3 | U16MB054 | CHILUMURI SARAYA |
| 4 | U16MB055 | CHRISTY AZMI A |
| 5 | U16MB056 | CIBI C |
| 6 | U16MB057 | CRESILDA SANGEERTHANA S |
| 7 | U16MB058 | DARSANA M S |
| 8 | U16MB059 | DEEPTHI PRITHA S |
| 9 | U16MB060 | DEPAK CHARAN S |
| 10 | U16MB061 | DEVA PRIYA R |
| 11 | U16MB062 | DEVI KRISHNA R |
| 12 | U16MB063 | DIKSHA TIWARI |
| 13 | U16MB064 | DINESH J |
| 14 | U16MB065 | DIVYA BHARATHI K |
| 15 | U16MB066 | DIVYA C REDDY V |
| 16 | U16MB067 | DIVYA W A |
| 17 | U16MB068 | EASWARR C |
| 18 | U16MB069 | ESWAR L |
| 19 | U16MB070 | FIRDAUS AHMED |
| 20 | U16MB071 | GANDHI KANNAPPAN G |
| 21 | U16MB072 | GEETHA C |
| 22 | U16MB073 | GEOS ASHISH G |
| 23 | U16MB074 | GIRABOINA BHAVITHA |
| 24 | U16MB075 | GONNABATHULA KAUSTUBHA |
| 25 | U16MB076 | GONUGUNTLA DIVYA VANI |
| 26 | U16MB077 | GOPIREDDY CHARAN TEJA REDDY |
| 27 | U16MB078 | GOVVIND GNANAM |
| 28 | U16MB079 | GOWTHAM S |
| 29 | U16MB080 | GURVEER SINGH CHAWLA |
| 30 | U16MB081 | HALEEMATHU SSAHDIYYA |
| 31 | U16MB082 | HANEESH V |
| 32 | U16MB083 | HARI PRIYA D S |
| 33 | U16MB084 | HARSHA M S |
| 34 | U16MB085 | HARSHAN R |
| 35 | U16MB086 | ISHWARYA V |
| 36 | U16MB087 | JADAV AKSHAY RAMESHBHAI |
| 37 | U16MB088 | JAHANVI SHARMA |
| 38 | U16MB089 | JAISHREE P |

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## COURSE FEEDBACK FORM

Date: 18/12/15

Course Title: Cerificate Program in Statistical Concepts and Application.

Name: C.B.I. C.

RegNo: U16MB056

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:

C.C.
Signature

***Thank you***

Scanned by TapScanner

## COURSE FEEDBACK FORM

Date: 18/12/15

Course Title: CERTIFICATE PROGRAM IN STATISTICAL CONCEPTS AND APPLICATION

Name: DIVYA. K. A.

RegNo: U16MB067

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:

Signature

***Thank you***

Scanned by TapScanner

11/18/2015

Chennai

From

The Course Coordinator

Introduction to Finance and Marketing in Health 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: Introduction to Finance and Marketing in Health Care**

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Introduction to Finance and Marketing in Health Care

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

**SREE BALAJI MEDICAL COLLEGE & HOSPITAL**

**CHROMPET CHENNAI -600044**

**Date:** 11/21/2015

**R. No 153/ SBMCH/2015**

# 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 Introduction to Finance and Marketing in Health Care from 12/18/2015 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 12/11/2015.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

| SREE BALAJI MEDICAL COLLEGE AND HOSIPTAL |
|---|
| INTRODUCTION TO FINANCE AND MARKETING IN HEALTH CARE |
| 40 HOURS |

LEARNING OBJECTIVES:

1. Management of healthcare organization
2. Basics of finance and accounting
3. Human resources management in healthcare
4. Public health systems and health insurance
5. Safety and risk management
6. Legal and ethical issues in healthcare
7. Hospital service marketing

| UNIT-1: MANAGEMENT OF HEALTHCARE ORGANIZATION | | | |
|---|---|---|---|
| S.NO | TOPICS | HOURS | FACULTY |
| 1. | Introduction | 1 | Lecture |
| 2. | Management organization of clinical uses | 1 | |
| 3. | Planning and organization of support services | 1 | |
| 4. | Evaluation of | 2 | |

| | | | |
|---|---|---|---|
| | data | | |
| 3. | Frequency distribution and related graphs and charts | 2 | |
| 4. | Assessment | 2 | lecture |

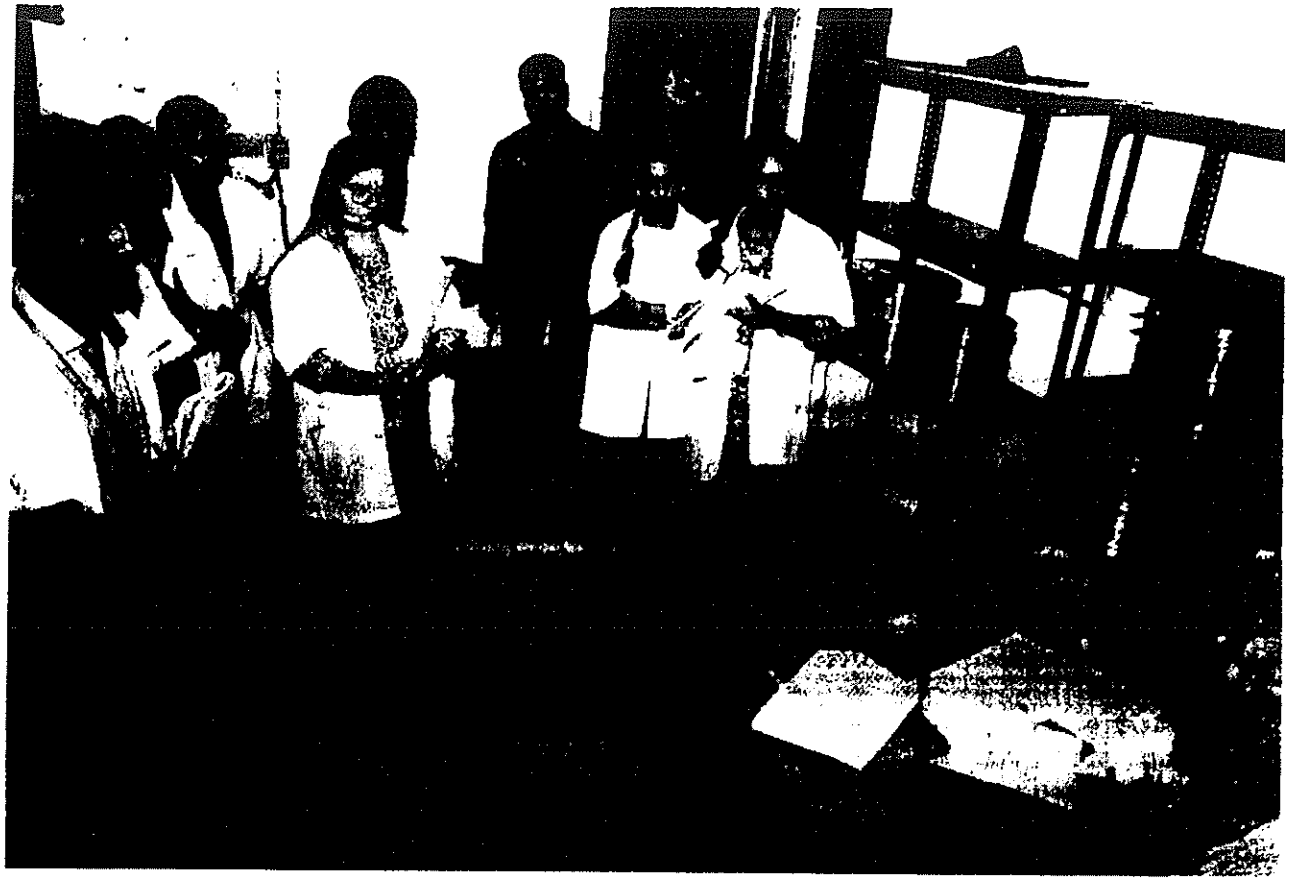
| UNIT-2: ELEMENTARY IDEA OF PROBABILITY | | | |
|---|---|---|---|
| S.NO | TOPICS | HOURS | FACULTY |
| 1. | Addition and multiplication theorems | 2 | Assistant professor |
| 2. | Statistical independence and conditional probability | 1 | |
| 3. | Mathematical expectation | 2 | |
| 4. | Assessment | 2 | Professor |

| UNIT-3: ELEMENTS OF STATISTICAL INFERENCE | | | |
|---|---|---|---|
| | | | |
| S.NO | TOPICS | HOURS | FACULTY |
| 1. | Properties of a good | 2 | Lecture |

| | | | |
|---|---|---|---|
| 2. | Training and development | 1 | |
| 3. | Wage and salary administration | 1 | |
| 4. | Labor laws | 1 | |
| 5. | Assessment | 1 | Lecture |

| **UNIT-4: PUBLIC HEALTH SYSTEMS AND HEALTH INSURNACE** | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Public health concepts and national health policy | 1 | Assistant professor |
| 2. | Public health financing | 1 | |
| 3. | Health insurance | 1 | |
| 4. | Risk and insurance management | 1 | |
| 5. | Structure and functions of insurance | 1 | |
| 6. | Assessment | 1 | Professor |

| **UNIT-5: SAFETY AND RISK MANAGEMENT** |
|---|



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

## CERTIFICATE

This is to certify that Mr./Ms, ALICIA CATHERINE A has completed the value added course on Introduction to Finance and Marketing in Health Care conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 12/18/2015.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## Introduction to Finance and Marketing in Health Care

| . S. No | Regn. No. | Name |
|---|---|---|
| 1 | U15MB188 | SHRIVIRUTHAA T |
| 2 | U15MB189 | SHRUTHI SRI R G |
| 3 | U15MB190 | SHRUTI U |
| 4 | U15MB191 | SHUBAVEE R |
| 5 | U15MB192 | SHYJU RAGLAND S R |
| 6 | U15MB193 | SIDDARTH VINCENT RAJ S |
| 7 | U15MB194 | SIDDHARTHANI A |
| 8 | U15MB195 | SIDHITHA S M |
| 9 | U15MB196 | SIVA VIGNESH A |
| 10 | U15MB197 | SIVASURIYAN S |
| 11 | U15MB198 | SMRITHI A |
| 12 | U15MB199 | SNEHA PREETHI E name changed as SAI SNEHA PREETHY E |
| 13 | U15MB200 | SNEKHA S |
| 14 | U15MB201 | SOUMIYA E |
| 15 | U15MB202 | SOWMIYA T |
| 16 | U15MB225 | TARIQ IBRAHIM |
| 17 | U15MB226 | THALINZAI PRAVEEN KUMAR A |
| 18 | U15MB227 | THANGAVELU SAKTHI VIGNESH name changed as SAKTHI VIGNESH T |
| 19 | U15MB228 | THILAKESH G ( Met with an accident 14.03.18 night and Expired 15.03.18 - 12.20 a.m.) |
| 20 | U15MB229 | THRILOK RAM B |
| 21 | U15MB230 | TRUP MOHAMED FASIH MAAZ |
| 22 | U15MB231 | UDAYA S |
| 23 | U15MB232 | UTHAYASURYA K |
| 24 | U15MB233 | VAIBHAVI D |
| 25 | U15MB234 | VAISHNAVI M |
| 26 | U15MB235 | VANI KRISHNA |
| 27 | U15MB236 | VARUN V |
| 28 | U15MB237 | VASANTH S |
| 29 | U15MB238 | VASANTHAKUMAR V S |
| 30 | U15MB239 | VEENA KRISHNA |
| 31 | U15MB240 | VENKATA MANISH REDDY MUNDLA |
| 32 | U15MB241 | VIDHYAPRIYADARSHINI S |
| 33 | U15MB242 | VIGNESH P |
| 34 | U15MB243 | VIGNESH R |
| 35 | U15MB244 | VIKAASH K S |
| 36 | U15MB245 | VINITH M V |
| 37 | U15MB246 | VINOTH G |
| 38 | U15MB247 | YASHOPRIYADARSHINI V R |
| 39 | U15MB248 | YAZHINI T |
| 40 | U15MB249 | YUVARAJ LAKSHMIPATHY |
| 41 | U15MB250 | YUVASHREE M |
| 42 | U15MB186 | SHIRAVANKUMAR S P |
| 43 | U15MB187 | SHONA NELSON |

## COURSE FEEDBACK FORM

Date: 15/12/15

Course Title: Introduction to finance and Marketing in Health Care

Name: Sneka. S

RegNo: U15MB200

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:

Sneka.S
Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 15/12/15

Course Title: Introduction to Finance and Marketing in Health Care

Name: Vignesh.R

RegNo: U15MB243

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

***Thank you***

12/18/2015

Chennai

From

The Course Coordinator

Certificate Program in Principles of Scientific Inquiry

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 Program in Principles of Scientific Inquiry**

Respected sir,

With reference to subject mentioned above, the Forensic Medicine proposes to conduct a value- added course titled: Certificate Program in Principles of Scientific Inquiry

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

**SREE BALAJI MEDICAL COLLEGE & HOSPITAL**

**CHROMPET CHENNAI -600044**

**Date:** 12/21/2015

**R. No 229/ SBMCH/2015**

# 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 Program in Principles of Scientific Inquiry from 1/18/2016 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 1/11/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

| SREE BALAJI MEDICAL COLLEGE AND HOSIPTAL |
|---|
| CERTIFICATE PROGRAM IN PRINCIPLE OF SCIENTIFIC INQUIRY |
| 40 HOURS |

**LEARNING OBJECTIVES:-**

1. **Introduction of course**
2. **Positivist research**
3. **Induction and deduction in the logic of science**
4. **Interpretive research**
5. **Design science**

| UNIT-1: INTRODUCTION OF COURSE | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Introduction to the research publication process | 2 | Assistant professor |
| 2. | Generalizing information of system research | 2 | |
| 3. | Types of generalizability | 1 | |
| 4. | Assessment | 2 | Professor |

| UNIT-2: POSTIVIST RESEARCH | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Laboratory experiments | 2 | Lecture |
| 2. | Statistical experiments | 2 | |
| 3. | Experimental designs | 1 | |
| 4. | Journal of management information system | 2 | |
| 5. | Assessment | 2 | Lecture |

| UNIT-3: INDUCTION AND DEDUCTION IN LOGIC OF SCIENCE | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Social theory | 2 | Lecture |
| 2. | Philosophy for information systems | 1 | |
| 3. | Growth of scientific knowledge | 2 | |
| 4. | Conjectures and refutations | 2 | |
| 5. | Assessment | 1 | Professor |

| | | | |
|---|---|---|---|
| | **hospital and health services** | | |
| **5.** | **Assessment** | **1** | **Lecture** |

| **UNIT-2: BASICS OF FINANCE AND ACCOUNTING** | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Scope of accounting | 1 | Assistant professor |
| 2. | Funds flow and cash flow analysis | 1 | |
| 3. | Budgeting and budgetary control | 2 | |
| 4. | Capital budgeting | 1 | |
| 5. | Sources of long term finanacing | 1 | |
| 6. | Assessment | 1 | Professor |

| **UNIT-3: HUMAN RESOURCES MANAGEMENT IN HEALTHCARE** | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | HR planning and development | 1 | Lecture |

| UNIT-4: INTERPRETIVE RESEARCH | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Social construction of reality | 2 | Professor |
| 2. | Ethnography | 1 | |
| 3. | Hermeneutics | 1 | |
| 4. | Grounded theory | 2 | |
| 5. | Assessment | 1 | Professor |

| UNIT-5: DESIGN SCIENCE | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Contemporary approaches and emergent traditions | 2 | Lecture |
| 2. | Action research | 1 | |
| 3. | Communications of the association for information systems | 2 | |
| 4. | Assessment | 2 | Lecture |



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

## CERTIFICATE

This is to certify that Mr./Ms, ANAND R has completed the value added course on Certificate Program in Principles of Scientific Inquiry conducted by Forensic Medicine at Sree Balaji Medical College & Hospital, Chennai held during 1/18/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

**Certificate Program in Principles of Scientific Inquiry**

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U16MB001 | AATHIRA A |
| 2 | U16MB002 | ABDUL MANNAN MOHAMMAD |
| 3 | U16MB003 | ABIRAMI R |
| 4 | U16MB004 | ABISHEK JOEL KUMAR V |
| 5 | U16MB005 | ADARSH KUMAR A |
| 6 | U16MB006 | ADITYA SESHA SAI UNDAVALLI |
| 7 | U16MB007 | AFRA MARIAM T F |
| 8 | U16MB008 | AFSANA S |
| 9 | U16MB009 | AISHVHARAANI S T |
| 10 | U16MB010 | AISHWARYA D |
| 11 | U16MB011 | AISHWARYA S |
| 12 | U16MB012 | AISHWARYA V |
| 13 | U16MB013 | AISWARYA MOHAN |
| 14 | U16MB014 | AJAY NAYAGAM P |
| 15 | U16MB015 | AJITHA BEGUM A |
| 16 | U16MB016 | AKASH D |
| 17 | U16MB017 | AKASH JAIN |
| 18 | U16MB018 | AKASH KRISHNA |
| 19 | U16MB019 | AKSHAYA R |
| 20 | U16MB020 | ALBERT SHAJI |
| 21 | U16MB021 | ALHEEBA M |
| 22 | U16MB022 | ALINA SAMAN |
| 23 | U16MB023 | AMAN SINGLA |
| 24 | U16MB024 | AMBATI LAKSHMI VAISHALI |
| 25 | U16MB025 | AMEYAARJUN ARUMUGAM |
| 26 | U16MB026 | AMISHA VERMA |
| 27 | U16MB027 | AMITHA HASHIM |
| 28 | U16MB028 | ANAGHA V K |
| 29 | U16MB029 | ANAM HIRANMAYI |
| 30 | U16MB030 | ANGEL CELIN S |
| 31 | U16MB031 | ANGELINE JEMEMA S J |
| 32 | U16MB032 | APPARANJITHA V RAMANA |
| 33 | U16MB033 | ARCHA BALACHANDRAN |

| | | |
|---|---|---|
| 34 | U16MB034 | ARJUN UMESH |
| 35 | U16MB035 | ARKAPRAVA CHAKRABORTY |
| 36 | U16MB036 | ASHWIN KUMAR S |
| 37 | U16MB037 | ASHWIN M G |
| 38 | U16MB038 | ASHWIN MUTHURAM T S |
| 39 | U16MB039 | ASWIN SANKAR RAJ O P |
| 40 | U16MB040 | ATMAJITA CHATTERJEE |
| 41 | U16MB041 | ATUL NAIR S S |
| 42 | U16MB042 | AVINASH ESAKKIAPPAN |
| 43 | U16MB043 | AYUSH KASHYAP |
| 44 | U16MB044 | BALLOLI HARI CHANDANA |
| 45 | U16MB045 | BATTULA SREEKRISHNA BHARGAVA |
| 46 | U16MB046 | BAVANI V |
| 47 | U16MB047 | BAVISHNA B |
| 48 | U16MB048 | BRISHA J |
| 49 | U16MB049 | CHAKRAPANI PEGU |
| 50 | U16MB050 | CHAMRIDHA D P |
| 51 | U16MB051 | CHANDIKA SURYA TEJA |
| 52 | U16MB052 | CHELIKANI LAKSHMI APOORVA |
| 53 | U16MB053 | CHERISA MAIBAM |
| 54 | U16MB054 | CHILUMURI SARAYA |
| 55 | U16MB055 | CHRISTY AZMI A |
| 56 | U16MB056 | CIBI C |
| 57 | U16MB057 | CRESILDA SANGEERTHANA S |
| 58 | U16MB058 | DARSANA M S |
| 59 | U16MB059 | DEEPTHI PRITHA S |

## COURSE FEEDBACK FORM

Date: 18/01/16

Course Title: Certificate Program in Principle of Scientific enquiry

Name: Abirami. R

RegNo: U16MB003

Department: Forensic 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:

Abirami. R
Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 18/01/2016

Course Title: Certificate program in principle of scientific inquiry.

Name: Barisha. J

RegNo: U16M048

Department: Forensic 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:

Barisha. J.

Signature

***Thank you***

12/19/2015

Chennai

From

The Course Coordinator

Certificate Program in Health Care Management and HR

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 Program in Health Care Management and HR**

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Certificate Program in Health Care Management and HR

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

**SREE BALAJI MEDICAL COLLEGE & HOSPITAL**

**CHROMPET CHENNAI -600044**

**Date:** 12/22/2015

**R. No 239/ SBMCH/2015**

# 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 Program in Health Care Management and HR from 1/18/2016 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 1/11/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

| SREE BALAJI MEDICAL COLLEGE AND HOSIPTAL |
|---|
| CERTIFICATE PROGRAM IN HEALTHCARE MANAGEMENT AND HR |
| 40 HOURS |

**LEARNING OBJECTIVES:-**

1. **Principle of management**
2. **Strategic management**
3. **Essentials of healthcare administration**
4. **HR in hosiptals**
5. **Healthcare management specialists/ training**

| UNIT-1: PRINCIPLES OF MANAGEMENT | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Financial accounting | 2 | Assistant professor |
| 2. | Marketing management | 1 | |
| 3. | Fundamental of communication | 2 | |
| 4. | Human resource management | 2 | |

| | | | |
|---|---|---|---|
| | organization (CCO) | | |
| 5. | Assessments | 1 | Lecture |

| UNIT-4: HR IN HOSIPTALS | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Revenue cycle management in healthcare | 2 | Lecture |
| 2. | Material management | 1 | |
| 3. | Legal aspects of healthcare | 2 | |
| 4. | Healthcare equipment | 1 | |
| 5. | Assessment | 1 | Lecture |

| UNIT-5: HEALTHCARE MANAGEMENT SPECIALISTS/ TRAINING | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Case studies | 2 | Lecture |
| 2. | Interview preparation | 1 | |
| 3. | Projects | 1 | |
| 4. | Seminars/practicals | 2 | |
| 5. | Assessment | 1 | Lecture |

| SREE BALAJI MEDICAL COLLEGE AND HOSIPTAL |
|---|
| CULTURAL DIFFERENCES IN CLIENTS |
| 40 HOURS |

**LEARNING OBJECTIVES:-**

1. **Introduction**
2. **Diversity and ethnicity**
3. **Regional diversity**
4. **Physical and mental stability**
5. **Education and training**

| UNIT-1: INTRODUCTION | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Logistics of course | 2 | Lecture |
| 2. | Overview of cultural diversity | 1 | |
| 3. | Relation diversity | 1 | |
| 4. | Initial personal understanding of cultural diversity and relation | 2 | |
| 5. | Assessment | 1 | Lecture |

| UNIT-2: DIVERSITY AND ETHNICITY | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Dimensions | 2 | Lecture |
| 2. | Concepts of cultural diversity | 1 | |
| 3. | Issues of cultural diversity | 2 | |
| 4. | Ethnicity in society | 1 | |
| 5. | Assessment | 1 | Lecture |

| UNIT-3: REGIONAL DIVERSITY | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Concepts related to social class and sexism | 2 | Assistant professor |
| 2. | Issues related to social class and sexism | 2 | |
| 3. | Collaborative exercise | 2 | |
| 4. | Assessment | 1 | Professor |

| UNIT-4: PHYSICAL AND MENTAL STABILITY |
|---|

| | | | |
|---|---|---|---|
| 5. | Managerial economics | 1 | |
| 6. | Assessment | 1 | Professor |

| UNIT-2: STRATGERIC MANAGEMENT | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Cost accounting | 2 | Lecture |
| 2. | Innovation management | 1 | |
| 3. | Quantitative management | 2 | |
| 4. | Assessment | 1 | Lecture |

| UNIT-3: ESSENTIALS OF HEALTHCARE ADMINISTRATION | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Planning of healthcare facilities | 2 | |
| 2. | Designing of healthcare facilities | 1 | |
| 3. | Quality management in hospitals | 2 | |
| 4. | Customer – centric | 2 | |

| S.NO | TOPICS | HOURS | FACULTY |
|---|---|---|---|
| 1. | Issues related to ageism | 2 | Lecture |
| 2. | Issues related to sexual orientation | 2 | |
| 3. | Weight and appearance | 2 | |
| 4. | Concept of reasonable accommodation | 2 | |
| 5. | Assessment | 2 | Lecture |

| UNIT-5: EDUCATION AND TRAINING | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Possible resolution of cultural diversity issues | 2 | Lecture |
| 2. | Case studies | 2 | |
| 3. | Development of cultural diversity education and training | 2 | |
| 4. | Assessment | 2 | Lecture |

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

## CERTIFICATE

This is to certify that Mr./Ms, ANAND S A has completed the value added course on Certificate Program in Health Care Management and HR conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 1/18/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

| Certificate Program in Health Care Management and HR | | |
|---|---|---|
| S. No | Regn. No. | Name |
| 1 | U16MB060 | DEPAK CHARAN S |
| 2 | U16MB061 | DEVA PRIYA R |
| 3 | U16MB062 | DEVI KRISHNA R |
| 4 | U16MB063 | DIKSHA TIWARI |
| 5 | U16MB064 | DINESH J |
| 6 | U16MB065 | DIVYA BHARATHI K |
| 7 | U16MB066 | DIVYA C REDDY V |
| 8 | U16MB067 | DIVYA W A |
| 9 | U16MB068 | EASWARR C |
| 10 | U16MB069 | ESWAR L |
| 11 | U16MB070 | FIRDAUS AHMED |
| 12 | U16MB071 | GANDHI KANNAPPAN G |
| 13 | U16MB072 | GEETHA C |
| 14 | U16MB073 | GEOS ASHISH G |
| 15 | U16MB074 | GIRABOINA BHAVITHA |
| 16 | U16MB075 | GONNABATHULA KAUSTUBHA |
| 17 | U16MB076 | GONUGUNTLA DIVYA VANI |
| 18 | U16MB077 | GOPIREDDY CHARAN TEJA REDDY |
| 19 | U16MB078 | GOVVIND GNANAM |
| 20 | U16MB079 | GOWTHAM S |
| 21 | U16MB080 | GURVEER SINGH CHAWLA |
| 22 | U16MB081 | HALEEMATHU SSAHDIYYA |
| 23 | U16MB082 | HANEESH V |
| 24 | U16MB083 | HARI PRIYA D S |
| 25 | U16MB084 | HARSHA M S |
| 26 | U16MB085 | HARSHAN R |
| 27 | U16MB086 | ISHWARYA V |
| 28 | U16MB087 | JADAV AKSHAY RAMESHBHAI |
| 29 | U16MB088 | JAHANVI SHARMA |
| 30 | U16MB089 | JAISHREE P |
| 31 | U16MB090 | JANANI M |
| 32 | U16MB091 | JANARTHANAN R |
| 33 | U16MB092 | JASHWINI T |
| 34 | U16MB093 | JAYPRADHA S |
| 35 | U16MB094 | JEBISHA S |
| 36 | U16MB095 | JEEVAN PRAKASSH B |
| 37 | U16MB096 | JEGATHSRI S |
| 38 | U16MB097 | JESSITA MARION KAREN P |
| 39 | U16MB098 | JEYAGANESH S |
| 40 | U16MB099 | JEYASHREE R |
| 41 | U16MB100 | JISHA G |
| 42 | U16MB101 | JOSIAH MIRACLIN J G |
| 43 | U16MB102 | KANAKAVALLI S |
| 44 | U16MB103 | KANYA R |
| 45 | U16MB104 | KARTHIK GANESH B |
| 46 | U16MB105 | KARTHIK S |
| 47 | U16MB106 | KAVIN B |
| 48 | U16MB107 | KAVIYAH MANE S V |
| 49 | U16MB108 | KHAN ARSH E BAREEN KHURSHID |
| 50 | U16MB109 | KIRTHIKA R S |
| 51 | U16MB110 | KISHOR B |
| 52 | U16MB111 | KOGANTI DEVI NAGASAHITHI |
| 53 | U16MB112 | KOKILA S |
| 54 | U16MB113 | KOMAL S |
| 55 | U16MB114 | KOTHADA REVATHI |
| 56 | U16MB115 | KRITHICA P |
| 57 | U16MB116 | KRITHIKA V |
| 58 | U16MB117 | LAKSHITA S |

## COURSE FEEDBACK FORM

Date: 18/01/16

Course Title: Certificate Program in healthcare Management and HA

Name: Jebisha.S

RegNo: U16MB09H

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:

Jebisha.S
Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 18/01/16

Course Title: Certificate Program in Healthcare Management and HR

Name: Eswar. L

RegNo: U16MB069

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 |

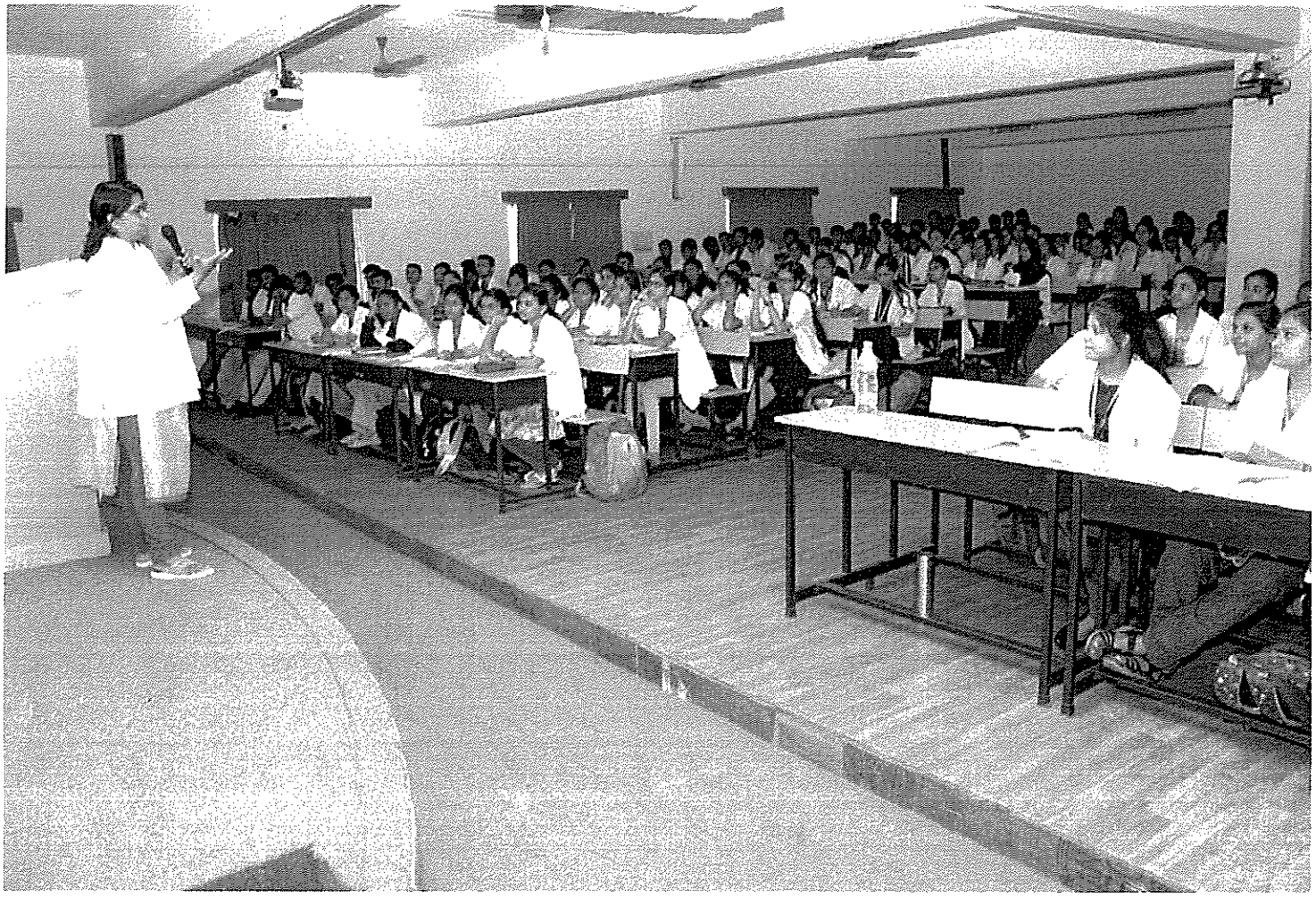
Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Eswar. L
Signature

***Thank you***



12/19/2015

Chennai

From

The Course Coordinator

Cultural Differences in Clients

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: Cultural Differences in Clients**

Respected sir,

With reference to subject mentioned above, the Forensic Medicine proposes to conduct a value- added course titled: Cultural Differences in Clients

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 12/22/2015

**R. No 245/ SBMCH/2015**

# 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 Cultural Differences in Clients from 1/18/2016 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 1/11/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

| SREE BALAJI MEDICAL COLLEGE AND HOSIPTAL |
|---|
| CULTURAL DIFFERENCES IN CLIENTS |
| 40 HOURS |

**LEARNING OBJECTIVES:-**

1. **Introduction**
2. **Diversity and ethnicity**
3. **Regional diversity**
4. **Physical and mental stability**
5. **Education and training**

| UNIT-1: INTRODUCTION | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Logistics of course | 2 | Lecture |
| 2. | Overview of cultural diversity | 1 | |
| 3. | Relation diversity | 1 | |
| 4. | Initial personal understanding of cultural diversity and relation | 2 | |
| 5. | Assessment | 1 | Lecture |

| UNIT-2: DIVERSITY AND ETHNICITY | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Dimensions | 2 | Lecture |
| 2. | Concepts of cultural diversity | 1 | |
| 3. | Issues of cultural diversity | 2 | |
| 4. | Ethnicity in society | 1 | |
| 5. | Assessment | 1 | Lecture |

| UNIT-3: REGIONAL DIVERSITY | | | |
|---|---|---|---|
| **S.NO** | **TOPICS** | **HOURS** | **FACULTY** |
| 1. | Concepts related to social class and sexism | 2 | Assistant professor |
| 2. | Issues related to social class and sexism | 2 | |
| 3. | Collaborative exercise | 2 | |
| 4. | Assessment | 1 | Professor |

| UNIT-4: PHYSICAL AND MENTAL STABILITY |
|---|

| S.NO | TOPICS | HOURS | FACULTY |
|---|---|---|---|
| 1. | Issues related to ageism | 2 | Lecture |
| 2. | Issues related to sexual orientation | 2 | |
| 3. | Weight and appearance | 2 | |
| 4. | Concept of reasonable accommodation | 2 | |
| 5. | Assessment | 2 | Lecture |

| UNIT-5: EDUCATION AND TRAINING | | | |
|---|---|---|---|
| S.NO | TOPICS | HOURS | FACULTY |
| 1. | Possible resolution of cultural diversity issues | 2 | Lecture |
| 2. | Case studies | 2 | |
| 3. | Development of cultural diversity education and training | 2 | |
| 4. | Assessment | 2 | Lecture |

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

## CERTIFICATE

This is to certify that Mr./Ms. AATHIRA A has completed the value added course on Cultural Differences in Clients conducted by Forensic Medicine at Sree Balaji Medical College & Hospital, Chennai held during 1/18/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Date: 18/01/2016

Course Title: Cultural Differences in Clinic

Name: Devi. C

RegNo: U15MB042

Department: Forensic 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

***Thank you***

Cultural Differences In Clients

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U15MB039 | DEEPAK GAUTAM G |
| 2 | U15MB040 | DEEPAKCHANDAR N |
| 3 | U15MB041 | DESHNA V |
| 4 | U15MB042 | DEVI C |
| 5 | U15MB043 | DHARANPATHY D |
| 6 | U15MB044 | DINEASH V R |
| 7 | U15MB045 | DIVYA KURUP P S |
| 8 | U15MB046 | DOMINIC BABU |
| 9 | U15MB047 | ELANGOVAN I |
| 10 | U15MB048 | ELBICH SONISA L |
| 11 | U15MB049 | ELIZA NONGMAITHEM |
| 12 | U15MB050 | FASALURAHMAN K M |
| 13 | U15MB051 | GADILI LAVANYA |
| 14 | U15MB052 | GANAPATHY S |
| 15 | U15MB053 | GANESH K |
| 16 | U15MB054 | GANUGAPANTA PREM SAI REDDY |
| 17 | U15MB055 | GAUTAM B |
| 18 | U15MB056 | GAUTHAM M |
| 19 | U15MB057 | GAUTHAM N |
| 20 | U15MB058 | GAYATHRI K |
| 21 | U15MB059 | GOKUL G |
| 22 | U15MB060 | GOKUL S |
| 23 | U15MB061 | GOPIKA GIRI |
| 24 | U15MB062 | GOPINATH S |
| 25 | U15MB063 | GOTTAM BHARGAVA SAI SRINIVAS |
| 26 | U15MB064 | GOWSHIK RAJA K S |
| 27 | U15MB065 | GOWTHAMAN K |
| 28 | U15MB066 | GRACELYN SHARON P |
| 29 | U15MB067 | GREESHMI C |
| 30 | U15MB068 | HARIHARAN M |
| 31 | U15MB069 | HARINI G |
| 32 | U15MB070 | HARRIBALAJI M |
| 33 | U15MB071 | HARSHATH KUMAR K N |
| 34 | U15MB072 | HARSHITHA REDDY D |
| 35 | U15MB073 | HOMA SAMANVITHA S |
| 36 | U15MB074 | IMMANUEL ABRAHAM S |
| 37 | U15MB075 | JANANI S |
| 38 | U15MB076 | JASMINE NISHA N |
| 39 | U15MB077 | JAYA KALYANI P S |
| 40 | U15MB078 | JAYAPREETHI S |
| 41 | U15MB079 | JEEVITHA P |
| 42 | U15MB080 | JENISHA THERESA LALICHAN |
| 43 | U15MB081 | JESVANTHAN E |
| 44 | U15MB082 | JEYA PRADHA C |
| 45 | U15MB083 | JINU SHIRLEY T |

## COURSE FEEDBACK FORM

Date: 18/01/16

Course Title: Cultural Differences in Clients

Name: Gautam. B

RegNo: 615MB055

Department: Forensic 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:

Gautam
Signature

***Thank you***



12/22/2015

Chennai

From

The Course Coordinator

Practices in Aging Health Studies

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: Practices in Aging Health Studies**

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Practices in Aging Health Studies

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 12/26/2015

**R. No 259/ SBMCH/2015**

# 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 Practices in Aging Health Studies from 1/21/2016 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 1/14/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

12

## CERTIFICATE PROGRAM IN AGING AND HEALTH

**Course Outline:**

In Promotion of Healthy Ageing, we will explore key lifestyle-related factors that are modifiable and influential in our well-being in old age, such as diet, physical activity, stress and sleep. By looking closely at the different aspects of lifestyle behaviours and their impact on our health as we get older, we can take action and promote healthy habits in ourselves and those we care for.

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 Coordinator: Associate professor / Assistant Professor of Medicine**

**Course Syllabus**

| **Topic** | **Faculty** | **Hours allotted** |
|---|---|---|
| Introduction course | Assistant Professor of Medicine | 2 hours |
| Health care | Associate Professor of Medicine | 2 hours |
| Common geriatric diseases | Assistant Professor of Medicine | 2 hours |
| Management of geriatric diseases | Associate Professor of Medicine | 2 hours |
| Palliative care | Assistant Professor of Medicine | 2 hours |
| Importance of Nursing in | Associate Professor of | 2 hours |

| | | |
|---|---|---|
| bedridden patients | Medicine | |
| lifestyle-related factors: cognitive and socioemotional aspects | Assistant Professor of Medicine | 2 hours |
| Long-term perspectives in healthy ageing | Associate Professor of Medicine | 2 hours |
| WHO's Global Strategy and Action Plan on Ageing and Health | Assistant Professor of Medicine | 2 hours |
| Environments that are age-friendly as well as improving measurement, monitoring and research on healthy ageing | Associate Professor of Medicine | 2 hours |
| Global course for Healthy Ageing | Assistant Professor of Medicine | 2 hours |
| Group discussion | Associate Professor of Medicine | 2 hours |
| Viva voce | 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, ABDUL MANNAN MOHAMMAD has completed the value added course on Practices in Aging Health Studies conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 1/21/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Date: 12/01/16

Course Title: Certificate Program in aging and health

Name: Homa Samanwitha. S

RegNo: U15MB013

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

***Thank you***

## COURSE FEEDBACK FORM

Date: 12/01/16

Course Title: Certificate Program in aging and Health

Name: Gokul.S

RegNo: U15MB060

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

***Thank you***

**Practices in Aging Health Studies**

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U15MB045 | DIVYA KURUP P S |
| 2 | U15MB046 | DOMINIC BABU |
| 3 | U15MB047 | ELANGOVAN I |
| 4 | U15MB048 | ELBICH SONISA L |
| 5 | U15MB049 | ELIZA NONGMAITHEM |
| 6 | U15MB050 | FASALURAHMAN K M |
| 7 | U15MB051 | GADILI LAVANYA |
| 8 | U15MB052 | GANAPATHY S |
| 9 | U15MB053 | GANESH K |
| 10 | U15MB054 | GANUGAPANTA PREM SAI REDDY |
| 11 | U15MB055 | GAUTAM B |
| 12 | U15MB056 | GAUTHAM M |
| 13 | U15MB057 | GAUTHAM N |
| 14 | U15MB058 | GAYATHRI K |
| 15 | U15MB059 | GOKUL G |
| 16 | U15MB060 | GOKUL S |
| 17 | U15MB061 | GOPIKA GIRI |
| 18 | U15MB062 | GOPINATH S |
| 19 | U15MB063 | GOTTAM BHARGAVA SAI SRINIVAS |
| 20 | U15MB064 | GOWSHIK RAJA K S |
| 21 | U15MB065 | GOWTHAMAN K |
| 22 | U15MB066 | GRACELYN SHARON P |
| 23 | U15MB067 | GREESHMI C |
| 24 | U15MB068 | HARIHARAN M |
| 25 | U15MB069 | HARINI G |
| 26 | U15MB070 | HARRIBALAJI M |
| 27 | U15MB071 | HARSHATH KUMAR K N |
| 28 | U15MB072 | HARSHITHA REDDY D |
| 29 | U15MB073 | HOMA SAMANVITHA S |
| 30 | U15MB074 | IMMANUEL ABRAHAM S |
| 31 | U15MB075 | JANANI S |
| 32 | U15MB076 | JASMINE NISHA N |
| 33 | U15MB077 | JAYA KALYANI P S |
| 34 | U15MB078 | JAYAPREETHI S |
| 35 | U15MB079 | JEEVITHA P |



1/18/2016

Chennai

From

The Course Coordinator

Critical Phases of Life

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: Critical Phases of Life**

Respected sir,

With reference to subject mentioned above, the Physiology proposes to conduct a value-added course titled: Critical Phases of Life

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 1/22/2016

**R. No 191/ SBMCH/2016**

# 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 Critical Phases of Life from 2/17/2016 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 2/10/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

## COURSE ON CRITICAL PHASES OF LIFE

**Course Outline:**

Emerging adulthood, viewed through the lens of life course health development, has the potential to be a very positive developmental stage with postindustrial societies giving adolescents and emerging adults a greater opportunity for choice and exploration but also greater challenges with greater educational and social role requirements. Over the life course, individuals will face a series of critical transitional periods, which require personal motivation, selfefficacy and a range of support mechanisms to cope with the challenges of living. These challenges may be age-related, educational, social and psychological, and we can all reflect back to these transitory times in our lives and how we traversed them.

**Course Coordinator: Associate professor /Assistant Professor of Medicine**

**Course Duration: 30 Hours**

**Course Coordinator: Associate professor / Assistant Professor of Medicine**

**Course Syllabus**

| **Topic** | **Faculty** | **Hours allotted** |
|---|---|---|
| Introduction course | Assistant Professor of Medicine | 2 hours |
| Health care | Associate Professor of Medicine | 2 hours |
| The Study of HumanDevelopmentTheory & Research | Assistant Professor of Medicine | 2 hours |
| Theory & Research | Associate Professor of Medicine | 2 hours |
| Birth & Physical Developmentduring the First 3 | Assistant Professor of Medicine | 2 hours |

| | | |
|---|---|---|
| years Cognitive Development during the First 3 years of life | | |
| Psychosocial Developmentduring the First 3 Years | Associate Professor of Medicine | 2 hours |
| Physical, Cognitive &Psychosocial Development - Early Childhood | Assistant Professor of Medicine | 2 hours |
| Physical, Cognitive &Psychosocial Development | Associate Professor of Medicine | 2 hours |
| Adult hood – cognition & behaviour | Assistant Professor of Medicine | 2 hours |
| Psychosocial aspects | Associate Professor of Medicine | 2 hours |
| Outline Geriatric scenario | Assistant Professor of Medicine | 2 hours |
| Group discussion | Associate Professor of Medicine | 2 hours |
| Viva voce | 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. ABIRAMI R has completed the value added course on Critical Phases of Life conducted by Physiology at Sree Balaji Medical College & Hospital, Chennai held during 2/17/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Course Title: Course on Critical Phases of life Date: 17/02/16

Name: Aiyal. T.M

RegNo: 13GMB14H

Department: Physiology

| 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: 17/02/16

Course Title: Course on Critical Phase of life

Name: Prabha. M

RegNo: U16MB155

Department: Physiology

| 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:

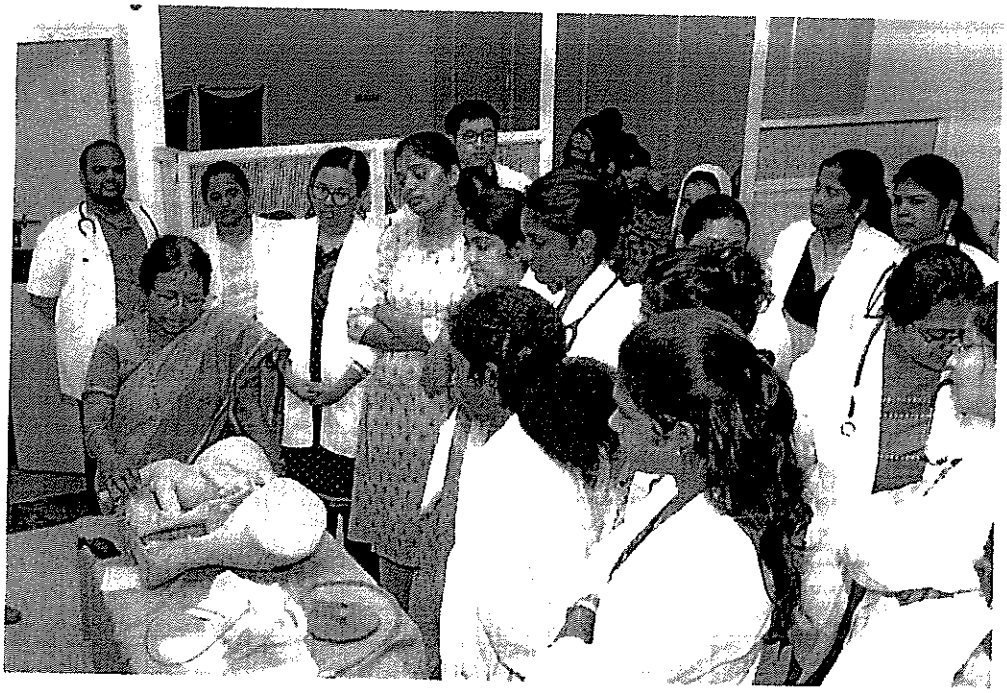
Weakness of the course:

Strength of the course:

Signature

***Thank you***

| Critical Phases of Life | | |
|---|---|---|
| S. No | Regn. No. | Name |
| 1 | U16MB121 | LILY MATHEW |
| 2 | U16MB122 | LINGKESHVAREN T |
| 3 | U16MB123 | LOKESHBABU A |
| 4 | U16MB124 | MADHUMITHA K |
| 5 | U16MB125 | MADHUMITHA PARVATHI I |
| 6 | U16MB126 | MAHIMA |
| 7 | U16MB127 | MANONIT S KUMAR |
| 8 | U16MB128 | MIRUDULA JOSENA J |
| 9 | U16MB129 | MITHILISH SARAN D S |
| 10 | U16MB130 | MUHAMMED NISAMUDDIN |
| 11 | U16MB131 | MUPPALLA NITEESH KUMAR |
| 12 | U16MB132 | MUSKAN YADAV |
| 13 | U16MB133 | MYTHILI V R |
| 14 | U16MB134 | NADAR DIANA DAVIDRAJ |
| 15 | U16MB135 | NAIDU SUSHAMA SENTHILKUMAR |
| 16 | U16MB136 | NALADALA NAVYA CHOWDARY |
| 17 | U16MB137 | NEDURUMALLI NAGA VAISHNAVI |
| 18 | U16MB138 | NEHA M |
| 19 | U16MB139 | NISHANTH NARAYAN V |
| 20 | U16MB140 | NIVEDHA B |
| 21 | U16MB141 | NIVEDHA R B |
| 22 | U16MB142 | NIVEDITHA S |
| 23 | U16MB143 | OGIRALA PRATHYUSHA |
| 24 | U16MB144 | OVIYAL T M |
| 25 | U16MB145 | PARVATHY K |
| 26 | U16MB146 | PAVITHRA T |
| 27 | U16MB147 | PERUMALLA NAGA LAKSHMI NAVEENA |
| 28 | U16MB148 | PINAKI NAYAK |
| 29 | U16MB149 | POLUPONGU MAHESH |
| 30 | U16MB150 | PONKAUSHIKAN M |
| 31 | U16MB151 | POOJA |
| 32 | U16MB152 | POOJA MOHAN |
| 33 | U16MB153 | POOJA S |
| 34 | U16MB154 | PRABANCHAN L G |
| 35 | U16MB155 | PRABHA M |
| 36 | U16MB156 | PRATHUSHA P M |
| 37 | U16MB157 | PRAVEEN KUMAR V |
| 38 | U16MB158 | PRAVEEN S |
| 39 | U16MB159 | PREETHI A |
| 40 | U16MB160 | PREETHI G |
| 41 | U16MB161 | PREETI SHARMA |
| 42 | U16MB162 | PRIYA RESHMA T |



1/18/2016

Chennai

From

The Course Coordinator

Introduction to Worksite Health Promotion

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 Worksite Health Promotion**

Respected sir,

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

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 1/22/2016

**R. No 192/ SBMCH/2016**

# 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 Worksite Health Promotion from 2/17/2016 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 2/10/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

## INTRODUCTION TO WORKSITE HEALTH PROMOTION

this course 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 | 2 hours | Asst Prof : Dept of |

| | | | |
|---|---|---|---|
| | Designing for Safety | | 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 to workflow analysis. | 2 hours | Asst Prof : Dept of Community Medicine |
| 14 | Viva Voce | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 15 | Assessment | 2 hours | Asst Prof : Dept of |

| | | | |
|---|---|---|---|
| | | | Community Medicine |

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

## CERTIFICATE

This is to certify that Mr./Ms, ABISHEK JOEL KUMAR V has completed the value added course on Introduction to Worksite Health Promotion conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 2/17/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Date: 17/02/16

Course Title: Introduction to Worksite Health Promotion

Name:

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:

Weakness of the course:

Strength of the course:

Signature

***Thank you***

## COURSE FEEDBACK FORM

Course Title: Introduction of Worksite Health Promotion

Date: 17/02/16

Name:

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 | ✓ | 4 | 5 |

Please give suggestion for the improvement of the course:

Weakness of the course:

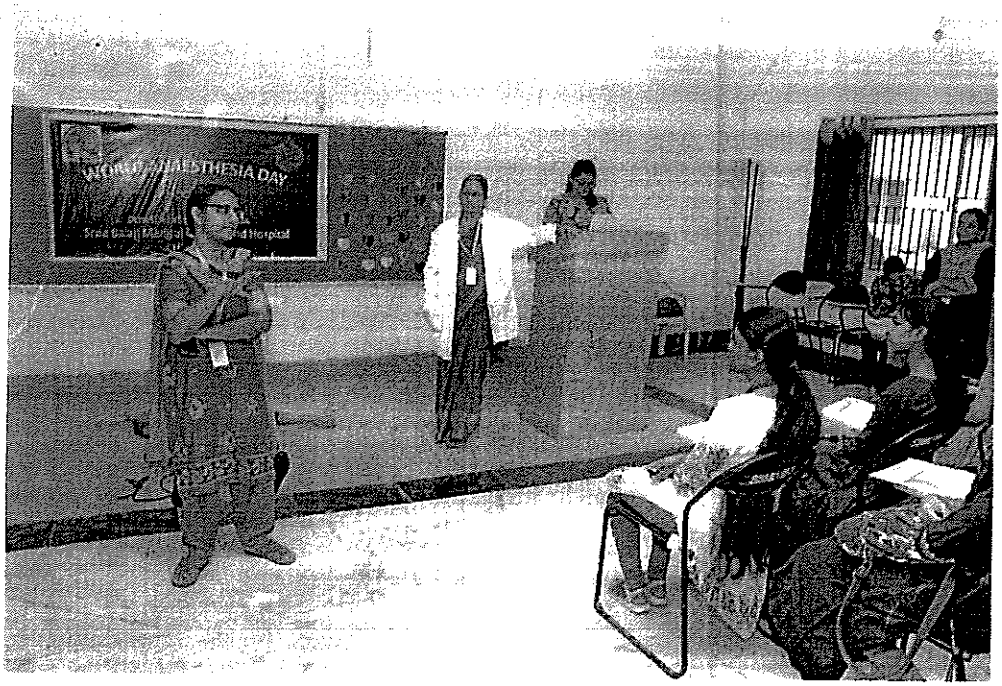
Strength of the course:

Signature

***Thank you***

INTRODUCTION TO WORKSITE HEALTH PROMOTION

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U15MB014 | ANAND S A |
| 2 | U15MB015 | ANNA SHAJU AYNIKKAL |
| 3 | U15MB016 | ANU ANANYA A |
| 4 | U15MB017 | ANUJA P |
| 5 | U15MB018 | ANUSHA A G |
| 6 | U15MB019 | ARCHANA S |
| 7 | U15MB020 | ARTHI SHREE V |
| 8 | U15MB021 | ARUN KUMAR G |
| 9 | U15MB022 | ASHRAF MOHAMED M |
| 10 | U15MB023 | ASHWIN GOPAL B |
| 11 | U15MB024 | ASHWIN KUMAR R P |
| 12 | U15MB025 | AYEESHA SHOWKKATH S |
| 13 | U15MB026 | BALAJI AJAYKRISHNA V |
| 14 | U15MB027 | BALAKRISHNAN N |
| 15 | U15MB028 | BALAMURUGAN C |
| 16 | U15MB029 | BAVATHARINI S A |
| 17 | U15MB030 | BENISHA DEFI S I |
| 18 | U15MB031 | BERNATSHA R |
| 19 | U15MB032 | BEWIN PIUS A |
| 20 | U15MB033 | BHARANI DHARAN V |
| 21 | U15MB034 | BHUVANESWARI K U |
| 22 | U15MB035 | BOOPESH K |
| 23 | U15MB036 | BRINDHA M |
| 24 | U15MB037 | DAKINI PALA |
| 25 | U15MB038 | DEBBIE AISHWARYA SATHYA |
| 26 | U15MB039 | DEEPAK GAUTAM G |
| 27 | U15MB040 | DEEPAKCHANDAR N |
| 28 | U15MB041 | DESHNA V |
| 29 | U15MB042 | DEVI C |
| 30 | U15MB043 | DHARANPATHY D |
| 31 | U15MB044 | DINEASH V R |
| 32 | U15MB045 | DIVYA KURUP P S |
| 33 | U15MB046 | DOMINIC BABU |
| 34 | U15MB047 | ELANGOVAN I |
| 35 | U15MB048 | ELBICH SONISA L |


WORLD ANESTHESIA DAY

2/13/2016

Chennai

From

The Course Coordinator

Certificate Program in Health Care Delivery

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 Program in Health Care Delivery**

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Certificate Program in Health Care Delivery

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 2/16/2016

**R. No 190/ SBMCH/2016**

# 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 Program in Health Care Delivery from 3/14/2016 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 3/7/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

## Certificate Program in Health Care Delivery

The science of global health delivery and healthcare implementation research have served as drivers for measuring the impact and effectiveness of healthcare interventions.

**Course Duration:** 30 hours

**Course Coordinator: Professor / Assoc Professor of CommunityMedicine**

**Syllabus**

| S.No | Topic | Duration | Faculty |
|---|---|---|---|
| 1 | Introduction to the biosocial | 2 hours | Asst Prof : Dept of Community Medicine |
| 2 | Why ideas matter: Social theory in global health | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 3 | The history of global health and colonial legacy | 2 hours | Asst Prof : Dept of Community Medicine |
| 4 | Political economy and foreign aid | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 5 | Assignment | 2 hours | Asst Prof : Dept of Community Medicine |
| 6 | The global AIDS movement | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 7 | Challenges in healthcare | 2 hours | Asst Prof : Dept of Community |

| | | | |
|---|---|---|---|
| | delivery: | | Medicine |
| 8 | Building an effective rural health delivery model | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 9 | Assignment | 2 hours | Asst Prof : Dept of Community Medicine |
| 10 | Critical perspectives on metrics of disease | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 11 | Student Presentations | 2 hours | Asst Prof : Dept of Community Medicine |
| 12 | The unique challenges of mental health | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 13 | Values and global health | 2 hours | Asst Prof : Dept of Community Medicine |
| 14 | Viva Voce | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 15 | Assessment | 2 hours | Asst Prof : Dept of Community Medicine |

## COURSE FEEDBACK FORM

Date: 14/03/16

Course Title: Certificate Program in Health Care delivery

Name: Priyanka. R

RegNo: U16NB163

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:

Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 14/03/16

Course Title: Certificate Program in Health Care Delivery

Name: Sathish.D

RegNo: U16MB189

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:

Signature

***Thank you***



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

## CERTIFICATE

This is to certify that Mr./Ms. ADARSH KUMAR A has completed the value added course on Certificate Program in Health Care Delivery conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 3/14/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

**Certificate Program in Health Care Delivery**

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U16MB163 | PRIYANKA R |
| 2 | U16MB164 | PRUDHVI BALAJI S |
| 3 | U16MB165 | PUTLURU PRUDHVINATH REDDY |
| 4 | U16MB166 | RACHARLA ARAVIND |
| 5 | U16MB167 | RAGAVI E |
| 6 | U16MB168 | RAGHAV PRASHAR |
| 7 | U16MB169 | RAHUL AGARWAL |
| 8 | U16MB170 | RAHUL BAROD |
| 9 | U16MB171 | RAHUL YADAV |
| 10 | U16MB172 | RAMYA R |
| 11 | U16MB173 | RANI ELIZUBAH JOSEPH |
| 12 | U16MB174 | RASHIQA G |
| 13 | U16MB175 | RAVI JHA |
| 14 | U16MB176 | RAVIVARMA M |
| 15 | U16MB177 | ROJA R |
| 16 | U16MB178 | RUBANESH M |
| 17 | U16MB179 | SABARIVENKAT R |
| 18 | U16MB180 | SAI BHUVAN J |
| 19 | U16MB181 | SAMEERUDDIN S |
| 20 | U16MB182 | SANA SHAJI |
| 21 | U16MB183 | SANDHYA M |
| 22 | U16MB184 | SANGAMITHRA C |
| 23 | U16MB185 | SANGEETHA SREE G |
| 24 | U16MB186 | SANTHOSSINI S |
| 25 | U16MB187 | SARANYA S |
| 26 | U16MB188 | SARANYA SURESH BABU |
| 27 | U16MB189 | SATHISH D |
| 28 | U16MB190 | SATHISH T |
| 29 | U16MB191 | SATYA VIKAS HRUDHAY SUNKARA |
| 30 | U16MB192 | SCHERRY |
| 31 | U16MB193 | SHALINI G |
| 32 | U16MB194 | SHALINI R |
| 33 | U16MB195 | SHANKER JWALANTH |
| 34 | U16MB196 | SHANMUGA PRIYA T |
| 35 | U16MB197 | SHANMUGASUNDARAM S |
| 36 | U16MB198 | SHARON J M |
| 37 | U16MB199 | SHIFA M |
| 38 | U16MB200 | SHINI YASSMIN S |
| 39 | U16MB201 | SHIVA DIVAKARAN B |

4/15/2016

Chennai

From

The Course Coordinator

Certificate Program in Health Promotion Planning

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 Program in Health Promotion Planning**

Respected sir,

With reference to subject mentioned above, the Community Medicine proposes to conduct a value- added course titled: Certificate Program in Health Promotion Planning

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 4/18/2016

**R. No 149/ SBMCH/2016**

# 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 Program in Health Promotion Planning from 5/16/2016 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 5/9/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

# CERTIFICATE PROGRAM IN HEALTH PROMOTION PLANNING

**Course Outline:**

The program aims to build understanding of core concepts of health promotion in participants and its application in designing, implementation and evaluation of health promotion programs.

**Course Objectives:**

The program aims to build understanding of core concepts of health promotion in participants and its application in designing, implementation and evaluation of health promotion programs.

**Course Contents**

The initial months of this course are assigned to learning core concepts of health promotion:

Basic public health skills: epidemiology, biostatistics and critical appraisal of scientific literature

History, theories and models of health promotion and behavior change

Planning, Developing and Implementing Health Promotion

Methodologies/ tools involved for evaluating health promotion programmes and policies

In addition to the core concepts, PGPHP students can choose any one 'elective learning' option during next 3 months:

Prevention and Control of Non Communicable Diseases

Tobacco Control

Reproductive, Maternal, Neonatal, Child and Adolescent Health (RMNCH+A)

Oral Health

Course duration: 30 hours

**Course Coordinator:** Professor / Assoc Professor of CommunityvMedicine

**Syllabus**

| Topic | Faculty | Duration |
|---|---|---|
| Introduction to course | Associate Professor of Community Medicine | 2 hours |
| Basic public health skills: Epidemiology, biostatistics and critical appraisal of scientific literature | Assistant professor of Community Medicine | 2 hours |

| | | |
|---|---|---|
| History, theories and models of health promotion and behavior change | Associate Professor of Community Medicine | 2hours |
| Planning, Developing and Implementing Health Promotion | Assistant professor of Community Medicine | 2hours |
| Methodologies/ tools involved for evaluating health promotion programmes and policies | Associate Professor of Community Medicine | 2hours |
| Prevention and Control of Non Communicable Diseases | Assistant professor of Community Medicine | 2hours |
| Tobacco Control | Assistant professor of Community Medicine | 2hours |
| Reproductive, Maternal, Neonatal, Child and Adolescent Health | Associate Professor of Community Medicine | 2hours |
| Oral Health | Associate Professor of Community Medicine | 2hours |
| Group discussion | Assistant professor of Community Medicine | 2hours |
| assignments | Assistant professor of Community Medicine | 2hours |
| Viva | Assistant professor of Community Medicine | 2hours |
| Assessment | Assistant professor of Community Medicine | 2hours |

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

## CERTIFICATE

This is to certify that Mr./Ms, ADITYA SESHA SAI UNDAVALLI has completed the value added course on Certificate Program in Health Promotion Planning conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 5/16/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Date: 16/05/2016

Course Title: Certificate Program in Health Promotion Planning

Name: Shradha. L

RegNo: U16M203

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:

Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 16/05/2016

Course Title: Certificate Program in Health Promotion Planning

Name: Srini. G M

RegNo: U16MB215

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:

Srini. G M
Signature

***Thank you***

| Certificate Program in Health Promotion Planning | | |
|---|---|---|
| S. No | Regn. No. | Name |
| 1 | U16MB199 | SHIFA M |
| 2 | U16MB200 | SHINI YASSMIN S |
| 3 | U16MB201 | SHIVA DIVAKARAN B |
| 4 | U16MB202 | SHIVANI M |
| 5 | U16MB203 | SHRADHA L |
| 6 | U16MB204 | SHREYA ROHRA |
| 7 | U16MB205 | SHRIJANI THAKURIA |
| 8 | U16MB206 | SHRIVIDYA R |
| 9 | U16MB207 | SHWETHA GOWTHAMAN |
| 10 | U16MB208 | SHYAM VIGNESH KUMAR S |
| 11 | U16MB209 | SIMRAN NAVKHANDEWALA |
| 12 | U16MB210 | SIVABALAJI M |
| 13 | U16MB211 | SIVASANKARA SEKARAN V |
| 14 | U16MB212 | SONIA VALIYAVEETTIL SOLOMAN |
| 15 | U16MB213 | SREEARTHI R |
| 16 | U16MB214 | SREERAG K G |
| 17 | U16MB215 | SRINI C M |
| 18 | U16MB216 | SUBIKSHA SENTHILKUMAR |
| 19 | U16MB217 | SUDESH RAJ R |
| 20 | U16MB218 | SUDHAN V |
| 21 | U16MB219 | SUNKU VENKATESWARLU CHETHAN |
| 22 | U16MB220 | SURYA A |
| 23 | U16MB221 | SUSRITA DWARI |
| 24 | U16MB222 | SWARNIKA S |
| 25 | U16MB223 | SWASTHIKA S (Sreyangkumar) |
| 26 | U16MB224 | SWASTHIKA S (Siva Kumar) |
| 27 | U16MB225 | SWATHI S |
| 28 | U16MB226 | SWATHY A |
| 29 | U16MB227 | SWETHA A |
| 30 | U16MB228 | SWETHA G |
| 31 | U16MB229 | SWETHA JOHN |
| 32 | U16MB230 | SWETHA SRINIVAS |
| 33 | U16MB231 | SYAMALA SAI VENNELA |
| 34 | U16MB232 | TANNAMALA HASHWANTH REDDY |
| 35 | U16MB233 | TAUHID RASUL |
| 36 | U16MB234 | TEJAL VAISHNAV H |
| 37 | U16MB235 | TEJAS M |
| 38 | U16MB236 | TELAGANEEDI SAI DINESH |
| 39 | U16MB237 | THIRIPOORANA BHAVANI M |
| 40 | U16MB238 | VADA RAMA HARSHITHA |
| 41 | U16MB239 | VAKINI S K |
| 42 | U16MB240 | VENKATANAGAPOOJITHA L |
| 43 | U16MB241 | VIDHYALAKSHMI S |
| 44 | U16MB242 | VIJAY A |
| 45 | U16MB243 | VISHAK R |
| 46 | U16MB244 | YAMINI T |
| 47 | U16MB245 | YELURI SUDEEPA LIBNY |
| 48 | U16MB246 | YOGESWARAN M |
| 49 | U16MB247 | YOGITA STEPHY RAVINDRAKUMAR |
| 50 | U16MB248 | YUVAN SHANKAR S P |
| 51 | U16MB249 | YUVANASH S |



4/16/2016

Chennai

From

The Course Coordinator

Certificate Program in Pathogenic Microbiology

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 Program in Pathogenic Microbiology**

Respected sir,

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

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 4/19/2016

**R. No 182/ SBMCH/2016**

# 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 Program in Pathogenic Microbiology from 5/16/2016 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 5/9/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

## CERTIFICATE PROGRAM IN PATHOGENIC MICROBIOLOGY

**Course Outline :**

Infectious diseases resulting from viruses, parasites, prions, and bacteria are a major cause of human morbidity and mortality. Some important infectious diseases, including HIV, malaria, and hepatitis C are becoming more rather than less prevalent. The threat of emerging infectious diseases and bioterrorism also calls for increased research in the area of microbiology, and in fact the NIH is greatly increasing research funding for work on infectious diseases. The recent outbreak of SARS and the continued spread of West Nile virus in North America are but two recent examples of emerging infectious diseases. By studying human pathogens, it is also frequently possible to learn much about normal cell biology, molecular biology, and immunology - infectious agents have long been used as model systems to study important processes.

If you find the study of infectious diseases interesting, then you should consider a research career in Microbiology, Virology or Parasitology. This course will enlighten you in the above context.

**Course Duration:** 30 hours

**Course Coordinator: Professor / Assoc Professor of Microbiology**

**Syllabus**

| S.No | Topic | Duration | Faculty |
|---|---|---|---|
| 1 | Clinical Microbiology I | 2 hours | Asst Prof : Dept of microbiology |
| 2 | Clinical Parasitology & Mycology | 2 hours | Assoc Prof : : Dept of Microbiology |
| 3 | Clinical Microbiology II | 2 hours | Asst Prof : Dept of microbiology |
| 4 | Clinical Laboratory Management | 2 hours | Assoc Prof : : Dept of Microbiology |
| 5 | Laboratory Operations | 2 hours | Asst Prof : Dept of microbiology |
| 6 | Immunology & Serology | 2 hours | Assoc Prof : : Dept of Microbiology |

| | | | |
|---|---|---|---|
| 7 | Molecular Diagnostics | 2 hours | Asst Prof : Dept of microbiology |
| 8 | Clinical Microbiology Practicum | 2 hours | Assoc Prof : : Dept of Microbiology |
| 9 | Infectious diseases | 2 hours | Asst Prof : Dept of microbiology |
| 10 | immunology | 2 hours | Assoc Prof : : Dept of Microbiology |
| 11 | virology | 2 hours | Asst Prof : Dept of microbiology |
| 12 | immunology | 2 hours | Assoc Prof : : Dept of Microbiology |
| 13 | Molecular biology | 2 hours | Asst Prof : Dept of microbiology |
| 14 | Viva voce | 2 hours | Assoc Prof : : Dept of Microbiology |
| 15 | Assessment | 2 hours | Asst Prof : Dept of microbiology |

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

## CERTIFICATE

This is to certify that Mr./Ms. AFRA MARIAM T F has completed the value added course on Certificate Program in Pathogenic Microbiology conducted by Community Medicine at Sree Balaji Medical College & Hospital, Chennai held during 5/16/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

COURSE FEEDBACK FORM

Date: 16/05/16

Course Title: Certificate program in Pathogenic Microbiology

Name: Hari Priya. D.S

RegNo: U16MB083

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:**

Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 16/05/16

Course Title: CERTIFICATE PROGRAM IN PATHOGENIC MICROBIOLOGY

Name: JANANI.M

RegNo: U16NB090

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 | ✓ |

Please give suggestion for the improvement of the course:

Weakness of the course:

Strength of the course:

Signature

***Thank you***

| Certificate Program in Pathogenic Microbiology | | |
|---|---|---|
| S. No | Regn. No. | Name |
| 1 | U16MB066 | DIVYA C REDDY V |
| 2 | U16MB067 | DIVYA W A |
| 3 | U16MB068 | EASWARR C |
| 4 | U16MB069 | ESWAR L |
| 5 | U16MB070 | FIRDAUS AHMED |
| 6 | U16MB071 | GANDHI KANNAPPAN G |
| 7 | U16MB072 | GEETHA C |
| 8 | U16MB073 | GEOS ASHISH G |
| 9 | U16MB074 | GIRABOINA BHAVITHA |
| 10 | U16MB075 | GONNABATHULA KAUSTUBHA |
| 11 | U16MB076 | GONUGUNTLA DIVYA VANI |
| 12 | U16MB077 | GOPIREDDY CHARAN TEJA REDDY |
| 13 | U16MB078 | GOVVIND GNANAM |
| 14 | U16MB079 | GOWTHAM S |
| 15 | U16MB080 | GURVEER SINGH CHAWLA |
| 16 | U16MB081 | HALEEMATHU SSAHDIYYA |
| 17 | U16MB082 | HANEESH V |
| 18 | U16MB083 | HARI PRIYA D S |
| 19 | U16MB084 | HARSHA M S |
| 20 | U16MB085 | HARSHAN R |
| 21 | U16MB086 | ISHWARYA V |
| 22 | U16MB087 | JADAV AKSHAY RAMESHBHAI |
| 23 | U16MB088 | JAHANVI SHARMA |
| 24 | U16MB089 | JAISHREE P |
| 25 | U16MB090 | JANANI M |
| 26 | U16MB091 | JANARTHANAN R |
| 27 | U16MB092 | JASHWINI T |
| 28 | U16MB093 | JAYPRADHA S |
| 29 | U16MB094 | JEBISHA S |
| 30 | U16MB095 | JEEVAN PRAKASSH B |
| 31 | U16MB096 | JEGATHSRI S |
| 32 | U16MB097 | JESSITA MARION KAREN P |
| 33 | U16MB098 | JEYAGANESH S |
| 34 | U16MB099 | JEYASHREE R |
| 35 | U16MB100 | JISHA G |
| 36 | U16MB101 | JOSIAH MIRACLIN J G |
| 37 | U16MB102 | KANAKAVALLI S |
| 38 | U16MB103 | KANYA R |
| 39 | U16MB104 | KARTHIK GANESH B |



4/23/2016

Chennai

From

The Course Coordinator

Certificate Program in International Approaches to Health

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 Program in International Approaches to Health**

Respected sir,

With reference to subject mentioned above, the Medicine proposes to conduct a value-added course titled: Certificate Program in International Approaches to Health

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 4/26/2016

**R. No 187/ SBMCH/2016**

# 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 Program in International Approaches to Health from 5/23/2016 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 5/16/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

## Certificate Program in International Approaches to Health

**Course Outline:**

The Certificate in Global Health and the associated study abroad program expands opportunities for Clemson University students from health-related disciplines. The program moves beyond the standard "language and culture" model of study abroad to provide an inter professional and integrated approach to the challenge of health care delivery across global settings. Focused on the societal issues that influence health care in low resource countries, this program will prepare students to address health disparities in domestic or international settings.

**Course Objectives**

1. synthesize knowledge of current global health issues and assist local health care partners to develop innovative strategies to improve health outcomes in low resource settings;
2. increase cultural competence in health care delivery;
3. strengthen skills for working with indigenous and/or underserved populations;
4. participate in a service learning experience in a low resource country; and,
5. prepare for entry level career positions with NGOs serving underserved populations, public health departments, immigrant health agencies; or
6. to prepare for entry into a master's degree in public health or global health

**Course Duration:** 30 hours

**Course Coordinator: Professor / Assoc Professor of CommunityMedicine**

**Syllabus**

| S.No | Topic | Duration | Faculty |
|---|---|---|---|
| 1 | Introduction to the biosocial | 2 hours | Asst Prof : Dept of Community Medicine |
| 2 | Why ideas matter: Social theory in global health | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 3 | The history of global health and colonial legacy | 2 hours | Asst Prof : Dept of Community Medicine |

| | | | |
|---|---|---|---|
| 4 | Political economy and foreign aid | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 5 | Assignment | 2 hours | Asst Prof : Dept of Community Medicine |
| 6 | The global AIDS movement | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 7 | Challenges in healthcare delivery: | 2 hours | Asst Prof : Dept of Community Medicine |
| 8 | Building an effective rural health delivery model | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 9 | Assignment | 2 hours | Asst Prof : Dept of Community Medicine |
| 10 | Critical perspectives on metrics of disease | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 11 | Student Presentations | 2 hours | Asst Prof : Dept of Community Medicine |
| 12 | The unique challenges of mental health | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 13 | Values and global health | 2 hours | Asst Prof : Dept of Community Medicine |

| | | | |
|---|---|---|---|
| 14 | Viva Voce | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 15 | Assessment | 2 hours | Asst Prof : Dept of Community Medicine |

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

## CERTIFICATE

This is to certify that Mr./Ms. AFSANA S has completed the value added course on Certificate Program in International Approaches to Health conducted by Medicine at Sree Balaji Medical College & Hospital, Chennai held during 5/23/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Course Title: Certificate program in International Approaches to Health Date: 23/05/16

Name: Arpit
RegNo: U17MB029
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:

Arpit
Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 23/05/16

Course Title: Certificate program in International approaches to healthc

Name: Anagha. K

RegNo: U17MB021

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

***Thank you***

Certificate Program in International Approaches to 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 |
| 44 | U17MB044 | BINDU PRIYA K |
| 45 | U17MB045 | CHANDRAPRAKASH V |
| 46 | U17MB046 | CHARULATHA G |
| 47 | U17MB047 | CHINMAYEE PANIGRAHI |
| 48 | U17MB048 | CLIVE ROYSON M J |
| 49 | U17MB049 | DAYALA GANESH T |
| 50 | U17MB050 | DEBASHREE SAHOO |
| 51 | U17MB051 | DHANUSIYA U |
| 52 | U17MB052 | DHARINI M (Name changed as HAASINI M) |
| 53 | U17MB053 | DHEVHA HARINI SA |
| 54 | U17MB054 | DHILIP V |
| 55 | U17MB055 | DINESH C K M |



4/23/2016

Chennai

From

The Course Coordinator

Certificate Program in Advanced Health Communication

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 Advanced Health Communication**

Respected sir,

With reference to subject mentioned above, the Psychiatry proposes to conduct a value-added course titled: Certificate Program in Advanced Health Communication

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 4/26/2016

**R. No 189/ SBMCH/2016**

# 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 Advanced Health Communication from 5/23/2016 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 5/16/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

## Certificate Program in Advanced Health Communication

This course which aims to up skill 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 to workflow analysis. | 2 hours | Asst Prof : Dept of Community Medicine |
| 14 | Viva Voce | 2 hours | Assoc Prof : : Dept of Community Medicine |

| | | | |
|---|---|---|---|
| 15 | Assessment | 2 hours | Asst Prof : Dept of Community Medicine |

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

## CERTIFICATE

This is to certify that Mr./Ms. AISHVHARAANI S T has completed the value added course on Certificate Program in Advanced Health Communication conducted by Psychiatry at Sree Balaji Medical College & Hospital, Chennai held during 5/23/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Date: 23/05/16

Course Title: Certificate program in Advanced Health Communication

Name: Atul Nair. S.S

RegNo: U16MB041

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:

Atul Nair. S.S
Signature

***Thank you***

## COURSE FEEDBACK FORM

Date: 23/05/16

Course Title: Certificate program in Advanced Health Communication

Name: Arjun Umesh

RegNo: U16MB034

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:

Arjun Umesh
Signature

***Thank you***

**Certificate Program in Advanced Health Communication**

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U16MB015 | AJITHA BEGUM A |
| 2 | U16MB016 | AKASH D |
| 3 | U16MB017 | AKASH JAIN |
| 4 | U16MB018 | AKASH KRISHNA |
| 5 | U16MB019 | AKSHAYA R |
| 6 | U16MB020 | ALBERT SHAJI |
| 7 | U16MB021 | ALHEEBA M |
| 8 | U16MB022 | ALINA SAMAN |
| 9 | U16MB023 | AMAN SINGLA |
| 10 | U16MB024 | AMBATI LAKSHMI VAISHALI |
| 11 | U16MB025 | AMEYAARJUN ARUMUGAM |
| 12 | U16MB026 | AMISHA VERMA |
| 13 | U16MB027 | AMITHA HASHIM |
| 14 | U16MB028 | ANAGHA V K |
| 15 | U16MB029 | ANAM HIRANMAYI |
| 16 | U16MB030 | ANGEL CELIN S |
| 17 | U16MB031 | ANGELINE JEMEMA S J |
| 18 | U16MB032 | APPARANJITHA V RAMANA |
| 19 | U16MB033 | ARCHA BALACHANDRAN |
| 20 | U16MB034 | ARJUN UMESH |
| 21 | U16MB035 | ARKAPRAVA CHAKRABORTY |
| 22 | U16MB036 | ASHWIN KUMAR S |
| 23 | U16MB037 | ASHWIN M G |
| 24 | U16MB038 | ASHWIN MUTHURAM T S |
| 25 | U16MB039 | ASWIN SANKAR RAJ O P |
| 26 | U16MB040 | ATMAJITA CHATTERJEE |
| 27 | U16MB041 | ATUL NAIR S S |
| 28 | U16MB042 | AVINASH ESAKKIAPPAN |
| 29 | U16MB043 | AYUSH KASHYAP |
| 30 | U16MB044 | BALLOLI HARI CHANDANA |
| 31 | U16MB045 | BATTULA SREEKRISHNA BHARGAVA |
| 32 | U16MB046 | BAVANI V |
| 33 | U16MB047 | BAVISHNA B |
| 34 | U16MB048 | BRISHA J |
| 35 | U16MB049 | CHAKRAPANI PEGU |
| 36 | U16MB050 | CHAMRIDHA D P |



5/11/2016

Chennai

From

The Course Coordinator

Introduction to global Health Care Systems

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 global Health Care Systems**

Respected sir,

With reference to subject mentioned above, the Paediatrics proposes to conduct a value-added course titled: Introduction to global Health Care Systems

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 5/15/2016

**R. No 197/ SBMCH/2016**

# 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 global Health Care Systems from 6/10/2016 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 6/3/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

## Introduction to global Health Care Systems

The science of global health delivery and healthcare implementation research have served as drivers for measuring the impact and effectiveness of healthcare interventions.

**Course Duration:** 30 hours

**Course Coordinator: Professor / Assoc Professor of CommunityMedicine**

**Syllabus**

| S.No | Topic | Duration | Faculty |
|---|---|---|---|
| 1 | Introduction to the biosocial | 2 hours | Asst Prof : Dept of Community Medicine |
| 2 | Why ideas matter: Social theory in global health | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 3 | The history of global health and colonial legacy | 2 hours | Asst Prof : Dept of Community Medicine |
| 4 | Political economy and foreign aid | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 5 | Assignment | 2 hours | Asst Prof : Dept of Community Medicine |
| 6 | The global AIDS movement | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 7 | Challenges in healthcare | 2 hours | Asst Prof : Dept of Community |

| | | | |
|---|---|---|---|
| | delivery: | | Medicine |
| 8 | Building an effective rural health delivery model | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 9 | Assignment | 2 hours | Asst Prof : Dept of Community Medicine |
| 10 | Critical perspectives on metrics of disease | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 11 | Student Presentations | 2 hours | Asst Prof : Dept of Community Medicine |
| 12 | The unique challenges of mental health | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 13 | Values and global health | 2 hours | Asst Prof : Dept of Community Medicine |
| 14 | Viva Voce | 2 hours | Assoc Prof : : Dept of Community Medicine |
| 15 | Assessment | 2 hours | Asst Prof : Dept of Community Medicine |

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

## CERTIFICATE

This is to certify that Mr./Ms. AISHWARYA D has completed the value added course on Introduction to global Health Care Systems conducted by Paediatrics at Sree Balaji Medical College & Hospital, Chennai held during 6/10/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Date: 10/06/16

Course Title: Introduction to global Health care system

Name: Haritha. S

RegNo: U 17MB077

Department: Paediatric

| 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: 10/06/16

Course Title: Introduction to global Health Care Systems

Name: Jeson Dagam

RegNo: U17M092

Department: Paediatric

| 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:

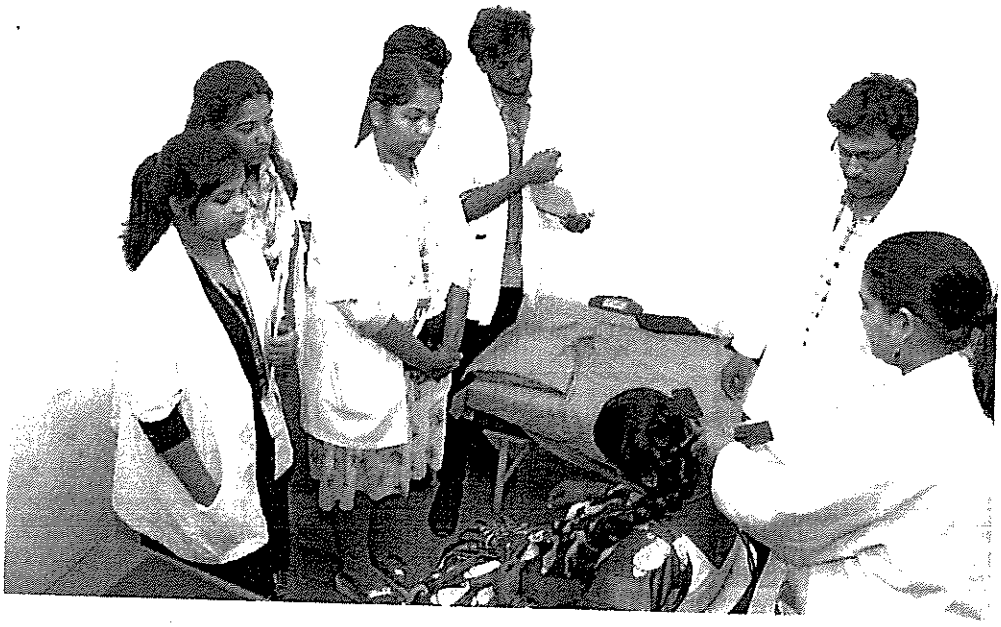
Strength of the course:

Signature

***Thank you***

| Introduction to global Health Care Systems | | |
|---|---|---|
| S. No | Regn. No. | Name |
| 1 | U17MB056 | DINESH KUMAR M |
| 2 | U17MB057 | DURGA ARUN PATWARDHAN |
| 3 | U17MB058 | FAZAL RIAZ |
| 4 | U17MB059 | FRANCIS N S |
| 5 | U17MB060 | GAGANCHAND C |
| 6 | U17MB061 | GAMANI V I |
| 7 | U17MB062 | GOKULA VARDHAN R |
| 8 | U17MB063 | GOPIKA A |
| 9 | U17MB064 | GOWTHAM GANESH D |
| 10 | U17MB065 | GOWTHAM S |
| 11 | U17MB066 | GUNASUNDARI V |
| 12 | U17MB067 | HAASHIKA M |
| 13 | U17MB068 | HAMRUTHA V |
| 14 | U17MB069 | HAMSANANDHINI S |
| 15 | U17MB070 | HARIHARAN B |
| 16 | U17MB071 | HARIHARAN S |
| 17 | U17MB072 | HARIKRISHNA SURESH |
| 18 | U17MB073 | HARIPRASATH M |
| 19 | U17MB074 | HARIRAM M R |
| 20 | U17MB075 | HARISH N |
| 21 | U17MB076 | HARISH SACHIN M |
| 22 | U17MB077 | HARITHA S |
| 23 | U17MB078 | HAROONKHAN M K J |
| 24 | U17MB079 | HARSHAN SABAPATHY V |
| 25 | U17MB080 | HARSHAVARDHINI A |
| 26 | U17MB081 | HEERA P |
| 27 | U17MB082 | HELEN ANGELLA B |
| 28 | U17MB083 | HEMA D |
| 29 | U17MB084 | HMANGAIHSANGZUALI |
| 30 | U17MB085 | JAI SANTHOSH T |
| 31 | U17MB086 | JAISHREE M |
| 32 | U17MB087 | JANANI S |
| 33 | U17MB088 | JAYALAKSHMI G |
| 34 | U17MB089 | JAYASURYA M |
| 35 | U17MB090 | JEEVARATHINAM SANCHEZ D |
| 36 | U17MB091 | JEMI DAFFODIL S |
| 37 | U17MB092 | JESON DAGAM |
| 38 | U17MB093 | JIDAN CHRISTINA TOPNO |

| | | |
|---|---|---|
| 35 | U15MB244 | VIKAASH K S |
| 36 | U15MB245 | VINITH M V |
| 37 | U15MB246 | VINOTH G |
| 38 | U15MB247 | YASHOPRIYADARSHINI V R |
| 39 | U15MB248 | YAZHINI T |
| 40 | U15MB249 | YUVARAJ LAKSHMIPATHY |
| 41 | U15MB250 | YUVASHREE M |
| 42 | U15MB186 | SHIRAVANKUMAR S P |
| 43 | U15MB187 | SHONA NELSON |
| 44 | U15MB188 | SHRIVIRUTHAA T |
| 45 | U15MB189 | SHRUTHI SRI R G |
| 46 | U15MB190 | SHRUTI U |
| 47 | U15MB191 | SHUBAVEE R |
| 48 | U15MB192 | SHYJU RAGLAND S R |
| 49 | U15MB193 | SIDDARTH VINCENT RAJ S |
| 50 | U15MB194 | SIDDHARTHANI A |
| 51 | U15MB195 | SIDHITHA S M |
| 52 | U15MB196 | SIVA VIGNESH A |
| 53 | U15MB197 | SIVASURIYAN S |
| 54 | U15MB198 | SMRITHI A |
| 55 | U15MB199 | SAI SNEHA PREETHY E |
| 56 | U15MB200 | SNEKHA S |
| 57 | U15MB201 | SOUMIYA E |
| 58 | U15MB202 | SOWMIYA T |



5/11/2016

Chennai

From

The Course Coordinator

Certificate Program in Historical and Contemporary Issues in Health

Department of Dermatology

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 Historical and Contemporary Issues in Health**

Respected sir,

With reference to subject mentioned above, the Dermatology proposes to conduct a value- added course titled: Certificate Program in Historical and Contemporary Issues in Health

We kindly solicit your kind permission to commence the program.

Warm Regards,

Course Coordinator

SREE BALAJI MEDICAL COLLEGE & HOSPITAL

CHROMPET CHENNAI -600044

Date: 5/14/2016

**R. No 208/ SBMCH/2016**

# CIRCULAR

**Notification for Value added courses offered by the Department of Dermatology**

The Department of **Dermatology** of Sree Balaji Medical College is scheduled to offer a Value added Course on Certificate Program in Historical and Contemporary Issues in Health from 6/10/2016 for a period of 3 weeks. Interested students can approach the Head of Dermatology department and Course Coordinator, for registration and for further details on or before 6/3/2016.

**Eligibility-MBBS STUDENTS**

Course Coordinator

HOD

Copy to:

Dean office

Vice Principal

Medical Superintendent

AO College

## CERTIFICATE PROGRAM IN HISTORICAL AND CONTEMPORARY ISSUES IN HEALTH

This course is a high level introduction to a dynamic and growing field of health innovations. Students will be provided with introductions to various health innovations, including pathways, technology, techniques, and outcomes. This course will expose students to the latest innovations happening in various segments of the healthcare industry. The purpose of the course is to provide tools for health innovators. On one hand, theoretical and practical understanding of information pathways in the health industries will introduce students to 'venues' for health innovators. Topics include brief introductions to different health technologies including electronic medical records, medical imaging, telemedicine, consumer health informatics, artificial intelligence in healthcare among others. The innovation process including design thinking and startup challenges will be discussed. Topics include needs findings, evaluation of existing solutions, stakeholder and market analysis, among others.

**Learning Objectives and Outcomes**

By the end of this course, students should be able to

: • Understand EMR/EHR & PHR

• Understand basics of Artificial Intelligence (AI)

• Understand how Virtual Reality (VR) & Augmented Reality (AR) is used in healthcare

• Explain impact of Precision medicine and Personalized medicine

• Differentiate between Health Exchanges and Health Network

s • Explain the processes involved in innovating in healthcare

• Conduct needs assessment and prioritize needs

• Evaluate healthcare markets

• Recognize the major differences between successful innovations and failures; and appreciate both of their places in the process of health innovations

• Discern competitive strategies

**Course Duration:** 30 Hours

**Course Coordinator:** Professor / Assoc Prof of Department of medicine

| S.No | Topic | Duration | Faculty |
|---|---|---|---|
| 1 | Course overview; Intro. to health innovations | 2 hours | Guest Speaker/Asst Prof : Dept Medicine |
| 2 | Great healthcare innovation | 2 hours | Guest Speaker/Assoc Prof : : Dept of Medicine |
| 3 | Health Data, Information & Knowledge | 2 hours | Guest Speaker/Asst Prof : Dept of y Medicine |
| 4 | Case presentations: One failure and one success | 2 hours | GuestSpeaker/Assoc Prof : : Dept of Medicine |
| 5 | The Innovation Process - Design thinking | 2 hours | Guest Speaker/Asst Prof : Dept of Medicine |
| 6 | Presentation of needs in a selected clinical setting | 2 hours | Guest Speaker/Assoc Prof : : Dept of Medicine |
| 7 | Electronic health records and patient health records | 2 hours | Guest Speaker/Asst Prof : Dept of Medicine |
| 8 | Health information exchanges Case presentations: Success and failure with EHRs | 2 hours | Guest Speaker/Assoc Prof : : Dept of Medicine |
| 9 | The Ten Types; Network | 2 hours | Guest speakerAsst Prof : Dept of Medicine |
| 10 | Introduction to AI & Machine Learning | 2 hours | Guest Speaker/Assoc Prof : : Dept of Medicine |
| 11 | Working with RapidMIner tool | 2 hours | Guest Speaker/Asst Prof : Dept of Medicine |

| | | | |
|---|---|---|---|
| 12 | Artificial Intelligence (AI) and Virtual Reality (VR) | 2 hours | Guest SpeakerAssoc Prof : : Dept of Medicine |
| 13 | Precision medicine and personalized medicine | 2 hours | Guest Speaker/Asst Prof : Dept of Community Medicine |
| 14 | Process and Product Performance | 2 hours | Guest SpeakerAssoc Prof : : Dept of Medicine |
| 15 | Assessment | 2 hours | Asst Prof : Dept of Community Medicine |

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

## CERTIFICATE

This is to certify that Mr./Ms, JENISHA THERESA LALICHAN has completed the value added course on Certificate Program in Historical and Contemporary Issues in Health conducted by Dermatology at Sree Balaji Medical College & Hospital, Chennai held during 6/10/2016.

**Dr.P.Sai Kumar MD**

Vice Principal, SBMCH

**Dr.Gunasekeran MS**

Dean, SBMCH

## COURSE FEEDBACK FORM

Date: 10/06/16

Course Title: Certificate program in Historical and Contemporary Issues in Health.

Name: Vinith. M. V

RegNo: U15MB245

Department: Dermatology

| 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: 10/06/16

Course Title: Certificate program in Historical and Contemporary Issues in Health

Name: Yazhini .T

RegNo: U15MB248

Department: Dermatology

| 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***

Certificate Program in Historical and Contemporary Issues in Health

| S. No | Regn. No. | Name |
|---|---|---|
| 1 | U15MB221 | SURYA R |
| 2 | U15MB222 | SWETHA M |
| 3 | U15MB223 | SYED AFRIDI S |
| 4 | U15MB224 | SYED ALI H F |
| 5 | U15MB225 | TARIQ IBRAHIM |
| 6 | U15MB226 | THALINZAI PRAVEEN KUMAR A |
| 7 | U15MB227 | SAKTHI VIGNESH T |
| 8 | U15MB228 | THILAKESH G |
| 9 | U15MB229 | THRILOK RAM B |
| 10 | U15MB230 | TRUP MOHAMED FASIH MAAZ |
| 11 | U15MB231 | UDAYA S |
| 12 | U15MB232 | UTHAYASURYA K |
| 13 | U15MB233 | VAIBHAVI D |
| 14 | U15MB234 | VAISHNAVI M |
| 15 | U15MB235 | VANI KRISHNA |
| 16 | U15MB236 | VARUN V |
| 17 | U15MB237 | VASANTH S |
| 18 | U15MB238 | VASANTHAKUMAR V S |
| 19 | U15MB239 | VEENA KRISHNA |
| 20 | U15MB240 | VENKATA MANISH REDDY MUNDLA |
| 21 | U15MB241 | VIDHYAPRIYADARSHINI S |
| 22 | U15MB242 | VIGNESH P |
| 23 | U15MB243 | VIGNESH R |
| 24 | U15MB244 | VIKAASH K S |
| 25 | U15MB245 | VINITH M V |
| 26 | U15MB246 | VINOTH G |
| 27 | U15MB247 | YASHOPRIYADARSHINI V R |
| 28 | U15MB248 | YAZHINI T |
| 29 | U15MB249 | YUVARAJ LAKSHMIPATHY |
| 30 | U15MB250 | YUVASHREE M |
| 31 | U15MB186 | SHIRAVANKUMAR S P |
| 32 | U15MB187 | SHONA NELSON |
| 33 | U15MB188 | SHRIVIRUTHAA T |
| 34 | U15MB189 | SHRUTHI SRI R G |
| 35 | U15MB190 | SHRUTI U |
| 36 | U15MB191 | SHUBAVEE R |
| 37 | U15MB192 | SHYJU RAGLAND S R |
| 38 | U15MB193 | SIDDARTH VINCENT RAJ S |
| 39 | U15MB194 | SIDDHARTHANI A |
| 40 | U15MB195 | SIDHITHA S M |
| 41 | U15MB196 | SIVA VIGNESH A |



# Sri Lakshmi Narayana Institute of Medical Sciences

Date: 04.05.2015

From
Dr. Raji Sharma
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: Fire hazards in hospital environment**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Fire hazards in hospital environment for undergraduates from July 2015-Dec 2015. We solicit your kind permission for the same.

Kind Regards
DR. RAJI SHARMA

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

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**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr RAJASEKAR

The HOD: DR. RAJI SHARMA

The Expert: Dr K SELVARAJU

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

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

05.06.2015

**Sub: Organizing Value-added Courses: Fire Hazard In Hospital Environment - 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 **"_FIRE HAZARD IN HOSPITAL ENVIRONMENT"** course in July-Dec 2015.

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 15/06/2015. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIE
AGARAM VILLAGE,
PUDUCHERRY

Encl: Copy of Course content.

# COURSE PROPOSAL

Course Title: **Fire hazards in Hospital Environment**

**Course Objective:**

1. To enable the students to learn about various risk factors pertaining to fire accidents in the hospital and identify and mange them accordingly

2. To be prepared for inadvertent events in hospital

**Course Outcome:**

On successful completion of the course, the students will have skill in identifying and managing fire hazards in hospital.

**Course Audience: II year MBBS students**

**Course Coordinator:** Dr. Raji Sharma

**Course Faculties with Qualification and Designation:**

1. Dr. Raji Sharma- Professor And HOD
2. Dr K Selvaraju- Associate Professor

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

| S.No | Date | Topic | Time | Hours | Faculty |
|---|---|---|---|---|---|
| 1 | 18.07.2015 | Hospital- a risk zone for fire hazards | 2-4PM | 2 | Dr. Raji Sharma |
| 2 | 25.07.2015 | Fire triad | 2-4PM | 2 | Dr K Selvaraju |
| 3 | 01.08.2015 | Fire prevention | 2-4PM | 2 | Dr. Raji Sharma |
| 4 | 08.08.2015 | Fire suppression | 2-4PM | 2 | Dr K Selvaraju |
| 5 | 22.08.2015 | evacuation | 2-4PM | 2 | Dr. Raji Sharma |
| 6 | 29.08.2015 | Infrastructure planning | 2-4PM | 2 | Dr K Selvaraju |
| 7 | 05.09.2015 | Electrical system planning | 2-4PM | 2 | Dr. Raji Sharma |
| 8 | 12.09.2015 | Equipment planning | 2-4PM | 2 | Dr K Selvaraju |
| 9 | 19.09.2015 | Safety /security equipments | 2-4PM | 2 | Dr. Raji Sharma |
| 10 | 26.09.2015 | Fire protection equipments | 2-4PM | 2 | Dr K Selvaraju |
| 11 | 03.10.2015 | Fire protection systems | 2-4PM | 2 | Dr. Raji Sharma |
| 12 | 10.10.2015 | Fire safety training and practices | 2-4PM | 2 | Dr K Selvaraju |
| 13 | 17.10.2015 | NABH standard | 2-4PM | 2 | Dr. Raji Sharma |
| 14 | 24.10.2015 | Gas supply installation | 2-4PM | 2 | Dr K Selvaraju |
| 15 | 31.10.2015 | Assessment | 2-4PM | 2 | Dr. Raji Sharma |

**References**

1) Fire Hazard Categorization and Risk Assessment for Dhaka City using GIS, January 2004.

2) Fire Hazard Assessment During Construction of A Mixed-Use Development Project In Kuala Lumpur; International Journal of Engineering & Technology, July 2018.

3) Fire and Smoke: Understanding the Hazards; Chapter:4 Hazards Associated with Fires(1986)

# VALUE ADDED COURSE

1. **Name of the program & Code**

   FIRE HAZARDS, ANAES 01

2. **Duration & Period**

   30 hrs: July 2015 – December 2015

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 2015- December 2015

8. **Year of discontinuation: 2016**

9. **Summary report of each program year-wise**

| Value Added Course- July 2015 – December 2015 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | ANAES 01 | FIRE HAZARDS | DR. SELVARAJU K | II MBBS | 20 |

10. **Course Feed Back**

    *Enclosed as Annexure- V*

**RESOURCE PERSON**

**Dr K SELVARAJU**

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

**COORDINATOR**

**DR. RAJI SHARMA**

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

**Annexure I**

# FIRE HAZARDS

| |
|---|
| Hospital- a risk zone for fire hazards |
| Fire triad |
| Fire prevention |
| Fire suppression |
| evacuation |
| Infrastructure planning |
| Electrical system planning |
| Equipment planning |
| Safety /security equipments |
| Fire protection equipments |
| Fire protection systems |
| Fire safety training and practices |
| NABH standard |
| Gas supply installation |
| Assessment |

## Hospital safety and its importance

Most fire-related hazards are caused due to carelessness and improper handling of goods. One of the places where it is difficult to evacuate people in case of a fire breakout is a hospital. Evacuating people from hospitals during a fire hazard is challenging because it involves moving patients who are immobile and are unable to help themselves.

The real challenge is evacuating high dependency people before the fire spreads in the vicinity. Therefore, it is important that hospitals and other health care centers have adequate fire prevention and safety measures in place. Prevention is the key in the case of fire-related accidents especially when places like hospitals are concerned. Every hospital must have well-planned exit ways and well-maintained firefighting equipment to ward off the casualties and damage to assets.

By ensuring fire safety in hospitals, we can prevent fire accidents. Hospitals stack a lot of combustible materials like chemicals, cylinders, surgical equipment, etc. And many hospitals also have an inbuilt kitchen or canteen. A fire accident may have a lot of casualties as the fire may become uncontrollable in minutes.

So, the hospital management should ensure that their buildings are fire safe all the times

## Some of the worst fire accidents in Hospitals in India

### 1. AMRI Hospital, Kolkata

On December 2011, a major fire accident at AMRI hospital in Kolkata killed 95 people. The main cause of this mishap was an electrical short circuit and stocking of combustible substances in the basement. This was a case of negligence by the management of the hospital. During the incident, the hospital had around 160 patients and also many staff members. At least 50 patients were there in the intensive ward.

### 2. IMS & SUM Hospital in Bhubaneshwar

October 17, 2016, we saw one of the worst fire accidents in IMS & SUM Hospital, Bhubaneswar. 22 were killed and 120 were injured. In this case, the hospital staff tried to douse the fire with fire extinguishers and in this process, they lost almost 20 crucial minutes before they called the fire department. This shows the lack of preparedness of the hospital staff during emergencies.

### 3. Rohini Super specialty hospital in Hanamkonda

On October 17, 2017, an electrical short-circuit triggered a fire in Rohini super specialty hospital in Hanamkonda, Telangana. 199 patients were admitted to this hospital at the time of the

accident. Two patients died and four were injured. The hospital's fire safety system did not work during this crucial time. Everyone including the doctors and hospital staff was in a state of panic and did not know how to respond.

### 4. MY Hospital Indore

The lives of 47 newborn babies were in danger when a fire broke on November 4, 2017, at MY Hospital, Indore. Fortunately, there was no loss of life. But, it is alleged that the hospital has been flouting fire safety laws.*

In all the cases, the fire safety laws have been violated.

## What are the best ways to prevent fire accidents in hospitals?

Preventive measures to reduce fire risks in hospitals are different from the fire safety measures adopted in other places such as schools, office, and industries. A hospital has many combustible substances, chemicals, and gases, heat dissipating equipment, and electrical wiring, which can lead to a serious fire accident if appropriate safety measures are not observed.

Adequate fire prevention methods must be designed and developed including the fixed evacuation points, fire equipment and regular maintenance of electrical equipment to prevent a fire hazard.

Here is a list of preventive measures to reduce fire risks in hospitals:

### 1. Architecture and layout

The design and architecture can prove as a turning point in case of a fire breakout. A hospital's architecture planner must make sure that there is ample of open space in the building to minimize the possibilities of spreading fire in the entire building. Pressurized exclusion of smoke must be a priority while planning the architecture of a hospital.

### 2. Fire safety plan

Every member of the hospital must be aware of a well-charted and detailed action plan which everyone needs to follow in case of a fire breakout. Fire drills must be carried out on a regular basis to make sure that hospital staff including doctors must know how to respond during emergency situations.

### 3. Fire detection equipment

Fire detection is the first step towards preventing fire hazards. Hospitals must have fire detection equipment such as heat detector, smoke detector, fire gas detector, flame detector, etc installed at important locations. Not only the installation of fire detection equipment is essential, it must also be ensured that these devices are working properly by checking them on a timely basis.

### 4. Prohibiting smoking to reduce chances of fire

Hospital authorities must ban smoking inside the premises of the hospital, especially near oxygen cylinders. This will significantly reduce the chances of fire outbreak.

### 5. Fire audit survey

Hospitals can seek help from professional bodies for conducting fire safety audits to make sure that the adequate fire prevention measures are observed in the hospital. If the authority recommends any changes, it should be implemented diligently.

### 6. Maintenance of electrical wiring and equipment

Faulty wiring systems can be a cause of fire outbreak. To prevent fires from electrical equipment, maintenance must be carried out at least once in a month and other electrical equipment that can lead to fire hazard must also be properly maintained.

In 1929, a Cleveland clinic fire killed 120 people when they ignored NFPA recommendations for storing their x-ray film (made of nitrocellulose). Several tons were stored in the basement, a few feet away from a heat source. When nitrocellulose reaches 300 degrees, it turns into an explosive gas. The heat source caught the film on fire and toxic, explosive gas spread through the floorboards, causing explosions throughout the hospital.

Since 1929, fire and building code has changed a lot in hospitals. In 1980-1984, data shows that an average of 7,100 hospital fire happened annually with 5 deaths per year. In the study for 2006-2010, fires in hospitals went down to 1,400 with an average of 1 death per year.

The main reason fires reduced in hospitals so much during this time was smoking being banned from hospitals. When that ban took effect, fires caused by smoking materials in hospitals went from 35% to 7%.

## Currently, the top causes of fires in hospitals are

- **Electrical Equipment**

Hospitals have a lot of electrical equipment, and often have overworked sockets and cables. They sometimes use extension cords and daisy chain them together, which is a violation.

- **Kitchen Facilities**

Fires in kitchen facilities are common because of cooking fats, electrical ovens, toasters and open flames.

- **Cigarette Smoke**

While cigarettes are banned in healthcare facilities now, people still sneak them or, while smoking outdoors, don’t properly dispose of them.

- **Specialized Medical Equipment**

Lasers and electrosurgical tools are an ignition hazard, especially near oxygen tanks, surgical clothing, and flammable sterilizing liquids.
A study done on fire code violations in hospitals showed that the top fire safety violations were

- **Extension Cord Daisy Chains**

Because of the need to have equipment plugged in, hospitals will use extension cords and daisy chain them together, which is a violation and can cause them to become overheated, sparking a fire.

- **Fire Door Compliance**

The Fire Marshal who collected data of the most violations in hospitals said that many fire doors were not closing or latching correctly. They also had holes in them, which would cause them to no longer be fire proof.

- **Fire Exit Obstructions**

Carts, wheel chairs, and medical equipment were found blocking fire exit doors.

- **Hand Sanitizers**

Alcohol based hand rubs are all over hospitals. However, they are flammable and need to have a 6-foot breadth between the sanitation station and any ignition sources.

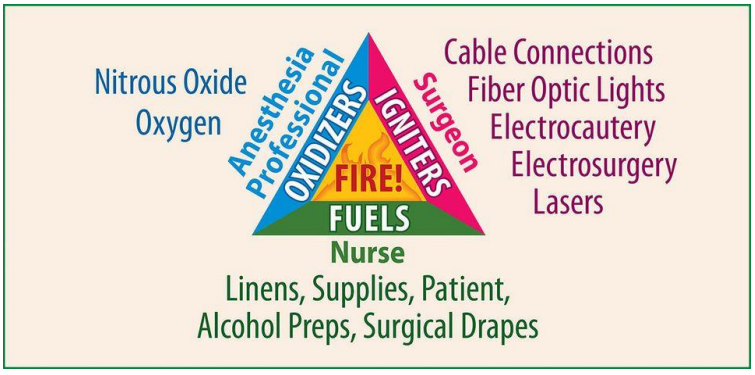
- **Gas Cylinders and Medical Oxygen Compliance**

Gas cylinders and medical oxygen need to be properly stored and secured.

- **Portable Fire Extinguishers**

Portable fire extinguishers were missing, obstructed, improperly mounted, previously discharged, past due inspection, improperly signed, or not enough were in the hospital.
From 2009-2013, only 4% of fires went beyond the point of origin thanks to the increase in fire sprinklers. Today, 79% of hospitals are protected by fire sprinklers and it has greatly reduced the spread of fires and fire-related death in hospitals.

# Fire triad



Before we undertake fire prevention, we first need to understand the three main ingredients that constitute a fire: heat, fuel, and oxygen. The paradigm below, referred to as the “fire triangle,” shows how these three components interact to create a fire

Fuel is any combustible material that can be used as the source of ignition of the fire, as well as to keep it burning.
Oxygen is an oxidizing agent that reacts with the fuel to start and continue the fire. Lower concentrations of oxygen result in slower fuel combustion.
Heat: Fires require oxygen and fuel reacting with each other at a temperature exceeding a threshold tem- perature, referred to as the “flash point.” Different materials and chemicals have different flash points, some at low temperatures and some high. The lower the flash point temperature of a compound, the more easily the compound ignites.

There are five classes of fires that are categorized based on the types of contributing fuel/combustion materials. These classes are as follows

**Class A**: Fires that involve ordinary combustible materials such as wood, cloth, paper, rubber, and many plas- tics.
**Class B**: Fires that involve flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases.
**Class C**: Fires that involve energized electrical equipment, such as power tools, wiring, fuse boxes, appliances, TVs, computers, and electrical motors.
**Class D**: Fires that involve combustible metals such as magnesium, potassium, titanium, zirconium, lithium, and sodium.
**Class K**: Fires that involve combustible cooking oils and fats used in commercial cooking equipment

## Fire prevention

This guide was created to address the vulnerability of hospitals to fires. All possible steps should be taken to mini- mize the hazard of fires in hospitals and to stress the need for evacuation. Hospitals Don’t Burn! Hospital Fire Prevention and Evacuation Guide is applicable to existing hospitals that can be retrofitted to improve safety against fires as well as proposed or newly built facilities. The document is formatted into four main sections, namely:
Prevention
Suppression
Evacuation
Evacuation Training Drills

The primary aim of a hospital facility is to not evacuate patients unless absolutely necessary. Hence, special attention should be focused on proper prevention and suppression techniques to avoid this worst-case scenario. That being said, evacuation training and preparedness is of paramount importance to avoid and/or minimize loss of life.

Section 3 provides a guide on hospital evacuation. It is not a fixed plan that completely details the tasks and respon- sibilities of each member of the evacuation team. Indeed, the components and personnel suggested in this guide may vary depending on the particular hospital for which the evacuation plan is being developed.

## Fire suppression

The eight leading causes of hospital fires in the United States of America are shown in the chart below (these figures are based on data from the National Fire Protection Association)

## Main Causes of Hospital Fires

Data on selected hospital fires in the Latin American and Caribbean region and around the world are presented

## SUPPRESSION

Fire suppression is critical in order to circumvent/minimize damage or the loss of property and life. The ability to quickly detect and extinguish fires is a key factor in avoiding the worst-case scenario, which is evacuation of the hospital.

## Fire Alarm System

There are several ways in which fires can be detected. The traditional and obvious method of detection is a person seeing the fire and/or smelling smoke, at which point a fire alarm should be activated or a notification issued. In some cases, a designated "runner" relays the notification to others through word of mouth. In other instances, manual fire alarm pulls or manually activated alarm-initiating devices are used to sound the fire alarm.

According to the National Fire Protection Association in the United States, suggested requirements for installing and locating manual fire alarm–initiating devices are as follows:

-Manual pull boxes should be securely mounted on a background of contrasting color.

-The operable part of the fire alarm box should not be more than 1.07 m (42 inches) to 1.22 m (48 inches) abovefloor level.

- Manual pull boxes should be located so that they are conspicuous, unobstructed, and accessible.

- Manual pull boxes should be located so that the horizontal travel distance between boxes on any floor is not more than 61 m (200 feet).

- Additionally, manual pull boxes should be located within 1.52 m (5 feet) of either side of a grouped opening (e.g., a bank of elevators and staircases located together) that is over 12.2 m (40 feet) in width.

## Smoke and Heat Detector

A variety of smoke and heat sensors can be installed as part of a fire alarm system to detect fires that begin in low-traffic areas away from personnel/staff. These sensors should ideally trigger an automatic alert system with visible (flashing lights/strobe lights) and audible bells or voice alerts to indicate that a fire was detected. The sensors should also be able to pinpoint the location at which the fire was detected, through a remote annunciator panel that lights up to indicate the area where the fire detection device was triggered.

Smoke detectors will generally detect a fire faster than heat detectors. However, personnel responsible for the specific siting of smoke and heat detectors should consider the possibility of any false or unwanted alarms. For instance, smoke detectors should likely not be used in the facility's kitchen. Instead, opt for fixed-temperature heat detectors in cases where a sudden rise in temperature is expected in a fire.

Smoke and heat from fires will tend to accumulate in the highest parts of the enclosed spaces of the building. This is where the detectors should be located.

REMEMBER: A fire alarm system is established to (i) enhance the safety of building occupants and (ii) to minimize damage to the property.

SUPPRESSION

The location of smoke and heat detectors depends on the type of detector being used and the geometry and occupancy of the space. Typically, the maximum coverage areas for smoke and heat detectors are 100 square meters (1,076.4 square feet) and 50 square meters (538.2 square feet), respectively.

There are three types of smoke detectors: ionized, photoelectric, and combined ionized/photoelectric. Ionized smoke detectors are relatively inexpensive, while photoelectric detectors tend to cost more.

## Fire Suppression

Once a fire has been detected, a suppression system to extinguish the fire is required to minimize damage and avoid evacuation. A variety of firefighting equipment can be installed in different locations in the hospital to combat specif- ic types of fires, with special consideration to the patients occupying each area and the medical equipment housed in those areas.

## Fire Extinguishers

Fire extinguishers are labeled with standard symbols and letters representing the classes of fires that they areABC Dry Chemical

These extinguishers, rated for Class A, B, and C fires, contain 2.3 to 9.1 kg (5 to 20 pounds) of monoammonium phosphate. Monoammonium phosphate is a finely ground extinguishing agent similar in appearance to yellow talcum powder. Nitrogen gas is used for the propellant. Dry chemical extinguishers, which have a range of about 4.6 m (15 feet), are easy to use but extremely messy. They are typically found in hallways and occasionally in labs.

## Carbon Dioxide (CO2)

These high-pressure vessels are filled with either 2.3 or 4.5 kg (5 or 10 pounds) of liquid CO2. They are to be used only on flammable liquid or electrical fires. Because the CO2 is expelled as a gas, the extinguisher has a very limited operation range of about 1.2 m to 1.8 m (4 to 6 feet). These extinguishers, easily identifiable because they do not have a pressure gauge, are found mostly in labs or mechanical rooms.

## Halon

Halon fire extinguishers, which have a range of about 4.6 m (15 feet), are rated for Class B and Class C fires but are also effective in fighting Class A fires. They use bromochlorodifluoromethane (halon 1211) as their extinguishing agent. Halon is an extremely clean agent that leaves no residue, making it effective for use around computers and other sensitive equipment. However, halon 1211 was deemed environmentally unsafe in 1995, and its use is being phased out in many countries.

## Dry Powder

These extinguishers are intended for Class D (metal) fires. The fire is extinguished by isolating and smothering it with either a copper-based or sodium chloride–based powder. Dry powder extinguishers are mounted on two- wheel carts and have a range of 0.9 m to 1.8 m (3 to 6 feet).

HOSPITALS DON'T BURN! Hospital Fire Prevention and Evacuation Guide

## How to Use Fire Extinguishers

The following are important considerations before you attempt to fight a fire:
-Make sure that everyone else is leaving the area, someone has sounded the alarm, and someone has called the fire department.
-Ensure that you have an unobstructed escape route at your back.
-Verify that the fire is small, confined, and not spreading.
- Make sure that you know what is burning and that you have the appropriate type of extinguisher to fight the fire.
-You are knowledgeable regarding the use of the extinguisher.
-Make sure that you keep your back to a clear exit and stand 2 to 3 meters (6 to 8 feet) away from the fire.

-Your safety is paramount; if the fire is out of control, leave the area immediately.
Fire wardens (or health and safety officers) and hospital staff should be trained on how to use fire suppression devic- es. Regular training sessions should be undertaken as part of the medical facility's scheduled safety and evacuation simulations

The four steps in using a fire extinguisher can be remembered through a simple acronym: **PASS.**

These extinguishers are rated to combat Class K (grease) fires. In recent years, many commercial kitchens have be- gun to use more efficient cooking appliances and unsaturated cooking oils that operate at much higher tempera- tures than the previous oils and appliances. The Class K extinguisher was developed to combat this new hazard. This extinguisher uses a wet-potassium-acetate-based, low-pH agent that has a greater firefighting and cooling effect for this type of hazard. Most of these extinguishers can safely be used to fight Class A, B, or C fires as well (although the label should be checked first). Their range is 3 m to 3.6 m ( 10 to 12 feet). Class K extinguishers can be found in kitchens where deep-fat fryers are in use.

P – Pull the pin

This unlocks the operating lever.

A – Aim low

Point the extinguisher nozzle or hose at the base of the fire.

S – Squeeze

Squeeze the lever above the handle to discharge the extinguishing agent. Re- lease the lever to stop.

S – Sweep

Sweep the nozzle or hose from side to side. If the fire is going out, move toward the flames; keep the extinguisher aimed at the base of the fire and sweep back and forth. Watch the fire area once the fire is extinguished and be prepared to repeat

e suppression system with fire extinguishers. There are other fire suppression devices that can be installed in a hospital to improve the facility's resilience to fire hazards. These include water sprinkler and mist sprin- kler systems, water hose reels, and smoke extractors.

## Water Sprinkler Systems

-These systems have a water droplet diameter greater than 1 mm, and the cumulative surface area coverage for 1 liter of water is approximately 3 square meters.

-Typically, in fire sprinkler systems, the full network of pipes is constantly charged with water.

-The sprinkler head is a heat-sensitive valve that releases water once the temperature exceeds a fixed temperature, generally 30oC above the ambient temperature.

- Each sprinkler head operates independently and will activate only once sufficient heat reaches the valve. Therefore, only the sprinklers closest to the fire will operate, maximizing the available water pressure to the location of the fire.

-Sprinkler systems cause less water damage than the hoses used by the fire service to combat a fire.

-Sprinkler systems do not automatically discharge water upon activation of the fire alarm but, rather, act independently.

## Mist Sprinkler Systems

- Mist sprinkler systems function similarly to traditional water sprinkler systems.
- Their water droplet diameter is less than 1 mm, and their cumulative surface area coverage for 1 liter of water

is approximately 60 square meters.

- Once the system is activated, a pump drives water through a special nozzle to form a dense water mist or fog.
- This mist suppresses and extinguishes the fire through the removal of heat and displacement of oxygen from the fire zone.
- These systems require only a low volume of water, making them safer than some other systems for use around medical and electrical equipment, especially in the ICU.

Some of the key advantages of well-maintained sprinkler systems are:

- They allow for a more open-plan layout in a facility—in other words, longer distances between firecompart- ments—while still meeting fire safety requirements.
- They allow greater flexibility in the design and future adaptability of the space in the facility.

- Structures with sprinklers can reduce fire rating requirements for structural elements by as much as 30 min- utes, depending on building code specifications and a country's regulations with respect to health care facili- ties.

A key disadvantage of sprinkler systems is that they may be quite expensive to incorporate into existing health care facilities. A fire safety specialist should investigate the building's structural and architectural layouts to determine the

## HOSPITALS DON'T BURN!

Hospital Fire Prevention and Evacuation Guidefeasibility of installing a sprinkler system. If it is not feasible to install a system for the entire facility, installation should be considered at least for critical areas of the hospital with higher vulnerability to fires.

### Water Hose Reels

- Water hose reels should be located on every floor of the hospital, to provide a realistically accessible and con- trolled supply of water to fight a fire.
- Fire hoses are connected to the main water supply or an independent water storage system.
- Fire hoses are typically 18 m to 36 m (59 to 118 feet) in length and have an internal diameter of 13 to 19 mm (0.5 to 0.7 inches). The size of the hose reel used is dependent on the size of the medical facility, as there needs to be sufficient length to overlap adjacent hoses.
- Fire hose reels are all similar in their operation. The general procedure for their use is as follows: n
- Ensure that the nozzle/jet is in the closed position.n Turn on the main valve. Pull the hose off the drum, toward the fire.
- Open the nozzle/valve and direct the stream of water toward the fire.

- Use fire hose reels only to fight Class A fires.Canvas fire hose reels are typically located close to fire hydrant points and are intended for use only by the fire service's emergency response team. It is important to ensure that the hose's nozzle/valve fittings correspond to those used by the local fire service.

### Smoke Extractors

The rapid spread and accumulation of smoke usually poses one of the highest risks to human life in the event of a fire. One of the means of minimizing this danger is by incorporating special smoke extraction systems, usually in the initial design of heat, ventilation, and air-conditioning (HVAC) systems.

- Smoke extraction systems are mechanical systems that can be manually or automatically activated once the alarm is triggered.
- These systems are designed to remove hazardous smoke from the area of the fire and prevent the spread of smoke to other areas of the building through the closing of specific

vents and the high-pressure pumping of air to designated areas to to prevent the ingress of smoke.

- Smoke extractor systems tend to be quite costly to incorporate in existing facilities.

## Evacuation

Types of Evacuation

Time frames for evacuation may differ depending on the nature of the threat and the amount of time that can be taken to prepare for moving patients. Specific types of evacuations are as follows:

"Emergency move"—evacuate immediately or patients and staff may die; no time to prepare.
Evacuate as quickly and safely as possible; limited time to prepare (1 to 2 hours); follow procedures.
No immediate danger; sufficient time for systematic evacuation procedures (many hours to several days).
Do not move patients, but begin to prepare for evacuation.

**EVACUATION**

Fire and bomb threats, for example, may necessitate immediate or rapid evacuation depending on the level of danger. Natural disasters with adequate warning periods, such as hurricanes and floods, may require only a gradual evacuation of the health care facility.

The following actions may be needed when the "prepare only" instruction is issued:

- If you hear the fire alarm or see flashing lights, close all fire doors in your area.
- Ensure that egress corridors are clear to allow movement of patients and equipment. Ü Locate and secure patients 'medical records and medical supplies.
- Ready evacuation transport equipment such as wheelchairs, blankets, and gurneys. Ü Set in motion a system to move people to designated assembly points.13
- Await further instructions; do not evacuate unless given the authorization to do so.

## Movement

The hospital's incident commander determines, based on reports from the persons who detected and/or reported the fire situation, what type of evacuation is required:
Horizontal: The primary mode of evacuation, this involves moving patients in immediate danger away from the threat but keeping them on their current floor.
Vertical: This usually involves the complete evacuation of a specific floor in the hospital. Patients and staff will be evacuated out of the hospital only if necessary.
Shelter in Place: The staff may be instructed to "shelter in place," that is, remain in their units and await further instructions.

The type of movement is dependent on the type of hazard; for instance, the fire may be on the floor below or the threat may be a tsunami, in which case the evacuation sequence will be to move upward.

## Evacuation Routes

Evacuation routes should be clearly established, as detailed earlier in Section 1.2.4. All hospital staff should have working knowledge of the evacuation routes and which one to take, based on the type of evacuation and as instruct- ed by the hospital's incident commander.

Specifically assigned staff members, sometimes referred to as "wardens" or "health and safety officers," should then direct patients and visitors to orderly and calmly evacuate.
Evacuation planning must take into consideration all spaces around the hospital compound. This will help in the development of emergency transit routes, assembly areas, holding areas, and so forth.

## Level of Evacuation

The level of evacuation can be one of the following:
Complete evacuation
Partial evacuation
In most emergencies, a full evacuation will not be required. Due to the complex needs and unstable condition of many hospital patients, evacuation is generally considered as a last resort. Evacuation should be ordered only when absolutely necessary and when there is an imminent or potential unmitigated threat to patient/staff safety.

The following situations may warrant evacuation:
-Fire, smoke, and/or toxic fumes
- Structural damage to the facility

## HOSPITALS DON'T BURN!

Hospital Fire Prevention and Evacuation Guide
- Potential exposure to hazardous materials Ü
- Terrorism or violent, armed visitors
- Credible bomb threat
-

When more time is needed and is available to assess the danger posed by the situation, hospitals should consider issuing a prepare only order.

### Estimating Needed Personnel Resources

Effective evacuation of a health care facility depends on the number of staff and trained personnel available, at any given point in time, to perform the necessary evacuation duties. Understanding the scope of the evacuation and knowing the minimum number of people required to undertake these procedures in the event of an emergency is paramount in saving lives.

1.Number of staff is a crucial component of the aim to save lives in emergency situations in hospitals. A comprehensive evacua- tion plan needs to be in place that all staff members are aware of and are experienced in carrying out.

This section presents the basic steps involved in the evacuation of a medical facility. It is important to note that there is no fixed methodology for evacuations; the procedure will vary for each individual health care facility.

Recall that evacuation procedures are undertaken only as a final resort action for the hospital. In the case of a fire, evacuation is performed once the preventative and suppression measures described earlier have failed to contain the fire and lives are under immediate threat.

The following assumptions were made in the development of this document:
1. The hospital's Incident Command System (ICS) will be used throughout the duration of the evacuation response.
2. This guide does not replace or alter the hospital's fundamental ICS structure but is intended to contribute to additional operations that may be activated during an evacuation.

Evacuation of a health care facility may be required in a range of disasters, not only in the event of fires. The following table lists some of these disasters

Standard acceptable ratios of number of medical staff to number of patients have been established. These ratios are dependent on the level of care required for each patient.

function equally well in all hospitals and all circumstances. Listed below are some general potential evacuation priorities in selected scenarios. Hospital leaders, including the chief executive officer, administrators, and the hospital board, should use these scenarios to discuss patient prioritization as part of their planning efforts.
In an immediate evacuation that is severely time sensitive and involves immediate and broad threats to life safety, the priority must be to get as many patients out as possible. Therefore, the acuity model16 (wherein the patients needing the most assistance are the last to be moved) may be adopted in these situations. Default priorities in such situations are indicated

If time is critical and the acuity model is employed, ICU patients may be moved after all of the general care units have been evacuated. In addition, to maximize the number of patients evacuated in the least amount of time, this model ensures that critical care patients have access to medical gases, suction, and monitoring for as long as possible.

If a resource model evacuation is possible, ICU patients should be evacuated as transport resources become avail- able. Although ICU patients may be the last to leave the hospital, they should be the first to leave the assembly point, as they are the highest priority for transfer to other hospitals.

In a rapid evacuation, the default transport plan should be based on an orderly, rapid process in which entire patient care units are moved sequentially. Simultaneous evacuation may also take place; that is, a general medical/surgical unit and an ICU may be evacuated in parallel when possible to avoid uneven demand on EMS resources.

There is controversy regarding the order of floor evacuations, but one recommended plan is to evacuate from the top of the building to the bottom if elevators are available or from the bottom of the building to the top if only stairs are available. It is important to note that, in situations such as fires and earthquakes, elevators should not be used.

1. Infra structure planning
2. Electrical system planning



## INFRA STRUCTURE PLANNING

Mechanical and electrical systems act as vital organs to a hospital, providing power, water, fresh air and other important elements that keep the hospital running efficiently and safely.
Keeping those systems healthy is an essential part of being a health facilities manager. However, it can be challenging to stay up-to-date with the requirements and developments of hospital mechanical and electrical systems.




Health facilities managers can find detailed guidance on these issues in the latest editions of the *Mechanical Systems Handbook for Health Care Facilities* and the *Electrical Systems Handbook for Health Care Facilities*.

The key issues covered in depth in these American Society for Healthcare Engineering (ASHE) handbooks will give health facilities managers a solid foundation in these systems to meet the special needs and functions of their facilities.

## Mechanical system issues

Proper construction and maintenance of mechanical systems, primarily heating, ventilation and air conditioning, are essential to the health of a hospital. Because of infection control, patient comfort, environmental concerns and other factors, mechanical systems in hospitals must be designed and maintained at a higher standard than those in a typical building. In recent years,

another essential mechanical systems issue has moved to the top of priority lists for facility managers: energy efficiency.

"I think the whole industry realizes that we need a paradigm shift in hospital systems design regarding energy use," says Ronald G. Holdaway, PE, a senior mechanical engineer with vast experience in health care facilities and the author of the latest edition of the *Mechanical Systems Handbook.*" Forty-two percent of energy used in hospitals is spent on reheating air. For years, the industry has made the excuse for high energy consumption that hospitals are unique and we can't save energy because it's a hospital, but all of a sudden the light bulb went off that we don't have to design the energy-consumption systems in a hospital the same way as we have in the past."

Some key mechanical systems issues health facilities managers should understand include:

**Codes issues.** Mechanical systems in health care facilities are regulated by standards established by a number of organizations, including the Facilities Guidelines Institute, ASHE, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the American National Standards Institute, the National Fire Protection Association (NFPA) and others. Chapter 7 of the *Mechanical Systems Handbook* provides a list of major codes to guide facility managers, and Appendix A-1 is a front-end project report that helps facility managers to prepare for inspections.

**Energy efficiency.** An entirely new chapter in the *Mechanical Systems Handbook,* called "High-Performance Design and Operation," spells out key design issues regarding efficiency.

"There are many low-cost things we can do from a design standpoint that can reduce energy use," Holdaway says. "We can also retrofit buildings at relatively low cost and still significantly reduce energy consumption in the facility."

A first step in creating an energy-efficient hospital is to benchmark energy use. One tool to use is ASHE's free Energy to Care benchmarking program that works with Energy Star Portfolio Manager and provides helpful data in graphic format and trend information. Energy to Care also includes an award program for ASHE members to recognize hospitals that have reduced energy consumption.

Other aspects of energy efficiency include measurement and verification. Metering can be added to such mechanical systems as cooling, heating and domestic hot water, and to electrical systems like HVAC loads, plug loads and lighting to direct efforts to reduce energy consumption.

Energy conservation specific to HVAC is highlighted in Chapter 8. Because patient comfort is a top priority in hospitals, energy conservation in HVAC sometimes takes a back seat. But Holdaway notes that properly scheduled maintenance does not need to interfere with patient comfort.

**Powerhouse equipment.** Powerhouse equipment is the primary heating and cooling equipment in a hospital. The equipment — boiler, chiller, etc. — likely was installed when the hospital was built, but facility managers should be aware of new system options, maintenance issues and code requirements.

An important powerhouse maintenance issue is proper chemical treatment of water in the cooling tower, which extends the life of the tower and maintains efficiency.

Another water treatment issue that facility managers must understand is minimizing the growth of *Legionella* in the cooling tower and the rest of a building's water system. The handbook references a new ASHRAE publication, 188P, which requires hospitals to establish a formal program to minimize *Legionella*

**Heating, ventilation and air conditioning.** HVAC, and air handling systems in general, play an important role in hospitals. Indoor air quality is essential to the comfort of patients, employees and visitors.
To properly understand HVAC principles, facility managers should have a basic understanding of the first two laws of thermodynamics, Holdaway says.
"In Chapter 5, I added a whole section on the basic laws of thermodynamics," he says. "Some would say that for the audience of maintenance engineers this is probably overkill, but I thought it was important. Quite honestly, I think the bar has been raised; they are better educated than in the past."
The next step in managing HVAC is understandingpsychrometrics, the dynamics of moist air. Appendix A-3 of the *Handbook* provides example psychrometric problems to help facility managers understand the use of a psychrometric chart.

A new section of this edition of the *Mechanical Systems Handbook* deals with chilled beams, a new way to maintain air temperature. "Chilled beams were not even an option when the previous editions were written," Holdaway says. "They have been introduced in just the last five to seven years."

Testing, balancing and adjusting the HVAC are other essential roles of facility managers. This work should be handled by certified contractors after a major construction project, but in-house staff can do the work after minor projects. Chapter 10 includes a guide for basic procedures in this regard.

Another important issue that facility managers should understand is commissioning, which is found in Appendix A-4. ASHE has several publications available on commissioning health facilities, including the *Health Facility Commissioning Guidelines* and the *Health Facility Commissioning Handbook*.

## Electrical system factors

Electrical systems control nearly every aspect of a modern hospital, and a knowledgeable facility manager recognizes the interconnectedness of electrical systems and their energy sources. A hospital's electrical system must provide reliable, disturbance-free power around the clock.

Furthermore, it must be exceedingly safe, because patients are often in vulnerable states. All of this must be accomplished according to overlapping regulations from national and local authorities.

"Electrical systems in hospitals are more complex than those found in other buildings," says Hugh O. Nash Jr., PE, FIEEE, FASHE, author of the *Handbook of Electrical Systems* and a consulting electrical engineer."The complexity of the diagnostic and treatment equipment in hospitals makes [it] heavily reliant on electricity. Reliability is probably the No. 1 concern, but electrical safety is also a huge concern."

Basic issues and recent developments surrounding hospital electrical systems include:

**Standards and codes.** Anyone dealing with electrical systems in a hospital must have a basic understanding of the plethora of standards and codes affecting the field. Depending on the hospital, standards that must be followed include those adopted by state and local health departments, the Joint Commission and the Centers for Medicare & Medicaid Services. Typically, authorities reviewing the design and construction of health care facilities use codes established by the NFPA, including NFPA 70: National Electrical Code; NFPA 99: Health Care Facilities Code; NFPA 110: Standard for Emergency and Standby Power Systems; and NFPA 111: Standard on Stored Electrical Energy Emergency and Standby Power Systems.

**Overcurrent protection.** A facility manager must understand the basics of protecting against "faults," which are open circuits, unintended grounds and short circuits. The equipment that protects against faults includes circuit breakers, fuses and ground-fault protectors. Every hospital should undergo an evaluation to ensure that overcurrent protective devices can handle the highest possible faults.

**Arc flash and selective coordination.** Arc flash and selective coordination are related to overcurrent protection, and a new chapter of the *Electrical Systems Handbook* specifically addresses this topic.

"Arc flash is a pretty hot topic in the industry right now, so it's timely," Nash says. "There's long been an understanding of the arc flash phenomenon and the risk it presents. But now the risk has been quantified, and it can be protected against with personal protective equipment (PPE)."

Arc flash and selective coordination are closely related. Selective coordination of overcurrent devices is generally desirable, because it ensures that the smallest area of a facility will have its power interrupted when a fault is cleared. But selective coordination means there is a time delay in tripping the circuit breaker, which increases the arc flash incident energy and the resulting risk.

To limit the risk of arc flash, managers should know the basics of reducing the incident energy of the arcs — by reducing the magnitude and time duration of the arc current — and understand the importance of distance and PPE in reducing the physiological effects of arc flash.

## Essential electrical systems.

Naturally, the electricity supply in a hospital must be reliable, and NFPA codes specify a number of requirements, including the installation of automatic transfer switches and the presence of

multiple branches to separate loads by type. Facility managers should be aware of the different types of acceptable generators, how they are fueled, and the basic operational procedure.
An important and growing topic is the parallel operation of generators, and a new chapter was added to the *Electrical Systems Handbook* to deal with this topic. "More and more hospitals are using paralleling systems, so it's incumbent upon engineers to have a better understanding," Nash says. "Also, there are some new technologies that attempt to mimic paralleling systems at a reduced cost, but that are not true paralleling systems with dedicated synchronizers for each standby generator. Some of the newer systems are not totally adequate, and this has created some confusion in the industry."
A section about ground-fault interruption explains that such protection was prohibited for standby generators by previous editions of NFPA, but the larger sizes of health care generators, especially paralleled sets of generators, led the NFPA 70 committee to make ground-fault protection optional.

**Patient safety.** Keeping patients safe from electrical shock is generally accomplished by grounding metallic surfaces that are likely to become energized, and by protecting people from energized parts. Facility managers should be aware of NFPA requirements, such as the use of isolated power systems as alternatives to ground-fault interrupters in wet locations, and the specific requirements for operating rooms.
**Lighting.** Requirements for lighting in hospitals vary widely, because these facilities contain offices, public spaces, sleeping quarters, work areas and many other spaces. Lighting in patient care areas should be cleaned frequently and have minimal crevices or cracks, which can trap infectious material. Operating rooms have specific lighting needs; for example, computer monitor glare must be carefully controlled. The latest edition of the *Electrical Systems*

**Maintenance and testing.** Maintenance and testing are critical for hospital electrical systems, but they need to be tailored to each facility. NFPA codes applicable to testing and maintenance recently have changed to emphasize customized maintenance. Among the basic concepts that apply to all health care facilities are the recommendations to create a one-line diagram that shows the connectivity of the electrical system and an equipment-labeling protocol that indicates voltage, location and other information

## A great resource

Hospital electrical and mechanical systems are complicated and ever-changing, and maintaining them requires constant attention. The ASHE handbooks provide a great resource for health facilities managers who are trying to wrap their arms around these systems.

### 3. Equipment planning

### 4. Safety , security equipments

### 5. Fire protection equipments

### 6. Fire protection systems

## 7. Fire safety training and practices

## 8. NAHB standards

### NABH & FIRE SAFETY

Fires can be devastating, especially in a hospital where a large number of people who need to be evacuated may be vulnerable – immuno compromised, on life support, and incapable of moving on their own. There are special requirements that must be met with while evacuating such people in case of fire emergencies. But before that " –fires must be prevented".

The 'part 4 'of 'National Building Code of India – 2005 'on 'Fire & Life Safety 'covers the requirements for fire prevention & life safety in relation to fire and fire protection of buildings. The Code specifies construction, occupancy and protection features that are necessary to minimize danger to life and property from fire.
Buildings on the basis of occupancies have been divided into different groups in the chapter. Hospitals have been classified as sub-division C-1under Group C for Institutional Buildings with some specific requirements applicable for this category in addition to the general requirements common for all occupancies.

The NBC gives detailed guidelines for Construction Materials, General Requirements for all buildings, Life Safety, Fire Protection, Specific Occupancy wise Requirements and specific requirements for buildings above 15 meters.

### NABH Survey:

During its survey process the NABH auditors look into the following to ensure that the organization is compliant with Fire Safety Regulations:
Fire Prevention and Control Infrastructure:
1. TheorganizationhasupdatedNOCfromstateFireDepartment.
2.Theorganizationhasamultidisciplinarysafetycommitteewithaseniorpersonasthechairmanofthesafety committee. The safety committee meetings are held at least once in 3 months. The minutes of the meeting are recorded and put up to the senior management.
3. TheorganizationhasaformallyappointedFireSafetyOfficerin-chargeofallconcernsrelatedtoFirePrevention& Safety. The Fire Safety Officer should be preferably from Security Staff and should be aware of all fire safety protocols.
4.TheorganizationhasawrittenplanforFirePreventionandSafetyandhasaFireSafetyManualapproved bythe safety committee.
5.TheorganizationhasanEmergencyCommandCentrethatbecomesfunctionalimmediatelywhenever thereisan emergency. There is a written protocol and written constitution of the committee and the Fire Command Centre is update with the name of the members. A designated person has the responsibility of informing all the Emergency Command members.
6. TheFireSafetyManualhasthefollowingcomponents:
• Plan for fire prevention & control.
• Systems for fire prevention & control.
• Maintenance Schedules/ SOPs for systems related to fire prevention & control
• Inspection protocols for fire safety installations.

• Codes for announcement of fire related emergency, procedures and communication protocols for the same.

• Responsibilities of different departments in case of fire.
• Procedures, frequency & protocols for mock drills.
• Constitution of Fire Fighting & Evacuation Teams.
• Evacuation Plan.
• Electrical Safety & System.

7.Amultidisciplinarycommittee,whichhasFireSafetyOfficerasamember,holdsfacilityroundsatleast onceayear for non-clinical areas & twice a year for clinical areas. Fire Safety requirements are on the checklist of the said committee and the reports are submitted in writing to the safety committee.

8. Thesafetycommitteehasasystemwherebyallfiresafetyconcernsareaddressed.

9.Themockdrillsareconductedandthereportssubmittedtothesafetycommittee.Necessaryactionistak ento address any issues that crop up during mock drills.

10.The fire exits are well defined and end on the ground floor or refuge area or any safe place decided by the management.

11.The Fire Signages are appropriate and placed at the right locations.

12.Emergency fire signages are glow in dark signages.

13.The Fire Signages are visible and are bilingual, with one local language.

14.The egress routes are free from any materials that would cause hindrance in evacuation.

15.The Fire Doors have a proper fire rating and open outside.

16.The Fire Doors preferably have panic bars.

17.The Fire Doors remain open at all times.

18.The Fire cabinets are open all the time.

19.The Manual Call Points have means to break the glass.

20.The Fire Alarm syatems are properly tested and maintained and a record is kept for the same.

21.The Emergency Exit signs should be displayed prominently.

22.The stairwells used for evacuation are pressurized in case of fire emergency.

23.The lifts are not used in case of fire.

24.The HVAC system has appropriate fire dampers to prevent spread of fire that function properly in case of fire. The dampers are tested and have a regular preventive maintenance schedule.

25.All the equipments have an organized preventive maintenance schedule that is recorded and stickers put on the equipments showing the date of preventive maintenance check and the next date for maintenance.

26.Appropriate type & number of fire extinguishers have been installed according to the type of fire that could take place.

27.The Fire Extinguishers have a regular preventive maintenance schedule and stickers are put showing the date of checking and the next scheduled date for checking.

28.10% of Fire Extinguishers are used every year for checking the same.

29.The building has an approachable peripheral road around it for access by fire brigade.

30.The Fire Pump House is maintained properly and the pumps have pressure gauges that have been calibrated and appropriate pressures are maintained in the fire hydrant & sprinkler lines.

31.There is a proper training program for handling fire emergencies and training records are maintained. The entire staff is imparted fire safety training.
32.The staff is aware of the fire fighting systems, responsibilities during fire emergencies, evacuation routes & techniques, conversant with the type of fire extinguishers and their area of use, trained to operate fire extinguishers, code announcements and assembly points in case of fire.
33.The organization has policies & protocols for storing, dispensing & use of flammable materials. Appropriate warning signs for flammables are displayed.
34.Electrical safeties are in place. Preventive maintenance & testing is done at regular pre decided intervals and are recorded and stickers affixed.
35.All electrical panels have a rubber mat in front of them.
36.Theearthing system is tested regularly.
37.The UPS batteries are checked regularly by loading the same periodically to check any heating up etc.
38.There is proper ventilation in panel, UPS & equipment rooms to avoid overheating.
39.There is an approval from the Indian Explosives Department for bulk storage of Diesel & any other flammable material as per Indian Explosives Act, in case stored in bulk.
40.The pumps used for pumping fuel are of flame proof construction. 41.The Provisions are there to take care of fuel overflow.
42.Flues are properly insulated.

## Gas supply installation

Medical Gas Definition
Medical Gas is defined as: NITROGEN, OXYGEN, NITROUS OXIDE and MEDICAL AIR. In addition, Waste Anesthesia Gas Disposal (WAGD) and Medical Vacuum are also considered part of the Medical Gas system.

## Location(s)

Medical Gas Medical and shut-off valves are located in patient care areas near nursing stations and procedure rooms. The shut-off valves are inside a 12” square cut-out in the wall, covered by a clear plastic door that can be removed by pulling on the metal ring attached to the center of the plastic door.
Medical gas shut-off valves are generally separated into zones (controlling a group of rooms/suites) or are dedicated to a single room/suite. The zone valves will identify by label and/or placard which rooms/suites they control. Pay attention and identify the right location (zone).

## Authorized Personnel

There’s ’authorized personnel that are assigned to properly shut off the medical gas in case of an emergency. Medical gas shut-off authority is assigned to Respiratory Therapy, Health System Facilities and the Charge Nurse or Area Supervisor. The decision to shut off the medical gas should be made in consultation with the Charge Nurse or Nursing Supervisor.

Steps to consider to properly shut-off valves
Step #1: Identify if medical gases are actually an existing or continuing hazard to the incident/emergency.

Step #2: Staff can verbalize their understanding of whether they can wait for the Fire Alarm Response Team to respond to shut-off the gases.

Step #3: Identify all rooms/suites and/or patients that are being supplied gases and provide alternative sources (i.e. prepare for shut-off with medical gas cylinders and have additional cylinders delivered)

Step #4: Staff can identify which medical gas line shut-off valve controls which group of rooms/suites.

Step #5: Is the staff competent to perform bag mask ventilation in the event that the medical gases are shut off?

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# FIRE PROTECTION

## INTRODUCTION PURPOSE

It is the policy of Duke University to take all possible steps to minimize the potential for fires and to install and maintain equipment necessary to control fires if they occur.

**RESPONSIBILITIES**

Facilities Management Department Construction Services, the Medical Center Engineering and Operations Department, and the Office of the University Architect shall ensure that all new installations of fire alarm systems, fire suppression systems, extinguishers and fire alarm equipment to include standpipes, sprinklers, hydrants and fixed extinguishing systems meet all federal, state and local regulations.

Departments shall:

• Ensure that employees are adequately trained in portable fire extinguisher use and general fire evacuation procedures.
• Report any extinguisher out of place, or one which appears to have been used, to the OESO-Fire Safety Division at 684-5609.

Employees shall know the location(s) of fire equipment in their specific workplace, be able to utilize such equipment as necessary and be familiar with all exits and evacuation instructions.

OESO shall:

• Inspect work places on a periodic basis.
• Ensure that adequate fire extinguishers of the correct type and size are available.
• Ensure that extinguishers are tested monthly.
• Monitor the installation and maintenance of fire equipment and suppression systems.
• Conduct fire drills and extinguisher training.
• Coordinate inspections by the Durham Fire Marshal and other fire inspection officials.

# PROCEDURES

## FIRE EXTINGUISHERS

Extinguishers shall be located, labeled, and maintained so that they may be easily identified and in good operating condition.
All fire extinguishers shall be checked monthly to provide reasonable assurance that they operate properly.

## EVACUATION AND GENERAL FIRE PROCEDURES HOSPITAL/MEDICAL CENTER

If a general evacuation is ordered, all persons (patients, visitors, and employees) must evacuate the building. Such circumstances would be an extreme emergency and ordered by Hospital Administration. General evacuation in Duke North and South Hospitals, the Eye Center, and the Clinical and Research Laboratory Building will be announced by the BAS Dispatcher over the building automated announcement system. In other Medical Center Buildings an audible alarm will sound. Persons should be evacuated to the outside of the building by using stairs designed as EXITS.

## Medical Gas Shutoff

To assure that patient safety issues are adequately addressed prior to shutting off medical gases during an emergency situation (e.g., spread of a fire), the following procedure clarifies who is authorized to initiate a medical gas shut off. The procedure outlined below applies when there is a fire at or near the medical gas distribution valves in a patient's room. Note: Medical gases should NOT be shut off during fire drills.

• The primary responsibility for shutting off medical gas(es) in a true emergency/fire situation (when medical gases could contribute to he spread of a fire) is the Charge Nurse. On Intensive Care Units, the Charge Nurse must consult with the Respiratory Therapist, when available, to assure appropriate patient support after the medical gases are shut off.

• The Nurse Manager (during normal working hours) and the Administrative Nursing Supervisor (during 2nd and 3rd shifts, holidays, and weekends) will respond to all fire alarms on their assigned units as quickly as possible to support the Charge Nurse's decision and response.

• Respiratory Care personnel will respond to all fire alarms on inpatient units as quickly as possible to support the Nursing decision and response

• Occupational and Environmental Safety personnel will respond to all fire alarms on inpatient units as quickly as possible to support the Nursing decision and response.

• Directions on how to turn off medical gas valves will be posted on each valve. CAMPUS Total evacuation is required from all sections of the building. The signal for evacuation is the sounding of the audible devices of the building fire alarm system

## GENERAL EVACUATION PROCEDURES

R -REMOVE ALL PERSONS IN IMMEDIATE DANGER TO SAFETY to include patients, visitors, students and employees.

A -ACTIVATE MANUAL PULL ALARM/DIAL 911.
Give the following information:
The exact location of the fire (Building and Location-Area, Building Zone or Color or Zone Floor, Room Number) and the name of person calling and phone number.
C -CLOSE ALL DOORS AND WINDOWS to prevent the spread of fire and smoke. E - EXTINGUISH THE FIRE with a portable fire extinguisher or EVACUATE THE AREA. DO NOT USE THE ELEVATOR.
NOTE: Employees should review the Departmental Safety Procedures and Site Specific Fire Plan to familiarize themselves with all specific duties and responsibilities assigned to their job description.
FIRE DRILL PROCEDURES
Fire drills are required by law. They are held, not only to comply with this law, but also to protect patients, visitors and employees in the buildings. The drills may be conducted at any time. All Duke buildings are subject to fire drills. See Supplement U for hospital specific procedures.

## EXITS IN OCCUPIED BUILDINGS

Doors, aisles, corridors or passageways leading directly to an exit must be kept clear of all obstructions at all times to include chairs, tables, merchandise, equipment or similar impediments.
No door, exit corridor, aisle, passageways leading to an exit or exit sign may be fully or partially covered, blocked, locked, or hidden by any decorations, objects (signs, banners, tables, chairs, etc.) or covering (sheets, banners, drapes, etc.).
Areas directly outside of an entrance or exit must be kept clear of all encumbrances for a minimum distance of 12 feet.

## OPEN FIRES

No open fire, cooking fire, campfire or bonfire will be allowed on University property unless the individuals responsible have obtained written consent of the OESO-Fire Safety Division and a permit from the Durham Fire Marshal.
Open Fire Permits will be issued on a case by case basis only depending on weather conditions, acceptable location and general compliance as outlined in this policy and local ordinances.

## ELECTRICAL EQUIPMENT

All electrical equipment utilized (lights, wires, plugs, connections, sockets, etc.) shall be UL approved and in good condition. The use of improvised wiring is prohibited.
All combustibles shall be kept at least 6 inches from any incandescent/fluorescent bulbs, electrical sockets, plugs, or other electrical appliance.
Portable space heaters are prohibited unless authorized by the Occupational and Environmental Safety Office, and either the Facilities Management Department (Campus) or Engineering & Operations (Hospital & Medical Center).

## DECORATIONS

Electrical:
Holiday lights shall not be left energized more than 3- hours daily to reduce overheating.

Electrical lights (110 volt) and fiber optic lights (110 volt) shall not be used on artificial Christmas trees, wreathes and greenery. Only UL or FM approved, battery operated, 9 volt lights may be used.

Each living group or office area should have an appointed representative to ensure that the electrical decorations are de-energized at the end of the daily period.
Holiday/Theme Party Decorations:
All decorations must be noncombustible, inherently flame resistant or treated with an approved fire retardant in accordance with manufacturer's specifications that will pass NFPA 701 test. Decorative materials shall not exceed 10% of the aggregate areas of walls and ceilings.

Straw, hay, corn fodder, dried flowers, bamboo and other similar combustibles are prohibited as decorations inside facilities without written authorization from the OESO- Fire Safety Division. Exit doors and smoke doors may not be covered or blocked in any manner by decorations.

All combustible party decorations shall be removed from the area immediately following the event.
Exception: During the Christmas Holidays decorations should be removed no later than December 30th. Residence Halls should have all decorations removed no later than the closing of the residence halls by Housing Management.
Greenery, such as live Christmas trees and holly, are prohibited inside of Hospital and Medical Center buildings. In addition, live Christmas trees and holly are prohibited in Assembly areas, Schools, Day Care Centers, Stores, Hotels or Residence Halls unless the building is protected throughout by an automatic sprinkler system.

If a live Christmas tree is allowed in a facility, the following rules apply:
• Only one tree will be purchased for each department, group or living group and the tree located in a public area such as a commons area, reception area or lounge.
• All trees will be prepared by sawing off the trunk of the tree at an angle at least one-half inch or more above the original cut and spraying the tree with an approved fire retardant in accordance with manufacturer's specifications as required by NC State Building Code.
• The tree will be placed within a tree holder/stand capable of containing water to prevent drying. The stand will be checked daily to assure the water level is adequate. Remember: A tree will absorb large quantities of water while it is indoors.
• The tree will be placed in a location away from all heat sources.
• Smoking is not permitted near trees or other "live decorations".

Candles or other open flames are strictly forbidden for use inside University facilities except during religious ceremonies such as the observance of the Holiday of Chanukah. Those individuals wishing to utilize candles in observance of a religious holiday should contact OESO-Fire Safety Division to obtain information concerning fire prevention.
All personnel should know the location of building fire equipment to include fire extinguishers and manual fire alarm pull stations.

Keep all decorations (electrical and combustible) out of the reach of small children.

**ss**

All employees are required to attend a fire safety training session upon hire and annually thereafter. The training covers fire prevention, procedures to follow in a fire, evacuation, and extinguisher familiarization.

## Value Added Course

## Fire Hazards In Hospital Environment

## Annexure II

STUDENT ENROLLMENT LIST ( JULY-DEC 2015)

| S.No. | University no | Name of the student | Year / CRRI | Signature |
|---|---|---|---|---|
| 1. | U14MB281 | NILA.R | II nd | |
| 2. | U14MB282 | NIMINESH.B.S | II nd | |
| 3. | U14MB283 | NIVETHA. B | II nd | |
| 4. | U14MB284 | NONG LEGO | II nd | |
| 5. | U14MB285 | OBED NEWMAI | II nd | |
| 6. | U14MB286 | PAVITHRA. S | II nd | |
| 7. | U14MB287 | PRADEEPA. A | II nd | |
| 8. | U14MB288 | PRASANNA.S | II nd | |
| 9. | U14MB289 | PRAVEENKUMAR.V | II nd | |
| 10. | U14MB290 | PREMKUMAR. P | II nd | |
| 11. | U14MB291 | PRIATHAM SWAMINATHAN.S | II nd | |
| 12. | U14MB292 | PRITHVIRAJAN. R | II nd | |
| 13. | U14MB293 | PRIYADHARSHINI.K | II nd | |
| 14. | U14MB294 | PRIYADHARSHINI.P | II nd | |
| 15. | U14MB295 | RAJALINGAM. N | II nd | |
| 16. | U14MB296 | RAJESWARI. J | II nd | |
| 17. | U14MB297 | RAMKATHIR | II nd | |
| 18. | U14MB298 | RANGARAJAN. R | II nd | |
| 19. | U14MB299 | RAVEENDHAREN.V | II nd | |
| 20. | U14MB300 | RENIL KUMAR. A | II nd | |

**RESOURCE PERSON**

**Dr K SELVARAJU**

**COORDINATOR**

**Dr RAJI SHARMA**

**ASSESSMENT**

**Annexure III**

# FIRE HAZARDS IN HOSPITAL ENVIRONMENT MCQ

1. PEEP stands for_____

    a. Personal evacuation exit point

    b. Prevention evaluation evacuation precaution

    c. Personal emergency evacuation plan

    d. Private evacuation exit point

2. How after fire alarm should be tested

    a. Once a week

    b. Once a year

    c. Once every 12hours

    d. Once a month

3. The available fire extinguisher can only use for a duration of

    a. 30-40sec

    b. 3-4min

    c. 15-20sec

    d. 1-2hours

4. In a case of fire we should rescue

    a. All patients

    b. All staffs

    c. Those at immediate danger

    d. All investors and contractors

5. When extinguishing a fire, you should

a. Turn your back always to north

b. Turn your back to fire exit

c. Turn your face to fire exit

d. Turn your face to south

6. When a fire breaks out, evacuate

a. Non ambulatory patients

b. Semi ambulatory patients

c. Ambulatory patients

d. None of the above

7. The ALERT step in RACE means

a. Code red

b. Break the alarm glass

c. Dial- 22

d. All the above

8. RACE stands for

a. Rescue alarm confine search

b. Release, accurate, contain, evacuate

c. Run away to the closer exit

d. Rescue, alarm, contain, evacuate

9. A lateral evacuation of patient care area involves

a. Closing all patients care area doors on the exit

b. Evacuating the patient through the smoke/ fire to a safe zone

c. Conducting a head count of the patient and staff

d. All the above

10. Steps of emergency management

    a. Mitigation

    b. Recovery

    c. Response

    d . All the above

Rangarajan-R

**ASSESSMENT --Annexure III**

# FIRE HAZARDS IN HOSPITAL ENVIRONMENT MCQ

7/10

1. PEEP stands for_____

   a. Personal evacuation exit point

   b. Prevention evaluation evacuation precaution

   c. Personal emergency evacuation plan

   d. Private evacuation exit point

2. How after fire alarm should be tested

   a. Once a week

   b. Once a year

   c. Once every 12hours

   d. Once a month

3. The available fire extinguisher can only use for a duration of

   a. 30-40sec

   b. 3-4min

   c. 15-20sec

   d. 1-2hours

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   a. All patients

   b. All staffs

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b. Evacuating the patient through the smoke/ fire to a safe zone

c. Conducting a head count of the patient and staff

d. All the above

10. Steps of emergency management

a. Mitigation

b. Recovery

c. Response

d. All the above

Rajeshwari. J.

8/10

**ASSESSMENT --Annexure III**

# FIRE HAZARDS IN HOSPITAL ENVIRONMENT MCQ

1. PEEP stands for_____

   a. Personal evacuation exit point

   b. Prevention evaluation evacuation precaution

   c. Personal emergency evacuation plan

   d. Private evacuation exit point

2. How after fire alarm should be tested

   a. Once a week

   b. Once a year

   c. Once every 12hours

   d. Once a month

3. The available fire extinguisher can only use for a duration of

   a. 30-40sec

   b. 3-4min

   c. 13-20sec

   d. 1-2hours

4. In a case of fire we should rescue

   a. All patients

   b. All staffs

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   d. All investors and contractors

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9. A lateral evacuation of patient care area involves

a. Closing all patients care area doors on the exit

b. Evacuating the patient through the smoke/ fire to a safe zone

c. Conducting a head count of the patient and staff

d. All the above

10. Steps of emergency management

a. Mitigation

b. Recovery

c. Response

d. All the above

## Annexure V

### Student Feedback Form

Course Name: **FIRE HAZARDS**

Subject Code: **ANAES 01**

Name of Student: NILA. R Roll No.: U14HB281

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

## Annexure V

### Student Feedback Form

Course Name: **FIRE HAZARDS**

Subject Code: **ANAES 01**

Name of Student: PRADEEPA. A Roll No.: 014MB287

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: 22.12.2015

From
Dr. Raji Sharma
Professor and Head,
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: Fire hazards in hospital environment**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Fire hazards in hospital environment in July- Dec 2015 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. RAJI SHARMA

Head of Dept. Dept. of Anaesthesiology
Sri Lakshmi Narayana Institute of Medical Sciences
Oulgaret, 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 _PRASANNA S_____ has actively participated in the Value Added Course on Fire hazards in Hospital Environment held during July - December 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.SELVARAJU K

RESOURCE PERSON

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

Dr. RAJI SHARMA

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 __NILA R _____ has actively participated in the Value Added Course on Fire hazards in Hospital Environment held during July - December 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.SELVARAJU K

RESOURCE PERSON

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

Dr. RAJI SHARMA

COORDINATOR

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


REDMI K20 PRO
AI TRIPLE CAMERA

# Sri Lakshmi Narayana Institute of Medical Sciences

Date 02/07/2015

From
Dr.K.R.Jothikumar,
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:** :Audiological Rehabilitation reg.

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Audiological Rehabilitation on July 2015 to Dec 2015. We solicit your kind permission for the same.
Kind Regards

Dr.K.R. Jothikumar

---

**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:03/07/15**

**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 2015-16 - 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 :Audiological rehabilitation**

**COURSE CO-ORDINATOR DETAILS**

**Faculty Name**: Dr. K.R. Jothikumar

**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:05.07.2015**

**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 2015-2016 – Reg.

**Ref:** Ref. No. SLIMS/Dean Off/VAC /024 Dated: 03.07.2015

*****

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 2015– 2016. 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**

.

07/07/2015

**Sub: Organising Value-added Course:** Audiological Rehabilitation **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 **"Audiological Rehabilitation"**. 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 15/07/2015. 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**

Audiological Rehabilitation– A value added course for the medical students.
**&ENT 01**

**2. Duration &Period**

30 hrs&july 2015-dec 2015

**3. Information Brochure and Course Content of Value AddedCourses**

*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 july 2015- dec 2015

**8. Year of discontinuation:**2016

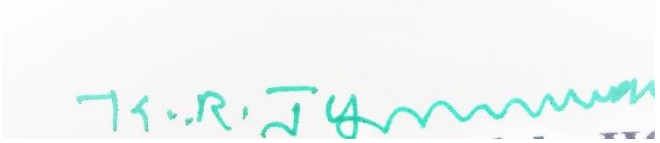
**9. Summary report of each program year-wise**

| **Value Added Course-** July 2015- December 2015 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | ENT 01 | Audiological Rehabilitation | 1.Dr.Venkataramanm<br>2. Dr. Sreedhar.B<br>3.Dr. Jayagar.P | 3rd year MBBS students | 15 students & 2015 |

**10. Course Feed Back**

*Enclosed as Annexure- V*





**RESOURCEPERSON**

1. **Dr.R.Venkataramanan**
2. **Dr. P.Jayagar**

**COORDINATOR**
**Dr.K.R.Jothikumar**

**COURSE PROPOSAL**

## 1.NAME OF THE PROGRAMME

Audiological Rehabilitation– A value added course for the medical students.

## 2. AIM

Training the students to perform AudiologicalRehabilitation

## 3. OBJECTIVES

a)Audiological Rehabilitation for patients with hearing loss – an extensive discussion

b) various methods of audiological rehabilitation

## 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 july 2015 – December 2015 . This course is conducted every 6 months.

**Course Audience: 3rd year MBBS students**

**Course Coordinator: Dr.K.R. Jothikumar**

**Course Faculties with Qualification and Designation:**

**1.Dr.Venkataramanan.R**

**2.Dr. Sreedhar.B**

**3.Dr. Jayagar.P**

# Schedule followed during the course

| Sl. no | COURSE TITLE | TPOICS COVERED | DURATION | Date and time |
|---|---|---|---|---|
| 1. | Audiological Rehabilitation | Audiological rehabilitation should be an important component of most audiology practices | 6hrs | 4pm-6pm(20/7/15),4pm-6pm(22/7/15),4pm-6pm(24/7/15) |
| | | Techno-centric in AR | 6 hrs | 4pm-6pm(17/8/15),4pm-6pm(19/8/15),4pm-6pm(21/8/15) |
| | | Family-centered care | 6 hrs | 4pm-6pm(15/9/15),4pm-6pm(17/9/15),4pm-6pm(19/9/15) |
| | | Over–the-counter (OTC) hearing aids | 6 hrs | 4pm-6pm(19/10/15),4pm-6pm(21/10/15),4pm-6pm(23/10/15) |
| | | How to Begin to offer AR services | 6 hrs | 4pm-6pm(9/11/15),4pm-6pm(11/11/15),4pm-6pm(13/11/15) |
| | | TOTAL | 30HRS | |

REFERENCE BOOKS: 1) SCOTT BROWN 6th edition

2) ANIRBAN BISWAS 1st edition

**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**
**PUDUCHERRY**

**ANNEXURE 1**

## Learning Outcomes

After reading this article, professionals will be able to:

1. Discuss the implementation of Audiological rehabilitation (AR) in audiology clinical practice
2. Identify ways to include family members in the AR process
3. Identify resources for group AR intervention in practice

**1. Do you think Audiologic rehabilitation should be an important component of most audiology practices?**

Audiologic rehabilitation (AR) most definitely is the foundation and background of audiology. However, issues exist when attempting to implement AR in practice. One of the major factors is trying to identify the meaning of the term AR. While we may acknowledge its importance and advocate its use, how AR is defined can be misunderstood and difficult to implement. There have been numerous definitions of AR over the years, some stressing fundamental aspects of therapeutic intervention such as speech reading and auditory training while others focused on the psycho-social impact of hearing loss and counseling. McCarthy and Alpiner looked back on the history of AR, its roots, and its influence in the creation of the audiology profession. One of the questions they address is the specific terminology. Historically, AR was referred to as aural rehabilitation and performed by speech-language pathologists. Ross described the aural rehabilitation services he received as an in-patient with hearing loss at the U.S. Army Walter Reed Hospital in 1952. He attended a program of therapeutic intervention for eight hours per day for eight weeks. The aural rehabilitation staff consisted of acoustic technicians, lip reading instructors, auditory training instructors, speech correctionists, psychologists and social workers, and operated through the Department of Otolaryngology. Ross believed as audiology developed as a profession, it took on an increased diagnostic role and there was a decline in AR services provided by audiologists. While AR is included in the scope of practices for both speech-language pathologists (SLP) and audiologists, the SLP tended to take the lead in AR service provision. So while it is important that AR be a part of audiology practice, we need to have a sense of what that really means.

**2. Since both audiologists and speech-language pathologists provide AR services, how do their roles differ?**

In 1984, ASHA published a paper on the competencies necessary to provide services in aural rehabilitation. While it did acknowledge that both professions (SLPs and audiologists) were designated to provide AR services as specified in their scopes, the paper did not delineate any distinction between the two professions. It merely provided the academic background necessary to achieve competency in therapeutic delivery and provided a general definition of the term. It was not until 2001 that the roles of SLPs and audiologists in the provision of AR

services were delineated. ASHA (2001) published the AR skills and knowledge paper developed by an ad hoc committee on audiological rehabilitation. The committee was comprised of both audiologists and speech-language pathologists. The paper was designed in such a way that each profession had designated sections; Skills and Knowledge for audiologists necessary to provide AR services and the same for Speech-Language Pathologists. For example, the document states that SLPs can identify the need and refer to an audiologist for evaluation and fitting of personal and group amplification systems and sensory aids, while audiologists conduct appropriate fittings with and adjustments of these devices and technologies.

**3. How has the definition of AR changed over the years?**

As you read the literature regarding the evolution of the definition of AR over the years, the most obvious change is conceptual. Early definitions stressed the clinical provision of service. They were task-specific and often stressing services to individuals with severe to profound hearing loss, focusing more on deafness than perhaps milder levels of hearing loss. Later definitions began to focus on the impact of hearing loss on function and included more aspects of the psycho-social elements of hearing loss and its impact on an individual's functioning ability in daily life.

The World Health Organization published a landmark paper in 2001 on International Classification of Function, Disability and Health (ICF). Most of the AR definitions published following the WHO's 2001 paper included concepts highlighted in the ICF report. Primarily, an important element was the break from considering hearing loss as a disease and rather, viewing it as a health condition that may limit activities and restrict participation in society. Relating the ICF paper to hearing loss allows us to focus our AR on what a person with an impairment can do or is capable of doing rather than their disability. Some recent definitions even use specific terminology from the ICF such as "activity limitations" and "participation restrictions" instead of disability and handicap when referring to an individual functioning with hearing loss.

**4. Is there a definition of AR that you personally prefer?**

My AR definition, recently published in the 3rd edition of a book I authored with Jaci Spitzer, is influenced by the WHO ICF paper and stresses certain concepts pivotal to managing hearing loss. "AR is a family-centered approach to assessment and management of hearing loss that encourages the creation of a therapeutic environment conducive to a shared decision process, which is necessary to explore and reduce the impact of hearing loss on communication, activities, and participation" (Montano, 2021, p. 27). The definition stresses the practice of family-centered care and focuses its emphasis on improving communication function within the context of communication environments; this is similar in many ways to the concepts guiding the WHO's International Classification of Function.

**5. While most audiologists acknowledge the importance of counseling, there often is not time on the schedule to allow for this. Can you address this?**

The importance of counseling in audiology is both my belief and the rule that guides my practice. While I may have an academic title, I am a working clinician seeing a full caseload of patients in our Cornell faculty practice. I take a counseling approach with every patient. Ordinarily, my patients have already had diagnostic testing performed either in my facility or

by an outside audiologist. The concept of performing a counseling-based audiologic consultation is really a matter of shifting of the emphasis of the meeting from an audiologist talking about an audiogram, to a patient talking about his or her hearing loss. In fact, unless my patient requests an explanation of his/her audiogram, I do not even discuss it. Instead, I use open-ended questions to elicit the patient's story and work with the individual and family to figure out the best possible solutions to the communication issues they have identified. A counselor, therefore, is more of a listener rather than a talker. It is important for audiologists to reject the techno-centric model of service delivery.

I have heard many audiologists report they are limited by time constraints and counseling frequently cannot be performed. My response is always the same, counseling does not require additional time in your schedule, it requires a different emphasis on how you manage the time. To me, it is far more important to learn the patient story than it is to talk about the audiogram.

**6. What do you mean by techno-centric?**

By techno-centric, I am saying that the services we provide focus primarily on technology. We tend to put our emphasis on the devices such as hearing aids and their accessories rather than on the hearing loss, thereby minimizing our counseling and treatment focus. Instead, it should be the patient and family that is the focus of our treatment with technology being one of the possible solutions to some communication issues. As most audiologists will agree, the hearing aid (or other amplification) alone will not solve all of life's communication problems. As reported in a qualitative study by Grenness and colleagues (2014), when patients work with an audiologist, technical competence is assumed but interpersonal relationships are valued.

**7. It seems you are implying that the actual audiology service delivery system interferes with audiologic counseling?**

Many times it does. Erdman, Wark and I (1994) reported on the service delivery models in audiology. Frequently, audiologists assume a medical model of service delivery, meaning, it becomes a top-down curative process as though we want to rid the person of his/her hearing loss. The authors advocated for a rehabilitative model that would be a more horizontal process where the patient becomes an equal partner in the treatment process. Erdman (2021) refers to this rehabilitation model as a bio psychosocial service delivery, which embraces counseling.

**8. Earlier you mentioned family-centered care. Don't we all already do this?**

I happen to agree with your assumption that indeed most audiologists believe they perform family-centered care (FCC) in their practice. However, the literature seems to suggest otherwise. Ekberg, Schuetz, Timmer, & Hickson (2020) have demonstrated that while most audiologists acknowledge the importance of FCC, there are few who have incorporated it into the daily function of their practices.

**9. Maybe then I need to know how you define family-centered care?**

FCC is an invitation to patients and their families to participate in the management of a person's hearing loss. As I have heard my friend Dr. Sam Trychin, a noted psychologist with severe hearing loss, say, "It is not a hearing loss, it is a communication loss." By family, I mean anyone a person with hearing loss invites to participate in his/her care; that might be a communication partner, spouse, child, sibling or friend. Together, the audiologist, person with

hearing loss and communication partner, form a therapeutic relationship that allows for the development of shared decision goals. The inclusion of family in medical treatments increases positive outcomes (Rathert, Wyrwich, & Boren, 2013) and even improves satisfaction with and uptake of amplification (Singh & Launer, 2016). My therapeutic interactions take place in a comfortable environment that welcomes family to participate in the process. There is room at the table for all and I do not sit behind a desk. Rather, we sit together around a table as equals. This seating sends a message that we are equal partners in this process. What message do you think we send when we wear a white lab coat and sit behind a huge desk? All you need to do is think back to that medical model I mentioned earlier.

**10. What components of family-centered care do you think can be easily integrated into the average audiology practice?**

Singh, Hickson, English and colleagues (2016) published a practical article that described FCC, gave it a definition and listed steps toward implementation in audiology practices. I would emphasize that, in order for a practice to adopt an FCC approach, it requires a buy-in from the entire staff including appointment clerks, secretaries and all audiologists. The first and arguably the most important step is to invite families to participate in the first place. This is accomplished easily by including the invitation with every scheduled appointment. This is a welcoming gesture and sends a positive message to the patient. Ultimately, it is the patient's decision to include family in the rehabilitation process but without an invitation they may not have considered it at all. Once scheduled, it is critical that the environment be welcoming and that family is welcomed "to the table". There can be nothing more counter-productive than to invite family to a rehabilitation session and leave them in the waiting area while the audiologist meets with the patient. The basis of FCC is that rehabilitation goals will be decided together as a team. Inclusion of family does not end with the initial consultation, but rather is encouraged for all the subsequent AR meetings.

**11. What about the current pandemic? Many practices are limiting the number of people who can attend an audiology session.**

Our practices have certainly changed a great deal in the last year. We have been struggling to re-invent ourselves and modify our practices to allow for safe treatment options with social distancing and proper infection control. Perhaps there is no patient population that has been more affected by use of face masks than people with hearing loss. The distortion of speech and lack of visual cues have made communication particularly difficult for our patient base. Here at Cornell, we actually have a policy that restricts the patients from bringing an accompanying person to medical appointments if they are capable of participating independently. This policy can certainly restrict our efforts to include family in the AR process.

If I have to find a positive aspect to the pandemic, it is the fact that audiologists have now begun to embrace telepractice. They are holding Zoom appointments and using manufacturers' distance support software to program or adjust hearing aids. I have found that the use of video visits has actually helped in the provision of FCC. I recently had an elderly patient whose son lives in Virginia and was able to participate in all her hearing related appointments. In fact, this particular patient had rejected the use of hearing aids in the past, but having her son encouraging her during the appointment resulted in her finally accepting hearing aids and wearing them on a daily basis. The use of Zoom, or even FaceTime or Skype, can allow family participants who would not ordinarily be able to participate in their loved one's treatment because of distance, work responsibilities or even illness to be a part of the rehabilitation

process.

**12. Aren't there issues regarding reimbursement for audiologists providing AR services?**

Reimbursement has always been a problem for audiologists. As a health care field, audiology is classified as a diagnostic profession. As a result, the provision of audiologic rehabilitation, being a treatment service, is for the most part, non-reimbursable. Speech-language pathologists, who are classified as both diagnostic and rehabilitative professions, can be reimbursed for AR. There has been a major push in recent years for this to change, but it requires legislative action that can take many years to achieve.

There has been a great deal of work in this area and now, as the American Academy of Audiology, The American Speech-Language Hearing Association and the Academy of Doctors of Audiology have begun working together on legislative efforts, I am beginning to feel some optimism for a change in future reimbursement for AR for audiologists.

**13. How can audiologists provide AR services without third-party reimbursement?**

It certainly would be great if third party reimbursement for AR could be available to audiologists. This however, does not mean that we cannot charge directly for the services. Still today, the most common model for hearing aid dispensing is bundling all services with the cost of the hearing aid. As a result, the patient believes they are paying for the hearing aids and thereby undervalues the services that audiologists perform. Many audiologists are already providing AR built into the hearing aid process. The ongoing counseling, training and support are all important components of the process. The problem is, patients do not realize that these services have value.

**14. This sounds like you are recommending that we unbundle audiologic services?**

Yes. I certainly acknowledge how difficult it is to shift from a bundled to an unbundled model of hearing aid dispensing. I am sure many audiologists experience it every day; a patient offers to pay for a follow-up appointment even though it was included in the cost of the hearing aid. That, of course, is determined by the professionalism of the practice. If a patient believes they are going to a store to buy a product, like perhaps the big box store model, they do not expect to pay for the service. However, when the patient believes they are receiving professional services, the value is increased. Many audiologists have begun itemizing the services they provide which then allows patients to have a better understanding of the process and cost.

**15. How do you think this will be impacted by over–the-counter (OTC) hearing aids?**

OTC hearing aids have been the talk of audiology non-stop for the past several years. I have never felt threatened by the push for new methods of hearing aid distribution; in fact, I see it as a great opportunity for audiologists and audiology. I am sure you all remember the report from the National Academy of Science, Engineering and Medicine (NASEM) in 2016 that lead to the OTC legislation in 2017. Recommendations from that report included increased insurance coverage for hearing aids and that Medicare should increase access to assessment for and delivery of (AR) including reimbursement for audiologists. This is our invitation and opportunity to distinguish ourselves from those who "sell" hearing aids to those who provide rehabilitation and management of hearing loss. My advice is to embrace the new avenues for

amplification and provide the services that make us audiologists.

**16. If I want to begin to offer some AR services, where should I start?**

I believe that most audiologists are already providing some form of AR. Certainly, counseling is a huge part of everything we do. I always say that counseling begins the moment we greet our patient in the waiting room and the relationship starts when the first appointment is booked. I still think that many people consider traditional therapeutic interventions like speechreading and auditory training as AR. While some may offer these services, it certainly is the minority of providers. Frequently patients are referred to online training programs like clEAR (Tye-Murray, Spehar, Sommers, & Barcroft, 2016) and LACE (Sweetow & Sabes, 2006). Research in the areas of auditory training and speechreading is not very strong and there is a lack of evidence and outcomes. However, group AR intervention has been shown to improve outcomes and has evidenced-based research to support its implementation (Hawkins, 2005; Chisolm & Arnold, 2012).

**17. Most of us do not have any experience offering group therapy, where can we obtain resources?**

There are many resources available to audiologists that can help with the creation and implementation of group AR. The Active Communication Education program (ACE; Hickson, Worrall, & Scarinci, 2007) is an evidence-based group treatment program that is available free through the University of Queensland, Australia. Audiologists can have access to strategies and actual lesson plans for administering the program. Another excellent resource available, also free, is on the Ida Institute website (idainstitute.com). They established a program referred to by the acronym GROUP that stands for "group rehabilitation online utility pack". GROUP allows users access to videos, sample lessons and suggestions for short or lengthy group programs. While most audiologists are apprehensive about running groups, one only has to try it to experience how rewarding it can be for patients, families, and providers. When we provide group AR at Cornell, our feedback is always positive and frequently results in word of mouth referrals.

**18. How do you implement groups in your facility?**

At Cornell, we use the ACE evidenced-base group AR program as the basis for our service. We advertise in our building lobby and office areas and keep a list of patients who have expressed interest in participation. We refer to it as a communication group and not a hearing aid group. Participants do not have to be hearing aid users nor even existing patients at Cornell. We do, in fact, charge for participating in the AR group, and it is not included in the price of the hearing aids. While the charge is minimal, it adds value to the service. We offer the program twice a year one evening a week for five weeks. Just recently, during the COVID, we held a well-received Zoom AR group. Our patients are always encouraged to bring a communication partner to all meetings. Prior to COVID restrictions, we held the meeting in our conference room and participants sat in a circle. Every week we covered a different topic about living with hearing loss. I refer you to the Ida institute GROUP site for specific suggestions on some activities you can implement. I have always taken a “field of dreams” attitude on offering group intervention, “If you build it, people will come.”

**19. Do you also include other outside services?**

In my facility, I am fortunate to have both audiologists and speech-language pathologists (SLPs) on my staff. We have the ability to refer to our SLPs when our patients need traditional AR services like speechreading and auditory training. In addition to offering group intervention for our patients with hearing loss, we are fortunate to have a local chapter of the Hearing Loss Association of America (HLAA) nearby. Many of our patients participate in the chapter and are grateful for the peer support they receive at the meetings and on the HLAA website.

**20. Are you optimistic about the future of AR and Audiology?**

Most definitely! We currently only reach a small percentage of people with hearing loss who can benefit from our services. As technology increases and more people begin to avail themselves of amplification options, the opportunity to provide audiology care will only increase. What I am most hopeful for is that the hearing aid will no longer be the focus of our practices but rather just another tool in the arsenal we already have to help patients manage their hearing loss. I am hopeful that AR services will soon become a reimbursable treatment option for audiologists and we will begin to shift our focus back to the communication needs of our patients through the provision of counseling, therapies and group interventions. I believe the future is indeed bright and encourage all audiologists to set forth on the AR road.

**Annexure 2**

**Bharath Institute of Higher Education and Research**

SLIMS

| | | |
|---|---|---|
| 1 | NIVETHA.R | U12MB264 |
| 2 | PARIDASAN.P | U12MB266 |
| 3 | PAVITHRAN.P | U12MB267 |
| 4 | PRIYADHARSHINI.K | U12MB272 |
| 5 | PRIYANKA.M | U12MB276 |
| 6 | RAJESHWARI.I | U12MB281 |
| 7 | REKA.D | U12MB286 |
| 8 | SANKAR.C | U12MB291 |
| 9 | SASIDHARAN.A | U12MB294 |
| 10 | SIBIE CASTRO.J | U12MB299 |
| 11 | SIVA RANJANI.T | U12MB303 |
| 12 | SIVA PRAKASH.M | U12MB305 |
| 13 | SOWMIYA DEVI.V | U12MB309 |
| 14 | STEPHEN BUSH.P | U12MB311 |
| 15 | VIGNEH.V | U12MB336 |

ANNEXURE 3

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## PUDUCHERRY

TOPIC: Audiological Rehabilitation **(ENT 01 )**
STUDENT NAME:
UNIVERSITY NO:

1. The most common cause of conductive hearing loss in young children is:
a. Rubella. b. Impacted cerumen.
c. Meningitis. d. Otitis media.

2. Which cranial nerve would be affected by an acoustic neuroma?
a. V b. VII
c. VIII d. IX

3. For typically developing children, the most common substitution for a prevocalic liquid is:
a. another liquid. b. a glide.
c. a front vowel. d. a rounded vowel.

4. Velopharyngeal inadequacy may compromise the ability to build up intra-oral air pressure during speech. Which consonant sound will be most noticeably affected?
a. /j/ b. /r/
c. /m/ d. /s/

5. Prior to selection of a augmentative communication system, fine motor control is carefully assessed to determine:
a. the minimum physical size of a target vocabulary item.
b. the type of vocabulary used (i.e. pictures versus letters).
c. the method of vocabulary manipulation (sentence versus one-word responses).
d. method of output (voice or printed or visual display).

6. pH monitoring is used to assess:
a. esophageal motility. b. achelasia.
c. gastroesophageal reflux. d. esophageal strictures.

7. For which of the following dysarthrias would intensive drill in over articulation be contraindicated?
a. Spastic dysarthria resulting from cerebrovascular accident.
b. Flaccid dysarthria resulting from myasthenia gravis.
c. Flaccid dysarthria associated with Bell's palsy.
d. Ataxic dysarthria resulting from cerebellar damage.

8. A young infant will typically stick out the tongue when the tip is touched. This is known as the :
a. rooting reflex. b. suckling reflex.
c. sucking reflex. d. tongue protrusion reflex.

9. When the transmission of sound energy is blocked in the pharynx, an individual's resonance will sound:
a. muffled. b. hypernasal.
c. hyponasal. d. mixed (both hypernasal and hyponasal).

10. Which muscle plays the greatest role in velopharyngeal closure?
a. Palatoglossus. b. Levatorn veli palatini .
c. Tensor veli palatini . d. Superior pharyngeal constrictor.

**PRE TEST**

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Audiological Rehabilitation **(ENT 01 )** (6)

STUDENT NAME: VIGNESH. V

UNIVERSITY NO: U12MB336

1. The most common cause of conductive hearing loss in young children is:

a. Rubella. b. Impacted cerumen.

c. Meningitis. d. Otitis media.

2. Which cranial nerve would be affected by an acoustic neuroma?

a. V b. VII

c. VIII d. IX

3. For typically developing children, the most common substitution for a prevocalic liquid is:

a. another liquid. b. a glide.

c. a front vowel. d. a rounded vowel.

4. Velopharyngeal inadequacy may compromise the ability to build up intra-oral air pressure during speech. Which consonant sound will be most noticeably affected?

a. /l/ b. /r/

c. /m/ d. /s/

5. Prior to selection of a augmentative communication system, fine motor control is carefully assessed to determine:

a. the minimum physical size of a target vocabulary item.

b. the type of vocabulary used (i.e. pictures versus letters).

c. the method of vocabulary manipulation (sentence versus one-word responses).

d. method of output (voice or printed or visual display).

6. pH monitoring is used to assess:

a. esophageal motility. b. achelasia.

X c. gastroesophageal reflux. d. esophageal strictures.

7. For which of the following dysarthrias would intensive drill in over articulation be contraindicated?

a. Spastic dysarthria resulting from cerebrovascular accident.

b. Flaccid dysarthria resulting from myasthenia gravis.

X c. Flaccid dysarthria associated with Bell's palsy.

d. Ataxic dysarthria resulting from cerebellar damage.

8. A young infant will typically stick out the tongue when the tip is touched. This is known as the :

a. rooting reflex. b. suckling reflex.

c. sucking reflex. d. tongue protrusion reflex.

9. When the transmission of sound energy is blocked in the pharynx, an individual's resonance will sound:

a. muffled. b. hypernasal.

X c. hyponasal. d. mixed (both hypernasal and hyponasal).

10. Which muscle plays the greatest role in velopharyngeal closure?

a. Palatoglossus. b. Levatorvelipalatini .

X c. Tensor velipalatini . d. Superior pharyngeal constrictor.

ANNEXURE 3

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## PUDUCHERRY

TOPIC: Audiological Rehabilitation **(ENT 01 )**

3

STUDENT NAME: Reka . D

UNIVERSITY NO: U12MB286

1. The most common cause of conductive hearing loss in young children is:

a. Rubella. b. Impacted cerumen.

c. Meningitis. d. Otitis media.

2. Which cranial nerve would be affected by an acoustic neuroma?

X a. V b. VII

c. VIII d. IX

3. For typically developing children, the most common substitution for a prevocalic liquid is:

a. another liquid. b. a glide.

X c. a front vowel. d. a rounded vowel.

4. Velopharyngeal inadequacy may compromise the ability to build up intra-oral air pressure during speech. Which consonant sound will be most noticeably affected?

a. /ʃ/ b. /r/

c. /m/ d. /b/

5. Prior to selection of a augmentative communication system, fine motor control is carefully assessed to determine:

X a. the minimum physical size of a target vocabulary item.

b. the type of vocabulary used (i.e. pictures versus letters).

c. the method of vocabulary manipulation (sentence versus one-word responses).

d. method of output (voice or printed or visual display).

6. pH monitoring is used to assess:

X a. esophageal motility. b. achelasia.

c. gastroesophageal reflux. d. esophageal strictures.

7. For which of the following dysarthrias would intensive drill in over articulation be contraindicated?

a. Spastic dysarthria resulting from cerebrovascular accident.

b. Flaccid dysarthria resulting from myasthenia gravis.

c. Flaccid dysarthria associated with Bell's palsy.

d. Ataxic dysarthria resulting from cerebellar damage.

8. A young infant will typically stick out the tongue when the tip is touched. This is known as the :

a. rooting reflex. b. sucking reflex.

X c. sucking reflex. d. tongue protrusion reflex.

9. When the transmission of sound energy is blocked in the pharynx, an individual's resonance will sound:

a. muffled. b. hypernasal.

c. hyponasal. d. mixed (both hypernasal and hyponasal).

10. Which muscle plays the greatest role in velopharyngeal closure?

a. Palatoglossus. b. Levatorvelipalatini .

c. Tensor velipalatini . d. Superior pharyngeal constrictor.

**POST TEST**

c. the method of vocabulary manipulation (sentence versus one-word responses).

d. method of output (voice or printed or visual display).

6. pH monitoring is used to assess:

a. esophageal motility. b. achelasia.

c. gastroesophageal reflux. d. esophageal strictures.

7. For which of the following dysarthrias would intensive drill in over articulation be contraindicated?

a. Spastic dysarthria resulting from cerebrovascular accident.

b. Flaccid dysarthria resulting from myasthenia gravis.

c. Flaccid dysarthria associated with Bell's palsy.

d. Ataxic dysarthria resulting from cerebellar damage.

8. A young infant will typically stick out the tongue when the tip is touched. This is known as the :

a. rooting reflex. b. suckling reflex.

c. sucking reflex. d. tongue protrusion reflex.

9. When the transmission of sound energy is blocked in the pharynx, an individual's resonance will sound:

a. muffled. b. hypernasal.

c. hyponasal. d. mixed (both hypernasal and hyponasal).

10. Which muscle plays the greatest role in velopharyngeal closure?

a. Palatoglossus. b. tevatorvelipalatini .

c. Tensor velipalatini . d. Superior pharyngeal constrictor.

6

ANNEXURE 3

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## PUDUCHERRY

TOPIC: Audiological Rehabilitation **(ENT 01 )**

STUDENT NAME: Rekha · D

UNIVERSITY NO: U12MB286.

1. The most common cause of conductive hearing loss in young children is:

a. Rubella. b. Impacted cerumen.

c. Meningitis. d. Otitis media.

2. Which cranial nerve would be affected by an acoustic neuroma?

a. V b. VII

c. VIII d. IX

3. For typically developing children, the most common substitution for a prevocalic liquid is:

a. another liquid. b. a glide.

c. a front vowel. d. a rounded vowel.

4. Velopharyngeal inadequacy may compromise the ability to build up intra-oral air pressure during speech. Which consonant sound will be most noticeably affected?

a. /l/ b. /r/

c. /m/ d. /s/

5. Prior to selection of a augmentative communication system, fine motor control is carefully assessed to determine:

a. the minimum physical size of a target vocabulary item.

b. the type of vocabulary used (i.e. pictures versus letters).

c. the method of vocabulary manipulation (sentence versus one-word responses).

d. method of output (voice or printed or visual display).

6. pH monitoring is used to assess:

a. esophageal motility. b. achelasia.

c. gastroesophageal reflux. d. esophageal strictures.

7. For which of the following dysarthrias would intensive drill in over articulation be contraindicated?

a. Spastic dysarthria resulting from cerebrovascular accident.

b. Flaccid dysarthria resulting from myasthenia gravis.

c. Flaccid dysarthria associated with Bell's palsy.

d. Ataxic dysarthria resulting from cerebellar damage.

8. A young infant will typically stick out the tongue when the tip is touched. This is known as the :

a. rooting reflex. b. suckling reflex.

c. sucking reflex. d. tongue protrusion reflex.

9. When the transmission of sound energy is blocked in the pharynx, an individual's resonance will sound:

a. muffled. b. hypernasal.

c. hyponasal. d. mixed (both hypernasal and hyponasal).

10. Which muscle plays the greatest role in velopharyngeal closure?

a. Palatoglossus. b. Levatorvelipalatini .

c. Tensor velipalatini . d. Superior pharyngeal constrictor.

(7)

ANNEXURE 3

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## PUDUCHERRY

TOPIC: Audiological Rehabilitation **(ENT 01 )**

STUDENT NAME: Vignesh . V

UNIVERSITY NO: U12MB336

1. The most common cause of conductive hearing loss in young children is:

a. Rubella. b. Impacted cerumen.

c. Meningitis. d. Otitis media.

2. Which cranial nerve would be affected by an acoustic neuroma?

a. V b. VII

c. VIII d. IX

3. For typically developing children, the most common substitution for a prevocalic liquid is:

a. another liquid. b. a glide.

c. a front vowel. d. a rounded vowel.

4. Velopharyngeal inadequacy may compromise the ability to build up intra-oral air pressure during speech. Which consonant sound will be most noticeably affected?

a. /l/ b. /r/

c. /m/ d. /s/

5. Prior to selection of a augmentative communication system, fine motor control is carefully assessed to determine:

a. the minimum physical size of a target vocabulary item.

b. the type of vocabulary used (i.e. pictures versus letters).

**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 Audiological Rehabilitation held during July 2015 – Dec 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.Venkataramanan.R
RESOURCE PERSON

Dr.K.R. Jothikumar
COORDINATOR

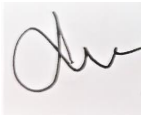

## Sri Lakshmi Narayana Institute of Medical Sciences

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. K. VIGNESH.V has actively participated in the Value Added Course on Audiological Rehabilitation held during July 2015 – Dec 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.



Dr. Venkataraman. R
RESOURCE PERSON



Dr.K.R. Jothikumar
COORDINATOR

**Annexure 5**
**Course/Training Feedback Form**
**Student Feedback Form**

Course Name: Audiological Rehabilitation

Subject Code: **ENT01**

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: Audiological Rehabilitation

Subject Code: **ENT01**

Name of Student: VIGNESH .V Roll No.: U12MB336

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: Audiological Rehabilitation

Subject Code: **ENT01**

Name of Student: SIBI E CASTRO Roll No.: U12MB299

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:

Excellent

**ANNEXURE 6**

Date : 15/12/2015

From
Dr.K.R. Jothikumar,
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:** Audiological Rehabilitationreg.

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled:**Audiological Rehabilitation** on July 2015 to Dec 2015. 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>



**ANNEXURE 7**



**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

Date: 10/06/2015

From
Dr. Muthukumarasamy. B
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: Ischemic Heart Disease and Exercise**

Respected sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: "Ischemic heart disease and exercise"on 10/07/2015. We solicit your kind permission for the same.

Kind Regards,

Dr. Muthukumarasamy. B

---

FOR THE USE OF DEAN OFFICE

Names of Committee members evaluating the course:

The Dean: Dr. Rajasekar

The HOD: Dr. Muthukumarasamy. B

The Expert: Dr. Panneerselvam

The committee has discussed about the course and is approved.

Subject Expert HOD

DEPARTMENT OF GENERAL MEDICINE
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU, PONDICHERRY.

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

14.06.2015

**Sub: Organising Value-added Course: Ischemic heart disease and exercise**

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 titled "**Ischemic heart disease and exercise**" between **July 2015 to December 2015.** 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 29/06/2015. Applications received after the mentioned date shall not be entertained under any circumstances.

Encl: Copy of Course content

# COURSE PROPOSAL

**Course Title:** **Ischemic Heart disease and exercise**

**Course Objective:** To create an awareness among students of the second year M.B.B.S about ischemic heart disease- its risk factors and pathogenesis and the role of suitable exercises in reducing the risk of acquiring the disease and modifying the disease

**Course Outcome:** Acquired an awareness regarding the role of exercise in primary and secondary prevention of Ischemic heart disease

**Course Audience:** A batch of 25 students belonging to the second year of M.B.B.S

**Course Coordinator:** Dr. Muthukumarasamy.B

**Course Faculties with Qualification and Designation:**

1. Dr. Panneerselvam
   Professor
   Department of Internal Medicine
2. Dr. S. Arul Murugan
   Associate Professor
   Department of Medicine

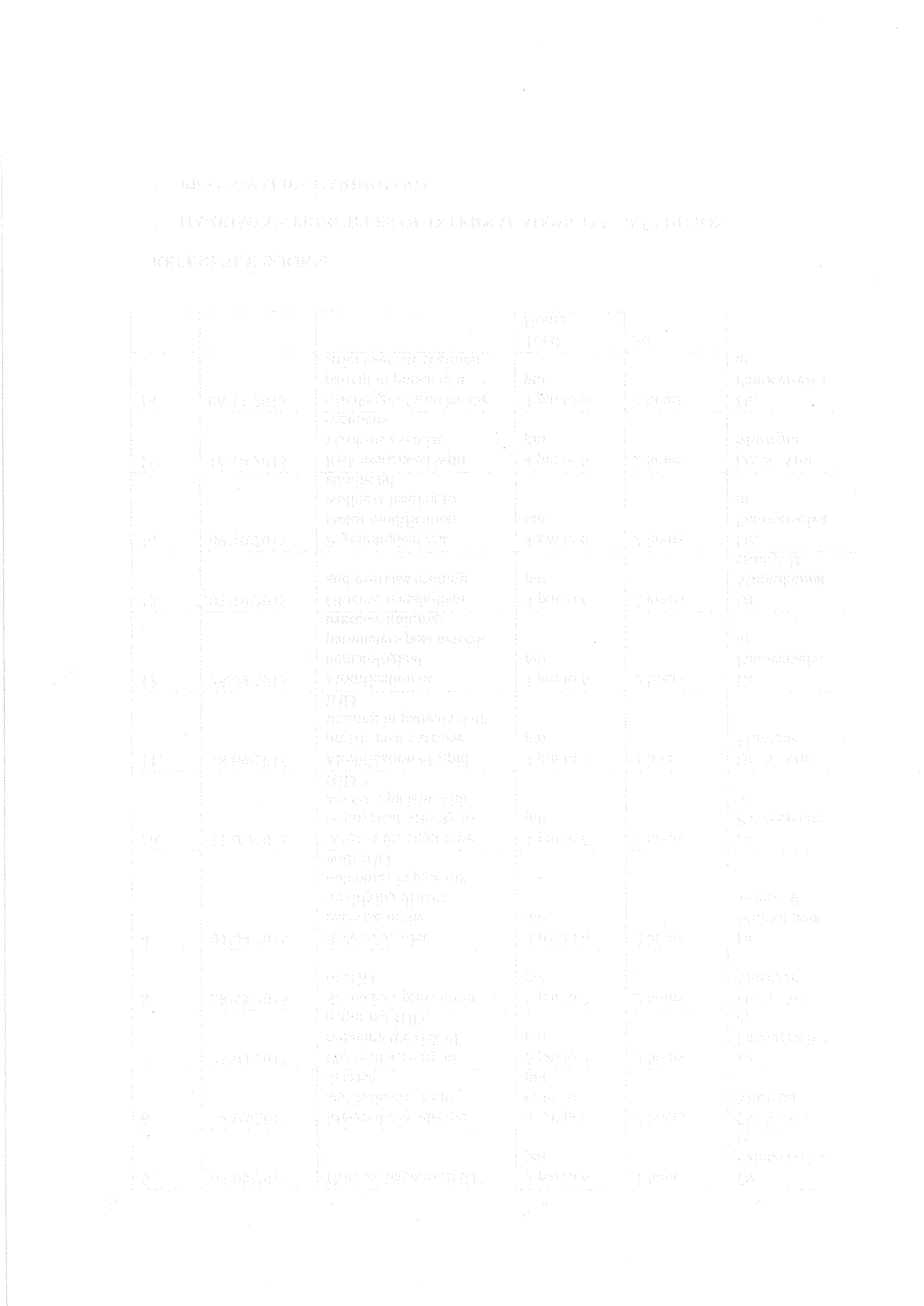
**Course Curriculum/Topics with schedule**

| SlNo | Date | Topic | Time | Hours | Name of faculty |
|---|---|---|---|---|---|
| 1. | 10/07/2015 | Ischemic heart disease – introduction | 5 pm to 7 pm | 2 hours | Dr. Panneerselvam |
| 2. | 17/07/2015 | Risk Factors for development of IHD | 4: 30 pm to 6: 30 pm | 2 hours | Dr. S. Arul Murugan |
| 3. | 24/07/2015 | Pathogenesis of IHD | 5 pm to 7 pm | 2 hours | Dr. Panneerselvam |
| 4. | 31/07/2015 | Clinical manifestations of IHD | 5 pm to 7 pm | 2 hours | Dr. S. Arul Murugan |

| | | | | | |
|---|---|---|---|---|---|
| 5. | 07/08/2015 | How to diagnose IHD? | 5 pm to 6 pm | 1 hour | Dr. Panneerselvam |
| 6. | 14/08/2015 | Metabolic syndrome and Ischemic heart disease | 4: 30 pm to 6: 30 pm | 2 hours | Dr. S. Arul Murugan |
| 7. | 21/08/2015 | Physical activity in reducing the risk of acquiring IHD | 5 pm to 7 pm | 2 hours | Dr. Panneerselvam |
| 8. | 28/08/2015 | Secondary prevention of IHD | 5 pm to 7 pm | 2 hours | Dr. S. Arul Murugan |
| 9. | 04/09/2015 | Role of aerobic exercise in the modifying disease outcomes in patients with IHD | 4 pm to 6 pm | 2 hours | Dr. Muthukumarasamy. B |
| 10. | 11/09/2015 | What is the right type of physical activity to advice a patient with IHD ? | 4 pm to 6 pm | 2 hours | Dr. Panneerselvam |
| 11. | 18/09/2015 | Modification of lipid profile post exercise training in patients with IHD | 4 pm to 5 pm | 1 hour | Dr. S. Arul Murugan |
| 12. | 25/09/2015 | Modification of hematological parameters post aerobic exercise training | 4 pm to 6 pm | 2 hours | Dr. Panneerselvam |
| 13. | 03/10/2015 | Glucose metabolism and exercise training | 4 pm to 6 pm | 2 hours | Dr. Muthukumarasamy. B |
| 14. | 09/10/2015 | Psychological risk factor modification: wellness leading to goodness! | 4 pm to 6 pm | 2 hours | Dr. Panneerselvam |
| 15. | 16/10/2015 | Risk associated with vigorous exercise regimens | 4 pm to 6 pm | 2 hours | Dr. S. Arul Murugan |
| 16. | 06/11/2015 | Challenges faced by the patient in pursuing a strict exercise regimen | 4 pm to 6 pm | 2 hours | Dr. Panneerselvam |
| | | | Total Hours | 30 | |

**REFERENCE BOOKS:**


1. **HARRISON'S PRINCIPLES OF INTERNAL MEDICINE; 18th EDITION**
2. **BRAUNWALD'S CARDIOLOGY**



# VALUE ADDED COURSE

1. Name of the programme and code

   Ischemic heart disease and exercise; IM01

2. Duration & period

   30 hrs; between July 2015 – November 2015

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 2015 – November 2015

8. Year of discontinuation

   2016

9. Summary report of each program year wise:

| VALUE ADDED COURSE: July 2015 – November 2015 | | | | | |
|---|---|---|---|---|---|
| Sl. No. | Course code | Course name | Resource persons | Target Students | Strength and year |
| 1 | IM01 | Ischemic Heart disease and exercise | Dr. Panneerselvam<br>Dr. S. Arul Murugan | Second year MBBS | 25 (July 2015 – November 2015) |

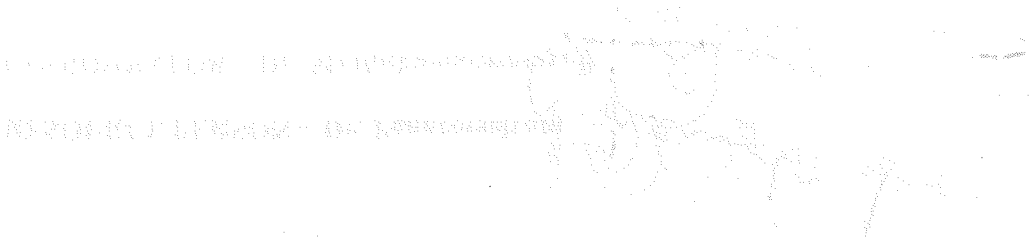
10. Course feedback

    Enclosed as Annexure- V

**RESOURCE PERSON – Dr. Panneerselvam**

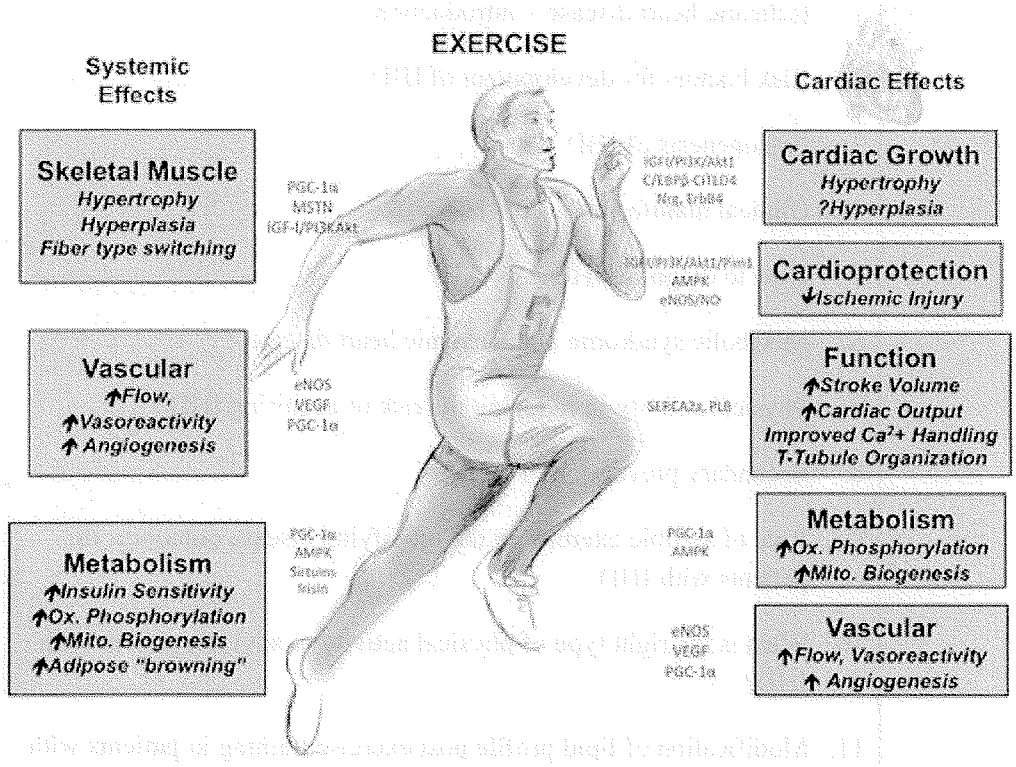
**COORDINATOR – Dr. Muthukumarasamy. B**

Dr. MUTHUKUMARASAMY, MD.
Reg. No. 33723
Professor, General Medicine



## ANNEXURE - I

## ISCHEMIC HEART DISEASE AND EXERCISE




## PARTICIPANT HAND BOOK

## VALUE ADDED COURSE (July 2015 to November 2015)

## COURSE DETAILS

| PARTICULARS | DESCRIPTION |
|---|---|
| **Course title** | ISCHEMIC HEART DISEASE AND EXERCISE |
| **Course code** | IM01 |
| **Objective** | 1. Ischemic heart disease – introduction<br>2. Risk Factors for development of IHD<br>3. Pathogenesis of IHD<br>4. Clinical manifestations of IHD<br>5. How to diagnose IHD<br>6. Metabolic syndrome and Ischemic heart disease<br>7. Physical activity in reducing the risk of acquiring IHD<br>8. Secondary prevention of IHD<br>9. Role of aerobic exercise in the modifying disease outcomes in patients with IHD<br>10. What is the right type of physical activity to advice a patient with IHD?<br>11. Modification of lipid profile post exercise training in patients with IHD<br>12. Modification of hematological parameters post aerobic exercise training<br>13. Glucose metabolism and exercise training<br>14. Psychological risk factor modification: wellness leading to goodness!<br>15. Risk associated with vigorous exercise regimens<br>16. Challenges faced by the patient in pursuing a strict exercise regimen |
| **Key competencies** | On successful completion of the course, the students will have a better knowledge about the role of exercise in primary and secondary prevention of ischemic heart disease |
| **Target students** | Second year MBBS |

| | |
|---|---|
| **Duration** | 30 hours; between July 2015 and November 2015 |
| **Assessment procedure** | SHORT NOTES |

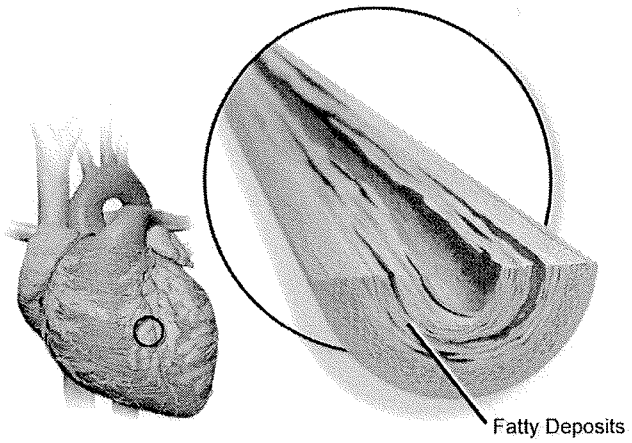
# ISCHEMIC HEART DISEASE AND EXERCISE

Also known as Coronary Artery Disease (CAD)

•Ischemic heart disease (IHD) is a condition in which there is an inadequate supply of blood and oxygen to a portion of the myocardium.

•Imbalance between myocardial oxygen supply and demand.

•Caused mainly by Atherosclerosis of Coronary Artery.




## Risk factor of Atherosclerosis

•Effect of risk factors is multiplicative rather than additive.

•It is important to distinguish between relative risk and absolute risk.

•Absolute Risk

–Age

–Male sex

–Positive family history

•Relative Risk

–Smoking

Limitation of blood flow to the heart causes ischemia (cell starvation secondary to a lack of oxygen) of the heart's muscle cells. The heart's muscle cells may die from lack of oxygen and this is called a myocardial infarction (commonly referred to as a heart attack). It leads to damage, death, and eventual scarring of the heart muscle without regrowth of heart muscle cells. Chronic high-grade narrowing of the coronary arteries can induce transient ischemia which leads to the induction of a ventricular arrhythmia, which may terminate into a dangerous heart rhythm known as ventricular fibrillation, which often leads to death.

Typically, coronary artery disease occurs when part of the smooth, elastic lining inside a coronary artery (the arteries that supply blood to the heart muscle) develops atherosclerosis. With atherosclerosis, the artery's lining becomes hardened, stiffened, and accumulates deposits of calcium, fatty lipids, and abnormal inflammatory cells – to form a plaque. Calcium phosphate (hydroxyapatite) deposits in the muscular layer of the blood vessels appear to play a significant role in stiffening the arteries and inducing the early phase of coronary arteriosclerosis. This can be seen in a so-called metastatic mechanism of calciphylaxis as it occurs in chronic kidney disease and hemodialysis (Rainer Liedtke 2008). Although these people suffer from a kidney dysfunction, almost fifty percent of them die due to coronary artery disease. Plaques can be thought of as large "pimples" that protrude into the channel of an artery, causing a partial obstruction to blood flow. People with coronary artery disease might have just one or two plaques, or might have dozens distributed throughout their coronary arteries. A more severe form is chronic total occlusion (CTO) when a coronary artery is completely obstructed for more than 3 months.

Cardiac syndrome X is chest pain (angina pectoris) and chest discomfort in people who do not show signs of blockages in the larger coronary arteries of their hearts when an angiogram (coronary angiogram) is being performed. The exact cause of cardiac syndrome X is unknown. Explanations include microvascular dysfunction or epicardial atherosclerosis. For reasons that are not well understood, women are more likely than men to have it; however, hormones and other risk factors unique to women may play a role.

–Hypertension

–Diabetes mellitus

–Haemostatic factors.

–Physical activity

–Obesity

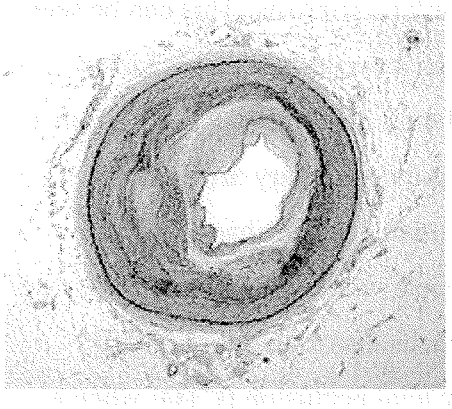
–Alcohol

–Other dietary factors

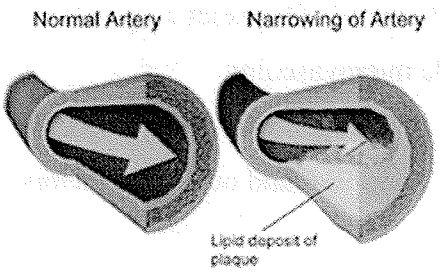
–Personality

–Social deprivation

## PATHOPHYSIOLOGY



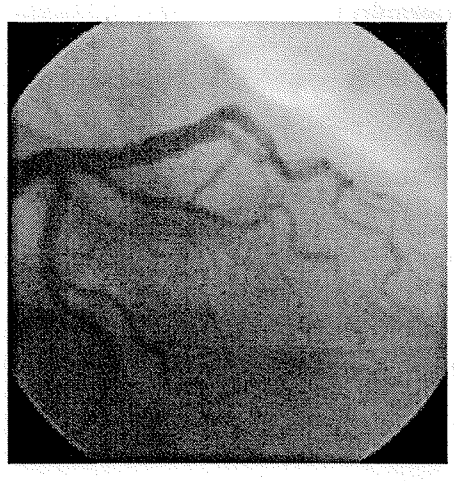
- Micrograph of a coronary artery with the most common form of coronary artery disease (atherosclerosis) and marked luminal narrowing. Masson's trichrome.

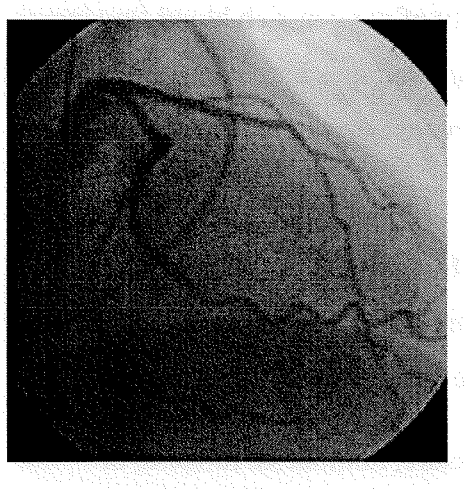



Coronary Artery Disease

- Illustration depicting coronary artery disease

DIAGNOSIS





For symptomatic people, stress echocardiography can be used to make a diagnosis for obstructive coronary artery disease. The use of echocardiography, stress cardiac imaging, and/or advanced non-invasive imaging is not recommended on individuals who are exhibiting no symptoms and are otherwise at low risk for developing coronary disease.

The diagnosis of "Cardiac Syndrome X" – the rare coronary artery disease that is more common in women, as mentioned, is a diagnosis of exclusion. Therefore, usually, the same tests are used as in any person with the suspected of having coronary artery disease:

a. Baseline electrocardiography (ECG)
b. Exercise ECG – Stress test

c. Exercise radioisotope test (nuclear stress test, myocardial scintigraphy)
d. Echocardiography (including stress echocardiography)
e. Coronary angiography
f. Intravascular ultrasound
g. Magnetic resonance imaging (MRI)

The diagnosis of coronary disease underlying particular symptoms depends largely on the nature of the symptoms. The first investigation is an electrocardiogram (ECG/EKG), both for "stable" angina and acute coronary syndrome. An X-ray of the chest and blood tests may be performed.

## SIGNS AND SYMPTOMS

The narrowing of coronary arteries reduces the supply of oxygen-rich blood flowing to the heart, which becomes more pronounced during strenuous activities during which the heart beats faster. For some, this causes severe symptoms while others experience no symptoms at all.

The most common symptom is chest pain or discomfort that occurs regularly with activity, after eating, or at other predictable times; this phenomenon is termed stable angina and is associated with narrowing of the arteries of the heart.

Angina also includes chest tightness, heaviness, pressure, numbness, fullness, or squeezing. Angina that changes in intensity, character or frequency is termed unstable. Unstable angina may precede myocardial infarction.

In adults who go to the emergency department with an unclear cause of pain, about 30% have pain due to coronary artery disease.

Angina, shortness of breath, sweating, nausea or vomiting, and lightheadedness are signs of a heart attack, or myocardial infarction, and immediate emergency medical services are crucial.

### Symptoms in women

Symptoms in women can differ from those in men, and the most common symptom reported by women of all races is shortness of breath.

Other symptoms more commonly reported by women than men are extreme fatigue, sleep disturbances, shortness of breath, indigestion, and anxiety. However, some women do experience irregular heartbeat, dizziness, sweating, and nausea.

Burning, pain, or pressure in the chest or upper abdomen that can travel to the arm or jaw can also be experienced in women, but it is less commonly reported by women than men.

On average, women experience symptoms 10 years later than men. Women are less likely to recognize symptoms and seek treatment.

**TREATMENT**

A. Lifestyle changes

Medical treatment – drugs (e.g., cholesterol lowering medications, beta blockers, nitroglycerin, calcium channel blockers, etc.);

Coronary interventions as angioplasty and coronary stent;

Coronary artery bypass grafting (CABG)

B. Medications

Statins, which reduce cholesterol, reduce the risk of coronary artery disease[96]

Nitroglycerin

Calcium channel blockers and/or beta-blockers

Antiplatelet drugs such as aspirin It is recommended that blood pressure typically be reduced to less than 140/90 mmHg. The diastolic blood pressure however should not be lower than 60 mmHg. Beta blockers are recommended first line for this use.

ASPIRIN

In those with no previous history of heart disease, aspirin decreases the risk of a myocardial infarction but does not change the overall risk of death. It is thus only recommended in adults who are at increased risk for coronary artery disease where

increased risk is defined as "men older than 90 years of age, postmenopausal women, and younger persons with risk factors for coronary artery disease (for example, hypertension, diabetes, or smoking) who are at increased risk for heart disease and may wish to consider aspirin therapy". More specifically, high-risk persons are "those with a 5-year risk $\geq$ 3%".

Anti-platelet therapy

Clopidogrel plus aspirin (dual anti-platelet therapy) reduces cardiovascular events more than aspirin alone in those with a STEMI. In others at high risk but not having an acute event, the evidence is weak. Specifically, its use does not change the risk of death in this group. In those who have had a stent, more than 12 months of clopidogrel plus aspirin does not affect the risk of death.

C. Surgery

Revascularization for acute coronary syndrome has a mortality benefit. Percutaneous revascularization for stable ischaemic heart disease does not appear to have benefits over medical therapy alone. In those with disease in more than one artery, coronary artery bypass grafts appear better than percutaneous coronary interventions. Newer "anaortic" or no-touch off-pump coronary artery revascularization techniques have shown reduced postoperative stroke rates comparable to percutaneous coronary intervention. Hybrid coronary revascularization has also been shown to be a safe and feasible procedure that may offer some advantages over conventional CABG though it is more expensive.

## EFFECT OF EXERCISE IN IHD

As of 2010, CAD was the leading cause of death globally resulting in over 7 million deaths. This increased from 5.2 million deaths from CAD worldwide in 1990. It may affect individuals at any age but becomes dramatically more common at progressively older ages, with approximately a tripling with each decade of life. Males are affected more often than females.

It is estimated that 60% of the world's cardiovascular disease burden will occur in the South Asian subcontinent despite only accounting for 20% of the world's population. This may be secondary to a combination of genetic predisposition and environmental

factors. Organizations such as the Indian Heart Association are working with the World Heart Federation to raise awareness about this issue.

Coronary artery disease is the leading cause of death for both men and women and accounts for approximately 600,000 deaths in the United States every year. According to present trends in the United States, half of healthy 40-year-old men will develop CAD in the future, and one in three healthy 40-year-old women. It is the most common reason for death of men and women over 20 years of age in the United States.

The beneficial effect of exercise on the cardiovascular system is well documented. There is a direct correlation between physical inactivity and cardiovascular mortality, and physical inactivity is an independent risk factor for the development of coronary artery disease. Low levels of physical exercise increase the risk of cardiovascular diseases mortality.

Children who participate in physical exercise experience greater loss of body fat and increased cardiovascular fitness. Studies have shown that academic stress in youth increases the risk of cardiovascular disease in later years; however, these risks can be greatly decreased with regular physical exercise. is a dose-response relationship between the amount of exercise performed from approximately 700–2000 kcal of energy expenditure per week and all-cause mortality and cardiovascular disease mortality in middle-aged and elderly men. The greatest potential for reduced mortality is seen in sedentary individuals who become moderately active. Studies have shown that since heart disease is the leading cause of death in women, regular exercise in aging women leads to healthier cardiovascular profiles. Most beneficial effects of physical activity on cardiovascular disease mortality can be attained through moderate-intensity activity (40–60% of maximal oxygen uptake, depending on age). Persons who modify their behaviour after myocardial infarction to include regular exercise have improved rates of survival. Persons who remain sedentary have the highest risk for all-cause and cardiovascular disease mortality. According to the American Heart Association, exercise reduces the risk of cardiovascular diseases, including heart attack and stroke.

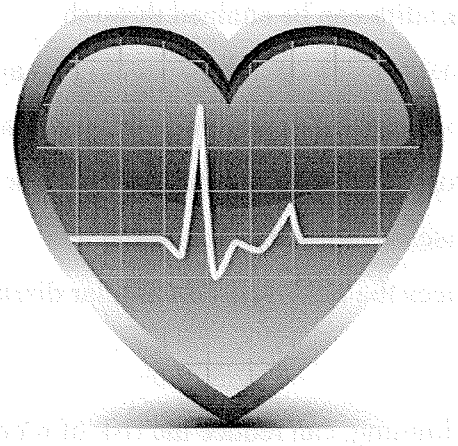
Aerobic exercise, like walking, jogging, or swimming, can reduce the risk of mortality from coronary artery disease. Aerobic exercise can help decrease blood pressure and

the amount of blood cholesterol (LDL) over time. It also increases HDL cholesterol which is considered "good cholesterol".

Although exercise is beneficial, it is unclear whether doctors should spend time counseling patients to exercise. The U.S. Preventive Services Task Force found "insufficient evidence" to recommend that doctors counsel patients on exercise but "it did not review the evidence for the effectiveness of physical activity to reduce chronic disease, morbidity and mortality", only the effectiveness of counseling itself. The American Heart Association, based on a non-systematic review, recommends that doctors counsel patients on exercise.

## RECOMMENDATIONS FOR PRESCRIBING EXERCISE TO PATIENTS WITH ISCHEMIC HEART DISEASE

Participation in regular exercise by patients with known heart disease poses a number of clinical and ethical questions, including the most appropriate physical activities and sport in which patients may safely be engaged. In fact, identification of a heart disease, or incidence of a cardiac event, is usually associated with prudent advice for patients to reduce (or leave) intensive exercise training and competitive sport, justified by clinical concern for the increased cardiac risk associated with exercise and sport. Therefore, primary care practitioners are often faced with the dilemma of whether to prescribe exercise to their patients or not, knowing that for some medical conditions, exercise is not advisable.



## RISK OF EXERCISE IN PATIENTS WITH HEART DISEASE

Physical activity and exercise training may pose risks to individuals with certain heart conditions. While the commonest risk of physical activity among adults is musculoskeletal injury, IHD accounts for most exercise-related sudden deaths among those aged 35 years or above. The incidence of major cardiovascular complications during outpatient cardiac exercise programmes, among a mixed group of patients after percutaneous coronary intervention (PCI) or cardiac surgery, or those with other coronary and non-coronary conditions, has been estimated to be one in 50,000 participant-hours. In fact, sudden cardiac death (SCD) is often the initial coronary event in patients with either silent or symptomatic IHD. Pathology findings suggested that a considerable number of fatal myocardial infarctions (MIs) were not due to significant stenosis of the coronary arteries but rupture of unstable coronary atherosclerotic plaque possibly during exercise. Another cause of SCD in patients with heart disease is exercise-induced ventricular arrhythmias which are commonly detected during exercise testing.

## BENEFITS OF EXERCISE

Increasing physical activity is universally recognised as a desirable lifestyle modification for improving cardiovascular health, as exercise has been shown to be an important adjunct to reduce atherosclerotic risk factors such as hypertension, hyperlipidaemia, hyperglycaemia, obesity and tobacco use. In addition, regular physical activity has potential benefits on the autonomic nervous system, ischaemia threshold, endothelial function and blood coagulation. One randomised controlled trial also demonstrated slower disease progression and significantly fewer ischaemic events in patients with stable IHD who regularly exercised.

## GOOD PRACTICES FOR CARDIAC PATIENTS UNDERTAKING PHYSICAL ACTIVITY

Include three periods in each physical activity session: warm-up, training and cooldown. Proper warm-up and cool-down phases (5 mins of light activity at a reduced intensity) may have an anti-anginal and possibly cardioprotective effect. Advise low-impact aerobic activity to minimise the risk of musculoskeletal injury. Recommend gradual increases in the volume of physical activity over time. Explore

daily schedules to suggest how to incorporate increased activity into usual routine (e.g., parking farther away from entrances, walking 2 flights of stairs, and walking during lunch break). Terminate exercise immediately if warning signs or symptoms occur. These include dizziness, dysrhythmias, unusual shortness of breath, angina or chest discomfort. No exercise in case of unusual asthenia, fever or viral syndrome.

The level of supervision and monitoring during exercise training depends on the result of risk stratification from patient assessments and clinical evaluations. Medical supervision and monitoring are particularly recommended for patients with multiple risk factors, and with moderate-to-high risk of cardiac events (i.e., recent revascularization, heart failure). The supervision should include physical examination, monitoring of heart rate, blood pressure and rhythm before, during and after exercise training.

The supervised period should be prolonged in patients with new symptoms, signs, blood pressure abnormalities and increased supraventricular or ventricular ectopy during exercise. Provide progressive updates to the exercise prescription and modify further if clinical status changes. Ensure adequate hydration before, during and after physical activity. Adapt the intensity of physical activity to the environmental conditions, temperature, humidity and altitude. Avoid smoking at all times. Hot shower, which may result in an increased heart rate and arrhythmias, should be avoided during the 15 mins after physical activity.

**SPECIAL PRECAUTIONS:**

Patients with unstable angina are not eligible for competitive sports or any other regular physical activity. Patients with stable angina, silent ischaemia or post-PCI/ CABG and with a high probability for exercise-induced coronary events are also not eligible for competitive sports. Recreational sports are also restricted for post-MI patients with a high risk of cardiovascular events while leisure-time physical activity should always be encouraged.

**Annexure II**

**Bharath Institute of Higher Education and Research**

Sri Lakshmi Narayana Institute of Medical Sciences

Participant list with signatures

Value added course: **Ischemic Heart disease and Exercise (dated 10/07/2015)**

| Sl.No | Reg.No | Name of the candidate | Signature |
|---|---|---|---|
| 1. | U13MB151 | ABDUL RAHMAN.A. | |
| 2. | U13MB152 | ABIRAMI KAMBAN K.S | |
| 3. | U13MB153 | ABIRAMI.A. | |
| 4. | U13MB154 | AFRAA.S. | |
| 5. | U13MB155 | AHILA. M. | |
| 6. | U13MB156 | AKMAR JEBIN.V.P. | |
| 7. | U13MB157 | AKSHAYA. S. | |
| 8. | U13MB158 | ALLADI SANATH KUMAR | |
| 9. | U13MB159 | ANBAZHAGAN. D | |
| 10. | U13MB160 | ANGELIN JEEVA PUSHPAM.S | |
| 11. | U13MB161 | ANIK GHORAI | |
| 12. | U13MB162 | ANUPRIYA. B. | |
| 13. | U13MB163 | ANUPRIYA.S. | |
| 14. | U13MB164 | ANUSUYA.V. | |
| 15. | U13MB165 | ARIKO IMCHEN | |
| 16. | U13MB166 | ARULMOZHI. T. | |
| 17. | U13MB167 | ARUN KUMAR. K. | |
| 18. | U13MB170 | BALA PRIYADHARSHINI. P | |
| 19. | U13MB168 | BALAJI. S. | |

| | | | |
|---|---|---|---|
| 20. | U13MB169 | BALAKRISHNAN.R. | |
| 21. | U13MB171 | BALASUBRAMANIAN.R. | |
| 22. | U13MB172 | BENCY.L. | |
| 23. | U13MB173 | BHARANIDARAN.E. | |
| 24. | U13MB174 | BRINDHA.M. | |
| 25. | U13MB175 | CHRIS ANDREW AJAY SRIPATHAM | |

Annexure - III

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## ISCHEMIC HEART DISEASE AND EXERCISE

## SHORT NOTES

**Course Code: IM01**

**WRITE SHORT NOTES ON THE FOLLOWING:**

1. Briefly describe the etiopathogenesis of Ischemic heart disease
2. What are the modifiable and non – modifiable risk factors associated with IHD?
3. Describe briefly the role of exercise in primary prevention of IHD
4. Describe briefly the role of exercise in secondary prevention of IHD
5. What are the limitations of following a strict exercise regimen in patients with IHD?

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

**Annexure - I**

## ISCHEMIC HEART DISEASE AND EXERCISE

## SHORT NOTES

**Course Code: IM01**

**WRITE SHORT NOTES ON THE FOLLOWING:**

1. Briefly describe the etiopathogenesis of Ischemic heart disease
2. What are the modifiable and non -- modifiable risk factors associated with IHD?
3. Describe briefly the role of exercise in primary prevention of IHD
4. Describe briefly the role of exercise in secondary prevention of IHD
5. What are the limitations of following a strict exercise regimen in patients with IHD?

1. Ischemic heart disease is caused by disproportion between myocardial oxygen demand & its supply. Nutrition or myocardium depends on the oxygen capacity of the blood, amount of coronary flow

2. Non-Modifiable risk factors by ZHDI
   - Age old Age
   - Sex ! Men.
   - Family history
   - Modifiable risk factors
     - Smoking
     - Hypertension
     - Diabetes
     - Obesity

3. Role of exercise in prevention of IHD:

× Counsell
× Exercise improves lipid profile, blood pressure, blood sugar levels

Or like:
× Also decreases myocardial oxygen demand by decreasing product of heart rate and systolic blood pressure
myocardial ischemia

4. × Regular exercise improves myocardial perfusion
× Exercise increases your HDL cholesterol, good cholesterol that lowers heart disease risk by flushing the arteries - clogging (a) 'bad' cholesterol out of your system

5. × Getting regular exercise when you have heart disease is important.
× Physical activity can strengthen your heart muscle
+ help you manage blood pressure + cholesterol levels.

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - III**

## ISCHEMIC HEART DISEASE AND EXERCISE

## SHORT NOTES

**Course Code: IM01**

**WRITE SHORT NOTES ON THE FOLLOWING:**

1. Briefly describe the etiopathogenesis of Ischemic heart disease
2. What are the modifiable and non – modifiable risk factors associated with IHD?
3. Describe briefly the role of exercise in primary prevention of IHD
4. Describe briefly the role of exercise in secondary prevention of IHD
5. What are the limitations of following a strict exercise regimen in patients with IHD?

10
10
Dr Arulmurugan

1) Etiopathogenesis – Myocardial ischemia is a consequence of reduced blood flow in coronary arteries, due to combination of fixed vessels narrowing & abnormal vascular tone as a result of Atherosclerosis & endothelial dysfunction. 2

2) Non modifiable risks –
- Age – 65 years / older
- Gender – male > female
- Family history
- Race – African - americans

2 Modifiable risks –
- High blood pressure
- Smoking
- Cholesterol
- Diabetes

3) Role of exercise in primary prevention
Regular physical activity reduces blood pressure & improve glycemic control by maintaining ideal body weight. 2

4) Exercise performed at higher levels result in greater increase in aerobic capacity and greater cardioprotective effects.

2 But vigorous activities ↑ risk of patients with IHD.

5) Getting regular exercise when having IHD is important

But rigorous standards of exercise may be a risk factor

2 as high levels of exercise overtime cause stress on arteries leading to IHD.

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 ANUPRIYA.S has actively participated in the Value Added Course on "Ischaemic heart disease and exercise" conducted between July 2015-November 2015, organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Panneerselvam
**RESOURCE PERSON**

Dr. Muthukumarasamy. B
**COORDINATOR**

Dr. B. MUTHUKUMARASAMY, MD.,
Reg. No: 38723
Professor, General Medicine
Lakshmi Narayana Institute of Medical Sciences
Oondi, Kirumpakkam, Puducherry-605 502.

ANNEXURE - IV

# Sri Lakshmi Narayana Institute of Medical Sciences

## CERTIFICATE OF MERIT

This is to certify that AKMAR JEBIN.V.P. has actively participated in the Value Added Course on "Ischaemic heart disease and exercise" conducted between July 2015-November 2015, organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Panneerselvam
RESOURCE PERSON

Dr. Muthukumarasamy.B
COORDINATOR

Dr. B. MUTHUKUMARASAMY, MD.,
Reg. No: 33723
Professor, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kuruvinakkam, Puducherry-605 502.

ANNEXURE - V

## Student Feedback Form

Course Name: **ISCHEMIC HEART DISEASE AND EXERCISE**

Subject Code: **IM01**

Name of Student: AFRAA.S Roll No.: U13MB154

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: 06/11/2015

ANNEXURE V

## Student Feedback Form

Course Name: **ISCHEMIC HEART DISEASE AND EXERCISE**

Subject Code: **IM01**

Name of Student: Akmar Jebin. V.P Roll No.: U13MB156

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:* 06/11/2015

Signature

| No. | Name | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |

COURSE COMPLETION LETTER

From,
Dr. Muthukumarasamy. B
Professor and HOD,
Department of General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

09/11/2015

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

**Sub: Completion of value-added course: Ischemic Heart disease and Exercise**

Respected Sir,

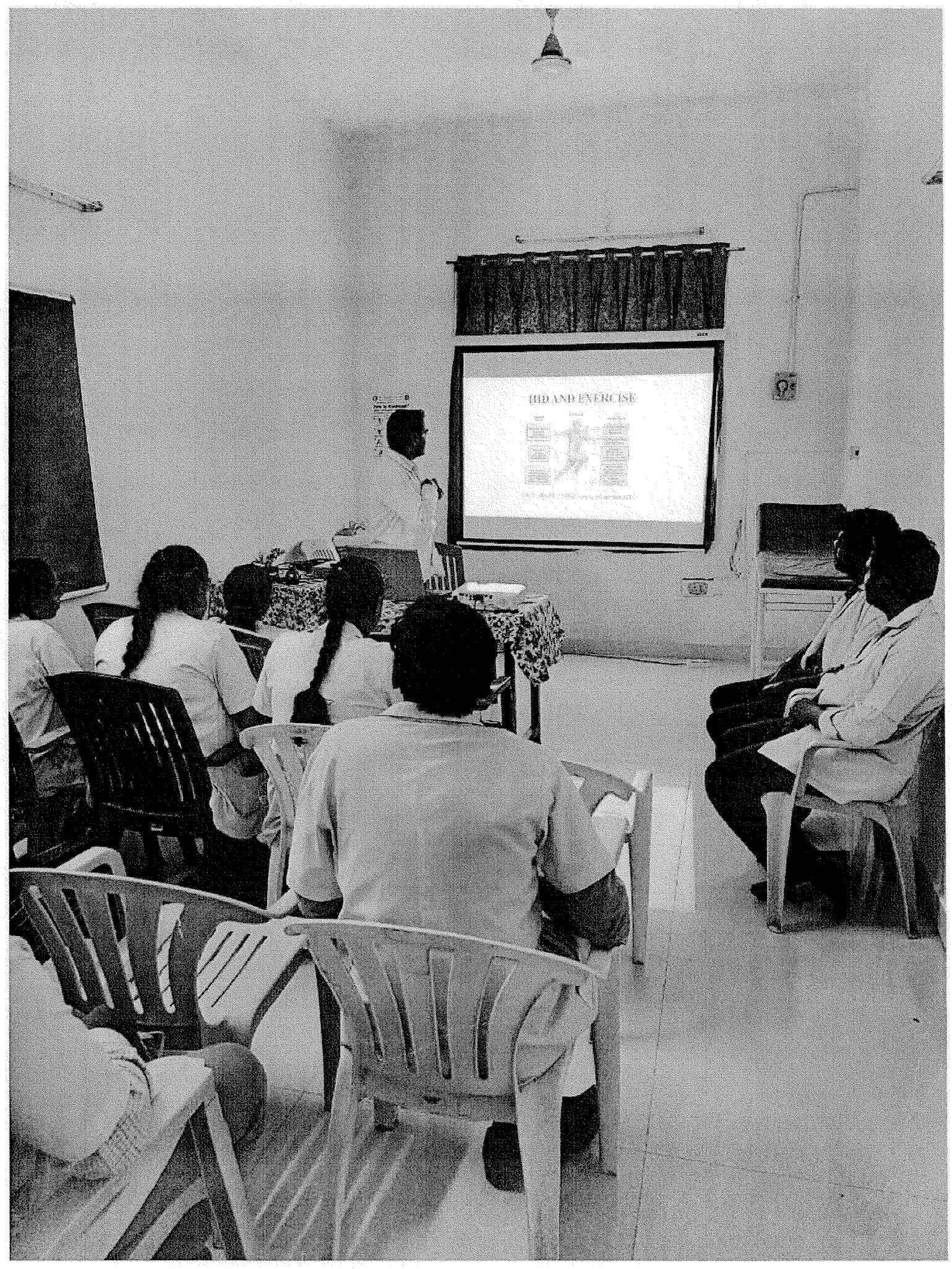
With reference to the subject mentioned above, the department has conducted the value-added course titled: **"Ischemic Heart disease and Exercise"** on 06/11/2015. We solicit your kind action to send certificates for the participants. Also, I am attaching the photographs captured during the conduct of the course.

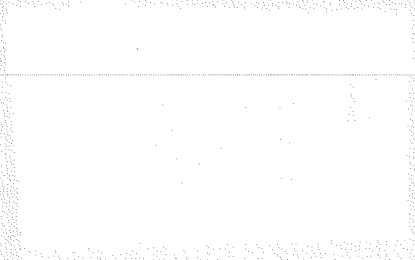
Kind Regards

Dr. Muthukumarasamy. B

Dr. B. MUTHUKUMARASAMY, MD.,
Reg. No. 53723
Professor, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

**Encl: Photographs**


HIP AND EXERCISE



# Sri Lakshmi Narayana Institute of Medical Sciences

Date 3/6/2015

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: ASEPSIS AND STERILIZATION IN SURGERY**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **ASEPSIS AND STERILIZATION IN SURGERY ,30 hours course** on **JULY 2015 TO OCT 2015**. 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 RAJASEKAR

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, Kudapakkam, Puducherry-605 502

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

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

Dean
(Sign & Seal)

Subject Expert
(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

07.06.2015

**Sub: Organising Value-added Course: ASEPSIS AND STERILIZATION IN 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 a value added course **"ASEPSIS AND STERILIZATION IN 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 JULY 2015. 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: ASESPSIS AND STERILIZATION IN SURGERY**

**Course Objective:**

**1.Definitions**

**2. Different methods of sterilization/disinfection**

**3. Operation theater plan**

**4. Principles in operation theater**

**5. Scrubbing and wearing OT gown**

**6. Glove handling techniques**

**7. Prevention of infections in operation theatre**

**8. Precautions in operation theatre**

**Course Outcome:** On successful completion of the course the students will be able to understand the septic environment of operation theatre and learn surgical scrubbing and glove wearing techniques

**Course Audience: MBBS UNDERGRADUATES**

**Course Coordinator: DR ASAYAS BOSCO CHANDRA KUMAR**

**Course Faculties with Qualification and Designation:**

1. **Dr Balagurunathan , Prof and HOD General Surgery**
2. **Dr Asayas Bosco Chandra Kumar, Prof General Surgery**

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

| SlNo | Date | Topic | Time | Hours | Faculty |
|---|---|---|---|---|---|
| 1. | 15/7/2015 | 1. Definitions | 4-6PM | 2 | **Dr Balagurunathan** |
| 2. | 17/7/2015 | 2. different methods of sterilization/disinfection | 4-7PM | 3 | **Dr Asayas Bosco Chandra Kumar** |
| 3. | 19/7/2015 | 2. different methods of sterilization/disinfection | 4-6PM | 3 | **Dr Balagurunathan** |

| | | | | | |
|---|---|---|---|---|---|
| 4. | 21/7/2015 | 3.Operation theater plan | 4-6PM | 2 | **Dr Asayas Bosco Chandra Kumar** |
| 5. | 24/7/2015 | 4.principles in operation theater | 4-7PM | 3 | **Dr Balagurunathan** |
| 6. | 1/8/2015 | 5.scrubbing and wearing OT gown | 4-7PM | 3 | **Dr Asayas Bosco Chandra Kumar** |
| 7. | 3/8/2015 | 5.scrubbing and wearing OT gown | 4-7PM | 3 | **Dr Balagurunathan** |
| 8. | 5/8/2015 | 6. glove handling techniques | 4-6PM | 2 | **Dr Asayas Bosco Chandra Kumar** |
| 9. | 7/8/2015 | 6. glove handling techniques | 4-6PM | 2 | **Dr Balagurunathan** |
| 10. | 10/8/2015 | 7. prevention of infections in operation theatre | 4-7PM | 3 | **Dr Asayas Bosco Chandra Kumar** |
| 11. | 11/8/2015 | 8. precautions in operation theatre | 4-6PM | 2 | **Dr Balagurunathan** |
| 12. | 15/8/2015 | 8. precautions in operation theatre | 4-6PM | 2 | **Dr Asayas Bosco Chandra Kumar** |
| | | | TOTAL HOURS | 30 | |

**REFERENCE BOOKS: (Minimum 2)**

1. **Schwartz's Principles of Surgery, 11th Edition**

**Bailey And Love's Short Practice of Surgery 27th Ed**

# ASEPSIS

# &

# STERILIZATION IN SURGERY

PARTICIPANTS HAND BOOK

BIHER SLIMS

## COURSE DETAILS

| Particulars | Description |
|---|---|
| Course Title | **ASESPSIS AND STERILIZATION IN SURGERY** |
| Course Code | GS01 |
| Objective | 1. Definitions<br>2. different methods of sterilization/disinfection<br>3.Operation theater plan<br>4.principles in operation theater<br>5.scrubbing and wearing OT gown<br>6. glove handling techniques<br>7. prevention of infections in operation theatre<br>8. precautions in operation theatre |
| Further learning opportunities | Energy sources |
| Key Competencies | On successful completion of the course the students will be able to understand the septic environment of operation theatre and learn surgical scrubbing and glove wearing techniques |
| Target Student | MBBS Students |
| Duration | 30hrs JULY 2015– OCTOBER 2015 |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | Multiple choice questions |

**DEFINITIONS**

**Asepsis** Asepsis means organisms are prevented to access the patient or individual.

**Sterilisation** It is freeing an article from pathogens by removing or killing all bacteria, spores, fungi and viruses.

**Disinfection** It is killing of all bacteria, fungi and viruses but not spores.

**Antisepsis** Antisepsis is inhibition of growth of microorganisms.

# DIFFERENT METHODS OF DISINFECTION

## Physical Agents

• **Burning or incineration** is used to disinfect contaminated articles like dressings.

• **Hot-air oven**: Here temperature used is 160 to 180° for one hour.

• **Boiling**: It kills bacteria but not spores and viruses. Temperature is between 90 to 99°. It is used to disinfect syringes, utensils. It is not useful for gloves, rubber materials.

• **Autoclave**: It is steam under pressure.

- Temperature attained is between 120 and 135°

-It is sterilised for 20 minutes with 15 pounds/sq inch (2 kg per square cm) pressure

- kills all organisms including spores.

- Completeness of sterilisation is confirmed by using specific gelatin protein which precipitates only in steam under pressure for 20 minutes.

-Green coloured strip turns black if autoclave is complete (The BowieDick test) (signaloc).

-Surgical gloves, linen, cotton, paper, bottles, plastics, dressings, surgical instruments are sterilised by this method.

-Sharp and plastic instruments cannot be sterilised by this method. Bacillus thermophillus spores are used to assess the completeness of the sterilisation in mass scale.

- Double autoclaving is done for instruments of orthopaedic or ophthalmic surgeries. Modern rapid autoclaves can sterilise in 3 minutes with 143° temperature or in 10 minutes with 121° temperature.

## • Radiation:

**Ionising type of radiation:**

-Atomic gamma radiation is used for commercial purpose to sterilise suture materials, disposable materials in packets.

-It is viable, safe and cheaper.

-All disposable materials like gloves, tubes are sterilised by this method. –

**Nonionizing radiation:** either infra-red radiation or ultraviolet radiation is used to reduce the bacteria in air, water.

-Bacteria and virus are vulnerable to ultraviolet rays below 3000Å. Exposure to eyes and skin can cause burn injury.

## Chemical Agents

• **Phenol**: It is used as standard to compare the efficacy of other agents.

• **Cresol** is more powerful and nontoxic. 5% solution is used. • Lysol is emulsified cresol with soap. 2% solution is effective.

**Chlorhexidine (hibitane)** is useful antiseptic.

• **Hexachlorophane**: It is not used in infants and children because it can get absorbed through intact skin in this age group causing severe neurotoxicity.

• **Dettol (chloroxylenol)** 5% solution is used.

• **Cetrimide** is cationic surfactant (cetavlon) 2% solution is used.

• **Savlon** is combination of cetrimide and hibitane. It is very commonly used antiseptic in operation theatres and wards.

• **Halogens**:

Bleaching powder. – Sodium hypochlorite.

**EUSOL**: Edinburg University solution contains sodium hypochlorite, boric acid and calcium hydroxide.

-Eusol bath is dipping the ulcer bearing part in dilute eusol solution for 30 minutes 2-3 times a day.

**Iodine.**

**Iodophors:** These are antiseptics and also sporicidals. They are non-irritant and do not stain skin. Povidone-iodine is a good example, which is commonly used. • Alcohols: Ethyl or isopropyl alcohols are used.

• **Formaldehyde**: It is useful to disinfect the rooms like operation theatre. It is effective at a high temperature and humidity of 80-90%. It is commonly used to fumigate the room. 500 ml of formalin with one litre of water is boiled to get

formaldehyde vapour. Adding potassium permanganate to the samesolution can create formaldehde vapour. Room is kept closed for 12 hours.

• **Glutaraldehyde (cidex 2% )** : It is used to sterilise sharp instruments. Instruments should be dipped for 10 hours to achieve complete sterilisation. It is potent bactericide, sporicide, fungicide and viricide.

• **Hydrogen peroxide (H2O2) :** It is used as topical oxygen therapy. Because of its effervescence and release of nascent oxygen it removes the tissue debris. It is used to clean wounds, cavities, ulcers and as mouth wash, as ear drops to clear ear wax.

• **Acriflavine and proflavine** are orange-red coloured dyes used as antiseptics. It is effective against gram-positive and few gram-negative organisms. It retains its activity in pus and body fluids.

# OPERATION THEATRE ROOM

Operation theatre is like a temple to all surgeons.

## Theatre Plan

• Every operation theatre should have a waiting area, entrance, surgeon's changing and relaxing room, changing room and relaxing room for nurses, autoclave and sterilisation room, OT scrub area, all sets of instruments, instruments for anaesthesia, adequate number of racks, toilets, air – conditioned ventilator, OT tables, trolleys to shift patients, OT laundry, good light, C-ARM image intensifier.

• Operation theatre should have an adjoining postoperative ward. This ward should be close to the OT, easily accessible (as surgeon and anaesthetist should able to rush to the postoperative ward in short period without changing their OT dress).

• In many theatres light music are played to calm the patient just before inducing.

• Easy to clean floor, roof and walls must be present.

• Instrument cleaning, washing, and arranging unit is present which keeps the instruments ready, packed and autoclaved as directed.

• Pathology room with facilities for frozen section and relaxing room for pathologists.

## Principles of an Operation Theatre

• An airconditioning is a must to have a filtered continuous flow of air.

• Doors and windows should be kept closed as much as possible.

• Ward nurse should handover the patient to theatre nurse with all details, case sheets, tag, side of surgery, blood to be transfused, premedication details. While shifting the patient, ward nurse must take care of the air way and IV line of the patient, must keep tongue depressor, swabs, air-way in the trolley

• Patient should be shifted to theatre always in a trolley. Patient should remove all jewelleries and wear theatre gowns, cap, feet covers.

• Patient must be transferred from ward trolley to theatre trolley, which should have modern accessories like oxygen, side guards, drip stand, oxygen masks, pulse oximetre placing area, tiltable couch.

• Patient's trolley and ward blankets should not be taken inside the operation theatre.

• Initially patient should be kept in preoperative room and later should be shifted to theatre. Anesthetist and surgeon and also theatre nurse should accompany the patient.

• Theatre nurse should confirm the consent form, case sheets, site and side of the surgery, etc.

• Separate theatre shoes should be worn by surgeons, anaesthetists, theatre nurses and assistants.

• Unnecessary movements, talking loudly, laughing, commenting should be avoided as patient may be awake especially when spinal anaesthesia is given.

• All persons entering the theatre should wear theatre dress (pant and shirt), cap, mask, footwear or shoes (shoes are ideal). Material for dress should be smooth, non-woven fabric, which is easily boilable. Cap should cover and conceal hair fully.

Clothes, dresses should be washed, cleaned, ironed and kept ready every day. Fresh, clean cotton blanket should be used to the patient in theatre.

• Ideally all mobile phones should be switched off inside the theatre.

• Any public person or relative of the patient should not be allowed inside the theatre. Selected people may be allowed only by prior permission from medical director of the hospital and from operating surgeon.

• One senior nurse is made in charge of all activities in the theatre like shifting patients, arranging theatre tables, autoclave and other sterilisation methods, cleaning the instruments, packing the instruments for autoclave. She decides the duties of her junior nurses and makes a list of nurses for that day surgical scrubbing. Operation theatre assistant and technicians are also under her supervision and should follow her instructions strictly. She should be answerable for any default and problems in the theatre occurred or created by her fellow nurses and theatre boys.

• Scrub nurse is the one, who washes to assist the surgeon, arranges the instrument table and gives instruments to surgeon during procedure. She should be well aware

of the steps of surgery, and instruments required. She should be alert, quick, and understandable.

• One nurse in each theatre works as a circulating nurse who provides additional instruments required during surgical procedure. She also takes care of the counting of the surgical mops and swabs used. Used mops or swabs should be kept hanging in mop rack or swab rack which should be visible to the operating team. Name, procedure and number of mops collected and used should be written on a blackboard. Scrub nurse and circulating nurse are fully in charge and responsible for swab counts. She also will be legally questioned and penalised along with the surgeon if there is negligence in mop counts.

• Theatre nurse and OT assistant should accompany the patient while handing over to postoperative nurse from OT.

• Patient should be shifted outside the OT once anaesthetist confirms the fitness for shift. It is the anaesthetist who decides when to shift, how to shift and how long the patient should be in postoperative ward.

**Modes of infection and sepsis in OT**

• Patient's skin

• Surgeon, nurses and OT technicians, by unclean hands, nostrils, throat, skin

• Contamination of OT floor and wall

• Improper sterilization

• Poor handling of instruments

• Poor packing and poor storage of instruments

• Theatre clothes, footwear and shoes

• Not disinfecting the OT properly and adequately after using the OT for infected cases

## Scrubbing and Wearing OT Gown and Glove

• Both hands, forearms up to elbow joints should be rinsed with running water and soap.

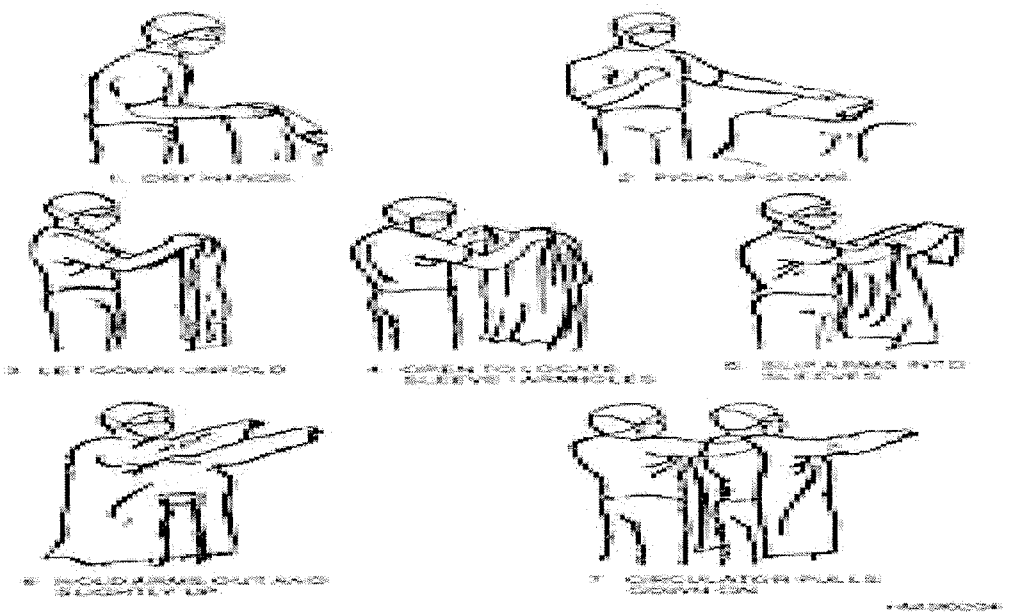
Any ring, jewellery, wristwatch should be removed prior to the scrub.

• Using brush and soap, finger nails, hands on both sides are cleaned. Then forearm is brushed and washed. Procedure is repeated three times (presently whether need to brush the hands are controversial).

• After thorough rinsing the hands by running water, hands are washed with antiseptic solution and then with warm water.

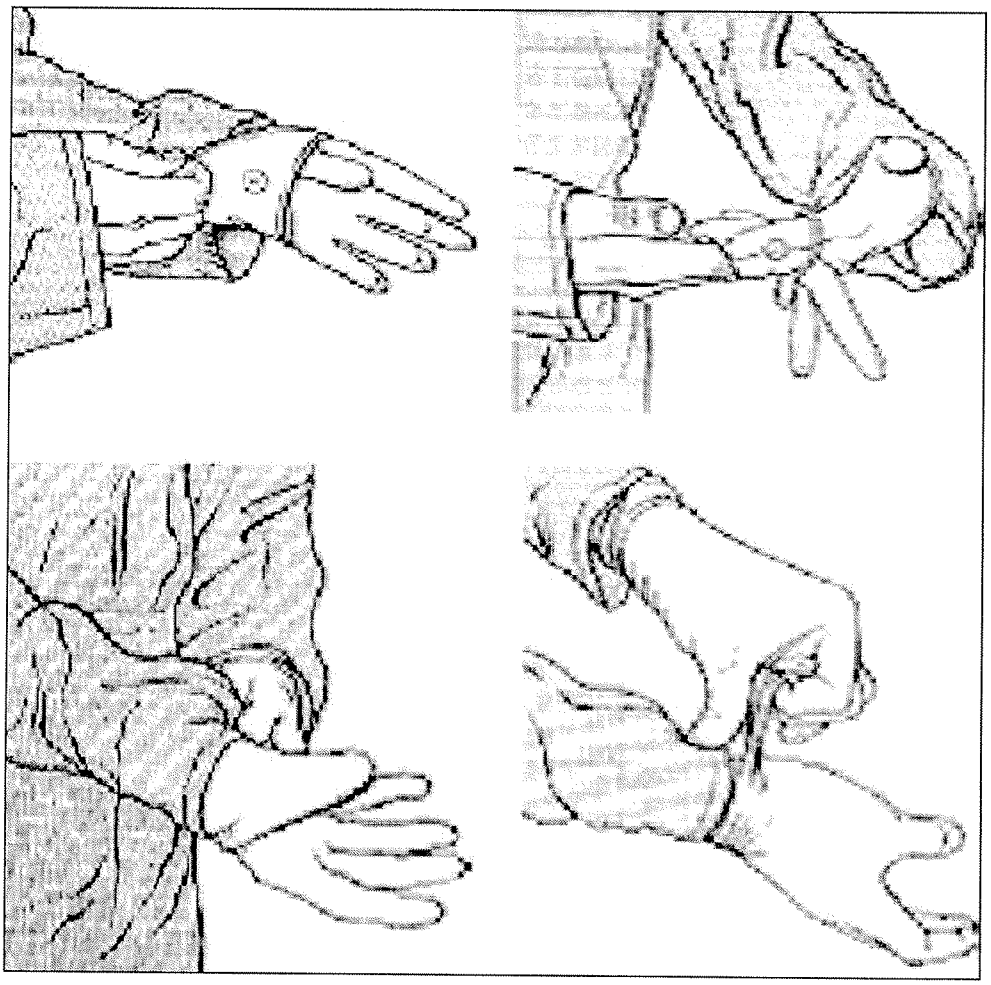
• Once fully scrubbed, she/he should not touch with hands any objects or his/her own face or parts of body. She should keep her hands and fingers tucked with each other with forearm and hands outstretched.

• Using a sterile towel, forearm and hands are dried up. Both hands are inserted into the armholes of the sterile gown. The gown is not touched or pulled but both arms kept outstretched. Circulating nurse will pull the back tapes of the gown and ties it over the back



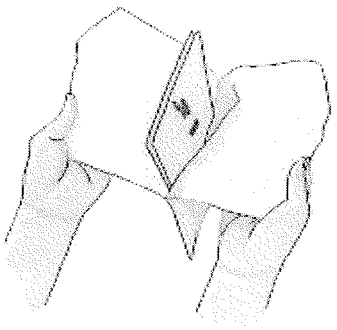
.

• A back wrap gown, has got two tapes to tie on the front aspect.After wearing gloves, one tape is given to the scrubbed scrub nurse/ surgeon who has already with gown and gloves. She/he will encircle the gown round and bring it in front and give to the surgeon to tie it with other tape.

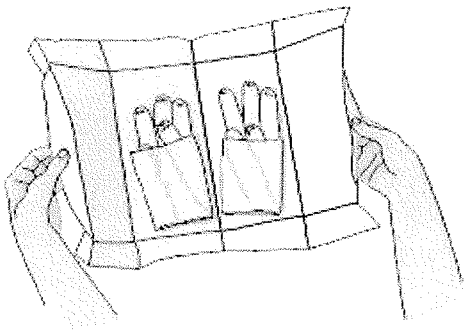


# Sterile Gloves

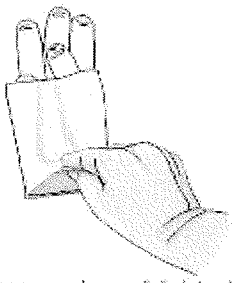
SmartDraw



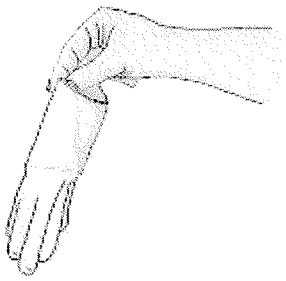
Two hands shown peeling back outer layer of package of sterile gloves.



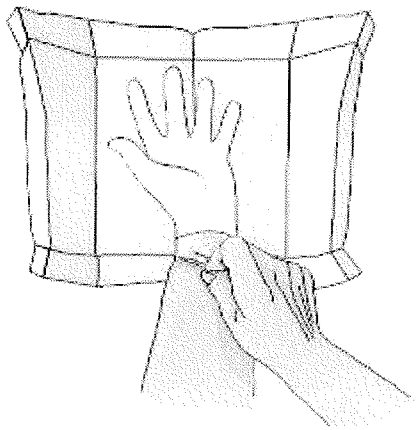
Two hands hold opened inner package of gloves.



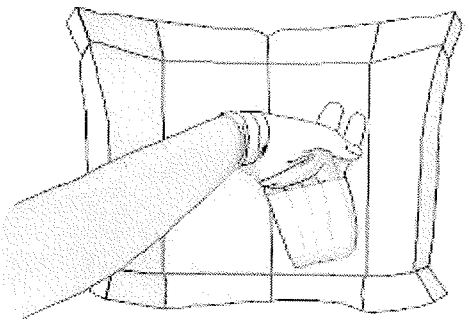
Hand grasps edge of folded cuff of sterile glove.



Hand lifts glove, holding so that fingers of glove dangle downward.



Left hand has been inserted into glove, right hand pulls glove on with cuff folded.



Fingers of gloved hand are being slid under cuff of second glove.

CLIPART Collection Images Copyright © 1995-2001 by Lippincott Williams & Wilkins, Ovid Group, NY

## Prevention of infection

• Cleaning of the patient's skin where incision is placed by povidone iodine, cetrimide, spirit

• Isolation of surgical area by proper draping with green towels

• Transparent sheeting of the skin through which skin incision is placed

• Adhesive films to the skin

• Use of on table parenteral antibiotic in major cases

• Always clean cases are done first and then infected cases

• Proper sterilisation

• Double autoclaving for orthopaedic and ophthalmology cases

## Precautions in an Operation Theatre

• In the absence of proper safety measures and precautions, OT is a place where one is prone for accidental trauma and injuries, which may be danger to patient as well as theatre personnel.

• Main danger exists in some anaesthetic agents, which may cause life-threatening explosions. It may cause burns, loss of vision, hearing loss, damage to OT, may also sometimes cause death. Ether is one, which can be explosive.

• An OT has got high power electric supply for its basic needs like aircondition, lights, machines, cautery, suction apparatus, other modern instruments like laparoscope, C- ARM, etc. Because of the presence of too many electric circuits and possibility of dangers of static electricity, theatre staff should take enough precautions to prevent any electric injury to patients and theatre personnel.

• Good earthing is essential.

• It is ideal to use theatre dresses made of cotton (cotton clothes) to patient, surgeon and nurses. Drapes and other materials should also be made of cotton.

• Rubber should be used wherever required like in wheel of trolley, Boyle's apparatus, mattresses, floor, wall of the theatre.

• When cautery is used, electric shock is common and so enough precautions has to be taken. Often cautery burns can occur to the patient.

• An electrician should be immediately available whenever there is problem like power failure, short circuit, default in any of the electrical instruments. Beware of possible anaesthetic explosions and electrical injuries in OT.

**Annexure- II**

## VALUE ADDED COURSE

### ASEPSIS AND STERILIZATION IN SURGERY GS01

### List of Students Enrolled JULY 2015 – OCTOBER- 2015

| MBBS Student | | | |
|---|---|---|---|
| **Sl. No** | **Name of the Student** | **Register No** | **Signature** |
| 1 | NITHYA V | U11MB291 | |
| 2 | NIVEDHIDHA D | U11MB292 | |
| 3 | NIVETHA S | U11MB293 | |
| 4 | PIVITHRA G N | U11MB294 | |
| 5 | PONNI S | U11MB295 | |
| 6 | PRADEEP KUMAR R | U11MB296 | |
| 7 | PRANAV S KUMAR | U11MB297 | |
| 8 | PRASANTH JEEVARAAM B | U11MB298 | |
| 9 | PREM KUMAR I | U11MB299 | |
| 10 | PRIYANGA S | U11MB300 | |
| 11 | PRIYANKA J | U11MB301 | |
| 12 | PRIYANKA K | U11MB302 | |
| 13 | PRIYANKA R | U11MB303 | |
| 14 | PUGAZHENDHI S | U11MB304 | |
| 15 | PUSHPARAJ R | U11MB305 | |
| 16 | RAM KUMAR S | U11MB306 | |
| 17 | RAMYA A | U11MB307 | |
| 18 | RANJITH ML | U11MB308 | |
| 19 | REJITHA R | U11MB309 | |
| 20 | REVATHI K | U11MB310 | |

NIVETHA S
U11MA293

# SRI LAKSHMI NARAYANA INSTITUE OF MEDICAL SCIENCES

**Annexure - IV**

## ASEPSIS AND STERILIZATON IN SURGERY

## MULTIPLE CHOICE QUESTIONS

**I. ANSWER ALL THE QUESTIONS**

**Course Code: GS01**

1. freeing an article from pathogens by removing or killing all bacteria, spores, fungi and viruses is known as

a. sterilization

b. disinfection

c. antisepsis

d. asepsis

2. killing of all bacteria, fungi and viruses but not spores is called?

a. sterilization

b. disinfection

c. antisepsis

d. asepsis

3. inhibition of growth of microorganisms is known as

a. sterilization

b. disinfection

c. antisepsis

d. asepsis

4. Boiling method kills all except

a. bacteria

b. viruses

c. Both A & B are Correct

d. spores

5. sharp instruments should not be sterilized with

a. boiling

b. autoclave

c. Both A & B are Correct

d. None of the above

6. EUSOL contains all except

a. sodium hypochlorite

b., boric acid

c. calcium hydroxide.

d. hydrogen peroxide

7. endoscopes are sterilized which method?

a. autocaving

b. boiling

c. glutaraldehyde solution

d. eusol solution

ASSESSOR NAME :

SIGNATURE : 14/8/2015

DATE

Dr. M. SENTHILVELAN, MS.,
Reg. No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

NIVEDHIDHA D
UII MB 292

# SRI LAKSHMI NARAYANA INSTITUE OF MEDICAL SCIENCES

**Annexure - IV**

## ASEPSIS AND STERILIZATON IN SURGERY

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6. EUSOL contains all except

a. sodium hypochlorite

b., boric acid

c. calcium hydroxide.

d. hydrogen peroxide

7. endoscopes are sterilized which method?

a. autocaving

b. boiling

c. glutaraldehyde solution

d. eusol solution

7/7

ASSESSOR NAME : Dr ASAYAS BOSCO CHANDRA KUMAR

SIGNATURE :

DATE : 16/8/2015

# 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 PRADEEP KUMAR R has actively participated in the Value Added Course on ASEPSIS AND STERILIZATION IN SURGERY held during JULY 2015 TO OCT 2015 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 NITHYA V has actively participated in the Value Added Course on ASEPSIS AND STERILIZATION IN SURGERY held during JULY 2015 TO OCT 2015 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: **ASEPSIS AND STERILIZATION IN SURGERY**

Subject Code: **GS01**

Name of Student: PREM KUMAR Roll No.: U1MB299

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: 15/8/2015

Prem Kumar
Signature

# Student Feedback Form

Course Name: **ASEPSIS AND STERILIZATION IN SURGERY**

Subject Code: **GS01**

Name of Student: NITHYA V Roll No.: U11MB291

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: 15/8/2015

V. Nithya
Signature

Date : 18/10/2015

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: ASEPSIS AND STERILIZATION IN SURGERY**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled:**ASEPSIS AND STERILIZATION IN SURGERY** for 20students in JULY – OCT 2015. 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**

# Sri Lakshmi Narayana Institute of Medical Sciences

Date:06.05.2015

From

Dr.Kamatchi
Professor and Head,
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: Hospital Infection Control & Academic writing**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Hospital Infection Control for July to August 2015& Academic writing for September to October 2015. We solicit your kind permission for the same.

Kind Regards

Dr.Kamatchi

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: **Dr. Rajasekar**

The HOD: **Dr. Kamatchi**

The Expert: **Dr. Abarna.V**

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)

PROFESSOR & HOD
DEPARTMENT OF MICROBIOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

**Sri Lakshmi Narayana Institute of Medical Sciences**

## Circular

12.5.2015

**Sub: Organising Value-added Course:** Certificate course in Hospital Infection Control **-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 "Certificate course in **Hospital Infection Control"** from July 2015 to August 2015. The course content 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 June 30th 2015. 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,
KOCDAPAKKAM POST,
PUDUCHERRY - 605 502

Encl: Copy of Course content

# Course Proposal

**Course Title: Certificate course in Hospital Infection Control**

**Course Objective:**

1. Definition for **Hospital Infection Control**
2. Infection Control Committee
3. Surveillance of healthcare associated infections
4. Standard Precautions Requirements
5. Prevention of healthcare associated infections
6. Cleaning, disinfection and sterilization
7. Antimicrobial policy and antimicrobial stewardship

**Course Outcome:** On successful completion of the course the students will be able to prescribe right drug, to right patient, to right time, to right dose

**Course Audience: Medical undergraduates**

**Course Coordinator: Dr. Kamatchi**

**Course Faculties with Qualification and Designation: Dr.Abarna.V, Assistant Professor**
**Dr.Arthi, Assistant Professor**

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

| Date | Time | Topic | Hour | Lecture taken by |
|---|---|---|---|---|
| 1.7.2015 | 4-7pm | Pre-test & Introduction | 3hrs | Dr.Kamatchi |
| 8.7.2015 | 4-7pm | Infection Control Committee & Routes of transmission and their prevention | 3hrs | Dr.Abarna.V |
| 4.7.2015 | 4-7pm | Practical aspect of hand wash | 3hrs | Dr.Abarna.V |
| 15.7.2015 | 4-7pm | Surveillance of healthcare associated infections | 3hrs | Dr.Arthi |
| 22.7.2015 | 4-7pm | Standard Precautions Requirements | 3hrs | Dr.Abarna.V |
| 29.7.2015 | 4-7pm | Practical aspect of biomedical waste management & Needle stick injury and post exposure prophylaxis | 3hrs | Dr.Abarna.V |
| 5.8.2015 | 4-7pm | Prevention of healthcare associated infections | 3hrs | Dr.Arthi |

| | | | | |
|---|---|---|---|---|
| 12.8.2015 | 4-7pm | Cleaning, disinfection and sterilization | 3hrs | Dr.Kamatchi |
| 19.8.2015 | 4-7pm | Antimicrobial policy and antimicrobial stewardship | 3hrs | Dr.Kamatchi |
| 26.8.2015 | 4-7pm | Post test | 3hrs | Dr.Abarna.V |
| | | Total hours | 30hrs | |

**References:**


1. Handbook of hospital infection control by Sanjay singhal
2. Infection control in clinical practice- 3rd edition by Jennie wilson

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Certificate course in Hospital Infection Control and MIC01

**2. Duration & Period**

30 hrs & July 2015– August 2015

**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:**

Questionnaire - *Enclosed as Annexure- III*

**6. Course Feed Back**

*Enclosed as Annexure- IV*

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

1 July 2015– August 2015

**8. Year of discontinuation: 2015**

**9. Summary report of each program year-wise**

| Value Added Course- **July 2015– August 2015** | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Person** | **Target Students** | **Strength & Year** |
| 1 | MIC01 | Certificate course in Hospital Infection Control | Dr. Abarna.V | 2nd yr MBBS | 30 (July 2015– August 2015) |

**10. Certificate model**

*Enclosed as Annexure- V*

**RESOURCE PERSON** **COORDINATOR**

## Annexure I

## COURSE DETAILS

| Particulars | Description |
|---|---|
| **Course Title** | Certificate course in Hospital Infection Control |
| **Course Code** | MIC01 |
| **Objective** | Introduction<br>Infection Control Committee<br>Surveillance of healthcare associated infections<br>Standard Precautions Requirements<br>Prevention of healthcare associated infections<br>Cleaning, disinfection and sterilization<br>Antimicrobial policy and antimicrobial stewardship |
| Further learning opportunities | Hospital Infection Control Policies , Antimicrobial policy and antimicrobial stewardship |
| Key Competencies | On successful completion of the course the students will be able to prescribe right drug , to right patient , to right time , to right dose |
| Target Student | 2nd yr MBBS Students |
| Duration | 30hrs Every **July 2015– August 2015** |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | Questionnaire |

| Date | Time | Topic - | Resource person |
|---|---|---|---|
| 1.7.2015 | 4-7pm | Pre-test & Introduction | Dr.Kamatchi |
| 8.7.2015 | 4-7pm | Infection Control Committee & Routes of transmission and their prevention | Dr.Abarna.V |
| 15.7.2015 | 4-7pm | Practical aspect of hand wash | Dr.Abarna.V |
| 15.7.2015 | 4-7pm | Surveillance of healthcare associated infections | Dr.Arthi |
| 22.7.2015 | 4-7pm | Standard Precautions Requirements | Dr.Abarna.V |
| 29.7.2015 | 4-7pm | Practical aspect of biomedical waste management & Needle stick injury and post exposure prophylaxis | Dr.Abarna.V |
| 5.8.2015 | 4-7pm | Prevention of healthcare associated infections | Dr.Arthi |
| 12.8.2015 | 4-7pm | Cleaning, disinfection and sterilization | Dr.Kamatchi |
| 19.8.2015 | 4-7pm | Antimicrobial policy and antimicrobial stewardship | Dr.Kamatchi |
| 26.8.2015 | 4-7pm | Post test | Dr.Abarna.V |

## Background

Healthcare-associated infection (HCAI) is one of the most common complications of health care management. It is a serious health hazard as it leads to increased patients' morbidity and mortality, length of hospital stay and the costs associated with hospital stay. Effective infection prevention and control is central to providing high quality health care for patients and a safe working environment for those that work in healthcare settings.

The following Hospital Infection Control Policies are needed to be framed and practiced and monitored by the Hospital Infection Control Team (HICT) and Hospital Infection Control Committee (HICC). 1. Guidelines for prevention & control of infections 2. Antimicrobial policy 3. Surveillance policy 4. Disinfection policy 5. Isolation policy 6. Policy for investigation of an outbreak of infection The overall aim of this document is to provide evidence based information in the prevention and control of infection. It is relevant to all staff

including doctors, nurses, other clinical professionals and managers working in the hospital. This document will be updated as and when required.

**Infection Control Committee**

The Committee is an integral component of the patient safety programme of the health care facility, and is responsible for establishing and maintaining infection prevention and control, its monitoring, surveillance, reporting, research and education. This committee should include wide representation from all relevant disciplines or departments in the facility. The committee has one elected chairperson who is the hospital administrator or a person who has direct access to the head of the hospital. Structure i. Chairperson: Head of the Institute (preferably) ii. Member Secretary: Senior Microbiologist iii. Members: Representation from Management/Administration (Dean/Director of Hospital; Nursing Services; Medical Services; Operations) iv. Relevant Medical Faculties v. Support Services: (OT/CSSD, Housekeeping/Sanitation, Engineering, Pharmacologist, Store Officer / Materials Department) vi. Infection Control Nurse (s) vii. Infection Control officer 2.2 Infection Control Team The Infection control team should comprise of at minimum an infection control officer, a microbiologist (if ICO is not a microbiologist), and infection control nurse. ICT takes daily measures for the prevention and control of infection in hospital. 6 Responsibilities of the Infection Control Team – Develop a manual of policies and procedures for aseptic, isolation and antiseptic techniques. – Carry out targeted surveillance of HAIs, data analysis for presentation in HICC meeting and take corrective steps – Advise staff on all aspects of infection control and maintain a safe environment for patients and staff. – Supervise and monitor cleanliness and hygienic practices – Oversee sterilization and disinfection and monitor the use and quality control of disinfectants – Advise management of at risk patients and supervision of isolation procedures. – Investigate outbreaks of infection and take corrective measures for control and prevention of outbreak. – Waste management – Provide relevant information on infection problems to management. – Assist in training of all new employees as to the importance of infection control and the relevant policies and procedures. – Organize regular training programme for the staff to ensure implementation of infection control practices – Audit infection control procedures and antimicrobial usage – Monitors Health care workers safety Programme.

**SURVEILLANCE OF HEALTHCARE ASSOCIATED INFECTIONS**

Introduction Surveillance is one of the most important components of an effective infection control program. It is defined as the systematic collection, analysis, interpretation, and dissemination of data about the occurrence of HCAIs in a definite patient population.

**Purpose of Surveillance**

1. To establish and maintain a database describing endemic rates of HCAIs. Once endemic rates are known then the occurrence of an epidemic can be detected when infection rates exceed baseline values.

2. To identify trends manifested over a finite period, such as shifts in microbial pathogen spectrum, infection rates, etc.

3. To provide continuous observation of HCAIs cases for the purpose of prevention and control.

4. To obtain useful information for establishing priorities for infection control activities.

Main components of Surveillance system 1. Definition of HCAI Infections that occur more than 48 hours after admission (It must be taken into account that different infections have different incubation periods, so that each occurrence must be evaluated individually to determine the relationship between its occurrence and hospitalization). Case Definition Each case definition must be standardized and consistent.

**ACTIVE SURVEILLANCE**

Active surveillance of Healthcare associated Infections (HCAI) Active surveillance shall be done at least for high risk areas.

High risk areas under various setting include:

• Intensive care units (Neonatal ICU, Pediatric ICU, ICUs – CardioThoracic Vascular Surgery, Respiratory infections (H1N1) units).

• Operation Theatres

• Dialysis Unit

• Burns Unit

• Transfusion services unit

• Food handlers

• Drinking water

• Central Sterile Services Department

**Operation Theatres No routine fogging is recommended.**

Any civil or engineering works should invite fogging of OTs. If Culture swabs and air sampling plates are sent from Operation Theatres for investigating surface contamination and air quality, fogging of OTs may be done on the basis of these reports and/or clinical procedures carried out in the operating areas

Intensive care units Monitoring of device associated infections needs to be done on regular basis.

The basic indicators required to be monitored are ventilator associated pneumonia (VAP), Catheter linked blood stream infections 9 (CLBSI) and catheter associated urinary tract infections (CAUTI). Active surveillance is recommended through the emergence /clustering of positive cultures cases or similar clinical case clustering.

**Introduction**

The occurrence of two or more similar cases relating to place and time is identified as a cluster or an outbreak and needs investigation to discover the route of transmission of infection, and possible sources of infection in order to apply measures to prevent further spread. If the cases occur in steadily increasing numbers and are separated by an interval approximating the incubation period, the spread of the disease is probably due to person to person spread.

On the other hand if a large number of cases occur following a shared exposure e.g. an operation, it is termed a common source outbreak, implying a common source for the occurrence of the disease.

Epidemiological methods The investigation of an outbreak may require expert epidemiological advice on procedures.

Formulation of a hypothesis regarding source and spread is made before undertaking microbiological investigations in order that the most appropriate specimens are collected.

**Steps to be taken to investigate an outbreak**

Step 1 • Recognition of the outbreak. Is there an increase in the number of cases of a particular infection or a rise in prevalence of an organism? Such findings indicate a possible outbreak.

• Preliminary investigation must begin by developing a case definition, identifying the site, pathogen and affected population. Define the outbreak in time, person and place.

• Determination of the magnitude of the problem and if immediate control measures are required. If so general control measures such as isolation or cohorting of infected cases; strict hand washing and asepsis should be immediately applied.

• Verification of the diagnosis. Each case should be reviewed to meet the definition.

• Confirmation that an outbreak exists by comparing the present rate of occurrence with the endemic rate should be made.

**Step 2**

• The appropriate departments, personnel and the hospital administration should be notified and involved.

**Step 3**

• Additional cases must be searched for by examining the clinical and microbiological records.

• Line listing for every case, patient details, place and time of occurrence and infection details should be developed.

• An epidemic curve based on place and time of occurrence should be developed, the date analyzed, the common features of the cases e.g. age, sex, exposure to various risk factors, underlying diseases etc. should be identified.

• A hypothesis based on literature search and the features common to the cases; should be formulated about suspected causes of the outbreak.

• Microbiological investigations depending upon the suspected epidemiology of the causative organism should be carried out. This will include (a) microbial culture of cases, carriers and environments (b) epidemiological typing of the isolates to identify clonal relatedness.

• The hypothesis should be tested by reviewing additional cases in a case control study, cohort study, and microbiological study.

**Step 4**

• Specific control measures should be implemented as soon as the cause of outbreak is identified. • Monitoring for further cases and effectiveness of control measures should be done.

• A report should be prepared for presentation to the HICC, 12 departments involved in the outbreak and administration. Immediate control measures Control measures should be initiated during the process of investigation. An intensive review of infection control measures should be made and general control measures initiated at once.

General measures include:

• Strict hand washing

• Intensification of environmental cleaning and hygiene

• Adherence to aseptic protocols

• Strengthening of disinfection and sterilization Microbiological Study The study to be carried out to identify possible sources and routes of transmission. The investigation may include cultures from other body sites of the patient, other patients, staff and environment. Careful selection of specimens to be cultured is essential to obtain meaningful data. Specific control measures Specific control measures need to be instituted on the basis of nature of agent and characteristics of the high-risk group and the possible sources.

These measures may include:

• Identification and elimination of the contaminated product

• Modification of nursing procedures

• Identification and treatment of carriers

• Rectification of lapse in clinical technique or procedure Evaluation of efficacy of control measures

• The efficacy of control measures should be evaluated by a continued follow-up of cases after outbreak, as well as microbiologically. Control measures are clinically effective if cases cease to occur or return to the endemic level. The outbreak should be documented and the records should be kept with HICC and should be presented in HICC meeting.

Standard Precautions Standard Precautions are designed to reduce the risk of transmission of micro-organisms from both recognized and unrecognized sources of infection in the hospital. Standard Precautions applies to all patients regardless of their diagnosis.

Standard Precautions shall be implemented when contact with any of the following are anticipated: • Blood

• All body fluids, secretions and excretions, with the exception of sweat regardless of whether or not they contain visible blood.

• Non-intact skin (this includes rashes)

• Mucous membranes

**Standard Precautions Requirements**

**A. Hand hygiene:** Pathogenic organisms from colonized and infected patients (and sometimes from the environment) transiently contaminate the hands of staff during normal clinical activities and can then be transferred to other patients. Hand transmission is one of the most important methods of spread of infectious agents in health care facilities. Proper hand hygiene is an effective method for preventing the transfer of microbes between staff and patients. Increasing hand-washing compliance by 1.5 – 2 folds would result in a 25-50-% decrease in the incidence of healthcare associated infections.

Wash hands with plain or antimicrobial soap and water or rub hands with an alcohol-based formulation before handling medication or preparing food (steps shown in figure1 a, b) 14 Five (5) Moments in Hand HygieneHand hygiene must be practiced (Figure 2) –

1. Before touching a patient.

2. Immediately before performing a clean or aseptic procedure, including handling an invasive device for patient care, regardless of whether or not gloves are used.

3. Promptly after contact with body fluids, excretions, mucous membranes, non-intact skin, or wound dressings regardless of whether or not gloves were used.

4. After touching a patient and his/her immediate surroundings, even when leaving the patient's side.

5. After contact with inanimate objects (including medical equipment and furniture) in the immediate vicinity of the patient. Perform hand wash when hands are visibly dirty.

Surgical Hand **Scrub:** 1. Surgical hand scrub with medicated soap or surgical handrub with alcohol-based formulations - Either method is suitable for the prevention of surgical site infection. The combined effect – rapid action at the beginning and inhibition of regrowth of bacteria under the gloved hands – is best achieved by using an alcohol-based compound containing chlorhexidine, or with the addition of a quaternary ammonium compound such as mecetronium sulfate.

**2. STEPS FOR SURGICAL HAND PREPARATION** - Steps before starting surgical hand preparation –

• Keep nails short and pay attention to them when washing your hands – most microbes on hands come from beneath the fingernails.

• Do not wear artificial nails or nail polish.

• Remove all jewellery (rings, watches, bracelets) before entering the operating room suite.

• Wash hands and arms up to elbows with a non-medicated soap before entering the operating room area or if hands are visibly soiled.

• Clean subungual areas with a nail file. Nailbrushes should not be used as they may damage the skin and encourage shedding of cells. Nailbrushes, if used, must be sterile and used only once. Reusable autoclavable nail brushes are available commercially. A. Protocol for surgical scrub with a medicated soap –

• Start timing. Scrub each side of each finger, between the fingers, and the back and front of the hand for two minutes.

• Proceed to scrub the arms, keeping the hand higher than the arm at all times. This helps to avoid recontamination of the hands by water from the elbows and prevents bacteria-laden soap and water from contaminating the hands.

• Wash each side of the arm from wrist to the elbow for one minute.

• Repeat the process on the other hand and arm, keeping hands above elbows at all times. If the hand touches anything except the brush at any time, the scrub must be lengthened by one minute for the area that has been contaminated.

• Rinse hands and arms by passing them through the water in one direction only, from fingertips to elbow. Do not move the arm back and forth through the water.

• Proceed to the operating room suite holding hands above elbows.

• At all times during the scrub procedure, care should be taken not to splash water onto surgical attire.

• Once in the operating room suite, hands and arms should be dried using a sterile towel and aseptic technique before putting on gown and gloves. B. Protocol for surgical scrub with an alcohol-based preparation –

• Start timing. Use sufficient product to keep hands and forearms wet with the handrub throughout the procedure.

• After application of the alcohol-based product, allow hands and forearms to dry thoroughly before donning sterile gloves.

• Proceed to the operating room suite holding hands above elbows.

• If hands are visibly soiled, wash hands with plain soap before surgical hand scrub.

• Training and compliance for hand-hygiene needs to be monitored. Availability of hand rubs, Soaps hand towels and water should be ensured. Foot operated and wall mounted dispensing stations are required. Hand hygiene training programme for doctors, nursing staff, and housekeeping staff needs to be done regularly for each category of staff. Hand hygiene compliance need to be monitored.

**B. Personal protective equipment**

1. Use of Gloves: Clean gloves must be worn when touching blood, body fluids, excretions, secretions and contaminated items and when performing venipuncture.

2. Face Mask, eye protection & face shield: Face Mask must be worn during procedures or patient care activities that are expected to generate splashes or sprays of blood, body fluids, secretions and excretions. For example, suctioning, irrigating a wound, performing certain laboratory tests, etc. N95 RespiratorsRespirators are masks specifically designed to filter small particles spread by the airborne route, such as tuberculosis, measles and varicella.

They are used for aerosol generating procedures that have been shown to expose staff, including:

• Sputum induction

• Diagnostic bronchoscopy

• Autopsy examination

• Laboratory handling of Mycobacterium tuberculosis such as concentrating respiratory samples for smear and culture. Staff required to wear N95 Respirators must undergo fitting

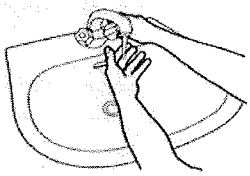
**3. Gown or Apron:** Gown/apron must be worn to protect skin and to prevent soiling of clothing during procedures or patient care activities that are expected to generate splashes or sprays of blood, body fluid, secretions and excretions. Respiratory hygiene/cough etiquette: Instruct symptomatic persons and health care workers to cover their mouths/noses when coughing or sneezing, use and dispose of tissues, perform hand hygiene after hands have been in contact with respiratory secretions and wear surgical mask if tolerated or maintain spatial separation, >3 feet if possible.

# How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

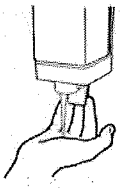
**Duration of the entire procedure:** 40-60 seconds

0



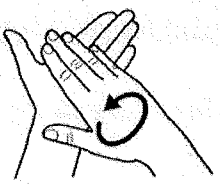
Wet hands with water;

1



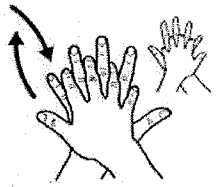
Apply enough soap to cover all hand surfaces;

2



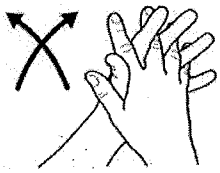
Rub hands palm to palm;

3



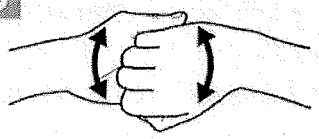
Right palm over left dorsum with interlaced fingers and vice versa;

4



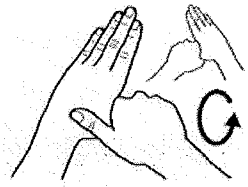
Palm to palm with fingers interlaced;

5



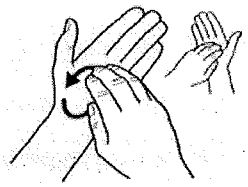
Backs of fingers to opposing palms with fingers interlocked;

6



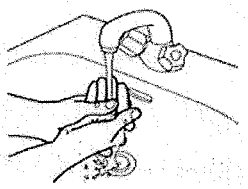
Rotational rubbing of left thumb clasped in right palm and vice versa;

7



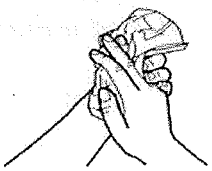
Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8



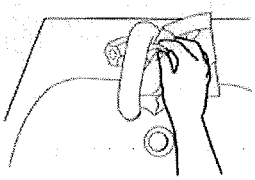
Rinse hands with water;

9



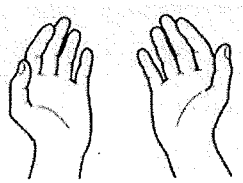
Dry hands thoroughly with a single use towel;

10



Use towel to turn off faucet;

11



Your hands are now safe.

World Health Organization | Patient Safety | SAVE LIVES Clean Your Hands

BIHER

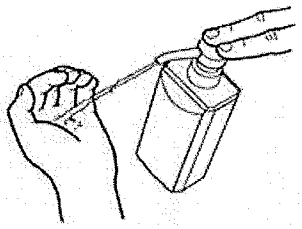
SLIMS

# How to Handrub?

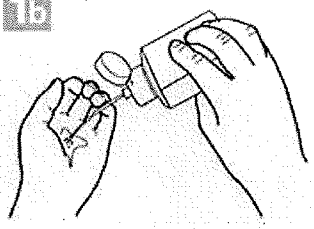
RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

**Duration of the entire procedure:** 20-30 seconds

1a

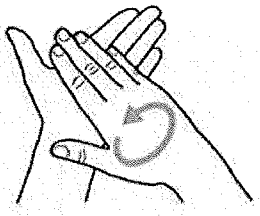


1b



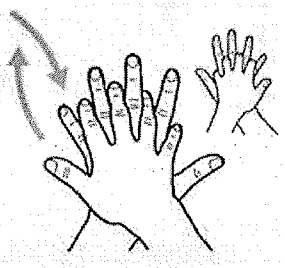
Apply a palmful of the product in a cupped hand, covering all surfaces;

2



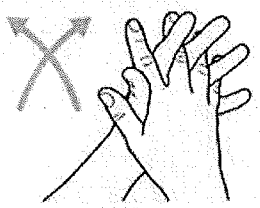
Rub hands palm to palm;

3



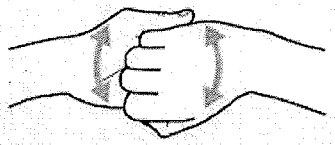
Right palm over left dorsum with interlaced fingers and vice versa;

4



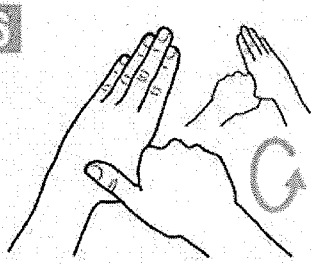
Palm to palm with fingers interlaced;

5



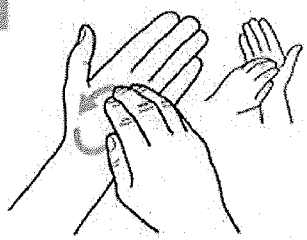
Backs of fingers to opposing palms with fingers interlocked;

6



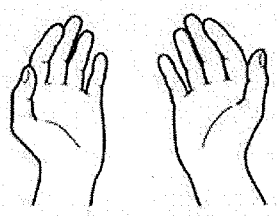
Rotational rubbing of left thumb clasped in right palm and vice versa;

7



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8



Once dry, your hands are safe.

World Health Organization

Patient Safety

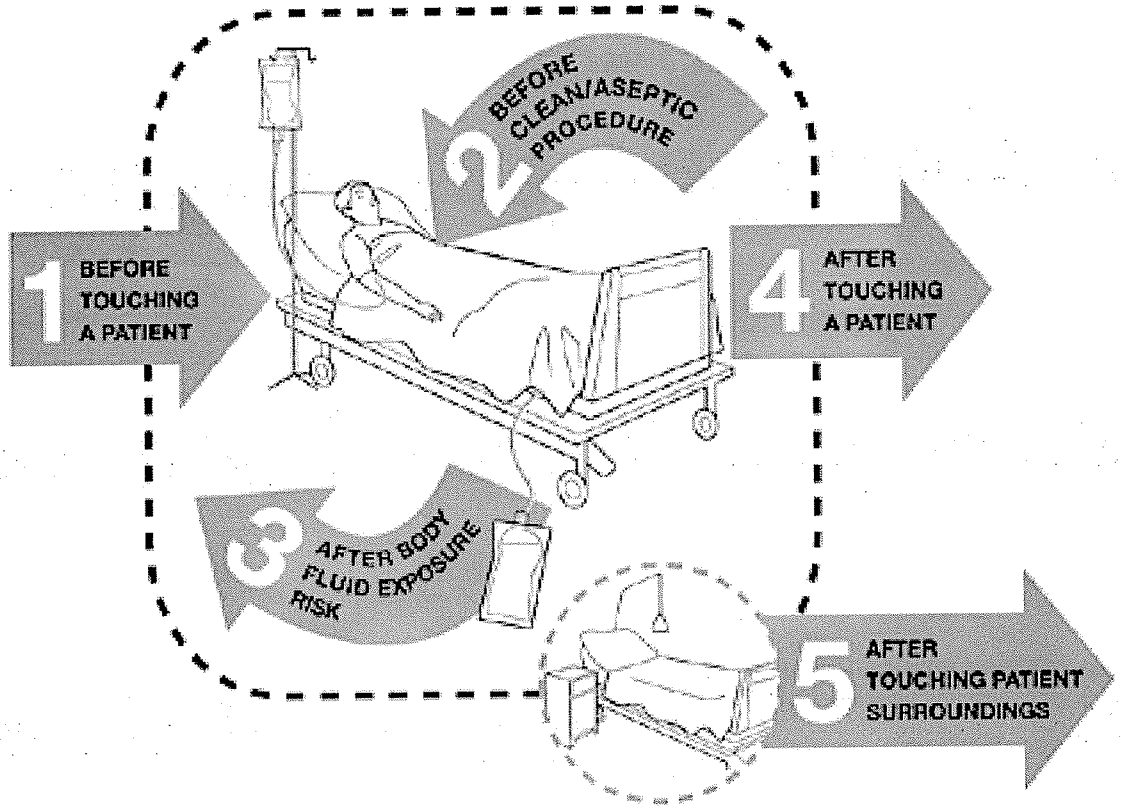
A World Alliance for Safer Health Care

SAVE LIVES
Clean Your Hands

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May 2009

BIHER SLIMS


1
BEFORE
TOUCHING
A PATIENT
2
BEFORE
CLEAN/ASEPTIC
PROCEDURE
3
AFTER BODY
FLUID EXPOSURE
RISK
4
AFTER
TOUCHING
A PATIENT
5
AFTER
TOUCHING PATIENT
SURROUNDINGS

BIHER

SLIMS

## PREVENTION OF HEALTHCARE ASSOCIATED INFECTIONS

The four major HCAIs are:

1. Catheter associated Urinary tract infection (CAUTI)

2. Surgical site Infection (SSI)

3. Catheter related blood stream infection (CRBSI)

4. Ventilator Associated Pneumonia (VAP)

A. CATHETER-ASSOCIATED URINARY TRACT INFECTION

**Introduction**

Urinary tract infections (UTIs) are one of the commonest types of HCAIs. One of the common reasons is the use of urinary catheters.

**Indications for Catheterization**

Placement of an indwelling catheter should be performed only when indicated. It should be removed as soon as possible. The accepted indications for catheterization are:

1. Patient requiring prolonged immobilization, such as in the setting of unstable lumbar/thoracic spine injuries, or multiple traumatic injuries including pelvic fracture For short-term (days) management of incontinence (the inability to control urination) needed to assist in healing of sacral or perineal wounds or for retention (the inability to pass urine) not helped by other methods.

2. To measure urine output over several days in critically ill patients

3. For treatment of bladder outlet obstruction

4. For post-operative management of surgical patients with impaired bladder function.

**B. SURGICAL SITE INFECTIONS (SSI)**

The common source of pathogens is the endogenous flora of the patient's skin, mucous membranes, or hollow viscera. Therefore, the pathogens isolated from infection differ, primarily depending on the type of surgical procedure. In clean surgical procedures, in which the gastrointestinal, gynaecologic, and respiratory tracts have not been entered;

Staphylococcus aureus from the exogenous environment or patient's skin flora is the usual cause of infection. In other categories of surgical procedures, including clean contaminated, contaminated, and dirty, the polymicrobial aerobic and anaerobic flora closely resembling the normal endogenous microflora of the surgically excised organ are the most frequently isolated pathogens. Other sources of SSI pathogens are from distance focus such as in patients with prosthesis or implant place during the surgery, surgical personnel, operating environment, surgical tools, instruments, and materials brought to the field during an operation.

**Antimicrobial prophylaxis**

1. Administer a prophylactic antibiotic agent only when indicated, and select it based on its efficacy against the most common pathogens causing SSI for a specific operation.

2. Administer by IV route the initial dose of prophylactic antibiotic agent, timed such that a bactericidal concentration of the drug is established in serum and tissues when the incision is made. Maintain therapeutic levels of the agent in serum and tissues throughout the operation and until at most a few hours after the incision is closed in the operating room. In most cases, antibiotic should be given within 60 minutes before the incision and the antibiotics should be stopped within 24 hours after surgery. Microbiological sampling Routine environment sampling of the Operation Room (OR) is not required. Perform microbiologic sampling of OR environment surfaces or air as part of an epidemiologic investigation.

**C. VENTILATOR-ASSOCIATED PNEUMONIA**

Pneumonia is one of the three most common HCAIs. Patients who are mechanically ventilated are at risk for ventilator-associated pneumonia (VAP). Most bacterial nosocomial pneumonias occur by aspiration of bacteria colonizing the oropharynx or upper gastrointestinal tract of the patient. Intubation and mechanical ventilation greatly increase the risk of nosocomial bacterial pneumonia because they alter first-line patient defenses.
Prevention of VAP

1. Adhere to hand-hygiene guidelines.

2. Health-care worker should ear a mask and an apron or gown when anticipates soiling of respiratory secretions from a patient (e.g. intubation, tracheal suctioning, tracheostomy, and

28 bronchoscopy) and change it after the procedure and before providing care to another patient.

3. Elevate the head of the bed 30 – 45 degrees of a patient on mechanical ventilation or at high risk for aspiration (e.g. on oro or nasoenteral tube)

4. Remove devices such as endotracheal, tracheostomy, oro/ nasogastric tubes from patients as soon as they are not indicated.

5. Perform orotracheal rather than nasotracheal intubation unless contraindicated.

6. Use non-invasive ventilation whenever possible.

7. Perform daily assessments of readiness to wean and use weaning protocols. 8. Avoid unplanned extubation and reintubation.

9. Use a cuffed endotracheal tube with in-line or subglottic suctioning.

10. Avoid histamine receptor blocking agents and proton pump inhibitors for patients who are not at high risk for developing a stress ulcer or stress gastritis.

11. Perform regular oral care with an antiseptic solution.

12. Avoid gastric overdistension.

13. Remove condensate from ventilatory circuits. Keep the ventilatory circuit closed during condensate removal.

14. Change the ventilatory circuit only when visibly soiled or malfunctioning. 15. Store and disinfect respiratory therapy equipment properly.

16. Educate healthcare workers who provide care for patients undergoing ventilation about VAP.

**Develop a surveillance system to study the incidence of VAP.**

1. Conduct active surveillance for VAP in units that care for patients undergoing ventilation who are known or suspected to be at high risk for VAP.

2. Collect data that will support the identification of patients of VAP and calculation of VAP rates.

## D. CATHETER-RELATED BLOOD STREAM INFECTIONS

### Hand hygiene

1. Observe proper hand hygiene.

2. Palpation of the insertion site should not be performed after the application of antiseptic, unless aseptic technique is maintained.

### Aseptic technique during catheter insertion and care

1. Maintain aseptic technique for the insertion and care of intravascular catheters. Wearing clean gloves rather than sterile gloves is acceptable for the insertion of peripheral intravascular catheters if the access site is not touched after the application of skin antiseptics.
2. Sterile gloves should be worn for the insertion of arterial, central, and midline catheters.

3. Change the dressing on intravascular catheters using aseptic technique. Maximal sterile barrier precautions during catheter insertion Use aseptic technique including the use of a cap, masks, sterile gown, sterile gloves, and a large sterile sheet for the insertion of Central venous catheter (CVCs, including peripherally inserted central catheter- [PICC]) or guidewire exchange.

### Catheter Site Dressing Regimens

1. Use either sterile gauze or sterile, transparent, semipermeable dressing to cover the catheter site.

2. Replace the catheter site dressing if the dressing becomes damp, loosened, or visibly soiled.

3. Replace dressings used on short-term CVC sites every 2 days for gauze dressings.

4. Replace dressings used on short-term CVC sites at least every 7 days for transparent dressings, except in those pediatric patients in which the risk for dislodging the catheter may outweigh the benefit of changing the dressing.

5. Monitor the catheter sites visually or by palpation through the intact dressing on a regular basis, depending on the clinical 30 situation of individual patients. If patients have tenderness at the insertion site, fever without obvious reasons, or other manifestations suggesting local

or BSI (Blood Stream infections), the dressing should be removed to allow thorough examination of the site. Prevention of CRBSI

1. Select the catheter, insertion technique, and insertion site with the lowest risk for complications (infectious and noninfectious) for the anticipated type and duration of IV therapy.

2. Avoid using the femoral vein for central venous access in adult patients.

3. Use a subclavian, rather than a jugular or a femoral site, in adult patients to minimize infection risk for nontunneled CVC placement.

4. Promptly remove any intravascular catheter that is no longer essential. Do not routinely replace central venous or arterial catheters solely for the purposes of reducing the incidence of infection. 5. There is no need to replace peripheral venous catheters more frequently than 72—96 hours to reduce the risk of infection and phlebitis in adults. Leave peripheral venous catheters in place in children until IV therapy is completed, unless complications (e.g: phlebitis and infiltration) occur.

**Develop a surveillance system to study the incidence of CRBSI.**

1. Conduct active surveillance for CRBSI in units that care for patients undergoing ventilation who are known or suspected to be at high risk for CRBSI.

2. Collect data that will support the identification of patients of CRBSI and calculation of CRBSI rates.

**CLEANING, DISINFECTION AND STERILIZATION**

**DISINFECTION**

Disinfection is a process where most microbes are removed from defined object or surface, except spores.

**Disinfectants** can be classified according to their ability to destroy different categories of micro-organisms:

• High Level disinfectants : Glutaraldehyde 2%, Ethylene Oxide

• Intermediate Level disinfectant : Alcohols, chlorine compounds, hydrogen Peroxide, chlorhexidine,

• Low level disinfectants : Benzalkonium chloride, some soaps

**GENERAL GUIDELINES FOR DISINFECTION:**

Critical instruments/equipment (that are those penetrating skin or mucous membrane) should undergo sterilization before and after use. e.g. surgical instruments. Semi-critical instruments /equipments (that are those in contact with intact mucous membrane without penetration) should undergo high level disinfection before use and intermediate level disinfection after use. e.g. endotracheal tubes. Non-critical instruments /equipments (that are those in contact with intact skin and no contact with mucous membrane) require only intermediate or low level disinfection before and after use. e.g. ECG electrodes.

**Endoscopes - cleaning and disinfection**

1. Clean: mechanically clean internal and external surfaces, including brushing internal channels and flushing each internal channel with water and a detergent or enzymatic cleaners

2. Disinfect: immerse endoscope in high-level disinfectant such as 2% glutaraldehyde and perfuse disinfectant into all accessible channels, such as the suction/biopsy channel and air/water channel and expose for a time recommended for specific products (20 minutes for 2% glutaraldehyde).

3. Rinse: rinse the endocope and all channels with sterile or filtered water followed by 70-90% ethyl or isopropyl alcohol to remove all traces of disinfectant.

4. Drying: After rinsing, purge the channels using forced air. Hang endoscopes in a vertical position to facilitate drying.

**STEAM STERILIZATION**

Use biological indicators, such as a commercial preparation of spores of Geobacillus stearothermophilus, at least weekly to monitor the effectiveness of steam sterilization.

**FOGGING:**

In patient care areas regular fogging is not recommended. Necessary decision is taken by in charge of concerned patient care area.

## ENVIRONMENTAL SURFACES

Clean housekeeping surfaces (e.g., floors, walls, tabletops) on a regular basis, when spills occur, and when these surfaces are visibly soiled. Disinfect environmental surfaces (e.g., bedside tables, bedrails, and laboratory surfaces) on a regular basis and when surfaces are visibly soiled. Clean walls, blinds, and window curtains in patient-care areas when these surfaces are visibly contaminated or soiled. Decontaminate mops heads and cleaning cloths regularly to prevent contamination (e.g., launder and dry at least daily).

Do not use high-level disinfectants or liquid chemical sterilants for disinfection of non-critical surfaces.

### Bedding and blanket

Clean and disinfect mattress impermeable covers. Launder pillow covers, washable pillows, and blankets between patients or when they become contaminated with body substances.

### Monitoring of biomedical waste management practices

A person or persons should be designated to be responsible for establishing, monitoring, reviewing, and administering a plan for the collection, handling, predisposal treatment, and terminal disposal of regulated medical wastes.

## DEALING WITH SPILLAGE:

### a. LIQUID SPILL MANAGEMENT:

1. Promptly clean and decontaminate spills of blood and other potentially infectious materials.

2. Wear protective gloves.

3. Using a pair of forceps and gloves, carefully retrieve broken glass and sharps if any, and use a large amount of folded absorbent paper to collect small glass splinters. Place the broken items into the puncture proof sharps container.

4. Cover spills of infected or potentially infected material on the floor with paper towel/ blotting paper/newspaper. Pour 0.5%freshly prepared sodium hypochlorite. 5. Leave for 30 minutes for contact

6. Place all soiled absorbent material and contaminated swabs into a designated waste container.

7. Then clean the area with gauze or mop with water and detergent with gloved hands. NB: Any material treated with hypo-chlorite solution should never be sent for incineration

**b.MERCURY SPILL MANAGEMENT:** If accidental spill of mercury occurs it is to be collected in a special manner as follows:

1. Spilled mercury should be collected with a ''mercury spill kit''- containing nitrile gloves, N-95 face mask, 2 pieces of cardboards, 2 plastic containers, cello tape, and flashlight.

2. Do not touch mercury.

3. Remove all jewelry, wear gloves, masks.

4. Use flashlight to locate and cardboards to bring mercury beads together.

5. Collect with an eyedropper of a syringe and carefully place it or 'contain' in a bottle containing water.

6. Any remaining beads of mercury should be picked up with a sticky tape and place 7. in the plastic bag, properly labeled.

8. The bottle should be sealed with a tape, labeled as hazardous waste and securely stored inside another plastic container; awaiting final disposal to Govt. nominated or authorized mercury dealers.

9. After mercury has been recovered the spill area should be covered with calcium sulfide or sodium thiosulfate to neutralize it.

10. Reporting formats will be used to report and register any mercury spills/leakages.

## ANTIMICROBIAL POLICY AND ANTIMICROBIAL STEWARDSHIP

### Introduction

The annual antibiogram should be prepared by microbiology department. Antibiotic susceptibility profile may be is analyzed regularly and the common resistance patterns of the bacterial isolates to be reported and discussed in the HICC meetings and the antibiotic policy

to be reviewed accordingly. Antibiotic policy need to be prepared in consultation with respective clinical departments.

**Antibiotic policy shall be prepared using following general principles:**

1. Data is analyzed on a quarterly basis as per hospital records)

(a) Common etiological agents as per

(i) site of infection (ii) age groups (iii) patient location – outdoor (OPD), indoor (wards & critical care areas)

(b) Antibiogram data as per

(i) site of infection (ii) age groups (iii) patient location – outdoor (OPD), indoor (wards & critical care areas)

(c) Unusually resistant organisms to be confirmed and submitted for further characterization to National Centre for Disease Control (NCDC) for

2. Standard treatment guidelines [categorization of patients as 45 per age and Community acquired infections (CAI) / Health care associated infections (HCAI)]

(a) Guidelines for empirical antimicrobial therapy as per common clinical syndrome

(i) Adults & older children

1. Blood Stream Infections (BSI)

2. Meningitis

3. UTI

4. Pneumonia

(a)Community Acquired Pneumonia (CAP) (b)Ventilator Associated Pneumonia (VAP)

5. GIT Infections

6. Conjunctivitis

7. Otitis Media

8. Tonsilltitis / Pharyngitis

9. Skin and Soft Tissue Infection (SSTI)

10.Genital Infections

11.Osteomyelitis

(ii) Neonates (special conditions)

1. Sepsis 2. Meningitis

(iii) Infants & Small Children (special conditions)

1. Meningitis

2. Sepsis

3. Pneumonia

(b) Classification of Antimicrobials into first line, second line and reserve group of drugs (c) Chemoprophylaxis

(i) Pre-operative antimicrobials

(ii) Other invasive procedures

(iii) Special high risk groups e.g. Prophylaxis for rheumatic fever, splenectomy patients, and immuno-compromised patients

(d) Special clinical syndromes (e.g. STIs)

4. Prescription auditing

5. Review of surveillance data generated from antibiograms & prescription auditing.

6. Education and training for all infection control activities in collaboration with the Hospital Infection Control Committee.

**Appropriate antimicrobial use**

1. Each health care facility should have an antimicrobial use programme. The goal is to ensure effective economical prescribing to minimize the selection of resistant microorganisms.

2. Formulation of guidelines with a multidisciplinary approach using the local antibiogram.

3. Provide ongoing education on rational use of antibiotics to clinicians and ensure implementation of antibiotic policies.

4. Restricted antibiotic use5. Use must be justifiable based on clinical diagnosis. 6. Before initiating antibiotic treatment, appropriate specimens for bacteriological examination must be submitted to laboratory and selection of an antibiotic must be based on the sensitivity pattern, patient tolerance, and cost

7. An agent with as narrow a spectrum as possible should be used with appropriate dosage and duration of antimicrobial therapy. 8. The correct dose must be used.

9. Control antibiotic use - Selected antibiotics may be restricted in use. -Cyclic rotation of antibiotics in a class - Discontinuation of antimicrobial therapy based on predefined criteria

10. Carry out periodic prescription audits.

11. Restriction of hospital formulary through pharmacy.

12. Standard and contact Precautions including rigorous adherence to hand hygiene, appropriate use of PPE.

**Annexure- II**

# VALUE ADDED COURSE

## Certificate course in Hospital Infection Control and MIC01

## List of Students Enrolled July 2015– August 2015

| 2nd Year MBBS Student | | | |
|---|---|---|---|
| **Sl. No** | **Name of the Student** | **Roll No** | **Signature** |
| 1 | AASHIK MUKESH. M. S | U14MB201 | |
| 2 | ABEETHA.M | U14MB202 | |
| 3 | ABHINAV. S | U14MB203 | |
| 4 | ABINAYA. M | U14MB204 | |
| 5 | ABISHEK. R | U14MB205 | |
| 6 | ABIRAMI. S | U14MB206 | |
| 7 | AGALYA. S | U14MB207 | |
| 8 | AJAY PANDIAN. V | U14MB208 | |
| 9 | AJEETH. R | U14MB209 | |
| 10 | AJITH KUMAR. M.K. | U14MB210 | |
| 11 | AKSHAI. S | U14MB211 | |
| 12 | ALLEN DANIEL XAVIER.J | U14MB212 | |
| 13 | ALTHAF AHMED | U14MB213 | |
| 14 | AMARA LOKESH | U14MB214 | |
| 15 | AMRESH. K | U14MB215 | |
| 16 | ANANT SURYA. R | U14MB216 | |
| 17 | ANDREW MARIE XAVIER.V | U14MB217 | |
| 18 | APSARA. P | U14MB218 | |
| 19 | ARPUDHA. A | U14MB219 | |
| 20 | ARUL PRABHA MADHIVADHANI. M | U14MB220 | |
| 22 | ARUNRAJ. T | U14MB221 | |

| | | | |
|---|---|---|---|
| 23 | ARVIND. M | U14MB222 | |
| 24 | ASHOK. V.S.I | U14MB223 | |
| 25 | ASPIN NIVYA. M | U14MB224 | |
| 26 | ASWINI @ LAKSHMI.B | U14MB225 | |
| 27 | AYYANAN. R | U14MB226 | |
| 28 | AZHARUDDIN. R | U14MB227 | |
| 29 | BALAJI. K | U14MB228 | |
| 30 | BARATHGANESH. A | U14MB229 | |

**RESOURCE PERSON**

**COORDINATOR**

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - III**

## Certificate course in Hospital Infection Control

**Questionnaire** **Course Code: MIC01**

Abeetha. M

**I. ANSWER ALL THE QUESTIONS**

**1. Surveillance of healthcare associated infections**

- TO provide continuous observation of HCAIS cases for the purpose of prevention & control

**2. Standard Precautions Requirements**

- Hand hygiene
- PPE
- Gown or Apron
- Mask
- Goggles

**3. Antimicrobial policy and antimicrobial stewardship**

- Carry out periodic prescription audits.

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - III**

## Certificate course in Hospital Infection Control

**Questionnaire** **Course Code: MIC01**

Aswini. T

**I. ANSWER ALL THE QUESTIONS**

**1. Surveillance of healthcare associated infections**

Systematic collection, analysis, Interpretation & dissemination of data about the occurence of HCAIs

**2. Standard Precautions Requirements**

- Hand Hygiene.
- Personal protective equipment.
- mask

**3. Antimicrobial policy and antimicrobial stewardship**

Systematic collection, analysis, Interpretation & dissemination of data about the occurence of HCAI

## Annexure IV

## Student Feedback Form

Course Name: **Certificate course in Hospital Infection Control**

Subject Code: **MIC01**

Name of Student: Arunraj.T Roll No.: UUMB22/

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: 26/8/2015

Signature Arunraj

## Annexure IV

## Student Feedback Form

Course Name: **Certificate course in Hospital Infection Control**

Subject Code: **MIC01**

Name of Student: Akshai. S Roll No.: U14MB211

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: 26.8.2015

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 Amarah . K has actively participated in the Value Added Course on **Certificate course in Hospital Infection Control** held during July 2015– August 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.Abarna.V

RESOURCE PERSON

Dr.Kamatchi

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 Abhinavi.S has actively participated in the Value Added Course on **Certificate course in Hospital Infection Control** held during July 2015– August 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.Abarna.V
RESOURCE PERSON

Dr.Kamatchi
COORDINATOR

Date : 27.8.2015

From
Dr.Abarna.V
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: Certificate course in Hospital Infection Control**

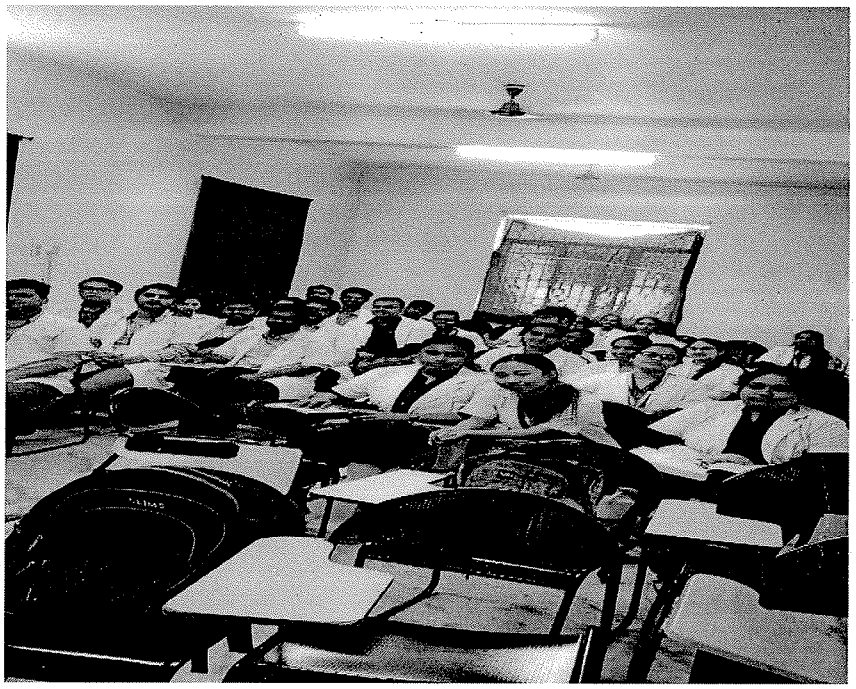
Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled Certificate course in Hospital Infection Control for 30 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.Abarna.V

**Encl: Photographs**



# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

**Date:27.03.2015**

**From**
Dr, Padma,
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: Palliative care in Gynaecological Cancer**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **: Palliative care in Gynaecological Cancer** on July 2015 to October 2015 We solicit your kind permission for the same.

Kind Regards

Dr. Padma,

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean : Dr. Rajasekaran

The HOD: Dr. Padma

The Expert: Dr. Nivethana Aarthi

The committee has discussed about the course and is approved.

DEAN

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

SUBJECT EXPERT

ASSISTANT PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

HOD

PROFESSOR & HEAD
DEPT. OF OBSTETRICS & GYNAECOLOGY
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

**Date : 01.06.2015**

**Sub: Organising Value-added Course: : Palliative care in Gynaecological Cancer - 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 **": Palliative care in Gynaecological Cancer"**. 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 30.06.2015. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

Encl: Copy of Course content and Registration form.

## Annexure 2 – Course Proposal

**Course Title: Palliative care in Gynaecological Cancer**

**Course Objective:**

i. **Introduction**
**Therapeutic relationship: Cornerstone of care**
**Ethical issues**
**Interdisciplinary teamwork**
**Pain control**
**Other symptoms**
**Social considerations**
**Palliative emergencieS**
**Pressure and wound care**
**End of Life care**

**Course Outcome:knowledge about palliative care in gynaecological cancer**

**Course Audience: Final MBBS Undergraduates**
**Course Coordinator: Dr. Nivedhana Arthi**
**Course Faculties with Qualification and Designation:**
**Dr. Padma, Prof. and HOD, OG**
**Dr. Nivedhana Arthi , Assistant Professor, OG**
**Course Curriculum/Topics with schedule (Min of 30 hours)**

| Sl No | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 6.7.2015 | Introduction | 4.00pm -5.00pm | 1 |
| 2 | 10.07.2015 | Therapeutic relationship | 4.00pm -7.00pm | 3 |
| 3 | 17.07.2015 | Ethical issues | 4.00pm -7.00pm | 3 |
| 4 | 4.08.2015 | Interdisciplinary team work | 4.00pm -7.00pm | 3 |
| 5 | 10.08.2015 | Pain control | 4.00pm -7.00pm | 3 |
| 6 | 16.08.2015 | Pathophysiology of cancer | 4.00pm-7.00pm | 3 |
| 7 | 22.08.2015 | Social considerations | 4.00pm -6.00pm | 2 |
| 8 | 2.09.2015 | Palliative emergencies | 4.00pm -7.00pm | 3 |
| 9 | 8.09.2015 | Pressure and wound care | 4.00pm -7.00pm | 3 |
| 10 | 10.09.2015 | End of life care | 4.00pm -6.00pm | 2 |
| 11 | 17.09.2015 | IAHPC List of essential medicine for palliative care | 4.00pm -7.00pm | 3 |
| 12 | 24.09.2015 | Mental health of diseased patients | 4.00pm -5.00pm | 1 |
| | | | Total Hours | 30 |

**REFERENCE BOOKS: (Minimum 2)**

**Willaims Gynaecology Edition 21**

**Novack gynaecology_**

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Palliative Care In Gynaecological Cancers & OBGY 1

**2. Duration & Period**

30 hrs & July 2015 - October 2015

**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 questions- *Enclosed as Annexure- III*

**6. Certificate model**

*Enclosed as Annexure- IV*

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

1 Time July 2015- October 2015

**8. Year of discontinuation: 2015**

**9. Summary report of each program year-wise**

| **Value Added Course-** July - October 2015-2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | OBGY 1 | Palliative Care in Gynaecological Cancers | Dr. Nivedhana arthi | Final Year MBBS | July - 2015October 2015 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCEPERSON**

ASSISTANT PROFESSOR
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of Medical Sciences
OSUDU, PUDUCHERRY.

**COORDINATOR**

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

# PALLIATIVE CARE IN GYNAECOLOGICAL CANCER

## PARTICIPANT HAND BOOK

BIHER
SLIMS

| Particulars | Descriptions |
|---|---|
| Course Title | Palliative Care in Gynaecological Cancers |
| Course Code | OBG-01 |
| Objectives | 01-Introduction<br>02-Therapeutic Relationship: Cornerstone of care<br>03-Ethical Issues<br>04-Interdisciplinary Teamwork<br>05-Pain control<br>06-Other Symptoms<br>07-Social Considerations<br>08-Palliative Emergencies<br>09-Pressure and Wound Care<br>10-End of Life Care<br>11-IAHPC list of essential medicine for palliative care |

| | |
|---|---|
| | 12-Referance and feed bearnen |
| Further learning Opportunities | Palliative care in other cancers |
| Key Competencies | On successful completion of course the students will have knowledge in palliative care |
| Target Students | Final Year MBBS Students |
| Durations | 30 hours every April 2015 to August 2015 and September 2015 to January 2016 |
| Theory Session | COURSE DETAILS<br>30 Hours |
| Assessment Procedure | Short Questions |

# 1 Introduction

According to the WHO definition, “Palliative care is an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and treatment of other problems, physical, psychosocial and spiritual”. In addition, “Palliative care is required from early in the disease course, can be delivered alongside potentially curative treatment, and continues to include end-of-life or terminal care”.

The WHO definition highlights fundamental principles. It “affirms life and regards dying as a normal process”; and “intends neither to hasten nor postpone death”. It also emphasizes “impeccable assessment” as essential for effective management.

Palliative care cannot be left solely to primary or palliative care physicians or to nurses. It needs to be actively embraced by all providers including oncologists and other specialists and integrated into all areas of medical care. Oncology follow-up visits are the ideal place to introduce the concept and every decision about treatment should take palliative or quality of life considerations into account. Giving up curative treatment does not mean giving up hope or concern, nor does an attempt at curative treatment mean

that palliative care should not be offered. Discussions about end-of-life care, refusal of care, and advance planning have cultural dimensions that require great sensitivity and thought, but opening these discussions is critical to the best end-of-life care.

Palliative care is an approach that embodies compassion. It is not dependent on sophisticated equipment, expensive buildings, or technology, and can be applied in any setting. It can easily be offered in resource-poor settings as well as in countries with highly developed healthcare services.

In practice this depends on a significant shift in focus. Many societies avoid and fear aging, death, and dying. Huge advances in medicine have fed the belief that medicine can rescue everyone. Medicine has a responsibility to explore and address these fears as well as embrace and advocate for the best of palliative care.

Some 80% of countries globally have low or very restricted access to strong pain medications. Although morphine is the gold standard and the cheapest drug available, it is still illegal or unavailable in many countries. The African Palliative Care Association and others are working actively to change this.

In addition to end-of-life issues, gynecological cancer presents many long-term problems related to disease and treatment. Both aspects require a palliative focus.

## 2 Therapeutic relationship: The cornerstone of care

People have a deep need to be seen and heard. This in itself is therapeutic. Very often it is not *what* was said but *how* it was said that is remembered. Good communication depends on sensitivity, authenticity, and genuine human relationship. Healthcare providers need to convey that they care and that they will be there for their patients whatever path they take. Patients can fear being abandoned if cure is no longer a possibility, and providing the security of a continuing relationship with their trusted caregiver is a key component.

Dealing with death and dying requires us to constantly confront our own fears. Physicians can struggle to overcome not only their teaching, which emphasizes rescuing and curing, but also their own fear of disability and dying. Caring for the dying invites us to look at our own lives, values, attitudes, and beliefs to care compassionately for the scope of needs our patients encounter on their cancer journey.

## 3 Ethical Issues

Ethical issues relate to both patients and context of care. Our primary ethical responsibilities are to benefit (beneficence) and not harm (non-maleficence) while making sure patients understand and can choose among options for their care (autonomy). In palliative care the treatment goals are primarily ameliorating symptoms, alleviating pain and suffering, and helping patients understand the disease course. These become our ethical measures for success. Care of symptoms and attention to

quality of life are goals regardless of the curability of the cancer, and have been shown to improve quality of life and mood, and even lengthened survival in some studies.

Preserving patient autonomy—the ability to make authentic decisions regarding their own health care—is essential, though often difficult. Societal, religious, and familial pressures on patients and caregivers have the potential to overwhelm decision making. The classic example of family demanding “everything” be done to save their mother, while the mother wants to have no resuscitative measures with her terminal disease illustrates how this tension can present. Women are at the center of families and often make choices that benefit the family before themselves—denying themselves adequate pain or other care because of cost or inconvenience to the family. Our role is to advocate for the patient's best interests, including encouragement to ask for what she wants and needs.

Globally, lack of access to adequate pain control, palliative care options such as radiation, or advanced pain control techniques create ethical challenges related to context of care. Regulations that limit access to narcotic pain management at the end of life are harmful to patients. Providers must advocate actively for policies and just allocation of essential medication and palliative care support in every resource setting.

## 4 Interdisciplinary team work

Palliative care emphasizes whole person medicine and it is impossible for one person to do this alone. Effective

palliative care depends on good teamwork. As an ideal, the basic care team should consist of a doctor, professional nurse, and social worker. The team can benefit from a dietician, occupational therapist, physiotherapist, massage therapist, and creative artists, as well as a “gynecologic oncologist, a radiation oncologist, a radiologist, an interventional radiologist, a pain specialist from hospice services, and/or a palliative care physician”. In many settings this is not possible—but engaging cross-disciplinary health providers provides different perspectives, ideas, and approaches that can benefit patient care. Incorporating spiritual care into the team helps address not only the patient's but their family's and even the team's need to find meaning in the process of care and dying and transcend suffering.

Constant exposure to death and dying can rapidly lead to provider burnout unless the load is shared. Teamwork can be challenging and requires good leadership and constant review. Well implemented it greatly improves quality of care, stress, and work satisfaction. Poor team work can contribute to burnout. Five essentials are: trust, two-way communication, respect, roles, and responsibility. Additional qualities of good team work include positive leadership and management; personal rewards, training, and development; skill mix; supportive team; clarity of vision; and respecting and understanding roles.

## 5 Pain control

“As with most incurable cancers, pain control is the dominant issue and must be addressed. Judicious use of narcotics, radiation, and non arcotic pain remedies is essential”.

The goal of pain control needs to be discussed. For example: is the goal to preserve normal function and ability to work—and what is required for that? Is it to provide relief from neuropathic pain? Each situation requires a unique approach that will often be multimodal.

Understanding pain type, acuity, inciting and diminishing factors is key to pain management. Prior drug interactions and physical, mental, and contextual status should all be reviewed initially and on an ongoing basis (**Table 1**).

**Table 1.** Key elements to review in planning a pain management strategy

| **Elements to consider** | |
|---|---|
| What is the goal of pain management? | Functional level, desired sensory levels, time specific goals such as a specific event. Priority among goals |
| What is the type of pain? | Neuropathic, tissue damage, pressure, musculoskeletal, inflammatory |
| Duration, level, and modifying factors | Constant, occasional, related to movement, morning, evening, etc. Use a scale to measure level of pain |

| | |
|---|---|
| Prior management programs that have been effective | Heat, cool, massage, physical therapy, types of pain medicines |
| Reactions to pain or psychotropic medicines | Allergies, nausea, constipation, depression, other adverse effects |
| Overall health that may impact choices for pain management | Depression, anxiety, or other psychiatric conditions; addictions; renal and hepatic function; cenral nervous system function; respiratory distress; physical performance status; nutritional status; skin status |
| Contextual modifiers | Lack of insurance, finances, or limitations; religious beliefs regarding suffering; lack of care givers; safety of home setting |

The axiom of pain control is to treat different types of pain differently. Pain from cerebral swelling with brain metastases includes corticosteroids to reduce swelling and enhance function, as well as analgesic medications. Pain from abdominal swelling can benefit from massage for back strain (due to abnormal posture), abdominal massage, or heat as well as analgesia. Neuropathic pain may require early medication, massage, and physical therapy to improve function. Treatment of anxiety may reduce the need for analgesics.

When medication is required, the WHO pain ladder, remains the standard, with non-narcotic therapies at its base. If the management plan is not meeting pain needs, then reassessment of all elements is required—before adding narcotic medications. Successful pain control depends on around the clock base relief, together with rapid acting breakthrough medication for intermittent increases in pain or desire to increase activity (**Table 2**). Finally, it is important to anticipate, assess, and manage any adverse effects of medication, in particular, constipation, nausea, and vomiting

**Table 2.** Elements of a cancer pain strategy

| **Strategy** | |
|---|---|
| Treat different types of pain differently. Use multimodal approach and combine as needed. | Neuropathic pain: anticonvulsants, antidepressants, gabapentinoids, transcutaneous stimulation.<br>Acute inflammation: corticosteroids.<br>Anxiety and depression: anxiolytics and antidepressants.<br>Tissue damage pain (nociceptive): scale of anti-inflammatory to narcotic medications.<br>Bone metastases/brain metastases: consider local radiation therapy. |

| | |
|---|---|
| | If available, for localized pain, blocks and indwelling epidural analgesia. |
| Give the medication at regular intervals | Provide a base level of pain control and accommodate for breakthrough pain. |
| Use the least invasive form of administration available | Oral, topical (patches and creams), sublingual forms preferred over subcutaneous or intravenous forms. |
| Adjust to comfort and individual goals | The patient is the best judge of whether pain control is meeting her goals, and individual tolerance and needs vary widely |
| Make liberal use of additional supportive care | Consider the role that massage, heat, meditation, physical therapy, positioning, and alternative therapies (aromatherapy, music therapy, etc.) and spiritual care can play to assist pain and anxiety control. |
| Anticipate adverse effects and plan for them | Constipation, somnolence, nausea can all accompany pain control and planning ahead can improve outcomes. |
| Anticipate changes in needs | Use a pain scale and follow over time, as needs will change both up and down with treatment or progression of disease |

In places without access to narcotic medications, pain management (particularly for end-of-life care or acute cancer pain) is exceptionally difficult and a tragedy for the patient and her family. Maximal use of all available

medication, liberal use of additional means of comfort (massage, heat, physical therapy, positioning), as well as ongoing advocacy for rational narcotic access to prevent suffering, become essential parts of treatment.

## 6 Other symptoms

Each disease has its own unique picture. Symptoms may be disease or treatment related. “Treatment…often has serious lifelong side effects, including cystitis, proctitis, intestinal strictures, fistulas, vaginal agglutination/sexual dysfunction, and chronic pain”.

### General management principles are:

Appropriate assessment

Explanation to patient and family at all stages

Correct reversible factors

Consider disease-specific palliative therapy

Non-pharmacological interventions

Appropriate first line treatment

Adjuvant or second line treatment

Regular review with involvement of the interdisciplinary team…or more experienced clinician; plus

Essential medication in palliative care (**Table 3**).

**Table 3.** Essential medication for palliative care.[a]

| Requirement | Use | Medication |
|---|---|---|
| Pain | General | Paracetamol, tramadol, codeine, morphine (a WHO essential medicine), fentanyl. |
| | Bone pain | Ibuprofen, indomethacin. |
| | Neuropathic pain | Gabapentin (neuropathic pain). |
| Neuro-psychiatric | Anxiety | Lorazepam, diazepam. |
| | Insomnia/restlessness | Zolpidem, midazolam, haloperidol. |
| | Depression | Amitriptyline, citalopram. |
| Gastrointestinal | Constipation | Laxatives (senna, liquid paraffin, glycerin and dulcolax suppositories, fleet enema). |
| | Diarrhoea | Immodium, codeine. |
| | Nausea/vomiting | Metoclopramide, hyoscine butylbromide, haloperidol, 5-HT3 antagonists, steroids, proton pump inhibitors |
| Other | Inflammation | Dexamethasone, prednisolone. |

| | |
|---|---|
| Fluid/ascites | Spironolactone, furosemide. |
| Bleeding | Adrenalin, cyklokapron. |

- IAHPC List of Essential Medicines for Palliative Care.

## 6.1 Loss of appetite and fatigue

Eating is a fundamental human experience and feeding people is a natural way of showing care and support. Many family members struggle to accept that the patient no longer wants to eat and this causes significant distress. If aiding the appetite will improve the patient's quality of life or the patient has specific short-term goals, then progestins or steroids to stimulate appetite may be considered.

## 6.2 Edema and ascites

Edema is common in late-stage gynaecologic cancers owing to low protein and lymphatic blockage, and is difficult to treat. Regular lymph drainage massage and limb wrapping or support stockings/sleeves may assist comfort.

Ascites may require repeated drainage or an indwelling catheter, although this must be balanced against the additional loss of protein and increase in edema that result. High-dose spironolactones (100–400 mg per day) with furosemide may improve ascites.

## 6.3 Nausea and vomiting

Common causes are mechanical bowel obstruction, infection, metabolic disturbance (including hypercalcemia), renal failure, and occasionally cerebral metastases.

Bowel obstruction is a frequent occurrence, especially with ovarian cancer, but few patients are amenable to surgical intervention and must be chosen carefully after balancing patient preference, likelihood of surgical success, prognosis, and risk factors. A simple colostomy with progressive pelvic cervical cancer may give relief quickly without a long surgical recovery time. Given the multiple sites of obstruction, particularly with progressive ovarian cancer, surgery is rarely used. Naso gastric tubes are discouraged because they are uncomfortable, but naso gastric or per cutaneous gastric tubes may be helpful when other approaches are not helping . Anti emetics and medications to reduce intestinal output are available for subcutaneous, rectal, oral/lingual, and intravenous use, and continuous or around-the-clock use is the most effective approach.

Often people cannot tolerate the idea of not being able to eat. Even in the presence of total gastric outlet obstruction, many patients prefer to eat a little and are prepared to tolerate vomiting rather than stop eating completely.

## 6.4 Constipation, diarrhoea, faecal incontinence

Constipation, whether disease or medication induced, is a major cause of discomfort and suffering. Pain medication

may complicate management, and a laxative regimen should always be provided along with these medications, assuming there is no obstruction. Regular assessment and repeated education sessions are necessary.

Diarrhoea may be a short- or long-term consequence of treatment, and treatment should be focused on the etiology. For example, simple lactose intolerance after radiation or long-term narcotic-based regimens to repress bowel motility have different solutions.

Faecal incontinence has a major impact on quality of life, and bowel regimens or rarely surgical diversion can help. For the most part, local attention to hygiene and skincare provides the best palliation for this symptom from surgery, fistulas, or disease.

### 6.5 Incontinence, urinary retention, urinary tract infection

Urinary incontinence may result from spinal cord compression, sacral plexus involvement, bladder infiltration, or fistulas. Skin protection using barrier creams is essential. Urinary catheters, suprapubic catheter, or nephrostomy are considerations. Each of these comes with increasing complexity of management for the patient and caregivers and may be unaffordable.

Urinary tract infection is common, with or without catheterization and should be actively checked and treated.

## 6.6 Vaginal discharge and bleeding

Evaluation of a new discharge is always warranted as it may represent fungal or bladder infection, which can be treated. Discharge from tumor growth, bleeding, or fistula is very upsetting to the patient and her caregivers. Collaboratively developing a plan for hygiene and providing a sense of control, particularly with vaginal bleeding, facilitates management and opens the door to further discuss progression of disease and expectations.

Minor bleeding wounds may respond to topical adrenaline. Cyklokapron (tranexamic acid), radiotherapy, or occasionally interventional radiology-based embolization, if available, may be useful to stop bleeding. Direct pressure may also assist, for example a vaginal pack and use of Monsel solution or other topical agents for cervical cancer bleeding. Symptomatic anemia can be treated with blood transfusion if resources allow and if the benefits in terms of symptom relief and quality of life are of reasonable and ethical duration.

Haemorrhage as the final event is one that can traumatize all who witness it. In patients where this is a possibility, family members and healthcare providers should be prepared.

## 6.7 Shortness of breath

Air hunger and shortness of breath may result from anaemia, infection, pleural effusion, lung metastases, or heart failure. Diuretics are seldom helpful except in heart

failure. Fanning, morphine, and oxygen bring symptomatic relief, as does anxiety control.

Pleural drainage and pleurodesis may be helpful for comfort and to prevent recurrence of a pleural effusion if the condition of the patient warrants this.

## 6.8 Deep vein thrombosis

Prevention is preferred with passive or active movement. Sequential compression devices and anticoagulant therapy need to be considered in the context of the patient's prognosis, quality of life, and living conditions, and balanced against the risk of bleeding.

## 6.9 Psycho-spiritual

Anxiety, depression, fear, denial, loss of body image, sexual frustration, and insomnia are almost always present to some degree and can significantly impact on physical symptoms. Treatment approaches are both pharmacological and non-pharmacological.

Gynaecological cancer strikes deep to the core of what it means to be a woman. It is hidden, private, deep-seated, and may be associated with deep shame. Additionally, women try to avoid causing distress to their families and one of the greatest challenges to their identity can come from being the one needing care rather than being the care giver. Great sensitivity is needed in handling these women.

Existential fear in the face of death cannot be avoided and is part of the human condition, but the more open the

discussion and the more active the personal support, the more ease the patient may feel in the transition. Denial may need to be more actively confronted when it interferes with proactive planning for future care of the patient or minors.

Spiritual support, essential and integral to holistic care, must be individualized according to the patient's religion, culture, and belief system. It cannot be imposed or directed by the caregiver's views.

## 7 Social considerations

Detailed social assessment of needs, preferably with a social worker is imperative. Particular attention should be given to financial needs, needs of children, care, legal issues and wills, unresolved family conflict, and future planning. Social problems are often the main cause of anxiety. Sometimes simple assistance, like a letter to an employer, is all that is needed.

## 8 Palliative care emergencies

Detailed discussion is beyond the scope of this article and can be found in the references. Extremely rapid treatment is needed in the case of haemorrhage, hypercalcemia, superior vena cava syndrome, and spinal cord compression, but we must still weigh the potential benefits and harms particularly with patients for whom survival is already expected to be short.

## 9 Pressure and wound care

Good care can prevent skin pressure ulcers. The sacrum and heels are vulnerable areas in bed-bound patients and need frequent evaluation. Simple movement on a regular basis will assure pressure relief and enable local circulation. Sheepskin or other “boots” and pads also improve circulation.

Wound healing can be assisted by multiple means. Keeping wounds clean and dry is the basis of care. Continuous vacuum dressings have significantly improved time to wound closure for open wounds and may also be helpful in managing discharge from malignant skin lesions (cutaneous metastases) where no further therapy is planned.

## 10 End-of-life care

Cultural, religious, and spiritual views determine how patient and family view the information that death is approaching. Good timing and sensitivity are imperative. Each family unit is unique and there are no blanket rules but clear, honest, compassionate communication is needed. People vary in how much they need and want to know. Usually the patient knows what is happening and may or may not want more information. Generally family members welcome honest communication and frequent updates are vital. Even in the late stages, include the patient in the discussion and do not assume that lowered level of consciousness means lack of awareness or feeling.

Comfort is the major factor determining treatment decisions. Physical and psycho-spiritual needs must be assessed regularly and unnecessary medication and

intervention discontinued. Common end-of-life symptoms are pain, nausea, vomiting, agitation, and respiratory difficulty. When oral medication is no longer possible, sublingual, rectal, and subcutaneous administration are options. A restless patient may have urinary retention, which can be relieved. Impeccable and gentle nursing care is imperative with special attention to turning, wet linen, diapers, bowel, skin, and mouth care.

Grief is expressed in myriad ways, some of which can be disturbing to the patient or others around her. Challenges can arise when religious or cultural taboos forbid the discussion of death as a possibility, let alone a probability. Some groups see it as a sin to give up hope or even to think "negatively." These beliefs can present major challenges to appropriate planning and management. Wherever possible provide information about the dying process, what to do in the event of death and the availability of bereavement support.

## 11 Conclusion

If the principles of palliative care are understood they can be integrated into all levels of health care and all levels of healthcare training. The principles are not complicated and once the concept is embraced, shifting focus from curative to palliative should ideally become as simple as watching the sun rise and the sun set. Palliative care requires both the art and science of medicine and is a pressing universal need.

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Annexure 3

**Bharath Institute of Higher Education and Research**

Sri Lakshmi Narayana Institute of Medical Sciences

Participant list of Value added course: : **Palliative care in Gynaecological Cancer**

JULY 2015 – OCTOBER 2015

| SL. No. | UNIVERSITY REG.NO | NAME | SIGNATURE |
|---|---|---|---|
| 1 | U12MB201 | ABINAYA.L | |
| 2 | U12MB202 | AFTAB HOSSAIN | |
| 3 | U12MB203 | AHASH BALAJEE .S.A | |
| 4 | U12MB204 | ALLI .P | |
| 5 | U12MB205 | AMARNATH .P | |
| 6 | U12MB206 | ANAND B. | |
| 7 | U12MB207 | ANISH.M | |
| 8 | U12MB208 | ANITHA.K | |
| 9 | U12MB209 | ARAVINDKUMAR V. | |
| 10 | U12MB210 | ARIVOLI .H | |
| 11 | U12MB211 | ARUN.K.G. | |
| 12 | U12MB212 | ARUN KUMAR .M | |
| 13 | U12MB213 | ASWINI.B | |
| 14 | U12MB214 | ASOKH KUMAR .K | |
| 15 | U12MB215 | ATHUL SURESH | |
| 16 | U12MB216 | BABU PRASATH.J | |
| 17 | U12MB217 | BHAGAVATH.N | |
| 18 | U12MB218 | BALAMURALI KRISHNAN A.G. | |
| 19 | U12MB219 | BHADHMA SHRI.S.U | |
| 20 | U12MB220 | BHARANI CHANDAR.G | |

## PALLIATIVE CARE IN GYNAECOLOGICAL CANCERS

## MCQs

**1. Palliative care is only indication in.....**

a) Resectable tumors b)Non - Resectable tumors c) both A and B d) None

**2. How much % of countries globally have low/very highest access to strong to pain medications ?**

a) 80% b) 70% c) 60% d) 70%

**3. Pain management prior to medications includes all EXCEPT**

a) cold compression b) warm compression c) psychotic drugs d) physiotheraphy

**4. All of the following are used in neuropathic pain EXCEPT**

a) Gabapentinoid b) anti - convulsant c) NSAIDs d) Anti - depression

**5. drug of choice for ascites…….**

a) Spironolactones b) Azetazolamide c) Digoxin d) Aspirin

**6. Which of the following cause urinary incontenence ?**

a)Cystitis b) Renal calculi c) vesicovaginal fistula

**7. Goal of pain management is to moniter Functional and Desired sensory level and to moniter time specific goal**

a) TRUE b) FALSE

**8. Which of the following drug is gold standard and cheapest drug available for palliative care ?**

a) Aceclofenac b) Morphine c) Ibuprofen d) Ketamine

**9. Drug of choice for Neuropathic pain.....**

a) Paracetamol b) Gabapentine c) Ibuprofen d) Azithral

10..... **requires both the art and science of medicine and is a pressing universal need.**

a) Home care b) Palliative care c) Hospital care d) ICU

# PALLIATIVE CARE IN GYNAECOLOGICAL CANCERS (1)

Reg No: U12MB201 - 3M

## MCQs

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8/10

KIZuya

# 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 **ANITHA** has actively participated in the Value Added Course on **PALLIATIVE CARE IN GYNECOLOGICAL CANCER** held during Jul 2015-Oct 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry-605 502, India.

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## CERTIFICATE OF MERIT

This is to certify that **ARUN.K.G** has actively participated in the Value Added Course on **PALLIATIVE CARE IN GYNECOLOGICAL CANCER** held during Jul 2015-Oct 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry-605 502, India.

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## 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 _____

(1)

## Annexure 4

### Course/Training Feedback Form

**Course:** PALLIATIVE CARE IN GYNECOLOGICAL CANCER
**Date:** 23/08/2015
**Name:** R. ABINAYA
**Reg NO.** U12MB201
**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: 24.02.2016**

**From**
Dr. Padma,
Professor and HOD,
Obstetrics and Gynaecology,
Sri Lakshmi Narayana institute of Medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

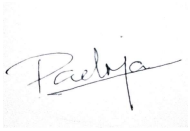
**To**
The Dean,
Sri Lakshmi Narayana institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

**Sub: Completion of value-added course: : Palliative care in Gynaecological Cancer**

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled**: Palliative care in Gynaecological Cancer** on April 15 – Jan 16. 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.Padma

PROFESSOR & HEAD
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
PUDUCHERRY.

**Encl: Certificates**

**Photographs**

**VALUE ADDED COURSES**

**OBGY 1 PALLIATIVE CARE IN GYNAECOLOGICAL CANCERS**



# Sri Lakshmi Narayana Institute of Medical Sciences

**Annexure 1**

Date 5/5/2015

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: AMNIOTIC MEMBRANE GRAFT**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **AMNIOTIC MEMBRANE GRAFT** on **JULY 2015 TO OCT 2015**. 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:

The HOD:

The Expert:

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, PONDICHERRY

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 / OPH03** **Date: 25.05.2015**

**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 2015-2016 - 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. SQUINT EVALUATION
2. LASERS IN OPHTHALMOLOGY
3. AMNIOTIC MEMBRANE GRAFT

This is for your kind information and needful action.

Thanking you

Yours faithfully

**[DEAN]**

**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. SQUINT EVALUATION
2. LASERS IN OPHTHALMOLOGY
3. AMNIOTIC MEMBRANE GRAFT

**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 / OPH03** **Date: 12.06.2015**

**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 2015-2016 – Reg.

**Ref:** Ref. No. SLIMS/Dean Off/VAC /OPH03 Dated: 25.05.2015

*****

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 2015– 2016. The abstract of the VAC course completion detail should be submitted to the Registrar office.

1. SQUINT EVALUATION
2. LASERS IN OPHTHALMOLOGY
3. AMNIOTIC MEMBRANE GRAFT

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**

28.06.2015

**Sub: Organising Value-added Course: AMNIOTIC MEMBRANE GRAFT**

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 **"AMNIOTIC MEMBRANE GRAFT"**. 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 10TH JULY 2015. 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**

Amniotic membrane graft

**2. Duration & Period**

30 hrs & July-2015 – Oct-2015

**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-2015 -Oct-2015 (1)

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- July-2015 – Oct-2015 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | **OPH03** | Amniotic membrane graft | Prof.K.Rathnakumar, M.S, D.O, | 30 | 2015 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**Prof. K. Rathnakumar, M.S, D.O,**
**(Prof-Ophthalmology)**
**RESOURCE PERSON**

**Prof. D. Baba, M.S,**
**(Prof & HOD-Ophthal)**
**COORDINATOR**

PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

## Annexure 2 – Course Proposal

**Course Title: AMNIOTIC MEMBRANE GRAFT**

**Course Objective:**

1.Amniotic membrane

2. Procurement of the graft

3. Preparation of the graft

4. Storage media

5. Storage techniques

6. Indications and usages

7. Membrane handling

8. Follow up and recovery

**Course Outcome:** On successful completion of the course the students will be able to understand the usage of Amniotic membrane grafts in Various ocular procedures

**Course Audience: MBBS UNDERGRADUATES**

**Course Coordinator: PROF.D.BABA, MS,**

**Course Faculties with Qualification and Designation:**

1. **Prof.D.Baba, MS, - HOD Ophthalmology**
2. **Prof.K.Rathnakumar, MS,DO, - Professor Ophthalmology**

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1. | 18/7/2015 | **1.Amniotic membrane** | 4-6PM | 2 |
| 2. | 20/7/2015 | **2. Procurement of the graft** | 4-7PM | 3 |
| 3. | 22/7/2015 | **2. Procurement of the graft** | 4-6PM | 3 |
| 4. | 25/7/2015 | **3. Preparation of the graft** | 4-6PM | 2 |
| 5. | 29/7/2015 | **3. Preparation of the graft** | 4-7PM | 3 |

| | | | | |
|---|---|---|---|---|
| 6. | 10/8/2015 | **4. Storage media** | 4-7PM | 3 |
| 7. | 13/8/2015 | **4. Storage media** | 4-7PM | 3 |
| 8. | 15/8/2015 | **5. Storage techniques** | 4-6PM | 2 |
| 9. | 17/8/2015 | **5. Storage techniques** | 4-6PM | 2 |
| 10. | 20/8/2015 | **6. Indications and usages** | 4-7PM | 3 |
| 11. | 21/8/2015 | **7. Membrane handling** | 4-6PM | 2 |
| 12. | 25/8/2015 | **8. Follow up and recovery** | 4-6PM | 2 |
| | | | TOTAL HOURS | 30 |

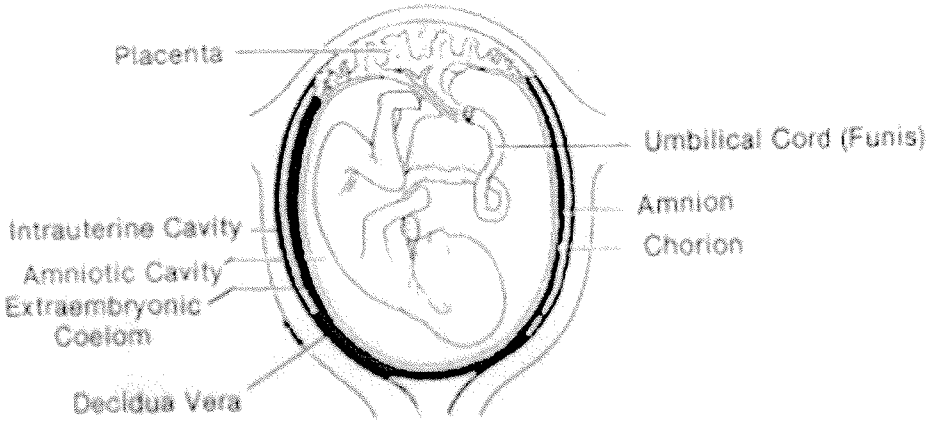
**REFERENCE BOOKS: (Minimum 2)**


1. JACK J KANSKI clinical ophthalmology a systemic approach-6th edition.
2. PARSON'S Diseases of the eye – 19th edition

# AMNIOTIC MEMBRANE GRAFT

**Introduction:**

- AM is the Innermost layer forming the fetal membrane.
- First used by Davis in 1910 in skin transplant.
- First documented ophthalmic application for conjunctival surface reconstruction in 1940 by De Roth.
- Sorsby et al in 1946 reported its use in acute ocular burns.
- Kim and Tseng successfully reintroduced usage in 1995




- Surrounds the developing fetus
- Derived from fetal tissue
- Amnion is translucent structure adjacent to amniotic fluid and provides nutrients
- Chorion is opaque membrane attached to the decidua

**Composition:**

- Inner surface- single layer- cuboida/columnar epithelium. Also has numerous microvilli with cytoplasmic core.

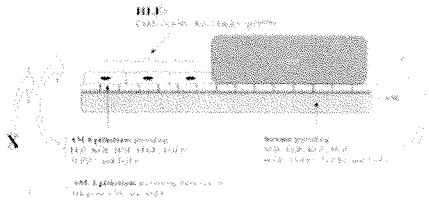
Derived from –embryonic ectoderm

- Basement membrane- collagen type 4,5 & laminin
- Loose stromal matrix
- A collagen layer-cross linked-mainly type 3 collagen- responsible for high tensile strength.
- Devoid of nerve, blood supply & lymphatics.

**Basic functions**

- Promotion of epithelialisation
- Inhibition of fibrosis

# Properties of Amniotic membrane



Facilitates migration of epithelial cells
Reinforcement of basal cell adhesion
Induction of epithelial cell differentiation and promotes goblet cell differentiation
Anti-inflammatory action reduces scarring and vascularization
bacteriostatic properties
Lack of Immunogenicity

- Cytokines, growth factors and protease inhibitors

(IL4,6) EPG, FGE TGR HGF and 2- microglobulin.

- Exclusion of inflammatory cells with anti-protease

activities

- Suppression of TGP- signalling system and

myofibroblast differentiation of normal fibroblasts

- Prolongation of life span of

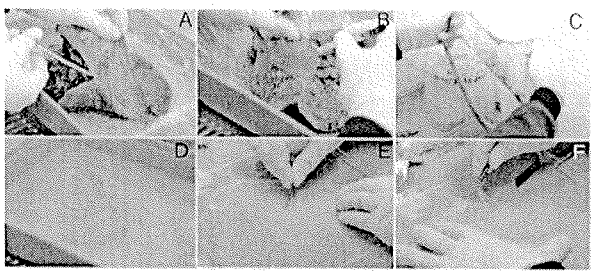
epithelial progenitor cells.

- Promotion of non-goblet cells epithelial differentiation
- Promotion of goblet cells differentiation when combined with epithelial fibroblast

**Collection:**

- Consenting Sero negative (Hepatitis B and C virus, Syphilis and HIV) maternal donors determined pre surgery
- elective caesarian section
- Under sterile conditions
- An antibiotic cocktail covering most of Gram positive and Negative bacteria and fungi in Balanced Salt Solution for 24 hours
- Second wash of BSS
- Amnion separated from chorion

## Harvesting Amniotic membrane



# Preservation

- BSS containing Ampicilin, Streptomycin and Amphotericin B used.
- Scrapped manually to remove debris
- Amnion is clear and Transparent
- Nitrocellulose membranes of required size
- Epithelial/basement layer up.

- Preserved in solution containing Modified Eagle's Medium (MEM) and glycerol in 1:1 ratio with 3.3% l-glutamine, 25 ug/ml Gentamicin, 50 units/ml penicillin, 100ug/ml ciprofloxacin and 0.5 mg/ml Amphotericin B

- Stored in 50 ML wide mouthed screw capped irradiated transparent bottles at -80 Degrees

**Preservation: 3 methods**

- Freeze drying
- Freeezing
- Hypothermic storage

**AMG preparation**

1. Amnion separated from chorion.
2. Amnion with chorion
3. Fresh membrane-no preservatives. Cleaned, stores in refrigerator at 4 deg cel, for 24 hrs before usage.

**Clinical uses**

1. Simple AMT: cell sources for epithelial regeneration and tear supply available eg. Pers.epi.defects.
2. Limbal stem cell deficient, but normal tear supply- chemical burns- AMT+ limbal stem cell transplantation
3. All 3 affected- steven Johnson syndrome- AMT+ limbal stem cell transplantation+ partial tarsoraphy.
4. AMT can also be done with PKP/ LKP
5. AMT with cyanoacrylate glue or human fibrin glue

## Surgical techniques

- Thawed at room temperature
- Rinsed three times in BSS
- Gently separated from the nitrocellulose paper
- Epithelium-basement membrane side up

- Stromal side up, away from the eye.
- The stromal side of the membrane is sticky
- Trimmed to the appropriate shape
- 10-0 nylon interrupted sutures
- Intercepted 10-0 nylon sutures

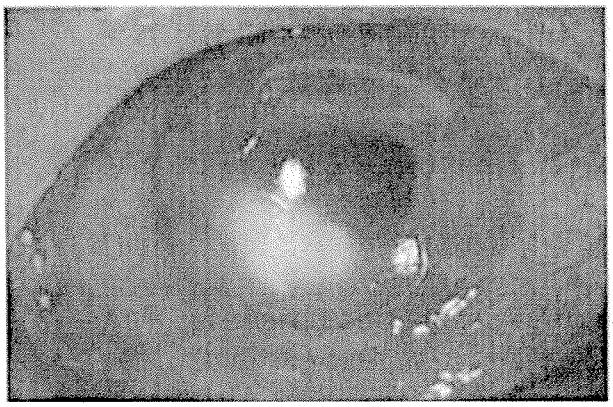
**Technique**

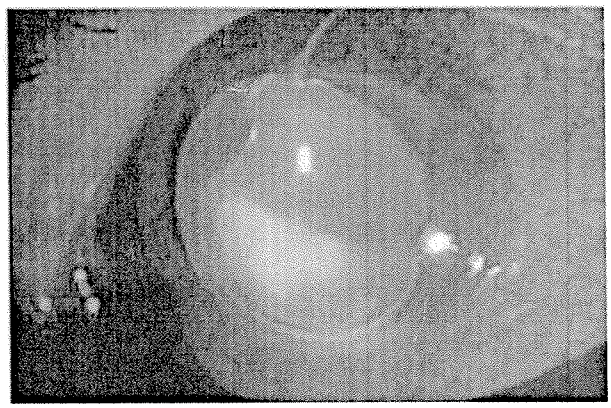
- Conj peritomy at limbus
- Perilimbal inflamed and scarred tissue removed to expose bare sclera upto 5-7 mm from the limbus
- Abnormal vascularised corneal epithelium and pannus removed
- Amg thawed, peeled from nitrocellulose paper
- Fashioned into required size and shape
- Secured to corneal edge of the defect **, epithelial side facing up.**
- Secured with 10-0 nylon suture to cornea and sclera

AMT in ophthalmology

**Persistent epithelial defects due to herpes simplex keratitis**

- Ulcerated area debrided with cellulose surgical sponge
- AMG prepared and placed onto recipient area
- Secured with sutures
- Post op- antibiotic, steroid drops
- Bandage contact lens applied until reepithelisation completed.





**Pterygium**

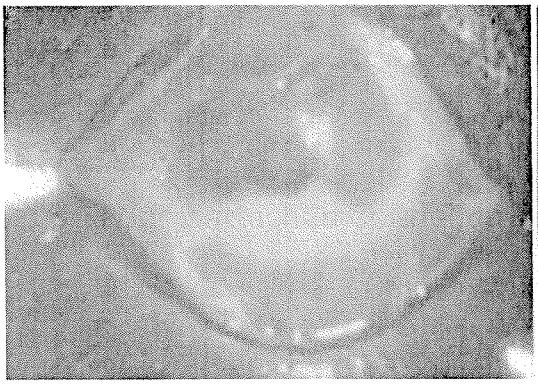
- After excision- bare sclera covered with required size AMG.

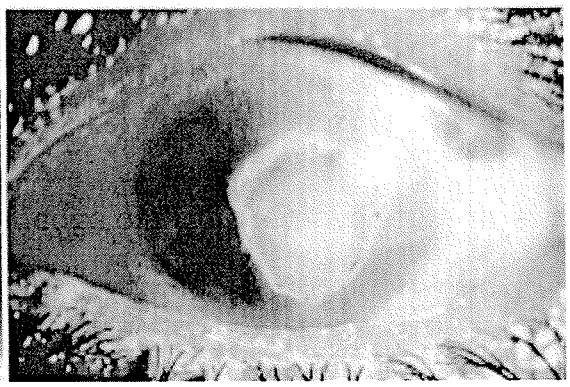
**SYMBLEPHARON:**

Same as above with fornix reformation and symblepharon ring application at end of surgery.

**Corneal ulcer**

- Base of ulcer- debrided properly
- Poorly attached epithelium at edge of ulcer- removed bluntly as possible.
- AMG prepared- cut into small pieces , stuffed into depressed area of ulcer
- Second layer-over stuffed layer with epi side facing up- acts as basement membrane.
- Third layer on top of all AM patch upto limbus with epi side up and secured with sutures.





**AMT with glue application**

- Indic: corneal perforation
- Base of ulcer debrided
- Small drop of glue applied to perforation site
- After polymerisation of glue, AC formed with visco
- Iris should be free from tissue adhesive and cornea

- AMG placed over glue and secured with sutures

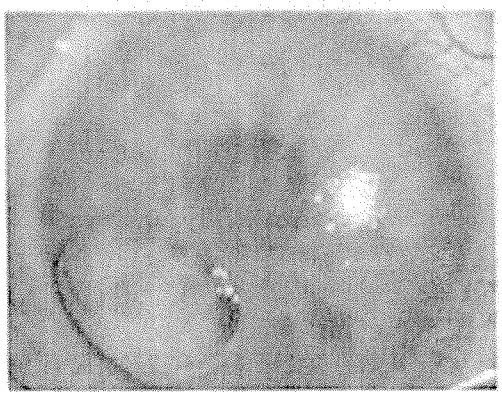
**Pseudophakic bullous keratopathy**

- Alt to conj flaps
- Decreased pain noted
- Early epithelisation

**FOLLOWING BAND SHAPED KERATOPATHY**

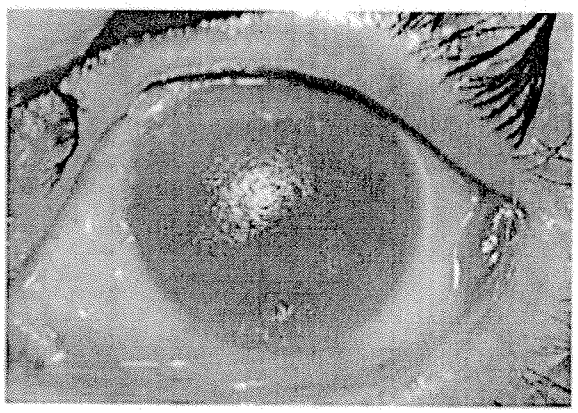
After surgical removal of calcific deposit with or without edta application

Followed by AMG



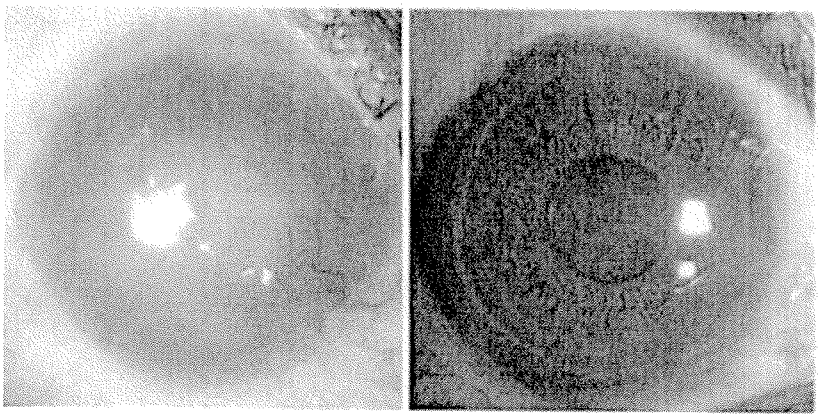
**Acute chemical burns**

- Mild and moderate burns –simple AM
- Severe burns- AMT+ limbal stem cell transplantation
- Following removal of ocular surface squamous neoplasia and other tumors with large defects.
- Following photorefractive keratectomy- helps in reducing corneal haze.



# Conjunctival cicatrisation/scar





Limbal stem cell transplant on amniotic membrane

**Glaucoma surgery**

- Antiadhesive property-desirable after trabeculectomy or during repair of leaking blebs- improves success rate of trab
- AM epithelises rapidly, antifibrotic properties, low immune response- ideal tissue for repair of leaking blebs.
- Am reduces subconjuctival fibrosis and promotes filtration when placed under scleral flap.
- Some studies reported better outcome- AMG supplemented with MMC in uncontrolled glaucoma.

**Culture of corneal epithelial cells**

- A confluent primary culture of limbal corneal epithelial cells was established on cellular human AM after 14 days.
- Cells were partially stratified and well attached toAM, but BM was not fully formed.
- So autologous transplantation of cultivated corneal epithelium is feasible by using acellular AM as a carrier.

**Annexure- II**

# VALUE ADDED COURSE

## Amniotic membrane graft

## List of students enrolment – July 2015 – Oct-2015

| SL.NO | University Reg. No. | NAME OF THE STUDENTS | Signature |
|---|---|---|---|
| 1 | U15MB250 | AARTHI .H | |
| 2 | U15MB251 | ABARNA. M | |
| 3 | U15MB252 | ABINAYA.J | |
| 4 | U15MB253 | ADARSH .S | |
| 5 | U15MB254 | AGILAN .A | |
| 6 | U15MB255 | AKSHAYA .S | |
| 7 | U15MB256 | AKSSHAYA .M.R | |
| 8 | U15MB257 | AMARNATH. S | |
| 9 | U15MB258 | AMUDHESAR .K.M | |
| 10 | U15MB259 | ANANDH.S | |
| 11 | U15MB260 | ARCHITH VIGNESH .B | |
| 12 | U15MB261 | ARJUNBALAJI .A | |
| 13 | U15MB262 | ARUL NIVETHINI V.A | |
| 14 | U15MB263 | ARUL PRINCE. E | |
| 15 | U15MB264 | ARUNKUMAR .S | |
| 16 | U15MB265 | ARUN PRASAD. K | |
| 17 | U15MB266 | ARUNA .S | |
| 18 | U15MB267 | ASAN THASTHAGIR. M | |
| 19 | U15MB268 | ASWIN. B | |
| 20 | U15MB269 | BALAMANI KANDAN. S | |
| 21 | U15MB270 | BHALA KUMARAN .S | |
| 22 | U15MB271 | CHELLAMARIAPPAN. S | |
| 23 | U15MB272 | CIBIBALAA. D | |

| | | | |
|---|---|---|---|
| 24 | U15MB273 | DEEPIKA DIVYA KUMARI.B | |
| 25 | U15MB274 | DEEPIKA PRIYADHARSHINI. B | |
| 26 | U15MB275 | DEVANAND .M | |
| 27 | U15MB276 | DEVANATHAN. R | |
| 28 | U15MB277 | DHANA PRIYA .P | |
| 29 | U15MB278 | DHANALAKSHMI. M | |
| 30 | U15MB279 | DHANUSH .R | |

**Prof.K.Rathnakumar, MS,DO**

**RESOURCE PERSON**

**Prof.D.Baba, MS, -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**

## AMNIOTIC MEMBRANE GRAFT

## MULTIPLE CHOICE QUESTIONS

**Course Code: OPH03**

### I. ANSWER ALL THE QUESTIONS

1. Amniotic membrane is obtained from
   a. Teeth
   b. Periosteum
   c. Placenta
   d. Skin
2. Amniotic membrane graft is done for
   a. Chalazion
   b. Conjunctivitis
   c. After pterygium removal
   d. Uveitis
3. Amniotic membrane is usual in
   a. Salt solution
   b. Formalin
   c. Sulfamic acid
   d. Glycol
4. Amniotic membrane graft can be used in all except
   a. Pterygium exam
   b. Chemical burn
   c. Deep corneal ulcerates

5. Limbal stem cell deficiency can be treated
    a. AMG
    b. TKP
    c. OKP
    d. Paracetamol
6. Amniotic membrane is _____ layer of fctain membrane
    a. Innermost
    b. Outermost
    c. Middle
7. AMG first used in skin transplant by
    a. Davis
    b. David
    c. John
    d. Abraham
8. AMG is preserved by all methods except
    a. Freeze injury
    b. Fuzzing
    c. Hypothermic strong
    d. Roon tempsertion
9. Function of AMG are all except
    a. Promotion of epithelise
    b. Healing of ulcer
    c. Aggravates corneal ulcer

10. Amniotic membrane graft can be collected from all except

    a. Elective caesirum section

    b. Normal healthy mother

    c. HIV + mother

    d. None of the above

# 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 .H (U15MB250) has actively participated in the Value Added Course on AMNIOTIC MEMBRANE GRAFT held during JULY 2015 TO OCT 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Prof.K.Rathnakumar, MS, DO,
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 ABARNA. M (U15MB251) has actively participated in the Value Added Course on AMNIOTIC MEMBRANE GRAFT held during JULY 2015 TO OCT 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Prof.K.Rathnakumar, MS, DO,
RESOURCE PERSON

Prof.D.Baba, MS,
COORDINATOR

# Student Feedback Form

Course Name: **AMNIOTIC MEMBRANE GRAFT**

Subject Code: **OPH03**

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:

Abarna. M
Signature

*Date:*

**Annexure 5**

Date : 28/10/2015

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: AMNIOTIC MEMBRANE GRAFT**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **AMNIOTIC MEMBRANE GRAFT** for 30students in JULY – OCT 2015. 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 18/12/2015

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: APPLANATION TONOMETRY**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **APPLANATION TONOMETRY** on **JAN 2016 TO APR 2016**. 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:
The HOD:
The Expert:
The committee has discussed about the course and is approved.

Subject Expert

HOD

DEAN
Prof.K.BALAGURUNATHAN,M.S
(General surgeon)
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
OSUDU, PONDICHERRY

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 / OPH04** **Date: 18.12.2015**

**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 2015-2016 - 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. APPLANATION TONOMETER
2. DRY EYE
3. CHEMICAL INJURIES

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. APPLANATION TONOMETER
2. DRY EYE
3. CHEMICAL INJURIES

**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 / OPH04** **Date: 21.12.2015**

**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 2015-2016 – Reg.

**Ref:** Ref. No. SLIMS/Dean Off/VAC /OPH04 Dated: 18.12.2015

*****

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 2015– 2016. The abstract of the VAC course completion detail should be submitted to the Registrar office.

1. APPLANATION TONOMETER
2. DRY EYE
3. CHEMICAL INJURIES

Thanking you

Yours faithfull

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

22.02.2016

**Sub: Organising Value-added Course: APPLANATION TONOMETRY**

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 **"APPLANATION TONOMETRY"**. 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 10TH JAN 2016. 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**

Applanation Tonometry

**2. Duration & Period**

30 hrs & Jan-2016 – Apr-2016

**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-2016 – Apr-2016 (1)

**8. Year of discontinuation: 2017**

**9. Summary report of each program year-wise**

| Value Added Course- Jan-2016 – Apr-2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | **OPH04** | Applanation tonometry | Prof.K.Rathnakumar, M.S, D.O, | 30 | 2016 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**Prof. K. Rathnakumar, M.S, D.O,**
**(Prof-Ophthalmology)**
**RESOURCE PERSON**

**Prof. D. Baba, M.S,**
**(Prof & HOD-Ophthal)**
**COORDINATOR**

PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

## Annexure 2 – Course Proposal

**Course Title: APPLANATION TONOMETRY**

**Course Objective:**

1. Intraocular Pressure
2. Types of tonometry
3. Principle of applanation tonometer
4. Uses of applanation tonometer
5. Correlation between CCT and AT
6. Fluorescein dye
7. Maintenance of applanation tonometer
8. Glaucoma correlation with AT

**Course Outcome:** On successful completion of the course the students will be able to understand the uses of AT and methods to handle the same, along with its maintenance.

**Course Audience: MBBS UNDERGRADUATES**

**Course Coordinator: PROF.D.BABA, MS,**

**Course Faculties with Qualification and Designation:**

1. **Prof.D.Baba, MS, - HOD Ophthalmology**
2. **Prof.K.Rathnakumar, MS,DO, - Professor Ophthalmology**

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1. | 18/7/2015 | 1.Intraocular Pressure | 4-6PM | 2 |
| 2. | 20/7/2015 | 2.Types of tonometry | 4-7PM | 3 |
| 3. | 22/7/2015 | 2.Types of tonometry | 4-6PM | 3 |
| 4. | 25/7/2015 | 3.Principle of applanation tonometer | 4-6PM | 2 |
| 5. | 29/7/2015 | 3.Principle of applanation tonometer | 4-7PM | 3 |
| 6. | 10/8/2015 | 4.Uses of applanation tonometer | 4-7PM | 3 |
| 7. | 13/8/2015 | 4.Uses of applanation tonometer | 4-7PM | 3 |
| 8. | 15/8/2015 | 5.Correlation between CCT and AT | 4-6PM | 2 |
| 9. | 17/8/2015 | 5.Correlation between CCT and AT | 4-6PM | 2 |
| 10. | 20/8/2015 | 6.Fluorescein dye | 4-7PM | 3 |
| 11. | 21/8/2015 | 7. Maintenance of applanation tonometer | 4-6PM | 2 |
| 12. | 25/8/2015 | 8. Glaucoma correlation with AT | 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

# APPLANATION TONOMETRY

Intraocular pressure (IOP) is determined by the balance between the rate of aqueous production and its outflow. The average IOP in the general population is around 16 mmHg on applanation tonometry, and a range of about 11–21 mmHg.

All clinical tonometers measure the IOP by relating a deformation of the globe to the force responsible for the deformation .

The two basic types of tonometers differ according to the shape of the deformation: indentation and applanation (flattening).

- **Tonometry**
  - **Applanation**
    - Variable force
      - Goldmann
    - Variable area
      - Maklakoff
  - **Indendation**
    - Schiotz

## Indendation tonometers

- The shape of the deformation with this type of tonometer is a truncated cone .
- The precise shape, however, is variable and unpredictable.
- In addition, these instruments displace a relatively large intraocular volume.
- As a result of these characteristics, conversion tables based on empirical data from in vitro and in vivo studies must be used to estimate the IOP.



Why applanation tonometry???

Indendation tonometry is:

- Significantly influenced by ocular rigidity
- Moses effect-at lower scale readings the cornea moulds into the space between the hole and plunger-pushes the plunger up-falsely high IOP values

Applanation tonometers

- The shape of the deformation with these tonometers is a simple flattening
- Because the shape is constant, its relationship to the IOP can, in most cases, be derived from mathematical calculations.
- The applanation tonometers are further differentiated on the basis of the variable that is measured.




Variable force applanation tonometers

- This type of tonometer measures the force that is required to applanate (flatten) a standard area of the corneal surface.
- The prototype is the Goldmann applanation tonometer, which was introduced in 1954.

Others are:

1. Perkin's
2. Draeger
3. Mackay Marg
4. Pneumotonometer
5. PASCAL-DCT

**Variable area tonometers**

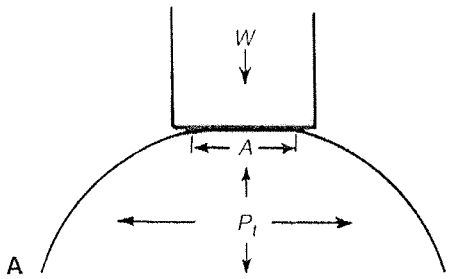
- Variable Area tonometers measure the area of the cornea that is flattened by a known force (weight)
- The prototype in this group is the Maklakoff tonometer, which was introduced in 1885.

Others are:

1. Applanometer
2. Tonomat
3. Halberg tonometer
4. Barraquer tonometer
5. Ocular tension indicator
6. Glaucotest

**Principle of Goldmann applanation tonometry**

- Goldmann based his concept of tonometry on a modification of the Maklakoff-Fick law, also referred to as the Imbert-Fick law
- This law states that an external force (W) against a sphere equals the pressure in the sphere (P) multiplied by the area flattened (applanated) by the external force (A)
- W=P x A




But???

The validity of the law requires that the sphere be

1. Perfectly spherical
2. Dry
3. Perfectly flexible

4. Infinitely thin

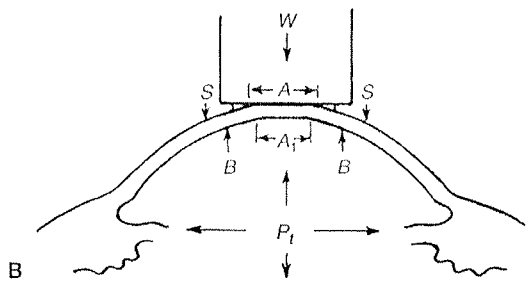
The cornea fails to satisfy any of these requirements, in that it is :

1. Aspherical
2. Wet
3. Neither perfectly flexible
4. Nor infinitely thin
5. The moisture creates a surface tension (S)
6. Lack of flexibility requires a force to bend the cornea (B), which is independent of the internal pressure.
7. In addition, because the cornea has a central thickness of approximately 550 μm, the outer area of flattening (A) is not the same as the inner area (A1)
8. It was therefore necessary to modify the Imbert Fick law to account for these characteristics of the cornea:
9. **W+S =(P x A1)+ B**
10. When A1 equals 7.35 sq.mm S balances B and W equals P

This internal area of applanation is obtained when the diameter of the external area of corneal applanation is **3.06 mm**, which is used in the standard instrument.

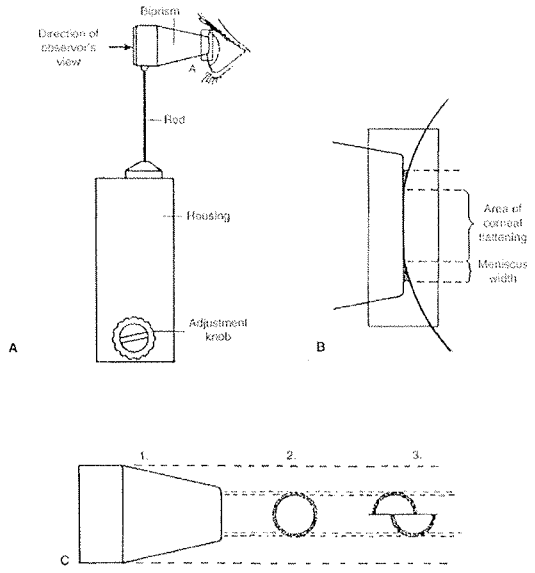
The volume of displacement produced by applanating an area with a diameter of 3.06 mm approximately **0.50 cu mm**.

11. Ocular rigidity does not significantly influence the measurement.

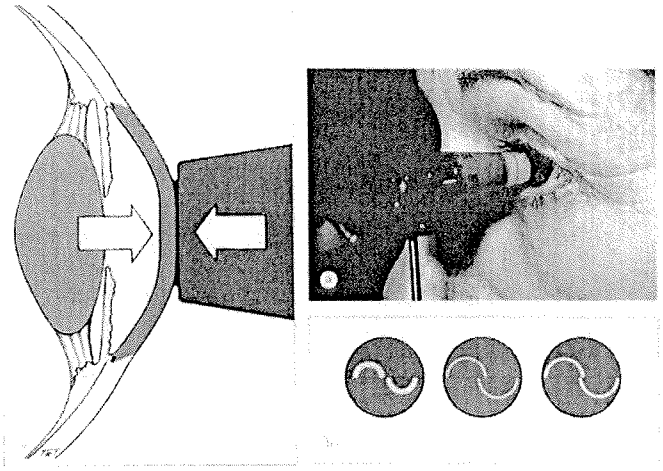



**Description of Tonometer:**

- The instrument is mounted on a standard slitlamp in such a way that the examiner's view is directed through the center of a plastic biprism, which is used to applanate the cornea.
- Two beam splitting prisms within the applanating unit optically convert the circular area of corneal contact into semi circles




- The cornea is anesthetized with a topical preparation, and
- the tear film is stained with sodium fluorescein(touching a fluorescein impregnated paper strip to the tears in the lower cul-de-sac)
- .the cornea and biprism illuminated by a cobalt blue light from the slitlamp,
- the biprism is brought into gentle contact with the apex of the cornea .
- The fluorescence of the stained tears facilitates visualization of the tear meniscus at the margin of contact between cornea and biprism.
- The fluorescent semicircles are viewed through the biprism, and
- the force against the cornea is adjusted until the inner edges overlap.
- The influence of the ocular pulsations is seen when the instrument is properly positioned,
- The IOP is then read directly from a scale on the tonometer housing.



**Sources of error in IOP reading**

1. Incorrect fluorescein pattern

- Over staining-Thick mires-Falsely high IOP
- Under staining-Thin mires-Falsely low IOP

2. Pressure on the globe

- By examimer
- Squeezing of eyelids by patient
- Thyroid myopathy

3. Corneal thickness

- Thick corneas-Flasely high IOP
- Thin corneas-Falsely low IOP-esp following refractive surgeries

4. Corneal edema-Artificially low IOP

5. Corneal astigmatism:

- Can distort the mires
- If more than 3 D the rism can be rotated over 90 deg and the average of the two readings can be taken.
- Incorrect calibration of the tonometer
- Other factors-tight collar-obstructs venous return
- Wide pulse pressure-smal loscillation can occur in the IOP with time due to variability in ocular perfusion; the mid point can be taken as the reading
- Repeated readings over a short period-lowers IOP due to massaging effect

**Reducing the risk of cross infection**

- Avoid in individuals with overt infection
- Using a disposable sleeve to cover the tonometer tip
- Swabbing the tip with an **alcohol prep pad** and allowing it to dry for 10 minutes-kills **HIV** and most organisms except HBV ,HBC and acanthamoeba
- Wiping then soaking the tonometer in **3% hydrogen peroxide** for 5 minutes-removes **HBC**
- As this is extremely toxic to the corneal epithelium the tip must be thoroughly wiped before use.

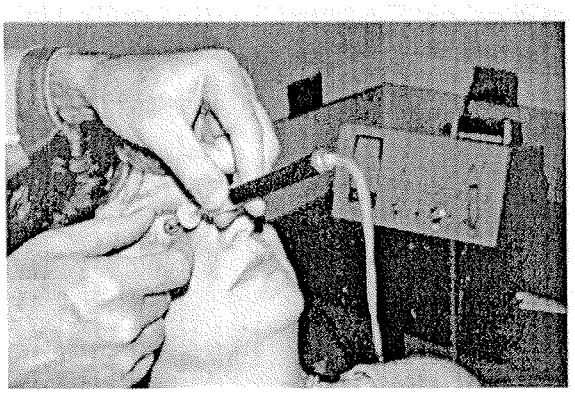
**Perkin's tonometer**

- Hand held Goldmann's tonometer
- Can be used in bed bound/anaesthetized patients



**Pneumotonometer**

- Based on applanation principle
- Uses a puff of air to flatten the cornea
- Time required to flatten the cornea co relates with the IOP
- Non contact-no risk of cross infection
- Can be used for screening
- But it is accurate only within the low to middle range values of IOP not for very high IOP.

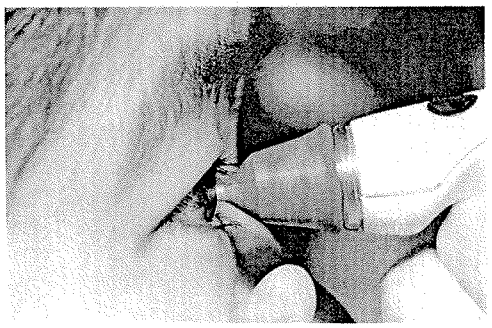


**Mackay marg tonometer**

- The original Mackay-Marg tonometer, which is no longer available, had a plate diameter of 1.5 mm surrounded by a rubber sleeve.
- The force required to keep the plate flush with the sleeve was electronically monitored and recorded on a paper strip .

**Tonopen**

- The most commonly used Mackay Marg type of tonometer is the tonopen.
- An electrical signal is created as the footplate flattens the cornea.
- This is picked up by a microprocessor which measures the force required to flatten the cornea.
- Averages 4 to 10 readings to give a final digital readout.
- **CAN BE USED IN SCARRED/EDEMATOUS CORNEAS/OVER BANDAGE CONTACT LENSES**

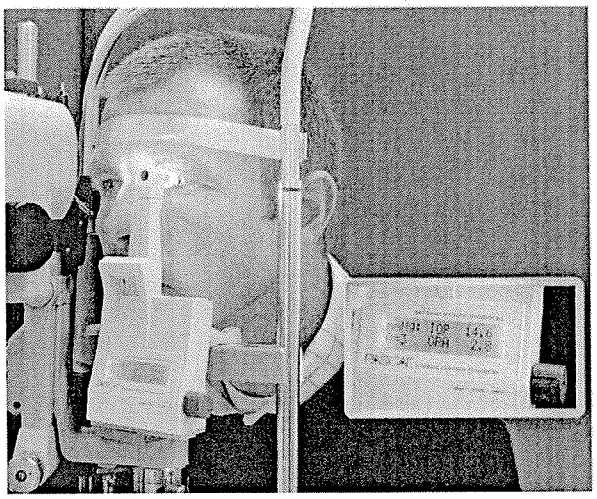


**NCT**

- After proper alignment of the patient, a puff of room air creates a constant force that momentarily deforms the central cornea,
- Detected by an optoelectronic system of a transmitter.
- This directs a collimated beam of light at the corneal vertex,
- A receiver and detector, which accepts only parallel, coaxial rays reflected from the cornea.
- At the moment that the central cornea is flattened, the greatest number of reflected light rays are received, which is recorded as the peak intensity of light detected.
- The time from an internal reference point to the moment of maximum light detection is converted to IOP.

**DCT**

- Measures IOP relatively independent of CCT
- It is used along with slit lamp similar to Goldmann's



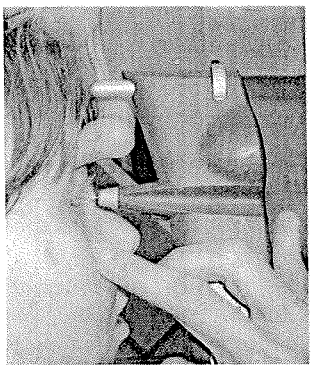
Other newer tonometers

**Reichert ocular response analyser:**

- Type of pneumotonometer
- Compensates for corneal hysteresis

**I care:**

- Hand held
- Rebound tonometry
- Only momentary contact-No anaesthetic needed ,useful for self monitoring



**Comparision between tonometers with respect to Goldmann**

- The Schiötz tonometer reads lower than the Goldmann.

- The Perkins applanation tonometer compared favorably against the Goldmann tonometer
- Tono-Pen underestimates Goldmann IOP in the higher range and overestimates in the lower range
- In comparing IOPs in eyes before and after LASIK for myopia, pneumotonometry showed less IOP lowering compared with Goldmann applanation tonometry after LASIK-induced cornea thinning.

**Annexure- II**

# VALUE ADDED COURSE

## Applanation Tonometry

### 4. List of Students Enrolled Jan-2016 – Apr-2016

| Sl. No. | Univ. Reg. No. | Name of the Student | Signature |
|---|---|---|---|
| 1 | U16MB251 | AARTHI.A | Aarthi. A. |
| 2 | U16MB252 | ABILASHA.K | Abilasha. K. |
| 3 | U16MB253 | ABITHA RAJLIN J.S | Abitha Rajlin J.S. |
| 4 | U16MB254 | ADAPALA PRIYANKA | Adapala priyanka |
| 5 | U16MB255 | ADHITHAYA RAJ .N | Adhithaya. Raj. |
| 6 | U16MB256 | AJAY .N | Ajay. N. |
| 7 | U16MB257 | AKSHYA .R | Akshaya. R. |
| 8 | U16MB258 | ALLARI KARTHIK ABHIROOP | Allari karthik abhiroop. |
| 9 | U16MB259 | AMAL ASHOK | Amal ashok |
| 10 | U16MB260 | AMIRTHAVARSHNI .R | amirthavarshini |
| 11 | U16MB261 | ANANYA SHARMA | Ananya sharma |
| 12 | U16MB262 | ANGALAKUDURU DEEPCHAND | Angalakuduru deepchand |
| 13 | U16MB263 | ANJAN BANERJEE | Anjan banerjee |
| 14 | U16MB264 | ANWESHA CHATTERJEE | Anwesha chatterjee. |
| 15 | U16MB265 | ARCHANA .A | Archana. |
| 16 | U16MB266 | ARCHITHA.A | Architha. A. |
| 17 | U16MB267 | ARIVUMATHI .R | Arivumathi. R. |
| 18 | U16MB268 | ARJUN.S | Arjun. S. |
| 19 | U16MB269 | ASHVANTH KUMAR .A | Ashvanth kumar. |
| 20 | U16MB270 | ASMITHA S.V | Asmitha. S.V. |
| 21 | U16MB271 | AVIDI VENKATA SAISUSHMA | Avidi venkata saisushma. |

| | | | |
|---|---|---|---|
| 22 | U16MB272 | AVIRAL PATPATIA | Aviral Patpatia. |
| 23 | U16MB273 | BALACHANDRAN .A | Balachandra |
| 24 | U16MB274 | BALAJI .S | Balaji. S |
| 25 | U16MB275 | BHASKARAN .K.C | Bhaskaran. K.C. |
| 26 | U16MB276 | BHAVANI . K.M | Bhavani. K.M. |
| 27 | U16MB277 | BLESSY AMALA RISHA .J | Blessyamalarisha.J |
| 28 | U16MB278 | CAREENA DANIEL | Careenadaniel. |
| 29 | U16MB279 | CHANDRA PRAKASH.M | Chandraprakash.M |
| 30 | U16MB280 | CHINJU S.R | Chinju.S.R |

**Prof.K.Rathnakumar, MS,DO**

**RESOURCE PERSON**

**Prof.D.Baba, MS, -HOD**

**COORDINATOR**

PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

Aadhi A
U16 MB 251

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

## APPLANATION TONOMETRY

## MULTIPLE CHOICE QUESTIONS

Course Code: OPH04

I. ANSWER ALL THE QUESTIONS

1. Normal IOP's
   a) 5-6 mmHg
   b) 11-21 mmHg
   c) 20-30 mmHg
   d) 30-40 mmHg
2. Tonometer head has
   a) Convex lens
   b) Concave lens
   c) Biprism
   d) None of above
3. Gold standard IOP Measurement is by
   a) Schiot
   b) NCT
   c) Goldman application
   d) Digital method
4. Source of error in IOP reading includes
   a) Thick corneas
   b) Over staining
   c) Corneal edema
   d) All of above

5. Tonometer head is sterilised using
   a) Alcohol swab
   b) Distilled water
   c) Beta dine solution
   d) Tap water
6. Hand held goldman tonometer is
   a) Perkins
   b) NCT
   c) Pneumotonometer
   d) Mackaymarg tonometer
7. Dye used during applanation tonometry is
   a) Trypan blue
   b) Flowercein strip
   c) Indoyanive green
   d) Yellow
8. Applanation Tonometry is base on
   a) Imbert – Fick law
   b) Snell's law
   c) Robert – Fick law
9. Tonometry means measwement of
   a) Intraocular pressure
   b) Corneal curvature
   c) Axial lengh of eyeball
   d) IOL power

10. Applanation Tonometry includes all except

a) Goldman's tonometer

b) Perkin's tonometer

c) Schiotz tonometer

d) Draeger tonometer

# 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.A (U16MB251) has actively participated in the Value Added Course on APPLANATION TONOMETRY held during JAN 2016 TO OCT 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Prof.K.Rathnakumar, MS, DO,
RESOURCE PERSON

Prof.D.Baba, MS,
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 ABILASHA.K (U16MB252) has actively participated in the Value Added Course on APPLANATION TONOMETRY held during JAN 2016 TO APR 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Prof.K.Rathnakumar, MS, DO,
RESOURCE PERSON

Prof.D.Baba, MS,
COORDINATOR

# Student Feedback Form

Course Name: **APPLANATION TONOMETRY**

Subject Code: **OPH04**

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:

Aarthi. A

Signature

*Date:*

**Annexure 5**

Date : 30/14/2016

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: APPLANATION TONOMETRY**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **APPLANATION TONOMETRY** for 30students in JAN – APR 2016. 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.

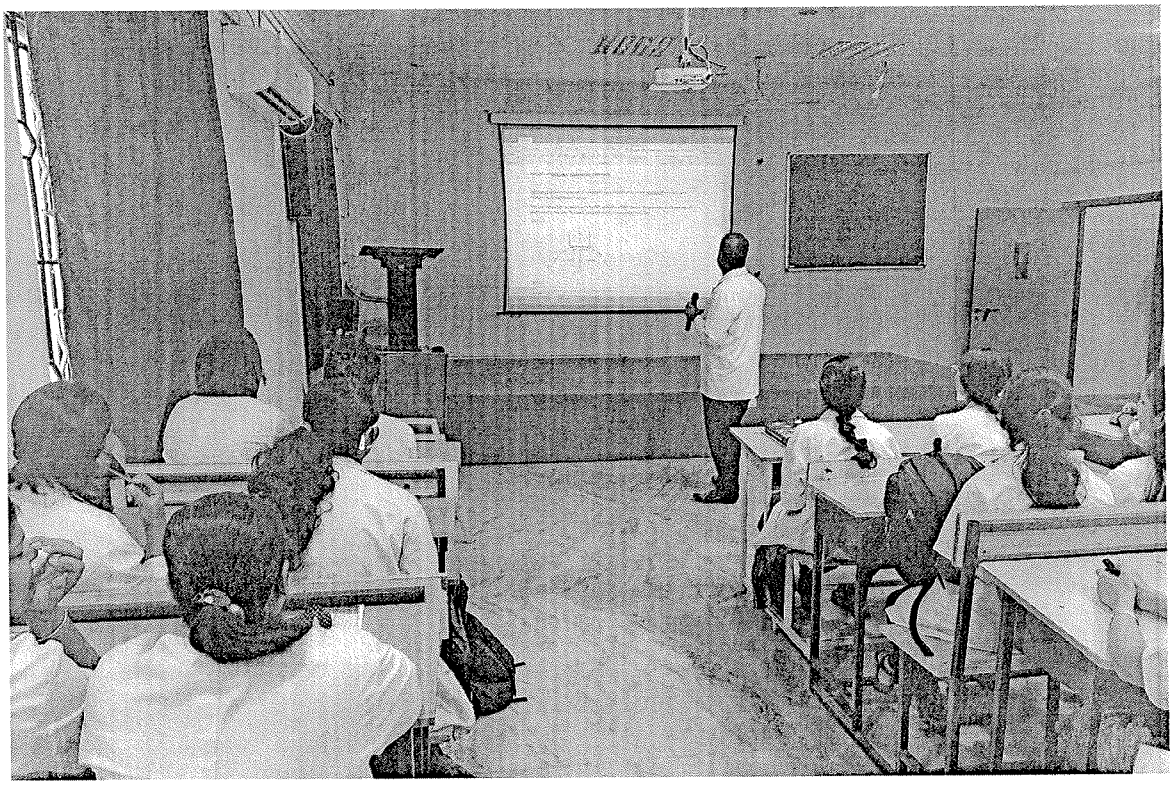
Kind Regards

Prof.D.Baba, MS

HOD ,Ophthalmology

**Encl: Certificates**

**Photographs**



# Sri Lakshmi Narayana Institute of Medical Sciences

Date:05.06.2015

From

Dr. Tiroumourougane Serane
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 College
Bharath Institute of Higher Education and Research,
Chennai.

**Sub: Permission to conduct value-added course: Paediatic nutrition Module for Undergraduate students.**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Paediatric Nutrition for II year MBBS students from July 2015- Oct 2015. Requesting your kind permission for the same.

Kind Regards

Dr. Tiroumourougane Serane

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**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: **Dr. Rajasekar**

The HOD: **Dr. Tiroumourougane Serane**

The Expert: **Dr. Abhijeet Shrivastava**

The committee has discussed about the course and is approved.

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

Dean

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

HOD

ASSISTANT PROFESSOR
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
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

15.06.2015

**Sub: Organising Value-added Course: Pediatric Nutrition Module for Undergraduate students 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 **Pediatric Nutrition Module** for Undergraduate students. July – October 2015 ( 3 months )

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 June 2015. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

Encl: Copy of Course content

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

# Annexure 2 – Course Proposal

**Course Title: DEVELOPMENTAL PAEDIATRICS**

**Course Objective: Developmental Paediatrics**

**Course Outcome: Developmental evaluation and assessment**

**Course Audience: II year MBBS Students**

**Course Coordinator: Dr. Abijeeth Shrivastava**

**Course Faculties with Qualification and Designation:**

**Dr. Tiroumourougane Serane – HOD, Department of paediatrics**
**Dr. Abijeeth – DNB Paediatrics – Assistant professor**

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

| S | DATE | TOPIC | COORDINATOR | TIM | HO |
|---|---|---|---|---|---|
| 1 | 20/10/20 | Laws of development | Dr.Tiroumourou | 2pm | 3 |
| 2 | 21/10/20 | Neonatal | Dr. Abijeeth | 2pm | 3 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **3** | **24/10/20** | **Motordevelop** | | **2pm** | **3** |
| **4** | **25/10/20** | **Finemotordeve** | **Dr. Abijeeth** | **2pm** | **3** |
| **5** | **26/10/20** | **Language and development** | **Dr. Abijeeth** | **2pm** | **3hrs** |
| **6** | **27/10/20** | **Vision and assessment** | **Dr.Tiroumourou** | **2pm** | **3** |

| | | | | | |
|---|---|---|---|---|---|
| **7** | **28/10/20** | **History** | **Dr.Tiroumourou** | **2pm** | **3** |
| **8** | **29/10/20** | **360** | **Dr. Abijeeth** | **2pm** | **3** |
| **9** | **1/10/201** | **Developmental** | **Dr. Abijeeth** | **2pm** | **3hrs** |
| **1** | **2/10/201** | **Upper age** | **Dr. Abijeeth** | **2pm** | **3hrs** |

| | | | | | |
|---|---|---|---|---|---|
| | | **attainment** | | | |
| | | | | **Tota** | **30** |

**REFERENCE BOOKS: (Minimum 2)**

**Nelson Textbook of pediatrics 20 E**

**Illingworth Developmental Pediatrics**

# VALUE ADDED COURSE

1. **Name of the programme & Code**

   Paediatric nutrition , PECO1

**2. Duration & Period**

30 hrs , July 2015-Oct 2015

**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

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| **Value Added Course-** | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | PECO1 | Paediatric nutrition | **Dr.Abijeeth** | II MBBS | 20 students ,2015 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**Dr. Abhijeet Shrivastava**
**RESOURCE PERSON**

ASSISTANT PROFESSOR
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

**Dr. Tiroumourougane Serane**
**COORDINATOR**

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

# NUTRITION & NUTRITIONAL ASSESSMENT


TheFeltSource.com
Have Fun
Eat Right
Exercise
OATMEAL
whole grain cereal
RICE
RAISINS
YOGURT
PEANUT BUTTER
TUNA
Grains
Make half your grains whole
Vegetables
Vary your veggies
Fruits
Focus on fruits
Milk
Get your calcium-rich foods
Meat & Beans
Go lean with protein
For an 1,800-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov
Eat 6 oz. every day: at least half should be whole grain
Eat 2½ cups every day
Eat 1½ cups every day
Get 3 cups every day: for kids ages 2 to 8, it's 2 cups
Eat 5 oz. every day
Oil
Oils are not a food group, but you need some for good health. Get your oils from fish, nuts and liquid oils such as corn oil, soybean oil and canola oil.
Find your balance between food and play
Fats and sugars - know your limits

COURSE DETAILS

| **Particulars** | **Description** |
|---|---|
| Course Title | Pediatric nutrition |
| Course Code | PECO1 |
| Objective | 1. Food pyramid<br>2. Importance of nutrition<br>3. Nutrition assessment<br>4. Anthropometry<br>5. ICMR guidelines<br>6. Calories and protein value<br>7. Protein energy malnutrition<br>8. Severe acute malnutrition |

| | |
|---|---|
| Further learning opportunities | **Nutrient deficiency , trace elements and mineral deficiency** |
| Key Competencies | On successful completion of the course the students will have skill in understanding the importance of nutrition and idea on nutrient rich food |
| Target Student | II MBBS Students |
| Duration | 30hrs |
| Theory Session | 0hrs |
| Practical Session | 30 hours |
| Assessment Procedure | Multiple choice questions |

# NUTRITION- DEFINITIONS
# NATIONAL NUTRITION WEEK – 1ST – 7TH SEPTEMBER

- **Nutrition**: The process by which the organism utilizes food.
- **IYCN:** infant & Young Child Nutrition
- Special emphasis on **1st 1000 Days of Life** (prenatal to 2yrs/minus 9 to plus 24 months)
- **Weaning/Complementary Feeding**: The systematic process of introduction of suitable food at the right time in addition to mother's milk in order to provide needed nutrients to the baby (UNICEF 1984).

# FOOD ITEMS & FOOD GROUPS

- Cereals, Pulses (legumes), Vegetables, fruits, Milk & milk products, Meat group & Fish, Sugar, Oils & Fats
- **Energy yielding**: Carbohydrates, Fats & Oils
- **Body building**: Protein
- **Protective foods**: Vitamins & Minerals
- **Micronutrients**: those required in small quantities; mg/mcg

# FOOD ITEMS & FOOD GROUPS CONTD…

- **Trace Elements**: present/required in trace quantities: <0.01% body weight
- **Balanced Diet**: Optimum quantity of all food groups and food items needed for physical activity, growth & development, repair or worn out/ageing tissues and maintenance of body functions.

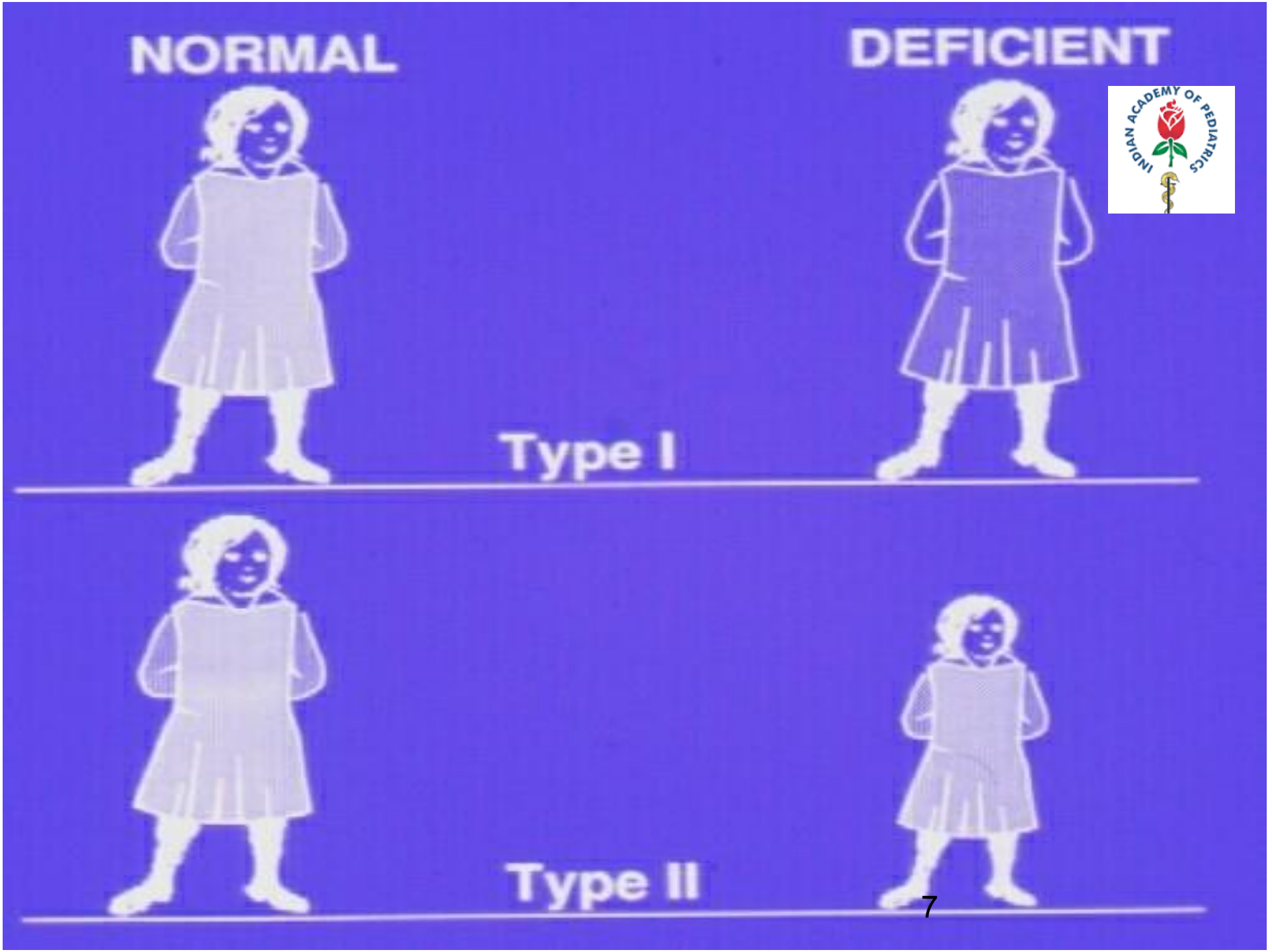
# NEW FOOD GUIDEPYRAMID






# TYPE I AND TYPE II NUTRIENTS

- Over 40 nutrients are essential to health
- If any one is deficient then the person will not be healthy and resist disease
- Many are ignored by practitioners and their deficiency is not recognized
- They are divided into two groups in terms of the response to a deficiency


NORMAL
DEFICIENT
INDIAN ACADEMY OF PEDIATRICS
Type I
Type II

## Type 1

- iron
- iodine
- copper
- calcium
- selenium
- thiamin
- riboflavin
- pyridoxine
- niacin
- folate
- cobalamin
- vitamin A, D, E, K

## Type 2

- nitrogen
- essential amino acids
- potassium
- magnesium
- phosphorus
- sulphur
- zinc
- sodium
- chloride

## Type 1

Functional nutrients

- has a body store
- reduces in concentration with deficiency
- Specific signs of deficiency
- Growth failure not a feature
- variable in breast milk

## Type 2

Growth nutrients

- has no body store
- stable tissue concentration
- no specific signs of deficiency
- Growth failure the dominant feature
- stable in breast milk

# ENERGY

- **Unit of Energy**: 1 kilocalorie (kcal./Cal.)
- Heat required to raise temperature of 1 kg of water from 14.5 to 15.5$^{o}$C.
- Unit in international system: Joule
- (1 cal.= 4.184 joule)

# CARBOHYDRATES: 1 G = 4 KCAL.

- Provide energy, taste, preserve foods
- Types: Starch, sugars
  - Monosaccharides: glucose
  - Disaccharides: sucrose, lactose, fructose
  - Complex: Maltodexrins, Polysaccharides, glycogen
- Glucose*
  - Fuel for brain and muscle
  - Converted to glycogen, stored in liver & muscles
  - * Heart & RBCs use only glucose or energy
- 55 – 60% of total calories

# FIBER- UNABSORBABLE CARBOHYDRATES

- Constituent of plant cell wall: **cellulose, pectins, gums, lignins**
- Contribute to the bulk, very little to energy
- Water holding capacity, bile binding capacity, promotes growth of normal intestine microflora
- Lowers cholesterol, limits glucose absorption
- Reduces constipation, colon cancers,
- Softens stool, accelerates bowel movement
- High fiber may reduce bioavailability of minerals, cause flatulence and decreased appetite

# PROTEIN: 1 G =4 KCAL.

- Protein means of 'prime importance'
- 24 amino acid, 8 essential in all & 3: cysteine, arginine, taurine essential in LBW babies
- Helps in growth, tissue repair, formation of body fluids and enzymes
- **RDA**:1.8-1.5 in child & 0.7 g/kg/day in adults
- To supply up to 15% of energy
- **Complete protein** supply all the essential aa.
- **Reference protein** : provides aa. pattern close to tissue protein, Egg with Digestibility quotient (DQ), Biological value (BV) & Net protein utilization (NPU) = 96.

# LIPIDS/FAT: LONG CHAIN 1 G = 9 KCAL

- Concentrates of energy, Both Visible & non visible, transports fat soluble vitamins
- Saturated, Monounsaturated & Polyunsaturated (Ideal ratio 1:1:1)
- Long chain: 12 or more, Medium: 7-11 & Short: 6 Carbons
- Triglycerides, phospholipids (lecithin), sterols (cholesterol: HDL (good cholesterol), LDL, VLBL)
- Cis. Vs. Trans fat (trans fat unhealthy)

# LIPIDS/FAT: LONG CHAIN 1 G = 9 KCAL CONTD…

- EFA- Polyunsaturated to supply 3% of energy →
- Derived Long Chain polyunsat. (LCPs)
- Omega 6: Linoleic → Arachidonic & Adrenic acid
  - Proinflammatory, health of skin
- Omega 3: Alpha Linolenic → Eicosa pentaenoic acid (EPA) & Docosa hexaenoic acid (DHA)
  - Anti inflammatory, EPA for heart & DHA for brain & vision
  - (ideal ratio of Omega 6: omega 3 = 5-10:1)

# MINERALS- MACRO & MICRO MINERALS

- Elements, Minerals, Electrolytes
- Calcium, Phosphorous, Magnesium, Sodium, Potassium, Chloride,,
- Trace elements
  - Essential - iron, iodine, zinc, selenium, copper, molybdenum, cobalt, chromium, manganese, silicon, nickel, boron
  - Potentially toxic - fluorine, lead, cadmium, mercury, arsenic

# PERIODS OF GROWTH

- Prenatal period
  - Ovum: 0-14 days
  - Embryo: 2 to 9 weeks
  - Fetus: 9 weeks to birth
- Perinatal period
  - 28 wks gestation (>1000 g) to 7 days after birth,
  - Extended: 22 wks to 7 days.

# PERIODS OF GROWTH

- Postnatal period
  - Newborn: first 28 days after birth
  - Infancy: first year
  - Toddler: 1 –3 year
  - Preschool: 3 –6 years
  - Schoolchild: 6 – 10 years & more
  - Adolescence: 10-19 yrs..
  - LBW: <2500 irrespective of gestational age, VLBW: <1500 & ELBW: < 1000 g

# ASSESSMENT OF NUTRITIONAL STATUS

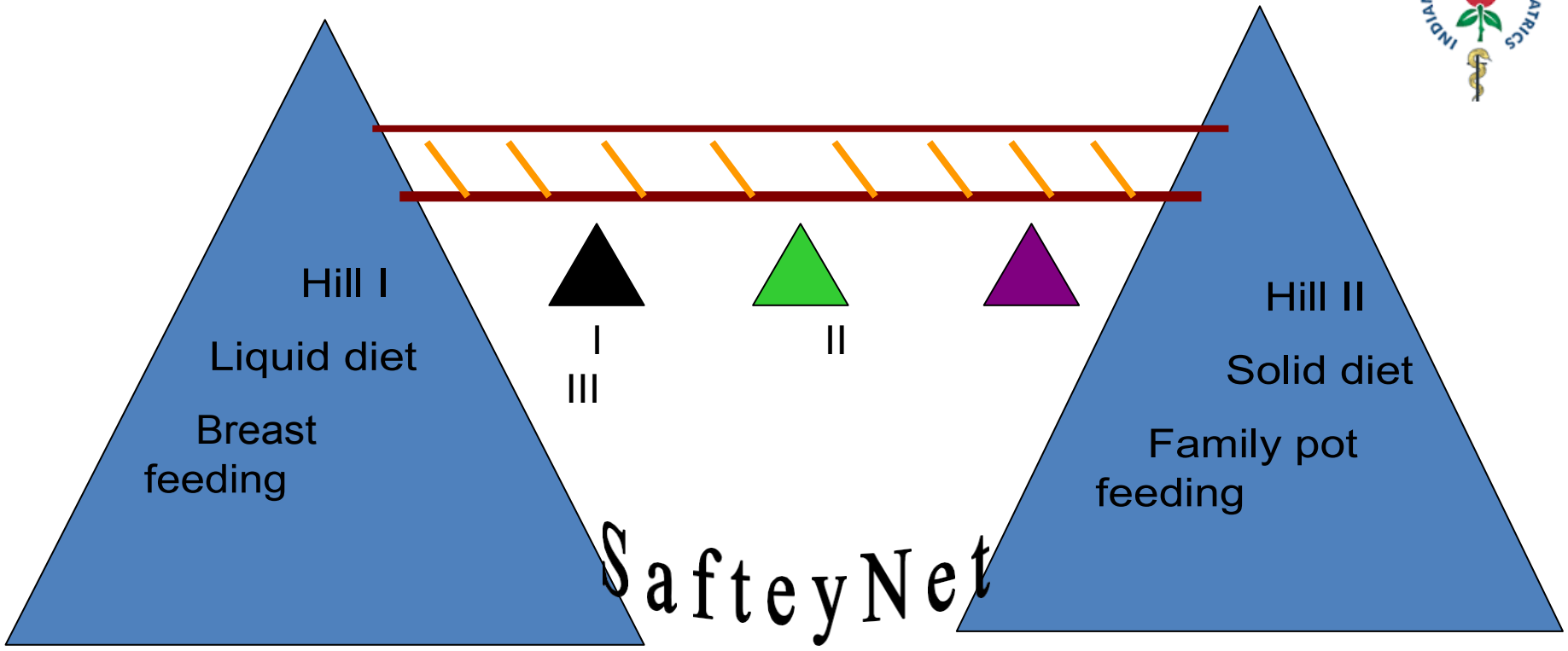
- Dietary History
- Anthropometry/Auxology*

(* preferred term than anthropometry for human measurements)

- Clinical features of Malnutrition/ specific deficiencies
- Biochemical Assessment
- Radiological Assessment: Bone, Teeth etc.
- Morphological & Histological
- Epidemiological: Vital statistics

# DIETARY EVALUATION

- Record **IYCF practices: Exclusive breast feed**, total duration of breast feeding,
- **Complementary feeding**: time of introduction, type, adequacy,
- Empowerment to **Family pot feeding,**
- Access to any **safety net** in the form of Supplementary feeding, Group eating/ small frequent special feeding (Akshayapatra concept)
- Present diet: **24 Hrs. dietary recall**
- Adequacy with respect to energy, protein, micronutrients & comparison with RDA
- Any H/o exclusion diet, diet during illness, any supplements




# Pit of malnutrition

Safety Net : Supplementary Feeding,

Group Eating,

Akshayapathra

# RDA

- **Energy Requirement: ICMR Recommended Dietary Allowances (RDA)** almost on par with American RDA for reference child/ ideal weight
- **Bedside Calculation- bare minimum**: 1 Yr. old 1000 kcal +100 kcal/each Yr. Adol. Boy 2400 & Girl 2200.
- **Holliday & Segar formula for both energy & fluid *:**
  - 1 – 10 kg: 100 kcal/ kg/day
  - 11 – 20 kg: 1000 + 50 kcal/kg/day
  - > 20 kg: 1500 + 20 kcal/ kg/day
  - Adult: 40 kcal/kg/day

*Use ideal weight for energy & observed weight for fluid calculation

# FOOD VALUES

- Ideally Standard measuring equipments should be demonstrated during dietary evaluation.
- 1 teas spoon: 5 ml or 5 g
- 1 table spoon:15 ml or 15 g (3 teaspoon)
- 1 glass: Usually 8 oz – 240 ml/g
- 1 cup: Usually 6 oz- 180 ml/g

| Food item | Protein g | Kilocalories |
|---|---|---|
| Idly – one | 2 | 50 |
| Puri – two | 2 | 70 |
| Wheat chappati 1 | 2 | 70 |
| Bread slice 1 1oz | 2 | 70 |
| Dosa | 2 | 70 |
| Uppma 1 cup | 6 | 250 |
| Ragi 6 tsp | 2 | 100 |
| Cooked dhal 1 tsp | 0.5 | 15 |
| Oil/ghee 1 tsp | 0 | 36 |

| Food item | Protein gms | Kilocalories |
|---|---|---|
| Cooked rice 1 cup | 4 | 175 |
| Honey 1 tsp | 0 | 15 |
| Rasam 1 cup | 0 | 20 |
| Coconut water 1 cup | 1.4 | 24 |
| Coffee 1 cup<br>Tea 1 cup | 1.8<br>1.0 | 80<br>60 |
| Butter milk 100 ml | 0.8 | 15 |
| Ragi flour 6 tsp | 2 | 100 |
| Ragi 100 g | 7.3 | 328 |
| Rice 100 g (Par boiled) | 6.4 | 346 |
| Wheat 100 g | 11.8 | 346 |

| Food item | Protein gms | Kilocalories |
|---|---|---|
| Mashed potato 1 tsp | - | 40 |
| Bengal gram 100 g | 22.5 | 369 |
| Black gram Dhal 100 g | 24 | 347 |
| Green gram dhal 100 g | 24.5 | 348 |
| Red gram dhal 100 g | 22.3 | 335 |
| Mutton 1 oz (8 bits) | 6 | 50 |
| Egg Hen 1 | 6 | 80 |
| Fish 1oz (10 cm) | 6 | 80 |
| Biscuit 1 | 0.5 | 25 |
| Papadam 1 | 0.5 | 25 |
| Banana 1 | 0.6 | 50 |

| Food item | Protein gms | Kilocalories |
|---|---|---|
| Spinach 100g | 2 | 26 |
| Cow's milk200 ml | 6 | 120 |
| Curd 30ml | 1 | 20 |
| Papaya ripe 100 G<br>Tomato 100g | 0.6<br>1.4 | 32<br>21 |
| Ground nut 100 seeds | 10 | 200 |

# ITEMS THAT GIVE 6 G OF PROTEIN

- 1 egg
- 3 slice bread
- 3 idlis
- 3 chappatis
- 3 dosas
- 6 puris
- 6 vada / bonda
- 12 tsp cooked dhal
- 18 tsp ragi
- 1 glass milk
- 1 ounce (30 ml) meat / fish
- 60 groundnuts
- 15 cashew nuts
- 1 ½ cup cooked rice
- 6 tsp bengal gram
- 12 Biscuit
- 12 pappadam

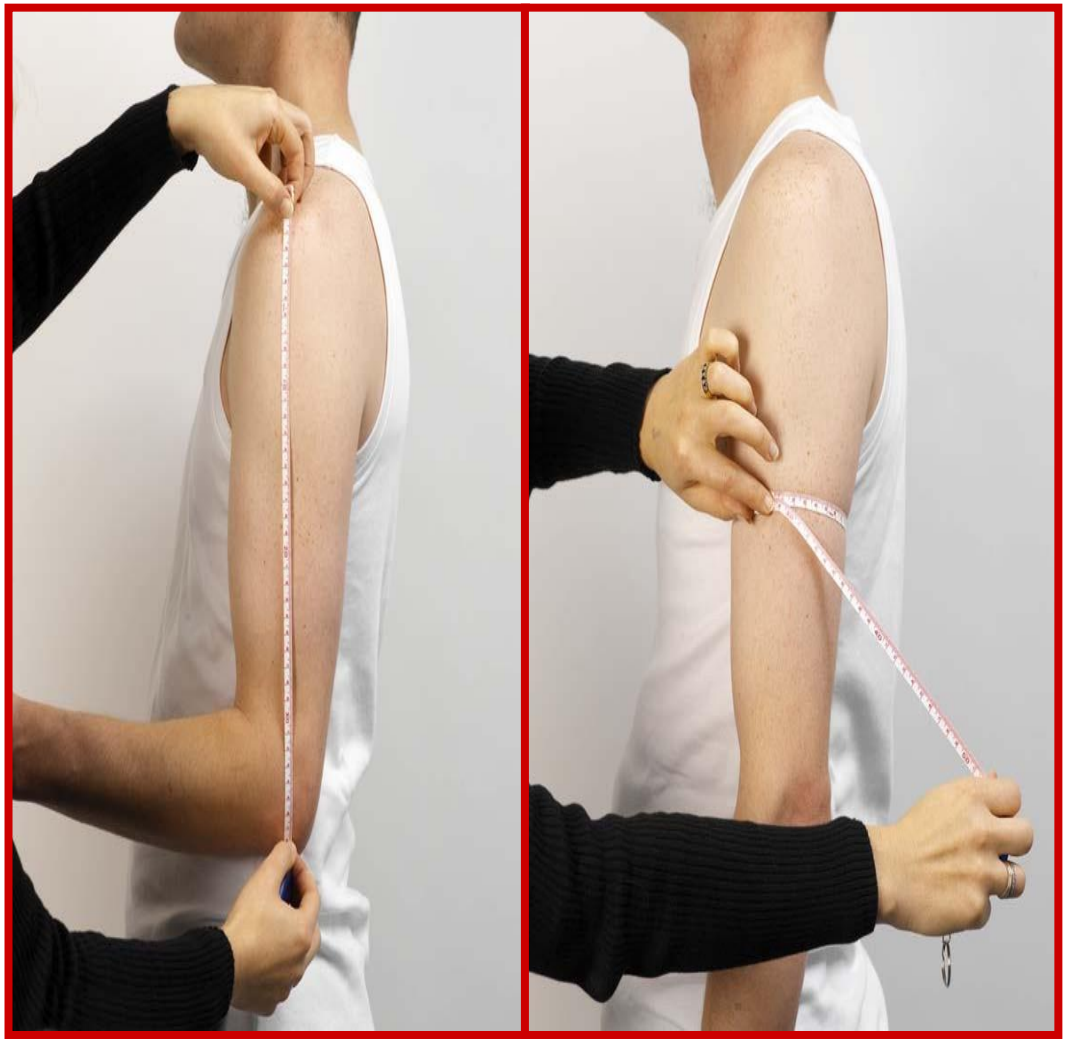
# AGE DEPENDENT & AGE INDEPENDENT ANTHROPOMETRIC CRITERIA

- Weight & Height for age, Length up to 2 Yrs
- & Height after 2 Yrs. (Anthropometric rod)
- Weight for Height
- Head circumference
- Chest circumference
- Mid Upper Arm circumference (MUAC Tape)
- Skin fold thickness- Harpenden Caliper
- Upper segment: Lower segment ratio
- Arm span
- Mid parental height (MPH: average of father's & mother's height) & predicted adult Target Height (MPH + 6.5 in boys & MPH- 6.5 cm in girls)

# AGE INDEPENDENT ANTHROPOMETRIC MEASUREMENTS

- MUAC: Left upper arm
- Bangle test: Internal diameter 4 cm
- Shakir's tape: Colored (green, yellow, red) MUAC tape
- Quac stick*: Relates height to MUAC (*Of historic importance only)
- Body mass index (BMI): very good to define both obesity & chronic energy deficiency
- Ponderal index: Used in newborns, relates weight to height.

# CLASSIFICATION BASED ON MID UPPER ARMCIRCUMFERENCE



Between 1-5 yrs. constant

16.5-17.5 cm

| *MUAC (cm)* | |
|---|---|
| *>13.5* | *Normal* |
| *13.5-12.5* | *Mild/moderate malnutrition* |
| *<12.5 < 11.5* | *Severe malnutrition SAM* |

# WEIGHT FOR AGE – GOMEZ INTERNATIONAL CLASSIFICATION

| Wt / age (%) | Degree of malnutrition |
|---|---|
| >90 | Normal |
| 75 – 90 | I degree |
| 60 – 75 | II degree |
| <60 | III degree |

# WEIGHT FOR AGE- WELLCOME TRUST CLASSIFICATION

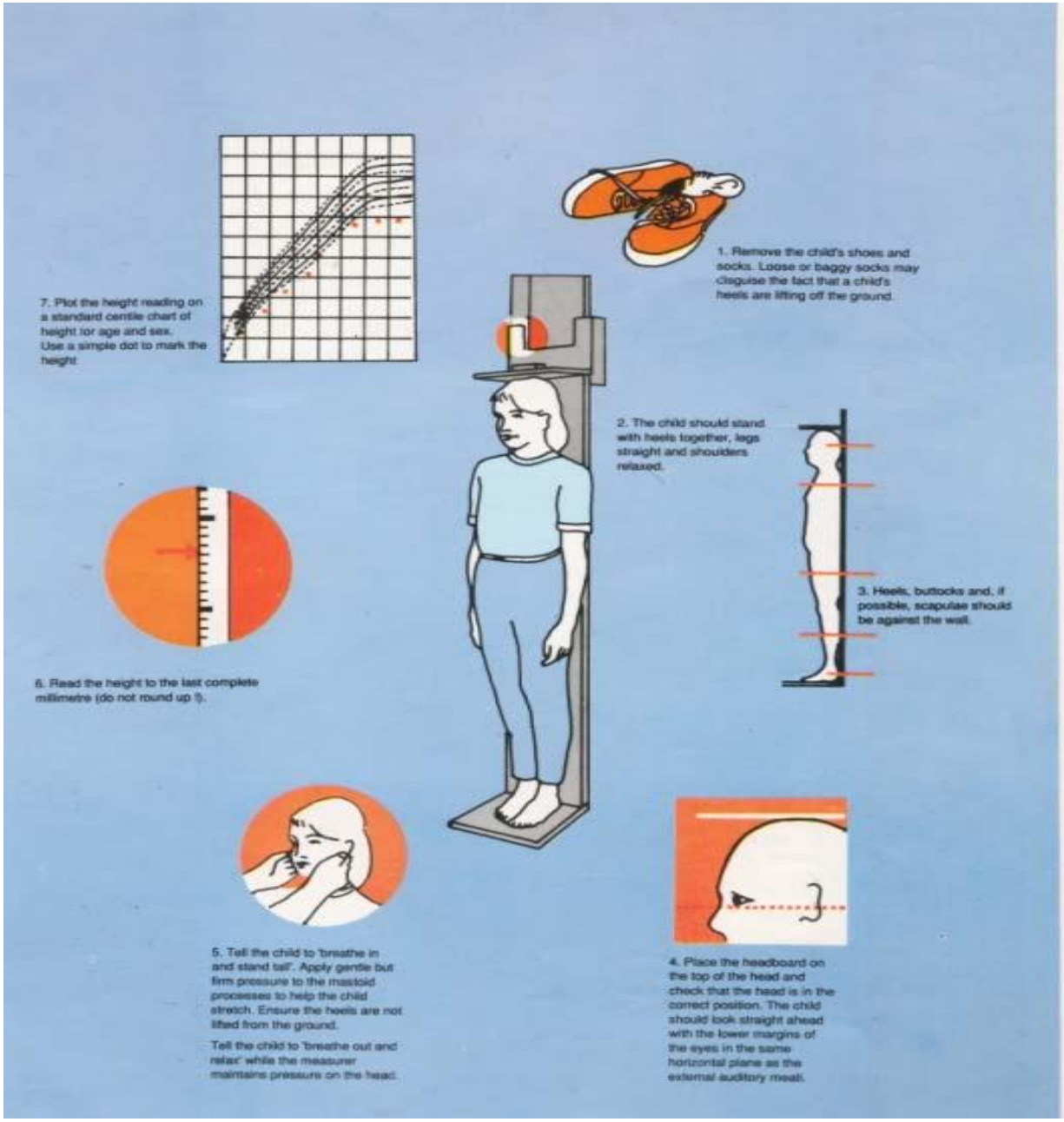
| | | |
|---|---|---|
| 60-80% | Edema + | Kwarshiorkor |
| 60-80% | - | Underweight |
| <60 | - | Marasmus |
| <60 | Edema + | Marasmic Kwashiorkor |

# WEIGHT FOR AGE- IAP CLASSIFICATION OF MALNUTRITION

| | |
|---|---|
| >80% | Normal |
| 71-80% | Grade I |
| 61-70% | Grade II |
| 51-60% | Grade III |
| <50% | Grade IV |

# HEIGHT FOR AGE: CLASSIFICATION OF STUNTING (WATERLOW)

| | |
|---|---|
| > 95% | Normal |
| 90-95% | 1 degree stunting (mild) |
| 85-90% | II degree stunting (moderate) |
| > 85% | III degree stunting (severe) |


1. Remove the child's shoes and socks. Loose or baggy socks may disguise the fact that a child's heels are lifting off the ground.
2. The child should stand with heels together, legs straight and shoulders relaxed.
3. Heels, buttocks and, if possible, scapulae should be against the wall.
4. Place the headboard on the top of the head and check that the head is in the correct position. The child should look straight ahead with the lower margins of the eyes in the same horizontal plane as the external auditory meati.
5. Tell the child to 'breathe in and stand tall'. Apply gentle but firm pressure to the mastoid processes to help the child stretch. Ensure the heels are not lifted from the ground.
Tell the child to 'breathe out and relax' while the measurer maintains pressure on the head.
6. Read the height to the last complete millimetre (do not round up !).
7. Plot the height reading on a standard centile chart of height for age and sex. Use a simple dot to mark the height.

# WEIGHT FOR HEIGHT: CLASSIFICATION OF WASTING (WATERLOW)

| | |
|---|---|
| > 90 % | Normal |
| 80 -90 % | 1 degree wasting (mild) |
| 70-80 % | II degree wasting (moderate) |
| < 70% | III degree wasting (severe) |

# MID PARENTAL HEIGHT

Boy

- $\frac{\text{paternal height} + \text{maternal height} + 6.5}{2}$

Girl

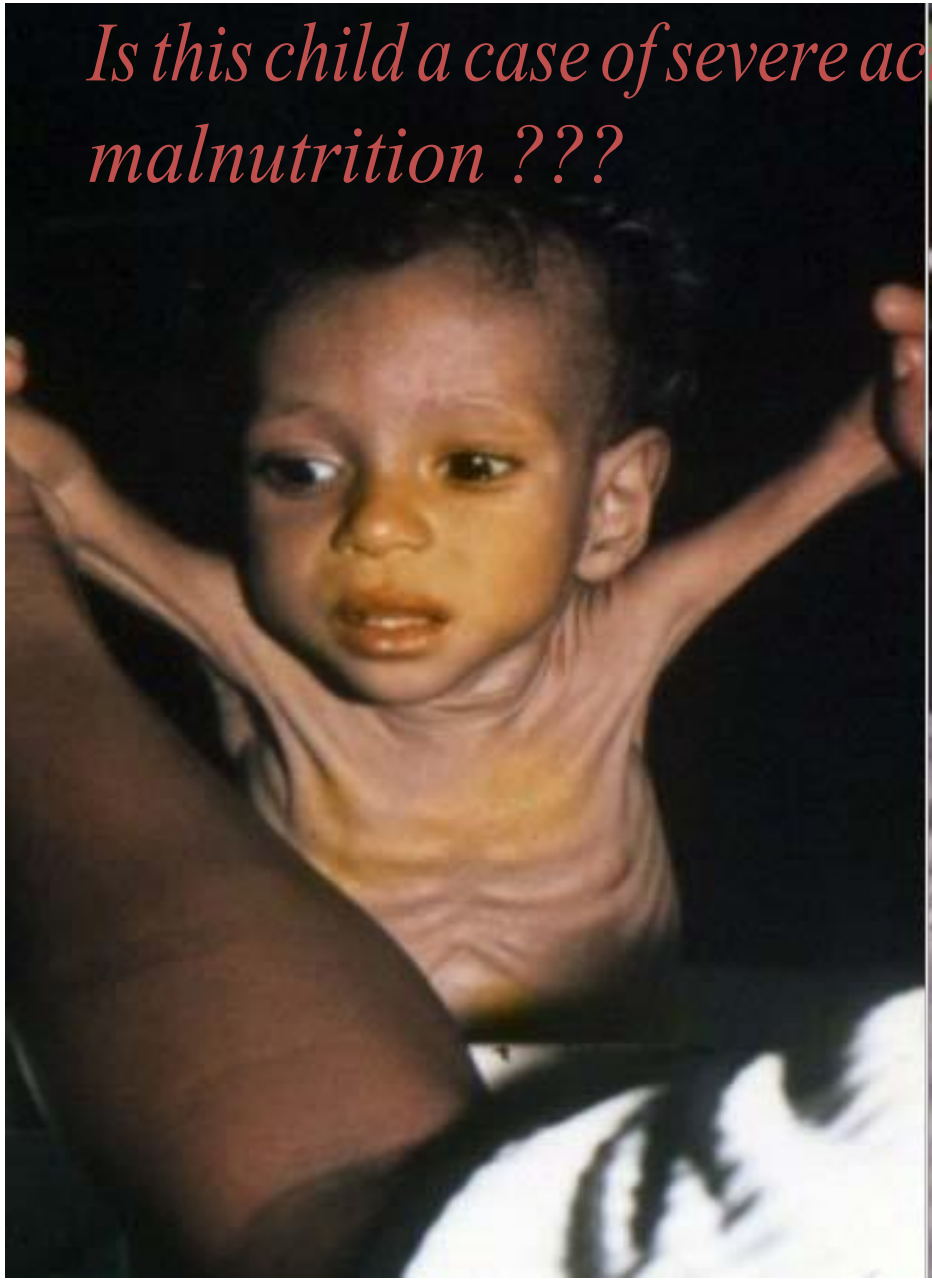
- $\frac{\text{paternal height} + \text{maternal height} - 6.5}{2}$

- Predicted target height is MPH +/- 2.5 cm

# SEVERE ACUTE MALNUTRITION

Is this child a case of severe acute malnutrition ???

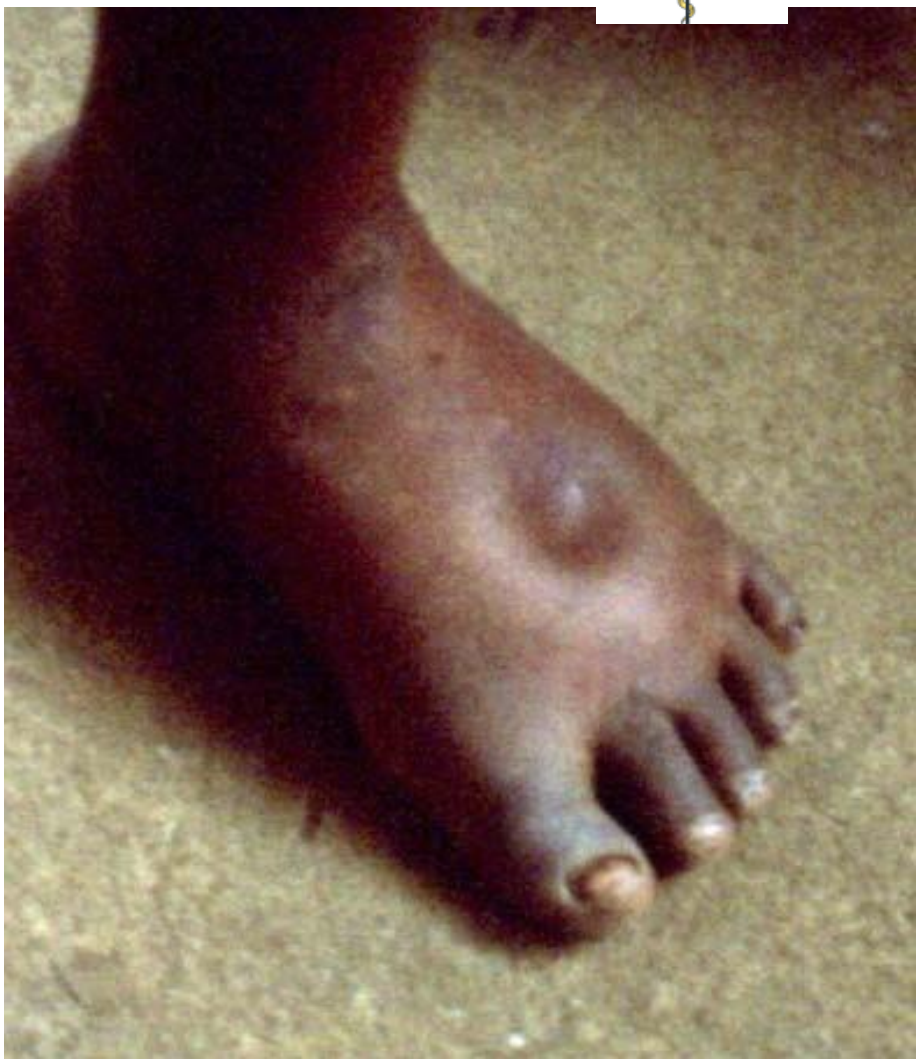
*Is this child a case of severe acute malnutrition ???*





# One cannot tell by just looking, Take measurements, Test for edema-finger pressure for 3 seconds





# MARASMUS

- Severe wasting of muscle & s/c fats
- Severe growth retardation
- No edema or hair changes or fatty liver
- Alert but miserable
- Hungry

# MARASMUS – GRADE IV







# KWASHIORKOR

## Cardinal features

- Oedema
- Psychomotor changes
- Growth retardation
- Muscle wasting

## Associated features

- Moon face
- Hair changes
- Skin changes
- Depigmentation
- Anemia
- Hepatomegaly
- Flaky paintdermatitis
- Cardiac failure
- Ddehydration
- Vitamin deficiencies

# KWASHIORKOR- GRADE IV







# GRADING OF SEVERITY

**Marasmus**

I: loose skin folds axilla & groin

II. Wasting of Thigh & buttocks

III. Wasting of Chest & back

IV. Wasting of Buccal pad of fat

**Kwashiorkor**

I. Pedal edema

II. Facial edema

III. Chest & body edema

IV. Ascites

# MARASMIC KWASHIORKOR

- Syndrome seen in marasmic children, with severe muscle & fat wasting who suddenly develop edema, due to increased protein deficiency than before.
- Thus clinical features, combination of Marasmus & Kwashiorkor .
- Anemia is moderate & one/ more Vitamin deficiencies may be evident.

# MARASMIC KWASHIORKOR



# INFECTION & IMMUNITY IN PEM

- Infection & Immunity interrelated to PEM
- Infectious disease worsens PEM & vise versa
- PEM usually weakens resistance to infection → high mortality among toddlers & under 5 children
- These children may present with recurrent attacks of diarrheal diseases, pneumonia, septicemia, measles, tuberculosis and malaria.

# INFECTION & IMMUNITY IN PEM

- Urinary tract infection often occur but may go undetected,.
- Intestinal helminthiasis & giardiasis frequent
- All these impair nutritional status leading to growth retardation & overt PEM & contribute to high mortality

# PEM & IMMUNITY

- Skin & mucus membrane barrier disrupted → infection
- Non specific defenses macrophages, tears, gastric acidity depressed
- Humoral : Ig G, IgM not significantly affected in mild to moderate PEM, hence host respond well to bacterial challenges & viral vaccines.
- Secretory Ig A → Surface tract infections, GIT & Rep. Tract

# PEM & IMMUNITY

- Cell Mediated Immunity (CMI) : is impaired in all grades
- This explains –ve Tuberculin (Mantoux) test in Marasmus & Kwashiorkor in spite active TB
- Following dietary treatment when the patient improves, Test may convert to +ve.
- Serum C reactive Protein & Complement C3 are depressed in severe PEM, but rise in presence of infection & behave as acute phase reactants.

# ECOLOGY/ETIOLOGY OF MALNUTRITION

- Conditioning influences
  - Low birth weight
  - Infections - eg., Diarrhea,
  - Respiratory infections,
  - VPDs: Measles / Whooping cough, Tuberculosis,
  - Helminthiasis
- Socio economic factors
  - Poverty, Ignorance
  - Illiteracy
  - Lack of knowledge regarding food values
  - Unhygienic environment
  - Large family size
  - Over crowding
- Cultural practices
- IYCF practices,
- Undue delay in rice giving ceremony
- Alcoholism
  - Food habits
  - Customs and belief
  - Tradition
  - Religion
  - Food fads (personal likes & dislikes)
  - Cooking practices
  - Child rearing practices
  - Superstitious belief

# ECOLOGY/ETIOLOGY OF PEM – CONTD..

- Food production & intake
  - abrupt withdrawal of breast milk
  - Delayed and inadequate complementary food
  - Lack of food supplementation for target group
- Availability and utilization of health/other services
  - Lack of health education, Nutritional surveillance
  - Nutritional rehabilitation, Primary health care
  - Immunization, Early diagnosis, Prompt treatment
  - Referral services

# EVIDENCE BASED HIGH IMPACT NUTRITION INTERVENTIONS FOR PREVENTION OF MALNUTRITION

1. Timely initiation of breast feeding within I hour of birth
2. Exclusive breastfeeding during the first six months of life
3. Timely introduction of complementary foods at six months
4. Age-appropriate foods for children six months to two years
5. Hygienic complementary feeding practices
6. Immunization and bi-annual Vitamin A supplementation with deworming

# STRATEGIES FOR PREVENTION

7. Appropriate feeding for children during and after illness
8. Therapeutic feeding for children with severe acute malnutrition
9. Adequate nutrition and support for adolescent girls to prevent anemia
10. Adequate nutrition and support for pregnant and breastfeeding mothers

These 10 essential interventions could halve the proportion of undernourished children over the next

10 years.

# THANK YOU



## VALUE ADDED COURSE

## NUTRITION (Module on NUTRITION IN PAEDIATRICS) PECO1

### List of Students Enrolled (july2015-oct 2015)

| 2nd Year MBBS Student | | | |
|---|---|---|---|
| **Sl. No** | **Name of the Student** | **Roll No** | **Signature** |
| 1 | AASHIK MUKESH. M. S | U14MB201 | |
| 2 | ABEETHA.M | U14MB202 | |
| 3 | ABHINAV. S | U14MB203 | |
| 4 | ABINAYA. M | U14MB204 | |
| 5 | ABISHEK. R | U14MB205 | |
| 6 | ABIRAMI. S | U14MB206 | |
| 7 | AGALYA. S | U14MB207 | |
| 8 | AJAY PANDIAN. V | U14MB208 | |
| 9 | AJEETH. R | U14MB209 | |
| 10 | AJITH KUMAR. M.K. | U14MB210 | |
| 11 | AKSHAI. S | U14MB211 | |
| 12 | ALLEN DANIEL XAVIER.J | U14MB212 | |
| 13 | ALTHAF AHMED | U14MB213 | |
| 14 | AMARA LOKESH | U14MB214 | |
| 15 | AMRESH. K | U14MB215 | |
| 16 | ANANT SURYA. R | U14MB216 | |
| 17 | ANDREW MARIE XAVIER.V | U14MB217 | |
| 18 | APSARA. P | U14MB218 | |
| 19 | ARPUDHA. A | U14MB219 | |
| 20 | ARUL PRABHA MADHIVADHANI. M | U14MB220 | |

**Dr. Abhijeet Shrivastava**

ASSISTANT PROFESSOR
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

**Dr. Tiroumourougane Serane**

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

Abhinav. S
U14MB203

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**EAnnexure - IV**

## PAEDIATRIC NUTRITION - MULTIPLE CHOICE QUESTIONS

**Course Code: PEC01**

**I. ANSWER ALL THE QUESTIONS**

5/10

1. Energy value for protein , carbohydrate and fat
   a-4kcal,4kcal,9 kcal
   b-6kcal,4kcal,7kcal
   c-4kcal,4kcal,4kcal

2. Caloie requirement for a 10 kg child
   a-1500kcal
   b-1000kcal
   c- 1250kcal

3. RDA for iron
   a-90-120mg
   b- 110-130mg
   c- 130-150mg

4. RDA for vit D
   a-400iu
   b-700iu
   c-200iu

5. Zinc deficiency causes acrodermatitis enteropathica ?
   a-True
   b-False

6. Vit k dependent clotting factors

Abinaya M
V14MB205

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**EAnnexure - IV**

## PAEDIATRIC NUTRITION - MULTIPLE CHOICE QUESTIONS

**Course Code: PEC01**

**I. ANSWER ALL THE QUESTIONS**

4/10

1. Energy value for protein , carbohydrate and fat
   a-4kcal,4kcal,9 kcal
   b-6kcal,4kcal,7kcal
   c-4kcal,4kcal,4kcal

2. Caloie requirement for a 10 kg child
   a-1500kcal
   b-1000kcal
   c- 1250kcal

3. RDA for iron
   a-90-120mg
   b- 110-130mg
   c- 130-150mg

4. RDA for vit D
   a-400iu
   b-700iu
   c-200iu

5. Zinc deficiency causes acrodermatitis enteropathica ?
   a-True
   b-False

6. Vit k dependent clotting factors

# 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 _ABINAYA. M (U14MB204)_____ has actively participated in the Value Added Course on *All About Adolescents (Module on Adolescent Paediatrics)* held during July 2017 – Oct 2017 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Satya Manasa Gayatri 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_____ABEETHA.M (U14MB202)__ has actively participated in the Value Added Course on *All About Adolescents (Module on Adolescent Paediatrics)* held during July 2017 – Oct 2017 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Satya Manasa Gayatri Vinay

**RESOURCE PERSON**

Dr. Raghavendran

**COORDINATOR**

Abinaya M
V14MB205

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**EAnnexure - IV**

## PAEDIATRIC NUTRITION - MULTIPLE CHOICE QUESTIONS

**Course Code: PEC0**

**I. ANSWER ALL THE QUESTIONS**

1. Energy value for protein , carbohydrate and fat
   a-4kcal,4kcal,9 kcal
   b-6kcal,4kcal,7kcal
   c-4kcal,4kcal,4kcal

2. Caloie requirement for a 10 kg child
   a-1500kcal
   b-1000kcal
   c- 1250kcal

3. RDA for iron
   a-90-120mg
   b- 110-130mg
   c- 130-150mg

4. RDA for vit D
   a-400iu
   b-700iu
   c-200iu

5. Zinc deficiency causes acrodermatitis enteropathica ?
   a-True
   b-False

6. Vit k dependent clotting factors

Abinaya M
VI4MB205

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

EAnnexure - IV

PAEDIATRIC NUTRITION - MULTIPLE CHOICE QUESTIONS

Course Code: PEC0

I. ANSWER ALL THE QUESTIONS

1. Energy value for protein , carbohydrate and fat
a-4kcal,4kcal,9 kcal
b-6kcal,4kcal,7kcal
c-4kcal,4kcal,4kcal

2. Caloie requirement for a 10 kg child
a-1500kcal
b-1000kcal
c- 1250kcal

3. RDA for iron
a-90-120mg
b- 110-130mg
c- 130-150mg

4. RDA for vit D
a-400iu
b-700iu
c-200iu

5. Zinc deficiency causes acrodermatitis enteropathica ?
a-True
b-False

6. Vit k dependent clotting factors

Abhinav · S VLHMB 203

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

EAnnexure - IV

PAEDIATRIC NUTRITION - MULTIPLE CHOICE QUESTIONS

Course Code: PEC0

I. ANSWER ALL THE QUESTIONS

1. Energy value for protein , carbohydrate and fat
a-4kcal,4kcal,9 kcal
b-6kcal,4kcal,7kcal
c-4kcal,4kcal,4kcal

2. Caloie requirement for a 10 kg child
a-1500kcal
b-1000kcal
c- 1250kcal

3. RDA for iron
a-90-120mg
b- 110-130mg
c- 130-150mg

4. RDA for vit D
a-400iu
b-700iu
c-200iu

5. Zinc deficiency causes acrodermatitis enteropathica ?
a-True
b-False

6. Vit k dependent clotting factors

**Student Feedback Form**
**Annexure -5**

Course Name: **PEDIATRIC NUTRITION**

Subject Code: **PEC01**

Name of Student: AKSHAY. S Roll No.: U 14MB211

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 -5**

Course Name: **PEDIATRIC NUTRITION**

Subject Code: **PEC01**

Name of Student: AYYANAN · R. Roll No.: U 14 MB 226

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: 01.11.2015

From

Dr. Tiroumourougane Serane
Professor and Head,
Department of Paediatrics,
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: Pediatric Nutrition for Undergraduates**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: PediatricNutrition for II year MBBS students from July 2015 to Oct 2015 for 10 Third 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. Tiroumourrougane Serane

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

**Encl: Photographs**




**PECO1 1**

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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 : 12/05/2015

From
DR.Boblee james,
Professor and Head,
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: evaluation of arthritis**

**Respected** Sir ,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Evaluation of Arthritis** on 8/7/2015. We solicit your kind permission for the same.

Kind Regards



Dr, Boblee james

PROFESSOR & HOD
Department of Orthopaedics
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.Jayakumar

The HOD: Dr. Boblee james

The Expert:Dr.Vijayakumaran

OFFICE OF THE DEAN

# Sri Lakshmi Narayana Institute of Medical Sciences

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The committee has discussed about the course and is approved

| Dean | Subject Expert | HOD |
|---|---|---|
| DEAN<br>Sri Lakshmi Narayana Institute of Medical Sciences<br>Osudu, Agaram Kudapakkam, Post,<br>Villianur Commune Puducherry-605 502. | Department of Orthopaedics<br>Sri Lakshmi Narayana Institute of Medical Sciences<br>Pondicherry - 605 502. | PROFESSOR & HOD<br>Department of Orthopaedics<br>Sri Lakshmi Narayana Institute of Medical Sciences<br>Pondicherry - 605 502. |

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[ Affliated to Bharath University, Chennai - TN ]

# Course Proposal

*Course Title:* ***evaluation of arthritis***

**CourseObjective: to asses types, symptoms and signs of arthritis**

**CourseOutcome: how to asses a case of arthritis**

**Course Audience: 20**

**Course Coordinator: Dr. Jayakumar**

**Course Faculties with Qualification and Designation:**

**1.DR.BOBLEE JAMES M.S ORTHO**

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 8/7/15 | AIM | 4.30 to5.30 | 1 |
| 2 | 10/8/15 | OA CLASSIFICATION | 5 to 6 | 1 |
| 3 | 12/9/15 | ETIOLOGY | 5 to 6 | 1 |
| 4 | 21/9/15 | MECHANISM | 6 to 7 | 1 |
| 5 | 16/10/15 | OA OF DIFFERENT JOINTS | 4.30 to 5.30 | 1 |
| 6 | 17/11/15 | SYMPTOMS | 6 to 7 | 1 |
| 7 | 5/12/15 | TREATMENT | 4.30 to 5.30 | 1 |
| 8 | 20/12/15 | DISABILITY IN OA | 6 to 7 | 1 |
| 9 | 1/1/16 | RHEUMATOID ARTHRITIS | 4 to 6 | 2 |
| 10 | 4/1/16 | PRACTICAL SESSION | 4 to 8 | 4 |
| 11 | 9/1/16 | PRACTICAL SESSION | 4 to 7 | 3 |
| 12 | 18/1/16 | PRACTICAL SESSION | 4 to 8 | 4 |
| 13 | 23/1/16 | PRACTICAL SESSION | 4 to6 | 2 |
| 14 | 26/1/16 | PRACTICAL SESSION | 4 to 7 | 3 |
| 15 | 30/1/16 | PRACTICAL SESSION | 4 to 8 | 4 |
| | | | Total Hours | 30 |

**REFERENCE BOOKS:**

1) LIVING WITH RHEUMATOID ARTHRITIS TAMMI. L. SHLOTZHAUER

2) OXFORD TEXT BOOK OF RHEUMATOID ARTHRITIS DAVID .L.SCOTT,JAMES GALLOWAY

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# VALUE ADDED COURSE

**1. Name of the programme & Code**

EVALUATION OF ARTHRITIS - OR01

**2. Duration & Period**

30 hrs & JULY 2015– JANUARY 2016

**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 2015– JANUARY 2016

| **Value Added Course-** JULY 2015-JAN 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | OR01 | EVALUATION OF ARTHRITIS | Dr. Boblee james | THIRD YEAR MBBS | 18 (JULY 2015 – Jan 16) |

**8. Year of discontinuation: 2017**

**9. Summary report of each program year-wise**

**10. Course Feed Back** *Enclosed as Annexure- V*

**RESOURCE PERSON**
**DR.BOBLEE JAMES**

PROFESSOR & HOD
Department of Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Pondicherry - 605 502.

**COORDINATOR**
**DR.JAYAKUMAR**

OFFICE OF THE DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
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PUDUCHERRY - 605 502.
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[ Affliated to Bharath University, Chennai - TN ]

EVALUATION OF ARTHRITIS

8/7/2015



EVALUATION OF ARTHRITIS

| Particulars | Description |
|---|---|

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[ Affliated to Bharath University, Chennai - TN ]

| | |
|---|---|
| Course Title | EVALUATION OF ARTHRITIS |
| Course Code | OR01 |
| Objective | AIM<br>OA CLASSIFICATION<br>ETIOLOGY<br>MECHANISM<br>OA OF DIFFERENT JOINTS<br>SYMPTOMS<br>TREATMENT<br>DIABILITY IN OA<br>RHEUMATOID ARTHRITIS |
| Further learning opportunities | TYPES OF ARTHRITIS |
| Key Competencies | On successful completion of the course the students will have complete understanding of evaluating and managing arthritis |
| Target Student | Pre final year Students |
| Duration | 30hrs JULY 15– January 2016 |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | Short notes |

AIM:

Types of arthritis

Symptoms of arthritis

Signs of arthritis

Treatment of arthritis

Rheumatoid arthritis (RA)

Osteoarthritis (OA)

Sero-negative arthritis

Ankylosing spondylitis

Psoriatic arthritis

Reactive arthritis

Enteropathic arthritis

Crystal arthropathies

ABCD stands for :

- A: ALIGNMENT
- B: BONY MINERALIZATION
- C: CARTILAGE SPACE
- D: DISTRIBUTION
- S: SOFT TISSUE

*A chronic joint disorder in which there is progressive softening and disintegration of articular cartilage accompanied by new growth of cartilage and bone at the joint margins (osteophytes) and capsular fibrosis*

Primary or idiopathic

Secondary

OA CLASSIFICATION:

- Infection
- Dysplasia
- Perthes
- SCFE
- Trauma
- AVN

ETIOLOGY:

Genetic

Metabolic

Hormonal

Mechanical

Ageing

MECHANISM:

Disparity between:- stress applied to articular cartilage and strength of articular cartilage

Increased stress (F/A) Increased load eg BW or activity

Decreased area eg varus knee or dysplastic hip

Weak cartilage age stiff eg ochronosis

soft eg inflammation

abnormal bony support eg AVN

OSTEOARTHRITIS:

Joint space narrowing

Osteophytosis

Subchondral cysts

Subchondral sclerosis

HIP OA:

Femoral neck buttressing

Tilt deformity ( flattening of head surface with osteophyte at anteroinferior aspect)

Superior >medial migration

Secondary OA due to previous trauma or nflammatory arthritis

OA KNEE:

Erect weight-bearing AP film

Unicompartmental

Sharpening of tibial prominence

- Loose bodies
- Varus deformity
- Patellar tooth sign – irregular anterior patellar Surface

OA SPINE:

Vacuum Phenomenon

Accumulation of Nitrogen

Degenarative etiology

Better seen in Extension

Excludes infective etiology

In peripheral joints physiological

SYMPTOMS:

pain

swelling

stiffness

deformity

instability

loss of function

TREATMENT:

Analgesia

Oral viscosupplements

Intrarticular steroids

Intrarticular viscosupplements

Altered activity

Walking aids

Physiotherapy

arthroscopy

osteotomy

arthrodesis

excision arthroplasty

replacement arthroplasty

RHEUMATOID ARTHRITIS:

Bilateral symmetry

Periarticular soft tissue swelling

Uniform joint space loss

Marginal erosions

Juxta-articular osteoporosis

Joint deformity

DISABILITY IN EARLY RA:

Inflammation

◦ Swollen

◦ Stiff

◦ Sore

◦ Warm

 Fatigue

 Potentially Reversible

RA- DEFORMITY:

Boutonniere deformity : flexion deformity at PIP jt & hyperextension at DIP

• Swan neck deformity : combination of flexion at DIP and extension at PIP

RA CERVICAL SPINE:

Atlantodental interspace > 3.0mm

Odontoid erosions

Subluxation

Pseudo basilar invagination

Reduced disc space

Apophyseal joint: erosion, sclerosis, ankylosis

Sharpened pencil spinous process ADI > 3.0mm

RA SHOULDER:

Soft tissue swelling

Rotator cuff rupture

Head erosions

Tapered distal clavicle due to erosions

Irregular coracoid process

Enlarged Olecranon bursa

Fat pad sign

Supinator notch sign: erosion at proximal ulna

RA-KNEE

Uniform bicompartmental joint space loss

Patellofemoral joint also involved

Soft tissue swelling

Baker's cyst

Subchondral cysts

Rheumatoid arthritis

Rheumatoid arthritis is a synovial disease

-Osteoarthritis is a disease of the cartilage.

-Volar subluxation never in osteoarthritis

Normal joint

DIABILITY IN RA:

Most of the disability in RA is a result of the INITIAL burden of disease

People get disabled because of:

◦ Inadequate control

◦ Lack of response

◦ Compliance

GOAL: control the disease early on!NSAIDS

Steroids

Oral

Intra-articular

DMARDS

Synthetic

Methotrexate

Hydroxychloroquine

Leflunomide

Sulfasalazine

Biological:

Monoclonal Antibodies to TNF

◦ Infliximab

◦ Adalimumab

 Soluble Receptor Decoy for TNF

◦ Etanercept

 Receptor Antagonist to IL-1

◦ Anakinra

- Monoclonal Antibody to CD-20
  - Rituximab

NSAIDS:

Cyclo-oxygenase inhibitors

Do not slow the progression of the disease

Provide partial relief of pain and stiffness

Disease Modifying Anti-Rheumatic Drugs

- Reduce swelling & inflammation
- Improve pain
- Improve function
- Have been shown to reduce radiographic progression (erosions)
- Dihydrofolate reductase inhibitor
- ↓ thymidine & purine nucleotide synthesis
- "Gold standard" for DMARD therapy
- 7.5 – 30 mg weekly
- Absorption variable
- Elimination mainly renal
- Hepatotoxicity
- Bone marrow suppression
- Dyspepsia, oral ulcers
- Pneumonitis

 Teratogenicity

 Folic acid reduces GI & BM effects

 Monitoring

◦ FBC, ALT, Creatinine  Sulphapyridine + 5-aminosalicylic acid

 Remove toxic free radicals

 Remission in 3-6 month Elimination hepatic

 Dyspepsia, rashes, BM suppression Mechanism unknown

◦ Interference with antigen processing ?

◦ Anti- inflammatory and immunomodulatory

• For mild disease Side effects

 Irreversible Retinal toxicity, corneal deposits

 Ophthalmologic evaluation every 6 months

Competitive inhibitor of dihydroorotate dehydrogenase (rate-limiting enzyme in denovo synthesis of pyrimidines)

 Reduce lymphocyte proliferation 

Oral

 T ½ - 4 – 28 days due to EHC

 Elimination hepatic

 Action in one month

 Avoid pregnancy for 2 years Hepatotoxicity

 BM suppression

 Diarrhoea

 rashes

Triple Therapy

◦ Methotrexate, Sulfasalazine, Hydroxychloroquine

Double Therapy

◦ Methotrexate & Leflunomide

◦ Methotrexate & Sulfasalazine

◦ Methotrexate & Hydroxychloroquine• Complex protein molecules

• Created using molecular biology methods

• Produced in prokaryotic or eukaryotic cell cultures

TNF is a potent inflammatory cytokine

 TNF is produced mainly by macrophages and monocytes

 TNF is a major contributor to the inflammatory and destructive changes that occur in RA

 Blockade of TNF results in a reduction in a number of other pro-inflammatory cytokines (IL-1, IL-6, & IL-8)Trans-Membrane

Bound TNF

Soluble TNF

Strategies for Reducing Effects of TNF

Macrophage

Monoclonal Antibody (Infliximab & Adalimumab)Infection

◦ Common (Bacterial)

◦Opportunistic (Tb)

Demyelinating Disorders

Malignancy

Worsening CHF

Potent anti-inflammatory drugs

 Serious adverse effects with long-term use

 To control the diaseas

 Indications

◦ As a bridge to effective DMARD therapy

◦ Systemic complications (e.g. vasculitis)

Most common childhood chronic disease causing disability.

 About 7/100,00 newly diagnosed children with JIA per year.

 Prevalence about 1/1,000 children = 1,000 children in BC with JIA.

 7 subtypes.

 Disease begins at any time during childhood or adolescence.

To be considered JIA, onset must occur before 16 years of age.

 JIA is heterogeneous: the presentation of the disease and its natural history vary among individuals and over time.

 The disease is typically classified into categories based on the symptoms displayed and their severity.

 Systemic arthritis

 Oligoarthritis

 Rheumatoid-factor positive (RF+) polyarthritis

 Rheumatoid-factor negative (RF-) polyarthritis

 Enthesitis-related arthritis

 Psoriatic arthritis

 Undifferentiated

G.ahrq.gov/dmardsjia.cfm. 

Child under 16 years old

At Least one joint with objective signs of arthritis:

› Swelling, or two of the following: pain with movement, warmth of the joint,restricted movement, or tenderness

Duration of more than 6 weeks

Other causes have been excluded (ex. Infections, Lupus and other connective tissue diseases, malignancies)

All kids with JIA have fevers.

All kids with JIA have rashes.

A child with joint pain (but no arthritis) must have JIA.

All arthritis is painful.

If a child has a positive rheumatoid factor, they must have arthritis. 

If x-rays are normal, there is no arthritis. 

Heterogeneous group of diseases characterized by chronic inflammatory processes involving the synovial membrane, cartilage, and bone

 The classification of JIA subgroups based on clinical and laboratory characteristics including the number of affected joints and the presence of autoimmune markers

 Th1 cell-mediated disorder, driven by a population of T cells producing inflammatory cytokines and chemokines

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**VALUE ADDED COURSE**
**EVALUATION OF ARTHRITIS**
**ORTH**

**4. List of Students Enrolled JULY 2015 - Jan- 2016**

**Pre final Year MBBS Student**

| Sl. No | Name of the Student | Roll No | Signature |
|---|---|---|---|
| 1 | ABDUL RAHMAN.A. | U13MB151 | |
| 2 | ABIRAMI KAMBAN K.S | U13MB152 | |
| 3 | ABIRAMI.A. | U13MB153 | |
| 4 | AFRAA.S. | U13MB154 | |
| 5 | AHILA. M. | U13MB155 | |
| 6 | AKMAR JEBIN.V.P. | U13MB156 | |
| 7 | AKSHAYA. S. | U13MB157 | |
| 8 | ALLADI SANATH KUMAR | U13MB158 | |
| 9 | ANBAZHAGAN. D | U13MB159 | |
| 10 | ANGELIN JEEVA PUSHPAM.S | U13MB160 | |
| 11 | ANIK GHORAI | U13MB161 | |
| 12 | ANUPRIYA. B. | U13MB162 | |
| 13 | ANUPRIYA.S. | U13MB163 | |
| 14 | ANUSUYA.V., | U13MB164 | |
| 15 | ARIKO IMCHEN | U13MB165 | |
| 16 | ARULMOZHI. T. | U13MB166 | |
| 17 | ARUN KUMAR. K. | U13MB167 | |
| 18 | BALAJI. S. | U13MB168 | |

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**Course: evaluation of arthritis**
**Date: 30/1/16**
**Name:ANUPRIYA.B**
**Reg NO.**
**Department: orthopaedics**

**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 _____

1 - 3 Small Joints 2
4 - 10 Small Joints 3
>10 Joints 5

Serology
Negative RF & Negative ACPA 0
Low-positive RF & low-positive ACPA 2
High-positive RF or High positive ACPA 3

Acute-phase Reactants
Normal CRP & Normal ESR 0
Abnormal CRP or abnormal ESR 1

Duration of Symptoms
<6 Weeks 0
>6 Weeks 1

Osteoarthritis: Assessment & Evaluation of Osteoarthritis
→ Anxious, Overweight (female)
Joint Examination
- No Swelling, Inflammation or deformities involving the hands, wrists, elbows, knees, ankles, or feet
→ Examination of Right hip demonstrated pain on full Rotation with tenderness over the lateral hip at the trochanteric bursa
→ diffuse soft tissue tenderness in the Neck, Shoulders & back
→ Acute Gout:
ESR - NORMAL
X-Ray - Largest Joint Space Narrowing was apparent

Assessment & Evaluation of Fibromyalgia
→ Chronic widespread pain & exhaustion
→ Generalized pain & soft tissue tenderness & ESR - Normal
- Moderate to Severe sleep problem or fatigue

1) How to assess & evaluate various type of arthritis ?
2) Management of various type of arthritis ?

11/20

1) Arthritis – Inflammation of Joint

Type of Arthritis
Osteoarthritis – Most Common
Rheumatoid Arthritis
Fibromyalgia
Lupus ~~Erythematosus~~ arthritis
Gout

Assessment & evaluation of ~~Arthritis~~ Rheumatoid Arthritis

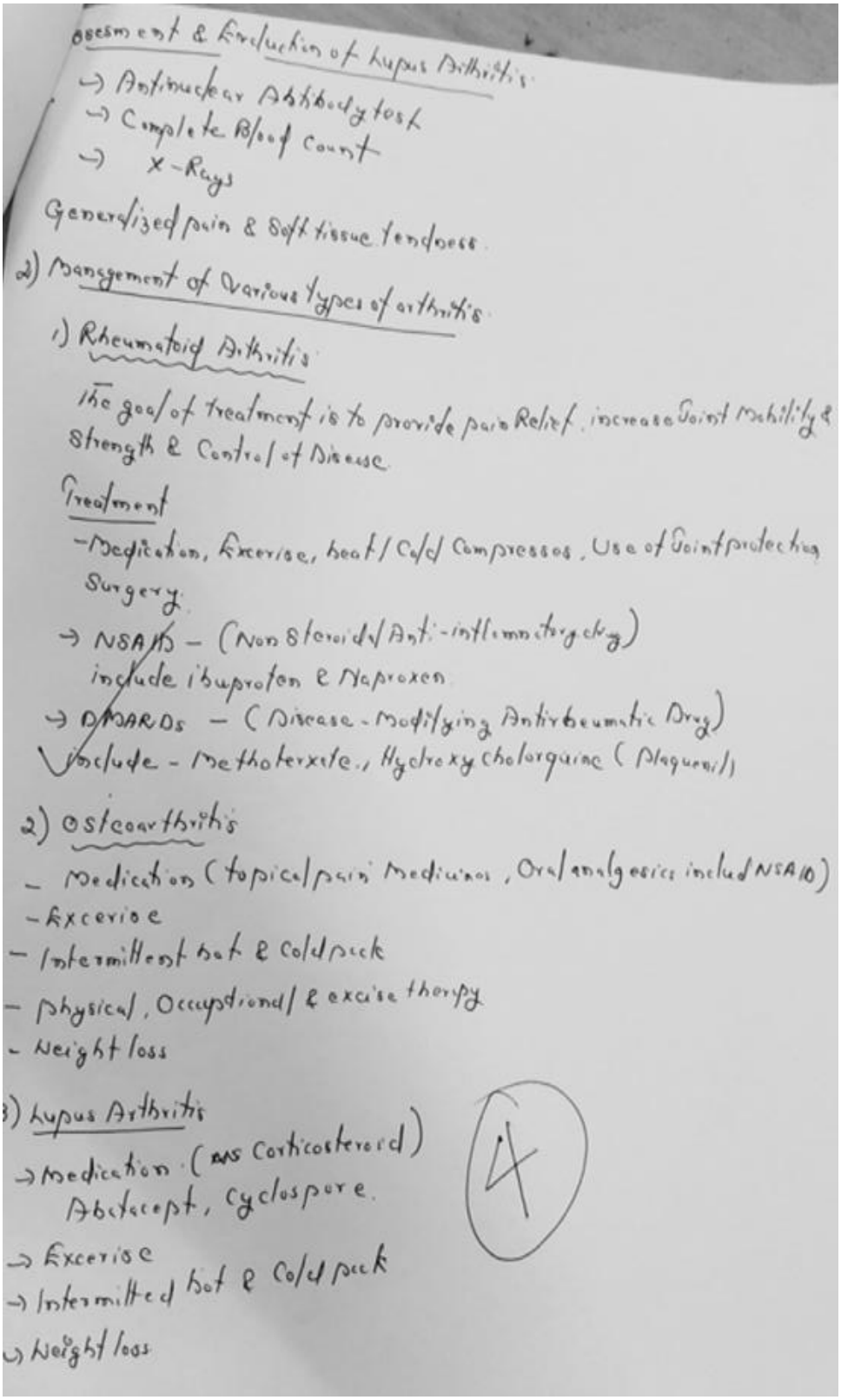
- presented with Swelling & Inflamed Joint
- fatigue & low-grade fever (Characteristic of an Immune or Inflammatory disease).

Evaluation
Complete Blood Count
Acute phase Reactant
Erythrocyte Sedimentation Rate or C-Reactive protein (CRP)
Rheumatoid factor (RF) or Antic Citrullinated peptide (Anti-ccp)
X-Rays.

finding Seen in Rheumatoid Arthritis → Elevated level of CRP or ESR
RF or test for anti-cyclic CCP) positive.
Inflammatory arthritis → Involving 3 or more Joints.

ACR/EULAR classification Criteria for RA

| Joint Involvement | Score |
|---|---|
| 1. large Joint | 0 |
| 1-10 large Joint | 1 |



Assessment & Evaluation of Lupus Arthritis

→ Antinuclear Antibody test
→ Complete Blood count
→ X-Rays

Generalized pain & Soft tissue tenderness

2) Management of various types of arthritis

1) Rheumatoid Arthritis

The goal of treatment is to provide pain Relief, increase Joint Mobility & Strength & Control of Disease

Treatment

-Medication, Exercise, heat / Cold Compresses, Use of Joint protecting Surgery.

→ NSAIDs - (Non Steroidal Anti-inflammatory drug)
include ibuprofen & Naproxen

→ DMARDs - (Disease-Modifying Antirheumatic Drug)
include - methotrexate, Hydroxychloroquine (Plaquenil)

2) Osteoarthritis

- Medication (topical pain Medicines, Oral analgesics includ NSAIDs)
- Exercise
- Intermittent hot & cold pack
- physical, Occupational & exercise therapy
- Weight loss

3) Lupus Arthritis

→ Medication (NSAIDs Corticosteroid)
Abatacept, cyclosporine.

→ Exercise
→ Intermitted hot & Cold pack
→ Weight loss

4

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(Deemed to be University under section 3 of the UGC Act 1956)

## CERTIFICATE OF MERIT

This is to certify that ABDUL RAHMAN has actively participated in the Value Added Course on *Evaluation of Arthritis* held during JULY 2015 – Jan 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. BOBLEE JAMES
**RESOURCE PERSON**

Dr. JAYAKUMAR
**COORDINATOR**

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## Student Feedback Form

Course Name: **EVALUATION OF ARTHRITIS**

Subject Code: **OR01**

Name of Student: Arulmozhi T Roll No.: U13MB166

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: 30/1/16

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Date:30/1/16

From
Dr.Boblee James,
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.

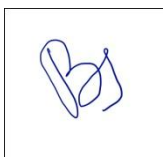
**Sub: Completion of value-added course: evaluation of arthritis**

Respected Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **_Evaluation of arthritis on 30/1/16** . 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. Boblee James



PROFESSOR & HOD
Department of Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Pondicherry - 605 502.

**Encl: Certificates**

**Photographs**

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# Sri Lakshmi Narayana Institute of Medical Sciences

Date: 01.06.2015

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: Anxiety Disorders and its management**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Anxiety Disorders and its management** on 1/07/2015. 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. Rajeshekaran. K**

The HOD: **Dr. Sridhar**

The Expert: **Dr. Arun Seetharaman.**The committee has discussed about the course and is approved.

Dean
( Sign & seal)

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-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.

HO
(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.

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**Circular**

15.06.2015

**Sub: Organising Value-added Course: Awareness, Identification and Classification of Anxiety Disorders and Its Management for final year students -6 months**

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, Identification and Classification of Anxiety Disorders and Its Management for final year students"**.

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 June, 2015. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

**Dr.Rajasekar**

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

Encl: Copy of Course content

# Course Proposal

Course Title: **Awareness, Identification And Classification Of Anxiety Disorders And Its Management** .

## Course Objective:

Awareness on the importance of anxiety disorders
Awareness On The Contributing Factors To Anxiety Disorders Bio-psychosocial Model Of Approach
Identify diagnostic criteria for anxiety disorders

**Course Outcome:**

**Course Audience: 2nd YEAR STUDENTS of 2013 Batch**
**Course Coordinator: Dr.V.R. Sridhar**
**Course Faculties with Qualification and Designation:**
**1.Dr.V.R.SRIDHAR, Professor & HOD**
**2.Dr.Arun, Assistant Professor**
**Course Curriculum/Topics with schedule (Min of 30 hours)**

| SlNo | Date | Topic | Faculty | Time | Hours |
|---|---|---|---|---|---|
| 1. | 1.07.2015 | Awareness on the importance of anxiety disorders | Dr.Arun | 4-5p.m | 1 |
| 2. | 3.07.2015 | Awareness On The Contributing Factors To Anxiety Disorders Bio-psychosocial Model Of Approach | Dr.Arun | 2-3p.m | 1 |
| 3. | 6.07.2015 | Identify diagnostic criteria for anxiety disorders | Dr.Arun | 4-6p.m | 2 |
| 4. | 8.07.2015 | Awareness on the role of physicians & HCWs in anxiety disorders | Dr.Arun | 4-6p.m | 2 |
| 5. | 10.07.2015 | Recognize the influence of society on patients with anxiety disorders | Dr.Arun | 4-6p.m | 2 |
| 6. | 13.07.2015 | **Module 1 –** Introduction to Anxiety Disorders | Dr.Arun | 4-5p.m | 2 |
| 7. | 15.07.2015 | **Module 2 –** Generalized Anxiety Disorder | Dr.Arun | 4-5P.M | 1 |
| 8. | 17.07.2015 | **Module 3 –** Panic Disorder | Dr.Arun | 4-5p.m | 1 |
| 9. | 20.07.2015 | **Module 4 –** Phobic Anxiety Disorder | Dr. Shridhar | 4-6p.m | 1 |
| 10. | 22.07.2015 | **Module 5 –** Obsessive Compulsive Disorder | Dr.Arun | 4-6p.m | 2 |
| 11. | 24.07.2015 | **Module 6 –** Other Anxiety Disorders | Dr.Arun | 4-6p.m | 1 |
| 12. | 27.07.2015 | **Module 7 –** Unspecified Anxiety Disorders | Dr.Arun | 4-6p.m | 2 |
| 13. | 29.07.2015 | Pre course and Post Course evaluation,<br>Feedback analysis from Likert | Dr.Arun | 2-5p.m | 3 |

| | | | | | |
|---|---|---|---|---|---|
| | | scale | | | |
| | | **Practical Class I** | Dr. Shridhar | | |
| 13. | 3.08.2015 | Cognitive Behaviour Therapy | Dr. Shridhar | 2-3 PM | 1 |
| 14. | 5.08.2015 | Graded Relaxation | Dr. Shridhar | 2-3 PM | 1 |
| 15. | 7.08.2015 | Hypnotherpy | Dr. Shridhar | 2-4 PM | 2 |
| 16. | 10.08.2015 | Yoga And Breathing Techniques | Dr. Shridhar | 2-4 PM | 2 |
| 17. | 12.08.2015 | Biofeedback | Dr. Shridhar | 2-4p.m | 2 |
| | | **Total** | | | 30 hrs |

**REFERENCE BOOKS:**


1.Comprehensive textbook of PSYCHIATRY by Kaplan and Saddocks.

2. Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic (2nd ed.)*. New York: Guilford Press.

3. DSM 5 AND ICD 10

4.Beck, A. T. & Emery, G. (1985). *Anxiety disorders and phobias: A cognitive perspective*. New York: Basic Books.

5.Borne, E. J. (2000). *The anxiety & phobia workbook (3rd ed.)*. Oakland: New Harbinger Publications.


**Websites**

- Anxiety disorders Association of America
- Association for Behavioral and Cognitive Therapies
- National Institute of Mental Health

# VALUE ADDED COURSE

**1. Name of the programme & Code**

An Introduction And Assessment Of Various Types Of Anxiety Disorders Along With Its Management - PSYC01

**2. Duration & Period**

30 hrs & July– December 2015

**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 Evolution by MCQ method - *Enclosed as Annexure- III*

**6. Certificate model**

*Enclosed as Annexure- IV*

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

1 time, July– December 2015

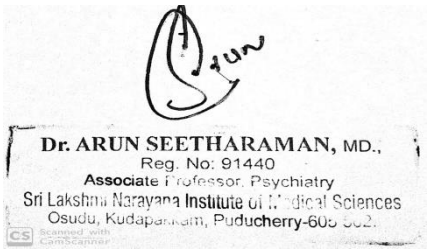
**8. Year of discontinuation:** 2016

**9. Summary report of each program year-wise**

| **Value Added Course-** July– December 2015 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | **PSYC01** | Anxiety Disorders Along With Its Management | **Dr. Sridhar** | IInd YEAR | (15) July– December 2015 |

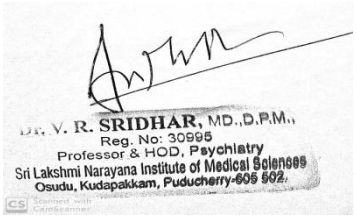
**10. Course Feed Back**

*Enclosed as Annexure- V*




**RESOURCE PERSON**

1. **Dr. V.R. Sridhar**
2. **Dr. C. Arun Seetharaman**




**COORDINATOR**

**V.R. Sridhar**

# ANXIETY DISORDERS




# PARTICIPANT HAND BOOK

BIHER SLIMS

## COURSE DETAILS

| Particulars | Description |
|---|---|
| Course Title | Anxiety disorders |
| Course Code | PSYC01 |
| Objective | **1.** Classification<br>**2.** Epidemiology<br>**3.** Etiology<br>**4.** Psychological test<br>**5.** Laboratory tests<br>**6.** Pathophysiology and brain studies<br>**7.** Differential Diagnosis<br>**8.** Course and prognosis<br>**9.** Treatment |
| Further learning opportunities | Diagnosis and treatment of anxiety disorders |
| Key Competencies | On successful completion of the course the students will have skill in diagnosing and treating anxiety disorders. |
| Target Student | IInd year MBBS Students |
| Duration | 30hrs Every July 2015– December 2015 |
| Theory Session | 20hrs |
| Practical Session | 10hrs |
| Assessment Procedure | Multiple choice questions |

**Classification**

There are 11 diagnostic types of anxiety disorders ranging in the fifth edition of Diagnostic Statistical Manual of Mental Disorders (DSM-5) from separation anxiety disorder to unspecified anxiety disorder. They are among the most common groups of psychiatric disorders. Each disorder is discussed separately below.

**A. Separation anxiety disorder**. Fears of separation from loved ones (not commensurate with appropriate development) (at least 3 of the following for >1 month if under 18, and >6 months if an adult): Anxiety when separating from home or loved ones leaving the home because it will entail such separation sleeping away (different room) from loved ones Along with feelings of worry about harm to loved ones worry about separation (even if not impending) from loved ones fear about isolation from loved ones Including nightmares physical symptoms

**B. Selective mutism.** Inability to speak in certain social situations despite the ability to speak in others (occurring for at least 1 month in the absence of a separate disorder and impeding social/educational/occupational functioning). Specific phobia. Marked and disproportionate anxiety about a specific thing (e.g., horses, heights, needles) or situation. This fear must be consistently and persistently present. The person experiences massive anxiety when exposed to the feared object and tries to avoid it at all costs. Up to 25% of the population has specific phobias.

**C. Social anxiety disorder (social phobia).** Social anxiety disorder is an irrational fear of public situations (e.g., speaking in public, eating in public, using public bathrooms [shy bladder]). May be associated with panic attacks. It usually occurs during early teens but can develop during childhood. Effects up to 13% of persons. Equally common in men and women.

**D. Panic disorder.** Panic disorder is characterized by spontaneous panic attacks. It may occur alone or be associated with agoraphobia (fear of being in open spaces, outside the home alone, or in a crowd). Panic may evolve in stages: subclinical attacks, full panic attacks, anticipatory anxiety, phobic avoidance of specific situations, and agoraphobia. It can lead to alcohol or drug abuse, depression, and occupational and social restrictions. Agoraphobia can occur alone, although patients usually have associated panic attacks. Anticipatory anxiety is characterized by the fear that panic, with helplessness or

humiliation, will occur. panic disorder often have multiple somatic complaints related to autonomic nervous system dysfunction, with a higher risk in females.

## HISTORY

The idea of panic disorder may have its roots in the concept of irritable heart syndrome, which the physician Jacob Mendes DaCosta (1833– 1900) noted in soldiers in the American Civil War. DaCosta's syndrome included many psychological and somatic symptoms that have since been included among the diagnostic criteria for panic disorder. In 1895, Sigmund Freud introduced the concept of anxiety neurosis, consisting of acute and chronic psychological and somatic symptoms.

## EPIDEMIOLOGY

The lifetime prevalence of panic disorder is in the 1 to 4 percent range, with 6-month prevalence approximately 0.5 to 1.0 percent and 3 to 5.6 percent for panic attacks. Women are two to three times more likely to be affected than men, although underdiagnoses of panic disorder in men may contribute to the skewed distribution. The differences among Hispanics, whites, and blacks are few. The only social factor identified as contributing to the development of panic disorder is a recent history of divorce or separation. Panic disorder most commonly develops in young adulthood—the mean age of presentation is about 25 years—but both panic disorder and agoraphobia can develop at any age. Panic disorder has been reported in children and adolescents, and it is probably underdiagnosed in these age groups.

## COMORBIDITY

Of patients with panic disorder, 91 percent have at least one other psychiatric disorder. About one-third of persons with panic disorders have major depressive disorder before onset; about two-thirds first experience panic disorder during or after the onset of major depression. Other disorders also commonly occur in persons with panic disorder. Of persons with panic disorder, 15 to 30 percent also have social anxiety disorder or social phobia, 2 to 20 percent have specific phobia, 15 to 30 percent have generalized anxiety disorder, 2 to 10 percent have PTSD, and up to 30 percent have OCD. Other common comorbid conditions are hypochondriasis or illness anxiety disorder, personality disorders, and substance-related disorders.

## ETIOLOGY

Biological Factors Research on the biological basis of panic disorder has produced a range of findings; one interpretation is that the symptoms of panic disorder are related to a range of biological abnormalities in brain structure and function. Most work has used biological stimulants to induce panic attacks in patients with panic disorder. Considerable evidence indicates that abnormal regulation of brain noradrenergic systems is also involved in the pathophysiology of panic disorder. These and other studies have produced hypotheses implicating both peripheral and central nervous system (CNS) dysregulation in the pathophysiology of panic disorder. The autonomic nervous systems of some patients with panic disorder have been reported to exhibit increased sympathetic tone, to adapt slowly to repeated stimuli, and to respond excessively to moderate stimuli. Studies of the neuroendocrine status of these patients have shown several abnormalities, although the studies have been inconsistent in their findings. The major neurotransmitter systems that have been implicated are those for norepinephrine, serotonin, and GABA. Serotonergic dysfunction is quite evident in panic disorder, and various studies with mixed serotonin agonist–antagonist drugs have demonstrated increased rates of anxiety. Such responses may be caused by postsynaptic serotonin hypersensitivity in panic disorder. Preclinical evidence suggests that attenuation of local inhibitory GABAergic transmission in the baso-lateral amygdala, midbrain, and hypothalamus can elicit anxiety-like physiological responses. The biological data have led to a focus on the brainstem (particularly the noradrenergic neurons of the locus ceruleus and the serotonergic neurons of the median raphe nucleus), the limbic system (possibly responsible for the generation of anticipatory anxiety), and the prefrontal cortex (possibly responsible for the generation of phobic avoidance). Among the various neurotransmitters involved, the noradrenergic system has also attracted much attention, with the presynaptic α2 -adrenergic receptors, particularly, playing a significant role. Patients with panic disorder are sensitive to the anxiogenic effects of yohimbine in addition to having exaggerated MHPG, cortisol, and cardiovascular responses. They have been identified by pharmacological challenges with the α2 -receptor agonist clonidine (Catapres) and the α2 -receptor antagonist yohimbine (Yocon), which stimulates firing of the locus ceruleus and elicits high rates of panic-like activity in those with panic disorder. Panic-Inducing Substances. Panic-inducing substances (sometimes called panicogens) induce panic attacks in most patients with panic disorder and in a

much smaller proportion of persons without panic disorder or a history of panic attacks. So-called respiratory panic inducing substances cause respiratory stimulation and a shift in the acid–base balance. These substances include carbon dioxide (5 to 35 percent mixtures), sodium lactate, and bicarbonate. Neurochemical panic-inducing substances that act through specific neurotransmitter systems include yohimbine, an α2 -adrenergic receptor antagonist; mCPP, an agent with multiple serotonergic effects; m-Caroline drugs; GABAB receptor inverse agonists; flumazenil (Romazicon), a GABAB receptor antagonist; cholecystokinin; and caffeine. Isoproterenol (Isuprel) is also a panic-inducing substance, although its mechanism of action in inducing panic attacks is poorly understood. The respiratory panic-inducing substances may act initially at the peripheral cardiovascular baroreceptors and relay their signal by vagal afferents to the nucleus tractus solitarii and then on to the nucleus paragigantocellularis of the medulla. The hyperventilation in patients with panic disorder may be caused by a hypersensitive suffocation alarm system whereby increasing PCO2 and brain lactate concentrations prematurely activate a physiological asphyxia monitor. The neurochemical panic-inducing substances are presumed to primarily affect the noradrenergic, serotonergic, and GABA receptors of the CNS directly. Brain Imaging. Structural brain imaging studies, for example, MRI, in patients with panic disorder have implicated pathological involvement in the temporal lobes, particularly the hippocampus and the amygdala. One MRI study reported abnormalities, especially cortical atrophy, in the right temporal lobe of these patients. Functional brain imaging studies, for example, positron emission tomography (PET), have implicated dysregulation of cerebral blood flow (smaller increase or an actual decrease in cerebral blood flow). Specifically, anxiety disorders and panic attacks are associated with cerebral vasoconstriction, which may result in CNS symptoms, such as dizziness, and in peripheral nervous system symptoms that may be induced by hyperventilation and hypocapnia. Most functional brain imaging studies have used a specific panic-inducing substance (e.g., lactate, caffeine, or yohimbine) in combination with PET or SPECT to assess the effects of the panic-inducing substance and the induced panic attack on cerebral blood flow. Mitral Valve Prolapse. Although great interest was formerly expressed in an association between mitral valve prolapse and panic disorder, research has almost completely erased any clinical significance or relevance to the association. Mitral valve prolapse is a heterogeneous syndrome consisting of the prolapse of one of the mitral valve leaflets, resulting in a midsystolic click on

cardiac auscultation. Studies have found that the prevalence of panic disorder in patients with mitral valve prolapse is the same as the prevalence of panic disorder in patients without mitral valve prolapse. Genetic Factors Various studies have found that the first-degree relatives of patients with panic disorder have a four- to eightfold higher risk for panic disorder than first-degree relatives of other psychiatric patients. The twin studies conducted to date have generally reported that monozygotic twins are more likely to be concordant for panic disorder than are dizygotic twins. At this point, no data exist indicating an association between a specific chromosomal location or mode of transmission and this disorder. Psychosocial Factors Psychoanalytic theories have been developed to explain the pathogenesis of panic disorder. Psychoanalytic theories conceptualize panic attacks as arising from an unsuccessful defence against anxiety-provoking impulses. What was previously a mild signal anxiety becomes an overwhelming feeling of apprehension, complete with somatic symptoms. Many patients describe panic attacks as coming out of the blue, as though no psychological factors were involved, but psychodynamic exploration frequently reveals a clear psychological trigger for the panic attack. Although panic attacks are correlated neuro-physiologically with the locus ceruleus, the onset of panic is generally related to environmental or psychological factors. Patients with panic disorder have a higher incidence of stressful life events (particularly loss) than control subjects in the months before the onset of panic disorder. Moreover, the patients typically experience greater distress about life events than control subjects do. The hypothesis that stressful psychological events produce neurophysiological changes in panic disorder is supported by a study of female twins. Separation from the mother early in life was clearly more likely to result in panic disorder than was paternal separation in the cohort of 1,018 pairs of female twins. Another etiological factor in adult female patients appears to be childhood physical and sexual abuse. Approximately 60 percent of women with panic disorder have a history of childhood sexual abuse compared with 31 percent of women with other anxiety disorders. Further support for psychological mechanisms in panic disorder can be inferred from a study of panic disorder in which patients received successful treatment with cognitive therapy. Before the therapy, the patients responded to panic attack induction with lactate. After successful cognitive therapy, lactate infusion no longer produced a panic attack. The research indicates that the cause of panic attacks is likely to involve the unconscious meaning of stressful events and that the pathogenesis of the panic attacks may be related to neurophysiological factors

triggered by the psychological reactions. Psychodynamic clinicians should always thoroughly investigate possible triggers whenever assessing a patient with panic disorder.

## DIAGNOSIS

A panic attack is a sudden period of intense fear or apprehension that may last from minutes to hours. Panic attacks can occur in mental disorders other than panic disorder, particularly in specific phobia, social phobia, and PTSD. Unexpected panic attacks occur at any time and are not associated with any identifiable situational stimulus, but panic attacks need not be unexpected. Attacks in patients with social and specific phobias are usually expected or cued to a recognized or specific stimulus. Some panic attacks do not fit easily into the distinction between unexpected and expected, and these attacks are referred to as situationally predisposed panic attacks. They may or may not occur when a patient is exposed to a specific trigger, or they may occur either immediately after exposure or after a considerable delay. Panic Disorder Some community surveys have indicated that panic attacks are common, and a major issue in developing diagnostic criteria for panic disorder was determining a threshold number or frequency of panic attacks required to meet the diagnosis. Setting the threshold too low results in the diagnosis of panic disorder in patients who do not have an impairment from an occasional panic attack; setting the threshold too high results in a situation in which patients who are impaired by their panic attacks do not meet the diagnostic criteria.

## CLINICAL FEATURES

The first panic attack is often completely spontaneous, although panic attacks occasionally follow excitement, physical exertion, sexual activity, or moderate emotional trauma. Clinicians should attempt to ascertain any habit or situation that commonly precedes a patient's panic attacks. Such activities may include the use of caffeine, alcohol, nicotine, or other substances; unusual patterns of sleeping or eating; and specific environmental settings, such as harsh lighting at work. The attack often begins with a 10-minute period of rapidly increasing symptoms. The major mental symptoms are extreme fear and a sense of impending death and doom. Patients usually cannot name the source of their fear; they may feel confused and have trouble concentrating. The physical signs often include tachycardia, palpitations, dyspnea, and sweating. Patients often try to leave whatever situation they are in to seek help. The attack generally lasts 20

to 30 minutes and rarely more than an hour. A formal mental status examination during a panic attack may reveal rumination, difficulty speaking (e.g., stammering), and impaired memory. Patients may experience depression or depersonalization during an attack. The symptoms can disappear quickly or gradually. Between attacks, patients may have anticipatory anxiety about having another attack. The differentiation between anticipatory anxiety and generalized anxiety disorder can be difficult, although patients with pain disorder with anticipatory anxiety can name the focus of their anxiety. Somatic concerns of death from a cardiac or respiratory problem may be the major focus of patients' attention during panic attacks. Patients may believe that the palpitations and chest pain indicate that they are about to die. As many as 20 percent of such patients actually have syncopal episodes during a panic attack. The patients may be seen in emergency departments as young (20s), physically healthy persons who nevertheless insist that they are about to die from a heart attack. Rather than immediately diagnosing hypochondriasis, the emergency department physician should consider a diagnosis of panic disorder. Hyperventilation can produce respiratory alkalosis and other symptoms. The age-old treatment of breathing into a paper bag sometimes helps because it decreases alkalosis.

Associated Symptoms Depressive symptoms are often present in panic disorder, and in some patients, a depressive disorder coexists with the panic disorder. Some studies have found that the lifetime risk of suicide in persons with panic disorder is higher than it is in persons with no mental disorder. Clinicians should be alert to the risk of suicide. In addition to agoraphobia, other phobias and OCD can coexist with panic disorder. The psychosocial consequences of panic disorder, in addition to marital discord, can include time lost from work, financial difficulties related to the loss of work, and alcohol and other substance abuse.

**DIFFERENTIAL DIAGNOSIS**

Panic Disorder

Medical Disorders Panic disorder must be differentiated from a number of medical conditions that produce similar symptomatology. Panic attacks are associated with a variety of endocrinological disorders, including both hypo- and hyperthyroid states, hyperparathyroidism, and pheochromocytomas. Episodic hypoglycemia associated with insulinomas can also produce panic-like states, as can primary neuropathological processes. These include seizure

disorders, vestibular dysfunction, neoplasms, or the effects of both prescribed and illicit substances on the CNS. Finally, disorders of the cardiac and pulmonary systems, including arrhythmias, chronic obstructive pulmonary disease, and asthma, can produce autonomic symptoms and accompanying crescendo anxiety that can be difficult to distinguish from panic disorder. Clues of an underlying medical aetiology to panic-like symptoms include the presence of atypical features during panic attacks, such as ataxia, alterations in consciousness, or bladder dyscontrol; onset of panic disorder relatively late in life; and physical signs or symptoms indicative of a medical disorder. Mental Disorders Panic disorder also must be differentiated from a number of psychiatric disorders, particularly other anxiety disorders. Panic attacks occur in many anxiety disorders, including social and specific phobia, Panic may also occur in PTSD and OCD. The key to correctly diagnosing panic disorder and differentiating the condition from other anxiety disorders involves the documentation of recurrent spontaneous panic attacks at some point in the illness. Differentiation from generalized anxiety disorder can also be difficult. Classically, panic attacks are characterized by their rapid onset (within minutes) and short duration (usually less than 10 to 15 minutes), in contrast to the anxiety associated with generalized anxiety disorder, which emerges and dissipates more slowly. Making this distinction can be difficult, however, because the anxiety surrounding panic attacks can be more diffuse and slower to dissipate than is typical. Because anxiety is a frequent concomitant of many other psychiatric disorders, including the psychoses and affective disorders, discrimination between panic disorder and a multitude of disorders can also be difficult. Specific and Social Phobias Sometimes it is diffcult to distinguish between panic disorder, on the one hand, and specific and social phobias, on the other hand. Some patients who experience a single panic attack in a specific setting (e.g., an elevator) may go on to have long-lasting avoidance of the speciOc setting, regardless of whether they ever have another panic attack. These patients meet the diagnostic criteria for a speciOc phobia, and clinicians must use their judgment about what is the most appropriate diagnosis. In another example, a person who experiences one or more panic attacks may then fear speaking in public. Although the clinical picture is almost identical to the clinical picture in social phobia, a diagnosis of social phobia is excluded because the avoidance of the public situation is based on fear of having a panic attack rather than on fear of the public speaking itself.

## COURSE AND PROGNOSIS

Panic disorder usually has its onset in late adolescence or early adulthood, although onset during childhood, early adolescence, and midlife does occur. Some data implicate increased psychosocial stressors with the onset of panic disorder, although no psychosocial stressor can be definitely identified in most cases. Panic disorder, in general, is a chronic disorder, although its course is variable, both among patients and within a single patient. The available long-term follow-up studies of panic disorder are difficult to interpret because they have not controlled for the effects of treatment. Nevertheless, about 30 to 40 percent of patients seem to be symptom free at long-term follow-up, about 50 percent have symptoms that are sufficiently mild not to affect their lives significantly, and about 10 to 20 percent continue to have significant symptoms. After the first one or two panic attacks, patients may be relatively unconcerned about their condition; with repeated attacks, however, the symptoms may become a major concern. Patients may attempt to keep the panic attacks secret and thereby cause their families and friends concern about unexplained changes in behavior. The frequency and severity of the attacks can fluctuate. Panic attacks can occur several times in a day or less than once a month. Excessive intake of caffeine or nicotine can exacerbate the symptoms. Depression can complicate the symptom picture in anywhere from 40 to 80 percent of all patients, as estimated by various studies. Although the patients do not tend to talk about suicidal ideation, they are at increased risk for committing suicide. Alcohol and other substance dependence occurs in about 20 to 40 percent of all patients, and OCD may also develop. Family interactions and performance in school and at work commonly suffer. Patients with good premorbid functioning and symptoms of brief duration tend to have good prognoses.

## TREATMENT

With treatment, most patients exhibit dramatic improvement in the symptoms of panic disorder and agoraphobia. The two most effective treatments are pharmacotherapy and cognitive-behavioral therapy. Family and group therapy may help affected patients and their families adjust to the patient's disorder and to the psychosocial difficulties that the disorder may have precipitated. Pharmacotherapy Overview. Alprazolam (Xanax) and paroxetine (Paxil) are the two drugs approved by the US Food and Drug Administration (FDA) for the treatment of panic disorder. In general, experience is showing superiority of the selective serotonin reuptake inhibitors (SSRIs) and clomipramine (Anafranil)

over the benzodiazepines, monoamine oxidase inhibitors (MAOIs), and tricyclic and tetracyclic drugs in terms of effectiveness and tolerance of adverse effects. Some reports have suggested a role for venlafaxine (Effexor), and buspirone (BuSpar) has been suggested as an additive medication in some cases. Venlafaxine is approved by the FDA for treatment of generalized anxiety disorder and may be useful in panic disorder combined with depression. β-adrenergic receptor antagonists have not been found to be particularly useful for panic disorder. A conservative approach is to begin treatment with paroxetine, sertraline (Zoloft), citalopram (Celexa), or fluvoxamine (Luvox) in isolated panic disorder. If rapid control of severe symptoms is desired, a brief course of alprazolam should be initiated concurrently with the SSRI followed by slowly tapering use of the benzodiazepine. In long-term use, fluoxetine (Prozac) is an effective drug for panic with comorbid depression, although its initial activating properties may mimic panic symptoms for the first several weeks, and it may be poorly tolerated on this basis. Clonazepam (Klonopin) can be prescribed for patients who anticipate a situation in which panic may occur (0.5 to 1 mg as required). Selective Serotonin Reuptake Inhibitors. All SSRIs are effective for panic disorder. Paroxetine and paroxetine CR have sedative effects and tend to calm patients immediately, which leads to greater compliance and less discontinuation, but this must be weighed against its weight gain potential. Citalopram, escitalopram (Lexapro), fluvoxamine, and sertraline are the next best tolerated. Anecdotal reports suggest that patients with panic disorder are particularly sensitive to the activating effects of SSRIs, particularly fluoxetine, so they should be given initially at small dosages and titrated up slowly. At therapeutic dosages—for example, 20 mg a day of paroxetine—some patients may experience increased sedation. One approach for patients with panic disorder is to give 5 or 10 mg a day of paroxetine or 12.5 to 25 mg of paroxetine CR for 1 to 2 weeks and then increase the dosage by 10 mg of paroxetine or 12.5 mg of paroxetine CR a day every 1 to 2 weeks to a maximum of 60 mg of paroxetine or 62.5 mg of paroxetine CR. If sedation becomes intolerable, then taper the paroxetine dosage down to 10 mg a day of paroxetine or 12.5 mg of paroxetine CR and switch to fluoxetine at 10 mg a day and titrate upward slowly. Other strategies can be used based on the experience of the clinician. Benzodiazepines. Benzodiazepines have the most rapid onset of action against panic, often within the first week, and they can be used for long periods without the development of tolerance to the antipanic effects. Alprazolam has been the most widely used benzodiazepine for panic disorder, but controlled studies have

demonstrated equal efficacy for lorazepam (Ativan), and case reports have also indicated that clonazepam may be effective. Some patients use benzodiazepines as needed when faced with a phobic stimulus. Benzodiazepines can reasonably be used as the first agent for treatment of panic disorder while a serotonergic drug is being slowly titrated to a therapeutic dose. After 4 to 12 weeks, benzodiazepine use can be slowly tapered (over 4 to 10 weeks) while the serotonergic drug is continued. The major reservation among clinicians regarding the use of benzodiazepines for panic disorder is the potential for dependence, cognitive impairment, and abuse, especially after long-term use. Patients should be instructed not to drive, abstain from alcohol or other CNS depressant medications, and avoid operating dangerous equipment while taking benzodiazepines. Whereas benzodiazepines elicit a sense of well-being, discontinuation of benzodiazepines produces a well-documented and unpleasant withdrawal syndrome. Anecdotal reports and small case series have indicated that addiction to alprazolam is one of the most difficult to overcome, and it may require a comprehensive program of detoxification. Benzodiazepine dosage should be tapered slowly, and all anticipated withdrawal effects should be thoroughly explained to the patient. Tricyclic and Tetracyclic Drugs. At the present time, SSRIs are considered the first-line agents for the treatment of panic disorder. Data, however, show that among tricyclic drugs, clomipramine and imipramine (Tofranil) are the most effective in the treatment of panic disorder. Clinical experience indicates that the dosages must be titrated slowly upward to avoid overstimulation and that the full clinical benefit requires full dosages and may not be achieved for 8 to 12 weeks. Some data support the efficacy of desipramine (Norpramin), and less evidence suggests a role for maprotiline (Ludiomil), trazodone (Desyrel), nortriptyline (Pamelor), amitriptyline (Elavil), and doxepin (Adapin). Tricyclic drugs are less widely used than SSRIs because the tricyclic drugs generally have more severe adverse effects at the higher dosages required for effective treatment of panic disorder. Monoamine Oxidase Inhibitors. The most robust data support the effectiveness of phenelzine (Nardil), and some data also support the use of tranylcypromine (Parnate). MAOIs appear less likely to cause overstimulation than either SSRIs or tricyclic drugs, but they may require full dosages for at least 8 to 12 weeks to be effective. The need for dietary restrictions has limited the use of MAOIs, particularly since the appearance of the SSRIs. Treatment Non-response. If patients fail to respond to one class of drugs, another should be tried. Recent data support the effectiveness of venlafaxine. The combination of an SSRI or a

tricyclic drug and a benzodiazepine or of an SSRI and lithium or a tricyclic drug can be tried. Case reports have suggested the effectiveness of carbamazepine (Tegretol), valproate (Depakene), and calcium channel inhibitors. Buspirone may have a role in the augmentation of other medications but has little effectiveness by itself. Clinicians should reassess the patient, particularly to establish the presence of comorbid conditions such as depression, alcohol use, or other substance use. Duration of Pharmacotherapy. When it becomes effective, pharmacological treatment should generally continue for 8 to 12 months. Data indicate that panic disorder is a chronic, perhaps lifelong, condition that recurs when treatment is discontinued. Studies have reported that 30 to 90 percent of patients with panic disorder who have had successful treatment have a relapse when their medication is discontinued. Patients may be likely to relapse if they have been given benzodiazepines and the benzodiazepine therapy is terminated in a way that causes withdrawal symptoms. Cognitive and Behavior Therapies Cognitive and behavior therapies are effective treatments for panic disorder. Various reports have concluded that cognitive and behavior therapies are superior to pharmacotherapy alone; other reports have concluded the opposite. Several studies and reports have found that the combination of cognitive or behavior therapy with pharmacotherapy is more effective than either approach alone. Several studies that included long-term follow-up of patients who received cognitive or behavior therapy indicate that the therapies are effective in producing long-lasting remission of symptoms. Cognitive Therapy. The two major foci of cognitive therapy for panic disorder are instruction about a patient's false beliefs and information about panic attacks. The instruction about false beliefs centers on the patient's tendency to misinterpret mild bodily sensations as indicating impending panic attacks, doom, or death. The information about panic attacks includes explanations that when panic attacks occur, they are time limited and not life threatening.

**E. Agoraphobia.**

Agoraphobia refers to a fear of or anxiety regarding places from which escape might be difficult. It can be the most disabling of the phobias because it can significantly interfere with a person's ability to function in work and social situations outside the home. In the United States, most researchers of panic disorder believe that agoraphobia almost always develops as a complication in patients with panic disorder. That is, the fear of having a panic attack in a public place from which escape would be formidable is thought to cause the

agoraphobia. Although agoraphobia often coexists with panic disorder, DSM-5 classifies agoraphobia as a separate condition that may or may not be comorbid with panic disorder.

## HISTORY

The term agoraphobia was coined in 1871 to describe the condition of patients who were afraid to venture alone into public places. The term is derived from the Greek words agora and phobos, meaning “fear of the marketplace.”

## EPIDEMIOLOGY

The lifetime prevalence of agoraphobia is somewhat controversial, varying between 2 to 6 percent across studies. According to the DSM-5, persons older than age 65 years have a 0.4 percent prevalence rate of agoraphobia, but this may be a low estimate. The major factor leading to this wide range of estimates relates to disagreement about the conceptualization of agoraphobia’s relationship to panic disorder. Although studies of agoraphobia in psychiatric settings have reported that at least three fourths of the affected patients have panic disorder as well, studies of agoraphobia in community samples have found that as many as half the patients have agoraphobia without panic disorder. The reasons for these divergent findings are unknown but probably involve differences in ascertainment techniques. In many cases, the onset of agoraphobia follows a traumatic event.

## DIAGNOSIS AND CLINICAL FEATURES

The DSM-5 diagnostic criteria for agoraphobia stipulates marked fear or anxiety about at least one situation from two or more of five situation groups:

(1) using public transportation (e.g., bus, train, cars, planes),

(2) in an open space (e.g., park, shopping center, parking lot),

(3) in an enclosed space (e.g., stores, elevators, theaters),

(4) in a crowd or standing in line, or

(5) alone outside of the home.

The fear or anxiety must be persistent and last at least 6 months Patients with agoraphobia rigidly avoid situations in which it would be difficult to obtain help. They prefer to be accompanied by a friend or a family member in busy

streets, crowded stores, closed-in spaces (e.g., tunnels, bridges, and elevators), and closed-in vehicles (e.g., subways, buses, and airplanes). Patients may insist that they be accompanied every time they leave the house. The behavior can result in marital discord, which may be misdiagnosed as the primary problem. Severely affected patients may simply refuse to leave the house. Particularly before a correct diagnosis is made, patients may be terrified that they are going crazy.

## DIFFERENTIAL DIAGNOSIS

The differential diagnosis for agoraphobia includes all the medical disorders that can cause anxiety or depression. The psychiatric differential diagnosis includes major depressive disorder, schizophrenia, paranoid personality disorder, avoidance personality disorder, and dependent personality disorder.

## COURSE AND PROGNOSIS

Most cases of agoraphobia are thought to be caused by panic disorder. When the panic disorder is treated, the agoraphobia often improves with time. For rapid and complete reduction of agoraphobia, behavior therapy is sometimes indicated. Agoraphobia without a history of panic disorder is often incapacitating and chronic, and depressive disorders and alcohol dependence often complicate its course.

## TREATMENT

Pharmacotherapy- Benzodiazepines. Benzodiazepines have the most rapid onset of action against panic. Some patients use them as needed when faced with a phobic stimulus. Alprazolam (Xanax) and lorazepam (Ativan) are the most commonly prescribed benzodiazepines. Clonazepam (Klonopin) has also been shown to be effective. The major reservations among clinicians regarding the use of benzodiazepines are the potential for dependence, cognitive impairment, and abuse, particularly with long-term use. However, when used appropriately under medical supervision, benzodiazepines are efficacious and generally well tolerated. The most common side effects are mild dizziness and sedation, both of which are generally attenuated by time or change of dose. Caution must be exercised when using heavy or dangerous machinery or when driving, especially when first starting the medication or when the dose is changed. Benzodiazepines should not be used in combination with alcohol because they can intensify its effects. Benzodiazepines are also best avoided in individuals

with histories of alcohol or substance abuse unless there are compelling reasons, such as failure to respond to other classes of medications. Selective Serotonin Reuptake Inhibitors. SSRIs have been shown to help reduce or prevent relapse from various forms of anxiety, including agoraphobia. Effective doses are essentially the same as for the treatment of depression, although it is customary to start with lower initial doses than in depression to minimize an initial anxiolytic effect, which is almost always short lived, and to titrate upward somewhat slower toward a therapeutic dose. The main advantages of SSRIs antidepressants include their improved safety profile in overdose and more tolerable side-effect burden. Common side effects of most SSRIs are sleep disturbance, drowsiness, light headedness, nausea, and diarrhea; many of these adverse effects improve with continued use. Another commonly reported side effect of SSRIs is sexual dysfunction (i.e., decreased libido, delayed ejaculation in men, delayed orgasm in women), which rarely improves with time or switching among SSRIs (or from an SSRI to a serotonin-norepinephrine reuptake inhibitor [SNRI]). Proposed strategies to combat sexual dysfunction in patients taking SSRIs include adjunctive use of yohimbine (Yocon), bupropion (Wellbutrin), or mirtazapine (Remeron); dose reduction; or adjunctive use of sildenafil (Viagra). Another issue to be considered when prescribing an SSRI is the possibility of a discontinuation syndrome if these medications are stopped abruptly. Commonly reported symptoms of this condition, which tend to occur 2 to 4 days after medication cessation, include increased anxiety, irritability, tearfulness, dizziness or lightheadedness, malaise, sleep disturbance, and concentration difficulties. This discontinuation syndrome is most common among SSRIs with shorter half-lives (e.g., paroxetine [Paxil]). Tricyclic and Tetracyclic Drugs. Although SSRIs are considered the first-line agents for treatment of panic disorders with or without agoraphobia, the tricyclic drugs clomipramine (Anafranil) and imipramine (Tofranil) are the most effective in the treatment of these disorders. Dosages must be titrated slowly upward to avoid overstimulation (e.g., “jitteriness” syndrome), and the full clinical benefit requires full dosages and may not be achieved for 8 to 12 weeks. Therapeutic drug monitoring (TDM) may be useful to ensure that the patient is on an adequate dose of medication while avoiding issues of toxicity. The other adverse effects to these antidepressants are related to their effects on seizure threshold, as well as anticholinergic and potentially harmful cardiac effects, particularly in overdose. Psychotherapy Supportive Psychotherapy. Supportive psychotherapy involves the use of psychodynamic concepts and a therapeutic

alliance to promote adaptive coping. Adaptive defenses are encouraged and strengthened, and maladaptive ones are discouraged. The therapist assists in reality testing and may offer advice regarding behavior. Insight-Oriented Psychotherapy. In insight-oriented psychotherapy, the goal is to increase the patient's development of insight into psychological conflicts that, if unresolved, can manifest as symptomatic behavior. Behavior Therapy. In behavior therapy, the basic assumption is that change can occur without the development of psychological insight into underlying causes. Techniques include positive and negative reinforcement, systematic desensitization, flooding, implosion, graded exposure, response prevention, stop thought, relaxation techniques, panic control therapy, self-monitoring, and hypnosis. Cognitive Therapy. This is based on the premise that maladaptive behavior is secondary to distortions in how people perceive themselves and in how other perceive them. Treatment is short term and interactive, with assigned homework and tasks to be performed between sessions that focus on correcting distorted assumptions and cognitions. The emphasis is on confronting and examining situations that elicit interpersonal anxiety and associated mild depression. Virtual Therapy. Computer programs have been developed that allow patients to see themselves as avatars who are then placed in open or crowded spaces (e.g., a supermarket). As they identify with the avatars in repeated computer sessions, they are able to master their anxiety through deconditioning.

**F. Generalized anxiety disorder**. Involves excessive worry about everyday life circumstances, events, or conflicts. The symptoms may fluctuate and overlap with other medical and psychiatric disorders (depressive and other anxiety disorders). The anxiety is difficult to control, is subjectively distressing, and produces impairments in important areas of a person's life. Occurs in children and adults with a lifetime prevalence of 45%. Ratio of women to men is 2:1.

**G. Substance/medication-induced anxiety disorder**. Panic attacks or anxiety developing during or soon after intoxication of or withdrawal from a substance/medication that is known to produce such symptoms. (Red flags include delirium and panic attacks at baseline.) A wide range of substances can cause anxiety symptoms that are often associated with intoxication or withdrawal states. Most common contributing drugs include amphetamine, cocaine, and caffeine, as well as LSD and MDMA. Primary treatment includes removal of casually involved substance.

**H. Anxiety disorder due to another medical condition**. Many medical disorders are associated with anxiety. It is fairly a common condition and DSM-5 suggests that clinicians specify whether the disorder is characterized by symptoms of generalized anxiety or panic attacks. A wide range of medical and neurologic conditions can cause anxiety symptoms.

**I. Other specified anxiety disorder.** Anxiety disorder not meeting full criteria (e.g., short duration, culturally specific symptoms, etc.).

**J. Unspecified anxiety disorder.** This condition does not meet criteria for any of the above-listed anxiety disorders despite resulting in significant social and occupational dysfunction. There is incomplete information for diagnoses. This may include the following conditions.

**1. Adjustment disorder with anxiety.** This applies to the patient with an obvious stressor in whom excessive anxiety develops within 3 months and is expected to last no longer than 6 months. It may occur as a reaction to illness, rejection, or loss of a job, especially if it is experienced as a defeat or failure.

**2. Anxiety secondary to another psychiatric disorder**. Seventy percent of depressed patients have anxiety. Patients with psychoses— schizophrenia, mania, or brief psychotic disorder—often exhibit anxiety (psychotic anxiety). Anxiety is common in delirium and in dementia (catastrophic reaction).

**3. Situational anxiety**. Effects of a stressful situation temporarily overwhelm the ability to cope. This may occur in minor situations if it brings to mind past overwhelming stress. 4. Existential anxiety. This involves fears of helplessness, aging, loss of control, and loss of others in addition to the fear of death and dying.

**5. Separation anxiety and stranger anxiety**. Regressed adults, including some who are medically ill, may manifest anxiety when separated from loved ones or when having to react to staff in a hospital. Separation anxiety disorder occurs in some young children when going to school for the first time. It is a normal reaction in infants and children until about 2½ years of age.

**6. Anxiety related to loss of self-control**. In circumstances in which control must be surrendered, such as medical illness or hospitalization, patients with a need to feel in control may be very threatened. Loss of autonomy at work can precipitate anxiety.

**7. Anxiety related to dependence or intimacy**. If past dependency needs were not met or resolved, a patient can be anxious being in a close relationship, which involves some dependence, or being a patient in a hospital, which involves giving up control.

**8. Anxiety related to guilt and punishment**. If a patient expects punishment for imagined or real misdeeds, he or she may feel anxiety and the punishment may be actively sought or even self-inflicted.

**K. Mixed anxiety–depressive disorder**. This disorder describes patients with both anxiety and depressive symptoms that do not meet the diagnostic criteria for either an anxiety disorder or a mood disorder. The diagnosis is sometimes used in primary care settings and is used in Europe; sometimes called neurasthenia.

## III. Epidemiology

The anxiety disorders make up the most common group of psychiatric disorders. One in four persons has met the diagnostic criteria for at least one of the above-listed anxiety disorders, and there is a 12-month prevalence rate of about 17%. Women are more likely to have an anxiety disorder than are men. The prevalence of anxiety disorders decreases with higher socioeconomic status. An epidemiologic overview of anxiety disorders as well as obsessive–compulsive disorder and posttraumatic stress disorder.

## IV. Etiology

### A. Biologic

1. Anxiety involves an excessive autonomic reaction with increased sympathetic tone.

2. The release of catecholamines is increased with the increased production of norepinephrine metabolites (e.g., 3-methoxy-4- hydroxyphenylglycol).

3. Decreased rapid eye movement (REM) latency and stage IV sleep (similar to depression) may develop.

4. Decreased levels of γ-aminobutyric acid (GABA) cause central nervous system (CNS) hyperactivity (GABA inhibits CNS irritability and is widespread throughout the brain).

5. Alterations in serotonergic system and increased dopaminergic activity are associated with anxiety.

6. Activity in the temporal cerebral cortex is increased.

7. The locus coeruleus, a brain center of noradrenergic neurons, is hyperactive in anxiety states, especially panic attacks.

8. Recent studies also suggest a role for neuropeptides (substance P, CRF, and cholecystokinin), but currently there are no agents available for these targets.

9. Hyperactivity and dysregulation in the amygdala may be associated with social anxiety.

**B. Psychoanalytic**. According to Freud, unconscious impulses (e.g., sex or aggression) threaten to burst into consciousness and produce anxiety. Anxiety is related developmentally to childhood fears of disintegration that derive from the fear of an actual or imagined loss of a love object or the fear of bodily harm (e.g., castration). Freud used the term signal anxiety to describe anxiety not consciously experienced but that triggers defense mechanisms used by the person to deal with a potentially threatening situation.

**C. Learning theory**

1. Anxiety is produced by continued or severe frustration or stress. The anxiety then becomes a conditioned response to other situations that are less severely frustrating or stressful.

2. It may be learned through identification and imitation of anxiety patterns in parents (social learning theory).

3. Anxiety is associated with a naturally frightening stimulus (e.g., accident). Subsequent displacement or transference to another stimulus through conditioning produces a phobia to a new and different object or situation.

4. Anxiety disorders involve faulty, distorted, or counterproductive patterns of cognitive thinking.

**D. Genetic studies**

1. Half of patients with panic disorder have one affected relative.

2. About 5% of persons with high levels of anxiety have a polymorphic variant of the gene associated with serotonin transporter metabolism.

**V. Psychological Tests**

**A. Rorschach test**

1. Anxiety responses include animal movements, unstructured forms, and heightened color.

2. Phobic responses include anatomic forms or bodily harm.

3. Obsessive–compulsive responses include over attention to detail.

**B. Thematic apperception test**

1. Increased fantasy productions may be present.

2. Themes of aggression and sexuality may be prominent.

3. Feelings of tension may be evident.

**C. Bender–Gestalt**

1. No changes indicative of brain damage are apparent.

2. Use of small area may be manifested in obsessive–compulsive disorder.

3. Productions may spread out on the page in anxiety states.

D. Draw-a-Person

1. Attention to head and general detailing may be noted in obsessive–compulsive disorder.

2. Body image distortions may be present in phobias.

3. Rapid drawing may be evident in anxiety disorders.

E. Minnesota Multiphasic Personality Inventory-2. High hypochondriasis, psychasthenia, hysteria scales in anxiety.

**VI. Laboratory Tests**

A. No specific laboratory tests for anxiety.

B. Experimental infusion of lactate increases norepinephrine levels and produces anxiety in patients with panic disorder.

**VII. Pathophysiology and Brain-Imaging Studies**

A. No consistent pathognomonic changes.

B. In obsessive–compulsive disorder, positron emission tomography (PET) reveals decreased metabolism in the orbital gyrus, caudate nuclei, and cingulate gyrus.

C. In generalized anxiety disorder and panic states, PET reveals increased blood flow in the right parahippocampus in the frontal lobe.

D. Magnetic resonance imaging (MRI) has shown increased ventricular size in some cases, but findings are not consistent.

E. Right temporal atrophy is seen in some panic disorder patients, and cerebral vasoconstriction is often present in anxiety.

F. Mitral valve prolapse is present in 50% of patients with panic disorder, but clinical significance unknown.

G. Nonspecific electroencephalogram (EEG) changes may be noted.

H. Dexamethasone suppression test does not suppress cortisol in some obsessive–compulsive patients.

I. Panic-inducing substances include carbon dioxide, sodium lactate, methyl-chloro

phenyl-piperazine (mCPP), carbolines, GABAB receptor antagonists, caffeine, isoproterenol, and yohimbine (Yocon).

## ICD-10 criteria Generalized anxiety disorder

A. A period of at least six months with prominent tension, worry and feelings of apprehension, about every-day events and problems.

B. At least four symptoms out of the following list of items must be present, of which at least one from items (1) to (4).

Autonomic arousal symptoms

(1) Palpitations or pounding heart, or accelerated heart rate.
(2) Sweating.
(3) Trembling or shaking.
(4) Dry mouth (not due to medication or dehydration).

Symptoms concerning chest and abdomen

(5) Difficulty breathing

SLIMS

## ICD-10 criteria Generalized anxiety disorder Cont:

Symptoms concerning brain and mind

(9) Feeling dizzy, unsteady, faint or light-headed.

(10) Feelings that objects are unreal (derealization), or that one's self is distant or "not really here" (depersonalization).

(11) Fear of losing control, going crazy, or passing out.

(12) Fear of dying.

General symptoms

(13) Hot flushes or cold chills.

(14) Numbness or tingling sensations.

Symptoms of tension

(15) Muscle tension or aches and pains.

(16) Restlessness and inability to relax.

(17) Feeling keyed up, or on edge, or of mental tension.

(18) A sensation of a lump in the throat, or difficulty with swallowing.

## Symptoms of a Panic Attack

- Sweating, shortness of breath or hyperventilation
- Racing heart, chest pain or discomfort
- Feeling dizzy, light-headed or faint
- Choking or smothering sensation
- Numbness or tingling
- Chills or hot flashes
- Trembling or shaking
- Nausea or upset stomach
- Feeling unreal or detached from one's surroundings
- Fear of losing control, "going crazy" or dying

## VIII. Differential Diagnosis

A. Depressive disorders. Fifty percent to 70% of depressed patients exhibit anxiety or obsessive brooding; 20% to 30% of primarily anxious patients also experience depression.

B. Schizophrenia. Schizophrenic patients may be anxious and have severe obsessions in addition to or preceding the outbreak of hallucinations or delusions.

C. Bipolar I disorder. Massive anxiety may occur during a manic episode.

D. Atypical psychosis (psychotic disorder not otherwise specified). Massive anxiety is present, in addition to psychotic features.

E. Adjustment disorder with anxiety. Patient has a history of a psychosocial stressor within 3 months of onset.

F. Medical and neurologic conditions. A secondary anxiety disorder is caused by a specific medical or biologic factor. Undiagnosed hyperthryroidism is a frequent cause.

G. Substance-related disorders. Panic or anxiety is often associated with intoxication (especially caffeine, cocaine, amphetamines, hallucinogens) and withdrawal states

H. Cognitive disorder. Severe anxiety may interfere with cognition and impairments may occur; however, they remit when the anxiety is diminished, unlike the cognitive defects in dementia.

## IX. Course and Prognosis

### A. Separation anxiety disorder

1. Starts as early as 1 year of age.

2. Periods of exacerbations and remissions.

3. Adults may have social and occupational dysfunction.

4. Overall good prognosis with 96% remission.

**B. Selective mutism**

1. Shy, anxious, and risk for depression.

2. Academic difficulties.

3. Increased risk for comorbid anxiety disorders.

4. Good treatment response to SSRIs.

**C. Specific phobia**

1. The course tends to be chronic.

2. Phobias may worsen or spread if untreated.

3. Agoraphobia is the most resistant of all phobias.

4. Prognosis is good to excellent with therapy.

**D. Social anxiety disorder (social phobia)**

1. Onset in late childhood or early adolescence.

2. Chronic but symptoms may remit.

3. Disruption in the individual's life.

4. Good prognosis with pharmacotherapy and psychotherapy.

**E. Panic disorder**

1. The course is chronic, with remissions and exacerbations.

2. Panic attacks tend to recur two to three times a week.

3. Patients with panic disorder may be at increased risk for committing suicide.

4. The prognosis is good with combined pharmacotherapy and psychotherapy.

**F. Agoraphobia**

1. Frequently caused by panic disorder.

2. Without panic disorder is chronic and incapacitating.

3. Comorbid alcohol dependence and depressive symptoms.

4. Treatment approach requires pharmacotherapy with CBT and virtual therapy.

## G. Generalized anxiety disorder

1. Course is chronic; symptoms may diminish, as the patient gets older.

2. With time, secondary depression may develop. This is not uncommon if the condition is left untreated.

3. With treatment, prognosis is good; over 70% of patients improve with pharmacologic therapy; best when combined with psychotherapy.

## X. Treatment

The treatment of anxiety disorders involves both a psychopharmacologic approach as well as psychotherapy (CBT, psychodynamic, time-limited, group, and family therapies).

### A. Pharmacologic.

**1. Benzodiazepines.** These drugs are effective in reducing anxiety generally. In panic disorder, they reduce both the number and intensity of attacks. They are also useful in social and specific **phobia**. Because of concern about physical dependence, benzodiazepines are not prescribed by physicians as often as they should be. With proper psychotherapeutic monitoring, however, they can be used safely for long periods of time without being abused. Discontinuation (withdrawal) syndromes may occur in patients who use these drugs for long periods, but, if the medication is properly withdrawn, signs and symptoms of withdrawal are easily managed. Commonly used drugs in this class include alprazolam (Xanax), clonazepam (Klonopin), diazepam (Valium), and lorazepam (Ativan). Alprazolam is effective in panic disorder and anxiety associated with depression. Alprazolam has been associated with a discontinuation syndrome after as little as 6 to 8 weeks of treatment.

**2. Selective serotonin reuptake inhibitors (SSRIs).** There are six SSRIs available in the United States that are effective in anxiety disorder: fluoxetine (Prozac), citalopram (Celexa), escitalopram (Lexapro), paroxetine(Paxil), sertraline (Zoloft), and venlafaxine (Effexor). Paroxetine is especially useful for the treatment of panic disorder. SSRIs are safer than the tricyclic drugs because they lack anticholinergic effects and are not as lethal if taken in overdose. The most common side effects are transient nausea, headache, and sexual dysfunction. Some patients, especially those with panic disorder, report an initial increase in anxiety after starting these drugs, which can be controlled with benzodiazepines until the full SSRI effect is felt, usually within 2 to 4 weeks. SSRIs are used with extreme caution in children and adolescents because of reports of agitation and impulsive suicidal acts as side effects of the medication in that population.

**3. Tricyclics**. Drugs in this class reduce the intensity of anxiety in all the anxiety disorders. Because of their side effect profile (e.g., anticholinergic effects, cardiotoxicity, and potential lethality in overdose [10 times the daily recommended dose can be fatal]), they are not first-line agents. Typical drugs in this class include imipramine (Tofranil), nortryptaline (Aventyl, Pamelor), and clomipramine (Anafranil).

**4. Monoamine oxidase inhibitors (MAOIs).** MAOIs are effective for the treatment of panic and other anxiety disorders; however, they are not first-line agents because of a major adverse side effect, which is the occurrence of a hypertensive crisis secondary to ingestion of foods containing tyramine. Certain medications such as sympathomimetics and opioids (especially meperidine [Demerol]) must be avoided because if combined with MAOIs, death may ensue. Common drugs in this class include phenelzine (Nardil) and tranylcypromine (Parnate).

**5. Other drugs used in anxiety disorders**

**a. Adrenergic receptor antagonists (beta blockers**). Drugs in this class include propranolol (Inderal) and atenolol (Tenormin), which act to suppress the somatic signs of anxiety, particularly panic attacks. They have been reported to be particularly effective in blocking the anxiety of social phobia (e.g., public speaking) when taken as a single dose about 1 hour before the phobic event. Adverse effects include bradycardia, hypotension, and drowsiness. They are not useful in chronic anxiety, unless it is caused by a hypersensitive adrenergic state.

**b. Venlafaxine (Effexor).** This drug has been found to be effective in the treatment of both generalized anxiety disorder and panic disorder. Because it also acts as an antidepressant, it is of use in mixed states. Its major indication is for the treatment of depression.

**c. Buspirone (Buspar).** This drug has mild serotonergic effects and is most effective in generalized anxiety disorder rather than in acute states. It is not cross-tolerant with benzodiazepines and cannot be used to treat discontinuation syndromes. It has a slow level of onset and may produce dizziness and headache in some patients.

**d. Anticonvulsant anxiolytics**. Typical drugs in this class used in the treatment of anxiety disorders include gabapentin (Neurontin), tiagabine (Gabitril), and valproate (Depakene, Depakote). Reports of their efficacy are few and anecdotal; however, they deserve consideration in the treatment of these disorders, especially if panic attacks are present.

**B. Psychological**

**1. Supportive psychotherapy**. This approach involves the use of psychodynamic concepts and a therapeutic alliance to promote adaptive coping. Adaptive defenses are encouraged and strengthened, and maladaptive ones are discouraged. The therapist assists in reality testing and may offer advice regarding behavior.

**2. Insight-oriented psychotherapy**. The goal is to increase the patient's development of insight into psychological conflicts that, if unresolved, can manifest as symptomatic behavior (e.g., anxiety and phobias). This modality is particularly indicated if

(1) anxiety symptoms are clearly secondary to an underlying unconscious conflict,

(2) anxiety continues after behavioral or pharmacologic treatments are instituted,

(3) new anxiety symptoms develop after the original symptoms have resolved (symptom substitution), or

(4) the anxieties are more generalized and less specific.

**3. Behavior therapy**. The basic assumption is that change can occur without the development of psychological insight into underlying causes. Techniques include positive and negative reinforcement, systematic desensitization, flooding, implosion, graded exposure, response prevention, stop-thought, relaxation techniques, panic control therapy, self-monitoring, and hypnosis. Virtual Therapy Treatment (VRT) uses augmented reality and virtual immersion experience to desensitize the patient against anxiety.

**a. Behavior therapy** is indicated for clearly delineated, circumscribed, maladaptive behaviors (e.g., panic attacks and phobias).

b. Most current strategies for the treatment of anxiety disorders include a combination of pharmacologic and behavioral interventions.

c. Current thinking generally maintains that although drugs can reduce anxiety early, treatment with drugs alone leads to equally early relapse. The response of patients who are also treated with cognitive and behavioral therapies appears to be significantly and consistently better than the response of those who receive drugs alone.

**4. Cognitive therapy**. This is based on the premise that maladaptive behavior is secondary to distortions in how people perceive themselves and in how others perceive them. Treatment is short-term and interactive, with assigned homework and tasks to be performed between sessions that focus on correcting distorted assumptions and cognitions. The emphasis is on confronting and

examining situations that elicit interpersonal anxiety and associated mild depression.

**5. Group therapy**. Groups range from those that provide only support and an increase in social skills to those that focus on relief of specific symptoms to those that are primarily insight-oriented. Groups may be heterogeneous or homogeneous in terms of diagnosis. Homogeneous groups are commonly used in the treatment of such diagnoses as posttraumatic stress disorder, in which therapy is aimed at education about dealing with stress.

**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**

**CLASSIFICATION OF ANXIETY AND ITS TREATMENT METHODS- 2ND YEAR STUDENTS**

| S.No | Register No | Students List | Department | SIGNATURE |
|---|---|---|---|---|
| 1 | U13MB261 | SHANMUGAVEL.L.N. | Psychiatry | |
| 2 | U13MB262 | SHEELA PRIYA DARSHINI. N | Psychiatry | |
| 3 | U13MB263 | SHEIK MOHAMMED YASAR | Psychiatry | |
| 4 | U13MB264 | SIVASANKARI. B | Psychiatry | |
| 5 | U13MB265 | SNEHA. T (DOB- 10.12.1994) | Psychiatry | |
| 6 | U13MB266 | SNEHA. T (DOB- 15.01.1996) | Psychiatry | |
| 7 | U13MB267 | SOBICA.D | Psychiatry | |
| 8 | U13MB268 | SOWNDARAVEL.S | Psychiatry | |
| 9 | U13MB269 | SRI SAKTHI PRIYA.N | Psychiatry | |
| 10 | U13MB270 | SRILEKHA.D.J | Psychiatry | |
| 11 | U13MB271 | SRIMUKESH.A | Psychiatry | |

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|---|---|---|---|---|
| 12 | U13MB272 | STEPHEN.A | Psychiatry | A. Steph... |
| 13 | U13MB273 | SUGANYA.P | Psychiatry | Suganya. |
| 14 | U13MB274 | SUGESH CHANDRAN.V | Psychiatry | Sugesh chandran |
| 15 | U13MB275 | SURIYAKUMAR.G | Psychiatry | Suriya |

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# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - IV**

**An Introduction And Assement Of Various Types Of Anxiety Disorders Along With Its Management**

**MULTIPLE CHOICE QUESTIONS**

**CANDIDATE AND ASSESSOR INFORMATION**

| Candidate Name | | Assessor Name | |
|---|---|---|---|
| Date of Assessment | | Assessor Position | |

**Course Code: PSYCO1**

**I. ANSWER ALL THE QUESTIONS**

1) An anxiety disorder is:

a) An emotional state identified by panic attacks.

b) An emotional condition classified by excessive checking.

c) Disordered thinking.

d) An excessive or aroused state characterized by feelings of apprehension, uncertainty and fear.

Check your answer

2) Which of the following are common aspects of co-morbidity in anxiety disorders?

a) Physiological symptoms of panic are found not only in panic disorder, but also in the reactions to phobic stimuli in specific phobias.

b) Cognitive biases - such as information processing biases that tend anxious people to selectively attending to threatening stimuli (Mathews & McLeod, 1994) - are common to almost all anxiety disorders.

c) Certain specific early experiences can be found in the aetiology of a number of different anxiety disorders (e.g. physical or sexual abuse during childhood), and experiences such as these may increase an individual's risk of developing several anxiety-based problems.

d) All of the above.

3) Specific phobias are defined as:

a) Excessive worry bouts triggered by a specific object or situation.

b) An abnormal sensitivity to light.

c) An excessive, unreasonable, persistent fear triggered by a specific object or situation.

d) A persistent fear of social situations.

Check your answer

**4) In phobia individuals acquire a strong set of phobic beliefs which:**

a) Information about why they think the phobia is threatening.

b) How to react when they are in the phobic situation.

c) Appear to control their fear.

d) All of the above.

Check your answer

5) Psychodynamic theory as developed by Freud saw phobias as:

a) Repressed Ego.

b) Repressed Id impulses.

c) Repressed superego.

d) Repressed defence mechanisms.

Check your answer

6) In the famous “Little Albert” study by Watson & Rayner, they attempted to condition in him, a fear of his pet white rat. This was done by:

a) Pairing the unconditioned stimulus (UCS) with unconditioned response (UCR) to produce the conditioned stimulus.

b) Pairing the conditioned response (CR) with conditioned stimulus (CS) which produced the unconditioned stimulus (UCS).

c) Pairing the rat - the conditioned stimulus (CS) with the unconditioned stimulus (UCS) which produced the unconditioned response (UCR) and subsequently conditioned response (CR).

d) Pairing the unconditioned response with the unconditioned stimulus (UCS) to produce the conditioned response (CR).

Check your answer

7) According to conditioning theory Incubation is a phenomenon that should lead to:

a) Distinction.

b) Extinction.

c) Annulation.

d) Conflagration.

Check your answer

8) Which of the following is a predominant evolutionary theory of phobias?:

a) Non-associative fear acquisition.

b) Learned fear responses.

c) Biological preparedness.

d) Specific phobia acquisition.

Check your answer

9) Recent evidence suggests that at least some phobias are closely associated with the emotion of:

a) Anger.

b) Disgust.

c) Exhilaration.

d) Sadness.

Check your answer

10) The disease-avoidance model of animal phobias (Matchett & Davey, 1991) is supported by which of the following?

a) Evidence that a medical approach supports psychological disturbances.

b) Findings that sick individuals avoid animals.

c) All spiders spread disease.

d) Findings that high levels of disgust sensitivity is a vulnerability factor for animal phobias.

Check your answer

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

**An Introduction And Assement Of Various Types Of Anxiety Disorders Along With Its Management**

**MULTIPLE CHOICE QUESTIONS**

**CANDIDATE AND ASSESSOR INFORMATION**

| | | | |
|---|---|---|---|
| Candidate Name | SNEHA T | Assessor Name | DR ARUN |
| Date of Assessment | 16.11.2015 | Assessor Position | ASSISTANT PROFESSOR |

UNIVERSITY REG NO:- 0131MB266

6/10

Course Code: PSYCO1

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- b) An emotional condition classified by excessive checking.
- c) Disordered thinking.
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- b) Cognitive biases - such as information processing biases that tend anxious people to selectively attending to threatening stimuli (Mathews & McLeod, 1994) - are common to almost all anxiety

-1-

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON
AND RESEARCH

disorders.

c) Certain specific early experiences can be found in the aetiology of a number of different anxiety disorders (e.g. physical or sexual abuse during childhood), and experiences such as these may increase an individual's risk of developing several anxiety-based problems.

d) All of the above.

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Check your answer

5) Psychodynamic theory as developed by Freud saw phobias as:

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AND RESEARCH

- a) Repressed Ego.
- b) Repressed Id impulses.
- c) Repressed superego.
- d) Repressed defence mechanisms.

Check your answer

6) In the famous "Little Albert" study by Watson & Rayner, they attempted to condition in him, a fear of his pet white rat. This was done by:

- a) Pairing the unconditioned stimulus (UCS) with unconditioned response (UCR) to produce the conditioned stimulus.
- b) Pairing the conditioned response (CR) with conditioned stimulus (CS) which produced the unconditioned stimulus (UCS).
- c) Pairing the rat - the conditioned stimulus (CS) with the unconditioned stimulus (UCS) which produced the unconditioned response (UCR) and subsequently conditioned response (CR).
- d) Pairing the unconditioned response with the unconditioned stimulus (UCS) to produce the conditioned response (CR).

Check your answer

7) According to conditioning theory Incubation is a phenomenon that should lead to

- a) Distinction.
- b) Extinction.
- c) Annulation.
- d) Conflagration.

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Check your answer

8) Which of the following is a predominant evolutionary theory of phobias?

- a) Non-associative fear acquisition.
- b) Learned fear responses.
- c) Biological preparedness.
- d) Specific phobia acquisition.

Check your answer

9) Recent evidence suggests that at least some phobias are closely associated with the emotion of:

- a) Anger.
- b) Disgust.
- c) Exhilaration.
- d) Sadness.

Check your answer

10) The disease-avoidance model of animal phobias (Matchett & Davey, 1991) is supported by which of the following?

- a) Evidence that a medical approach supports psychological disturbances.
- b) Findings that sick individuals avoid animals.

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Annexure - IV

**An Introduction And Assement Of Various Types Of Anxiety Disorders Along With Its Management**

**MULTIPLE CHOICE QUESTIONS**

**CANDIDATE AND ASSESSOR INFORMATION**

| Candidate Name | SNEHA .T | Assessor Name | DR. ARUN |
|---|---|---|---|
| Date of Assessment | 16.12.2015 | Assessor Position | ASSISTANT PROFESSOR |

UNIVERSITY REG NO:- U13MB265

5/10

**Course Code: PSYCO1**

**I. ANSWER ALL THE QUESTIONS**

1) An anxiety disorder is:

- a) An emotional state identified by panic attacks.
- b) An emotional condition classified by excessive checking.
- c) Disordered thinking.
- d) An excessive or aroused state characterized by feelings of apprehension, uncertainty and fear.

Check your answer

2) Which of the following are common aspects of co-morbidity in anxiety disorders?

- a) Physiological symptoms of panic are found not only in panic disorder, but also in the reactions to phobic stimuli in specific phobias.
- b) Cognitive biases - such as information processing biases that tend anxious people to selectively attending to threatening stimuli (Mathews & McLeod, 1994) - are common to almost all anxiety

-1-

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disorders.

c) Certain specific early experiences can be found in the aetiology of a number of different anxiety disorders (e.g. physical or sexual abuse during childhood), and experiences such as these may increase an individual's risk of developing several anxiety-based problems.

d) All of the above.

3) Specific phobias are defined as:

a) Excessive worry bouts triggered by a specific object or situation.

b) An abnormal sensitivity to light.

c) An excessive, unreasonable, persistent fear triggered by a specific object or situation.

d) A persistent fear of social situations.

Check your answer

4) In phobia individuals acquire a strong set of phobic beliefs which:

a) Information about why they think the phobia is threatening.

b) How to react when they are in the phobic situation.

c) Appear to control their fear.

d) All of the above.

Check your answer

5) Psychodynamic theory as developed by Freud saw phobias as:

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a) Repressed Ego.

b) Repressed Id impulses.

c) Repressed superego.

d) Repressed defence mechanisms.

Check your answer

6) In the famous "Little Albert" study by Watson & Rayner, they attempted to condition in him, a fear of his pet white rat. This was done by:

a) Pairing the unconditioned stimulus (UCS) with unconditioned response (UCR) to produce the conditioned stimulus.

b) Pairing the conditioned response (CR) with conditioned stimulus (CS) which produced the unconditioned stimulus (UCS).

c) Pairing the rat - the conditioned stimulus (CS) with the unconditioned stimulus (UCS) which produced the unconditioned response (UCR) and subsequently conditioned response (CR).

d) Pairing the unconditioned response with the unconditioned stimulus (UCS) to produce the conditioned response (CR).

Check your answer

7) According to conditioning theory Incubation is a phenomenon that should lead to:

a) Distinction.

b) Extinction.

c) Annulation.

d) Conflagration.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON
AND RESEARCH

Check your answer

8) Which of the following is a predominant evolutionary theory of phobias?:

- a) Non-associative fear acquisition.
- b) Learned fear responses.
- c) Biological preparedness.
- d) Specific phobia acquisition.

Check your answer

9) Recent evidence suggests that at least some phobias are closely associated with the emotion of:

- a) Anger.
- b) Disgust.
- c) Exhilaration.
- d) Sadness.

Check your answer

10) The disease-avoidance model of animal phobias (Matchett & Davey, 1991) is supported by which of the following?

- a) Evidence that a medical approach supports psychological disturbances.
- b) Findings that sick individuals avoid animals.

# Sri Lakshmi Narayana Institute of Medical Sciences

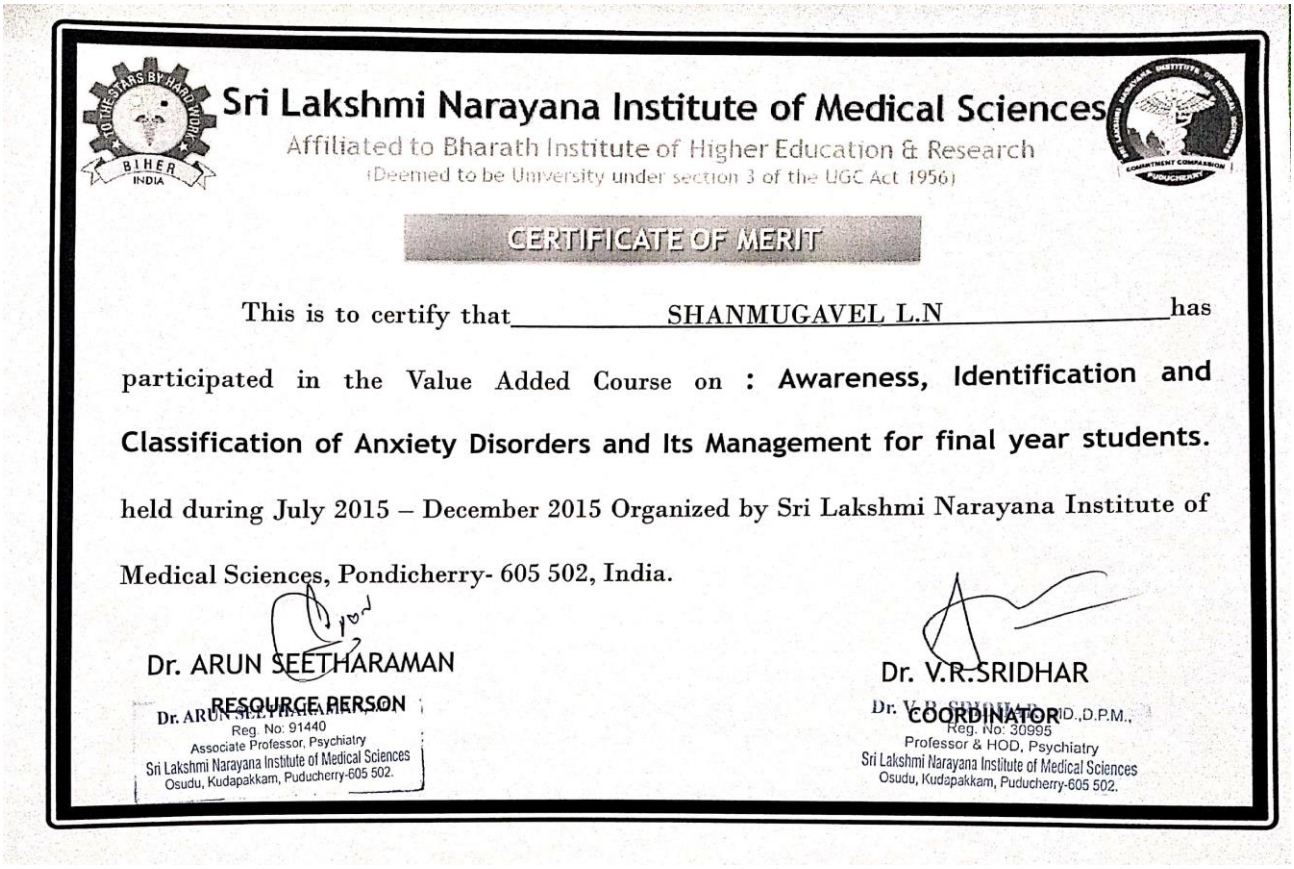
Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

## CERTIFICATE OF MERIT

This is to certify that SHEELA PRIYADARSHINI N. has actively participated in the Value Added Course on **Awareness, Identification and Classification of Anxiety Disorders and Its Management for final year students** held during July 2015 – Dec 2015 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
Osudu, Kudapakkam, Puducherry-605 502.

Dr. V.R.Sridhar
Dr. V. R. SRIDHAR, MD.,D.P.M.,
Reg. No. 36000
**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 SHANMUGAVEL L.N has participated in the Value Added Course on : Awareness, Identification and Classification of Anxiety Disorders and Its Management for final year students. held during July 2015 – December 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. ARUN SEETHARAMAN
RESOURCE PERSON
Reg. No: 91440
Associate Professor, Psychiatry
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. V.R.SRIDHAR
COORDINATOR
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: **ANXIETY DISORDERS**
Subject Code: **PSYC01**

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:

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

## Student Feedback Form

Course Name: **ANXIETY DISORDERS**
Subject Code: **PSYC01**

Name of Student: SIVASANKARI - B Roll No.: U13MB264

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:

Sivasankari
Signature

Date: 31 12 . 2015

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

## Student Feedback Form

Course Name: **ANXIETY DISORDERS**
Subject Code: **PSYC01**

Name of Student: SHEIK MOHAMMED YASAR Roll No.: U13MB263

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 HIGHER EDUCATON AND RESEARCH

Signature

*Date:*

Date: 31-12-2015

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: 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. 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.

Dr. Sridhar

**Encl: Certificates**

**Photographs**

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH





**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

**OSUDU,AGARAM VILLAGE,KUDAPAKKAMPOST,PUDUCHERRY-605502.**

Date:10.8.2015

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: Diagnosis and prevention strategies for dental caries**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **__Diagnosis and prevention strategies for dental caries** on 10.8.2015. 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.JAYAKUMAR

The HOD: DR.BALAJI SUBRAMANIYAN

The Expert: DR.BALAJI SUBRAMANIYAN

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 Sciences
PONDICHERRY - 605 502.

Dr. BALAJI SUBRAMANIYAN
Associate Professor
Department of Dentistry
Sri Lakshmi Narayana
Institute of Medical Sciences
Osudu, Agaram, Pudu

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

13.8.15

**Sub: Organising Value-added Course: Diagnosis and prevention strategies for dental caries- 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 **"Diagnosis and prevention strategies for dental caries"**. 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 13.8.15. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. P. JAYAKUMAR, M.S., M.Ch.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Puducherry-605502.

Dean

Encl: Copy of Course content and Registration form.

# COURSE PROPOSAL

**Course Title:** Diagnosis and prevention strategies for dental caries

**Course Objective: To enlighten the basics and treatment options for dental caries**

**Course Outcome: In depth knowledge about the dental caries**

**Course Audience: MBBS STUDENTS**

**Course Coordinator: Dr. Jayakumar**

**Course Faculties with Qualification and Designation:**

1. DR.BALAJI SUBRAMANIYAN. R. M.D.S& associate professor

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1. | 19.8.15 | Etiology of dental caries | 4PM-6PM | 3 hrs |
| 2. | 26.8.15 | Pathogenesis of caries | 4pm-7 pm | 3hrs |
| 3. | 2.9.15 | Staphylococcousmutans | 5pm-8pm | 3 hrs |
| 4. | 11.9.15 | Sequalae of caries | 4pm-7pm | 3hrs |
| 5. | 24.9.15 | Prevention of caries | 5pm-8pm | 3 hrs |
| 6. | 30.9.15 | Treatment modalities for caries | 5pm-8pm | 3 hrs |
| 7. | 3.10.15 | Dentoalveolar abscess | 4pm-7pm | 3 hrs |
| 8. | 11.10.15 | Cellulitis | 5pm-8pm | 3 hrs |
| 9. | 19.10.15 | Ludwig's angina | 5pm-8pm | 3 hrs |
| 10. | 29.10.15 | Periodontal abscess | 4pm-7pm | 3 hrs |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | Total Hours | 30 |

**REFERENCE BOOKS: (Minimum 2)**

**1. TEXTBOOK FOR DENTAL CARIES-VIMAL SIKRI**

**2. DIAGNOSIS AND RISK PREDICTION OF DENTAL CARIES-PER AXELSSON**

# Diagnosis and Prevention Strategies for Dental Caries

## Abstract

Dental caries is one of the oldest and most common diseases found in humans. With the recent shift from the surgical model, which emphasized restorative treatment, to a medical model of disease management, newer strategies emphasize disease prevention and conservation of tooth structure. For early detection and monitoring of caries, rather than waiting until a cavity is formed and restorative treatment is needed, devices such as DIAGNOdent, Digital Imaging Fiber-Optic Transillumination, quantitative light-induced fluorescence, and the Electronic Caries Monitor have been introduced. For caries prevention, oral hygiene measures, fluoride application, pit-and-fissure sealants, the use of xylitol, the development of a dental caries vaccine, and the role of the primary caregiver for infants are briefly discussed.

**Keywords:** Dental caries, Prevention, Diagnosis, Detection, Risk assessment

## INTRODUCTION

Dental caries is one of the oldest and most common diseases found in humans. While there have been continuous efforts to reduce its prevalence, it is still widespread, especially in lower socio-economic classes [1]. Traditional caries management strategies adopted a surgical model of treatment: after removing the decay, a more geometrically perfect cavity is created and filled with the most compatible and artificial material. This surgical model eventually created bigger and bigger cavities as secondary dental caries progressed even after restorative treatment, subsequently requiring re-treatment, until eventually the tooth was lost. With the shift from the surgical model to a medical model of disease management, the newer strategies emphasize disease prevention and conservation of tooth structure. This review briefly discusses the etiology of and current detection and prevention methods for dental caries.

## ETIOLOGY

Dental caries is a multifactorial disease caused by host, agent, and environmental factors. Mutans streptococci (MS) is the primary etiologic agent of dental caries. Through adhesion, MS attaches to the dental pellicle and breaks down sugars for

energy to produce lactic acid, causing an acidic environment around the tooth. As a result, demineralization of the enamel and, subsequently, the dentin occurs [2]. Factors involved in the dental caries process include the tooth, bacteria in the form of a dental plaque, and a diet containing sugar. The quantity, quality, and frequency of sugar intake have a definitive influence on the incidence and prevalence of caries.

## DETECTION AND PREVENTION OF DENTAL CARIES

More emphasis is being placed on dental caries prediction and caries risk analysis than mere detection of cavities which require immediate filling. While in the past, the cavities were filled at their earliest detection, now the indications for restorative treatment have narrowed; rather than restorative treatment, plaque control measures are employed to promote remineralization and reversal of the dental caries process.

### 1. Caries diagnosis

Traditionally, dental caries were detected by visible color and texture change, tactile sensation using a dental explorer, and radiographs. However, radiographs are not useful for detecting early enamel caries, and, using these methods, it is difficult to monitor the progress of dental caries and quantify its reversal. Recently, several new technologies have emerged to help diagnosis, especially of early lesions, which can help reverse the process before cavity filling is needed.

DIAGNOdent uses laser fluorescence technology to measure bacterial products in caries lesions, and it may be sensitive enough to detect early demineralization [3]. The intensity of fluorescence is displayed with a numerical value from 0 to 99. Digital Imaging Fiber-Optic Translllumination (DIFOTI) uses fiber-optic light to produce an image, which may be useful for detecting initial areas of demineralization, cracks, or fractures, and provides a quantitative characterization of the caries process [4]. Quantitative light-induced fluorescence (QLF) uses the ability of human enamel to show fluorescence under certain conditions. Demineralized enamel shows reduced fluorescence due to scattering, as the fluorescence is attributed to the cross-links between structural proteins [5]. The Electronic Caries Monitor (ECM) measures the changes in electrical impedance between sound enamel and demineralized tooth structure, as normal teeth have lower electrical conductivity compared to demineralized teeth [6]. Currently, there is no device available that accurately diagnoses whether the caries lesion is active and in need of intervention, and the dentist cannot rely solely on such equipment

Dental caries, a chronic disease is unique among human and is one of the most common important global oral health problems in the world today. It is the destruction of dental hard a cellular tissue by acidic by-products from the bacterial fermentation of dietary carbohydrates especially sucrose. It progresses slowly in most of the people which results from an ecological imbalance in the equilibrium between tooth minerals and oral bio films which is characterised by microbial activity, resulting in fluctuations in plaque p H due to bacterial acid production, buffering action from saliva and the surrounding tooth structure. The microbial community of caries is diverse and contains many facultatively and obligately-anaerobic bacteria.

S. mutans is the most primary associated with it. Dental caries can affect the humans in various ways i.e. presence of tooth pain, infection or dysfunction of the stomatognathic system can limit the necessary ingestion of energetic foods, affecting the growth in children and adults as well as their learning, communication skills and recreational activities. Moreover, oral and pharyngeal cancers and oral tissue lesions are also significant health concern. Cavernous sinus thrombosis and Ludwig angina can be life-threatening. Due to this, treatment is needed for dental diseases which cost is normally high and is not feasible for all community due to limited resources such as time, person and money. therefore, prevention is more affordable. Personal hygiene cares and dietary modification should recommended.

for treatment planning. Therefore, the dentist should also consider the overall caries risk and the susceptibility of individual patients.

## 2. Caries risk assessment

Past caries experience, current caries index, oral hygiene measures such as the use of fluoride toothpaste and mouth rinse, calculus deposit, deep pits and fissures, MS level, snacking habits, and salivary flow may all help assess individual caries risk and predict dental caries progression. These factors should be considered in deciding whether preventive measures should be taken or restorative treatment is necessary.

## 3. Prevention methods

*1) Oral hygiene:*

Since dental caries do not progress without the bacteria present in dental plaques, daily plaque removal by brushing, flossing, and rinsing is one of the best ways to prevent dental caries and periodontal disease. Proper brushing and flossing methods may be taught at the dental office during routine check-ups.

*2) Fluoride application:*

Fluoride prevents dental caries by inhibiting demineralization of the crystal structures inside the tooth and enhancing remineralization. The remineralized surface is resistant to acid attack. In addition, fluoride inhibits bacterial enzymes [7]. Methods of fluoride application include water fluoridation, fluoride tooth paste, fluoride mouth rinse, dietary fluoride supplements, and professionally applied fluoride compounds such as gels and varnishes.

*3) Pit and fissure sealants:*

The majority of dental caries in young children occur in pits and fissures. Pits and fissures are more susceptible to dental caries because the anatomy favors plaque accumulation; these areas are often too narrow for any oral hygiene measures to be effective. By filling such irregularities with flowable restorative material, the area becomes less morphologically susceptible [8]. This is especially recommended in young patients with erupting teeth and adults with a high caries index.

### *4) Xylitol:*

Sucrose is a well-known cause of dental caries, and higher sucrose intake increases the risk of dental caries. However, it is impossible to eliminate sugar from the modern diet. Therefore, sugar substitutes have been developed to reduce caries risks. Xylitol is one of these sugar substitutes. Xylitol has a sweet flavor comparable to sugar, and it is not only non-cariogenic, but also anti-cariogenic. It keeps sucrose molecules from binding with MS, thereby blocking its metabolism. It also reduces the adhesion ability and number of MS [9]. The anti-cariogenicity of xylitol is affected more by the frequency of intake than by the amount consumed.

### *5) Vaccine:*

As dental caries is an infectious microbiologic disease, there have been attempts to develop a vaccine. Some vaccines against MS in the form of proteins, recombinant or synthetic peptides, or protein-carbohydrate conjugates, as well as those based on DNA, have been successful experimentally, and an immune intervention can be undertaken by blocking the receptors which are necessary for the colonization of MS or by inactivating glucosyl transferases. However, none of these vaccines have appeared on the market thus far [10,11] due to difficulty in inducing and maintaining high levels of antibodies in oral fluids; research is still ongoing for clinical applications.

### *6) Role of the primary caregiver in children:*

As dental caries is an infectious disease, the primary caregiver of infants (most often the mother) can transmit caries-causing microorganisms to a child, resulting in the colonization of MS in the infant's oral cavity. In fact, there is a direct relationship between MS levels in parents and their children [12]. Therefore, efforts to reduce the MS level in the parent, including maintaining oral hygiene and undergoing dental treatment when necessary, are also important for prevention of dental caries in young children.

## CONCLUSION

Despite the advancements in dental caries detection and prevention, it is still a common infectious disease. Even with recent dental caries research, most clinical practice is still based on treating the disease by restorative treatment once it is

detected, rather than on prevention. Future education and clinical research efforts should continue to emphasize early detection and caries prevention.

## Annexure- II

### Diagnosis and prevention strategies for dental caries
### DI-01

### List of Students Enrolled Sep 2015 – NOV- 2015

| MBBS Student | | |
|---|---|---|
| **Sl. No** | **Roll no** | **Name of the student** |
| 1 | U13MB281 | THOTA SHARMILA JANAKI |
| 2 | U13MB282 | UMA MAHESHWARI. D |
| 3 | U13MB283 | UMAYAL @ UMA.V |
| 4 | U13MB284 | VANAJA KATE GARFINSUNDARAM.B |
| 5 | U13MB285 | VANI.V |
| 6 | U13MB286 | VEDARATHINAM.S |

Dr. Balaji Subramaniyan. R
**RESOURCE PERSON**

Dr. Jayakumar
**COORDINATOR**

Bharath Institute of Higher Education and Research

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

**Participant list of Value added course:** Diagnosis and prevention strategies for dental caries

| Sl.No | Reg.No | Name of the candidate | Signature |
|---|---|---|---|
| 1 | U13MB281 | THOTA SHARMILA JANAKI | |
| 2 | U13MB282 | UMA MAHESHWARI. D | |
| 3 | U13MB283 | UMAYAL @ UMA.V | |
| 4 | U13MB284 | VANAJA KATE GARFINSUNDARAM.B | |
| 5 | U13MB285 | VANI.V | |
| 6 | U13MB286 | VEDARATHINAM.S | |

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - III**

## Diagnosis and prevention strategies for dental caries

**QUESTIONS**

**Course Code: DI -1**

**I. ANSWER ALL THE QUESTIONS**

**1. Etiology/pathogenesis of dental caries?**

**2. Staphylococous mututans?**

**3. Oral hygiene?**

**4. Brushing technique?**

**5.Early childhood caries?**

NAME:- VANI. V

ROLL NO:- U13MB286

38½
50

(1) Explain in details - Pathogenesis of Dental caries / Etiology

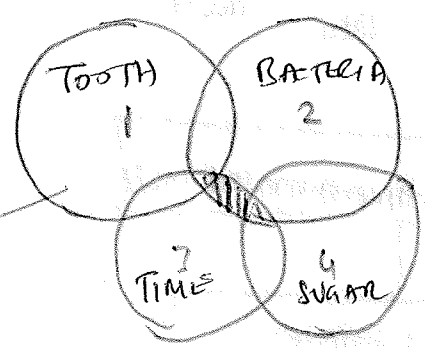
- Dental caries, a bacterial infection which destroys the tooth structure, dissolving the enamel, dentin and cementum.

Most commonest problem in children and adults.

- Basic etiological factor is due to consumption of sugar content foods.

The first sign of a caries lesion is the appearance of chalky white spot on the surface of tooth, indicating the demineralization of the tooth.

ETIOLOGY OF DENTAL CARIES



Four keys ① tooth surface

② Caries causing bacteria

③ fermentable carbohydrates

④ Time.

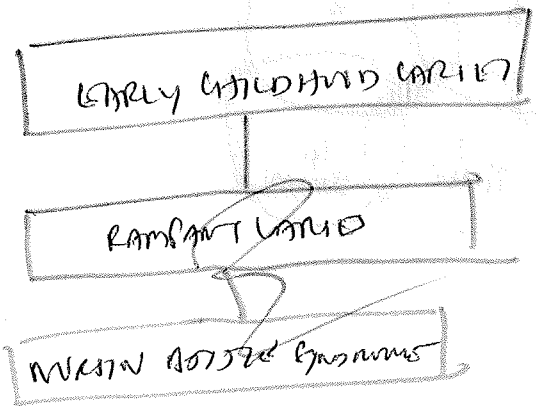
- The most common bacteria are Streptococci mutans, Streptococcus sobrinus and Lactobacilli. Cariogenic bacteria are present in the dental plaque.

Streptococcus mutans — gram +ve bacteria.

- Dental caries is diagnosed as dental cavities.

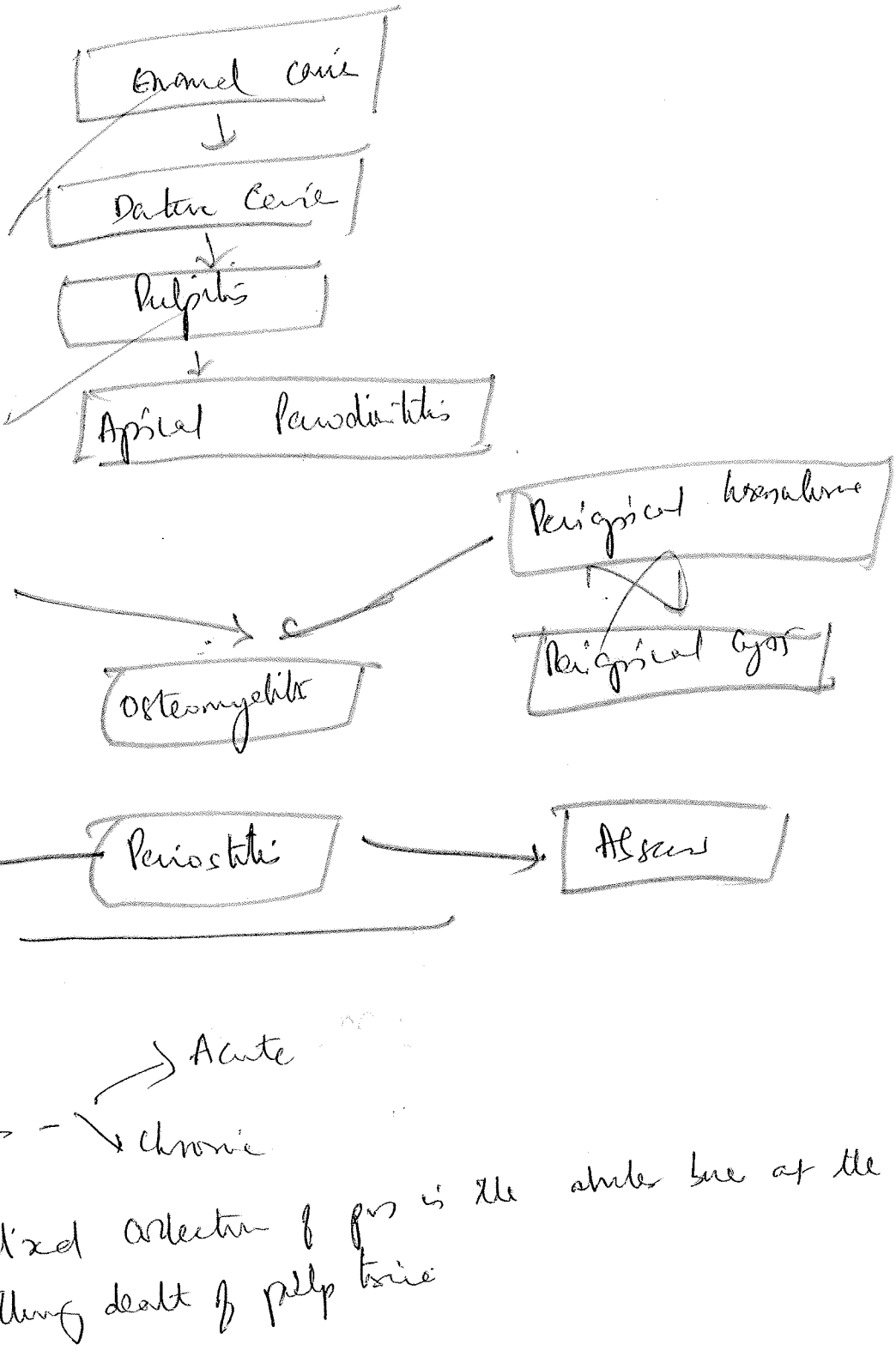
- Early childhood caries / Rampant caries also known as Baby Bottle caries (Nursing bottle syndrome).

Mesially acting teeth are the most commonly affected.



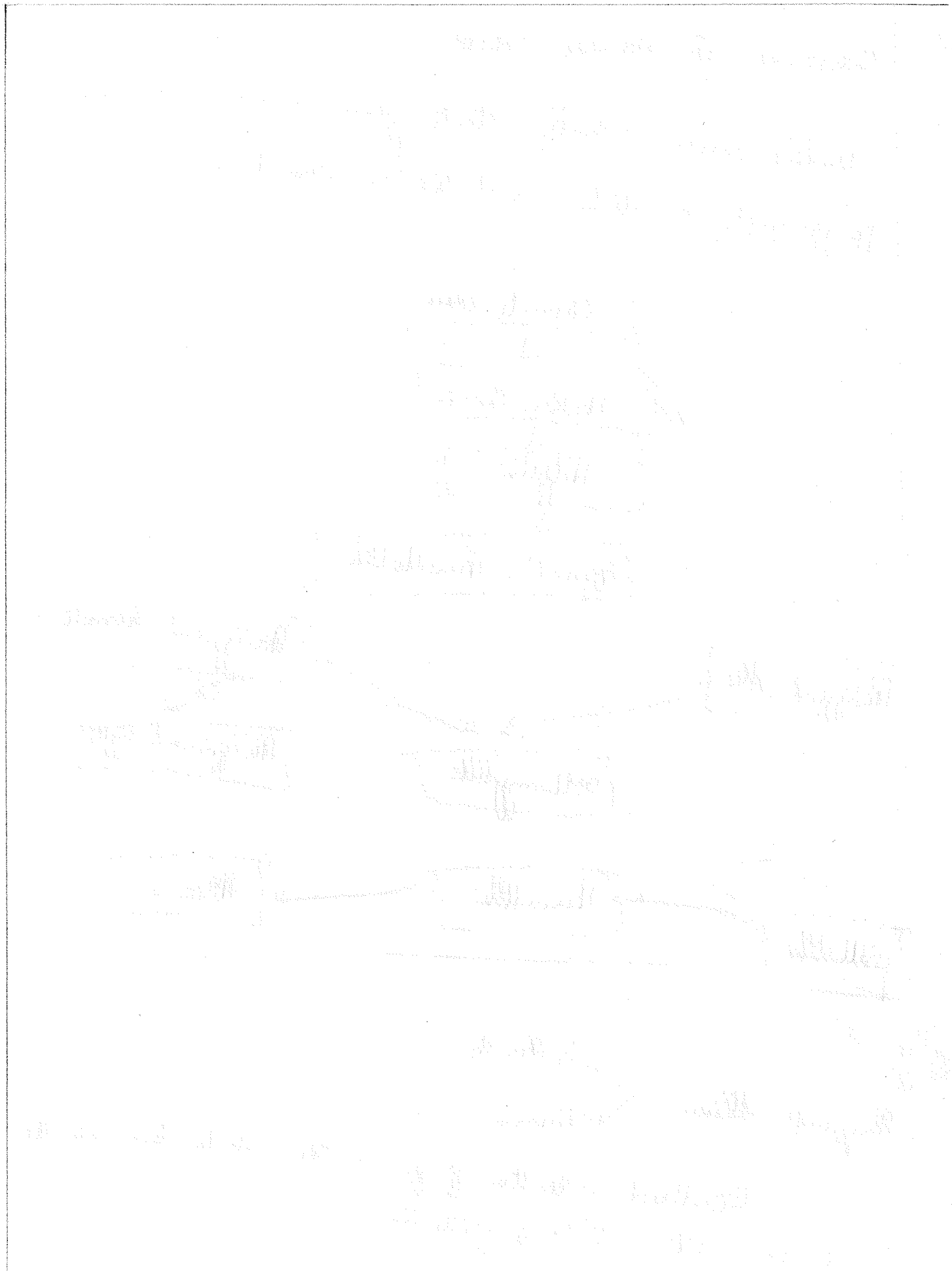
## SEQUENCE OF DENTAL CARIES

- Dental caries initially starts from dental enamel structure, progressively & destroy finally reaches pulp tissue..




Periapical Abscess - → Chronic

localized collection of pus is the abscess base at the root apex following death of pulp tissue



# 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 VANI.V has actively participated in the Value Added Course on *Diagnosis and Prevention Strategies for dental caries* held during Sep 2015– Nov 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Balaji Subramaniyan.R
RESOURCE PERSON

Dr. Jayakumar
COORDINATOR

# Student Feedback Form

Course Name: DIAGNOSIS AND PREVENTION STRATEGIES FOR DENTAL CARIES

Subject Code: DI - 1

Name of Student: UMA MAHESWARI. D Roll No.: U13MB282

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

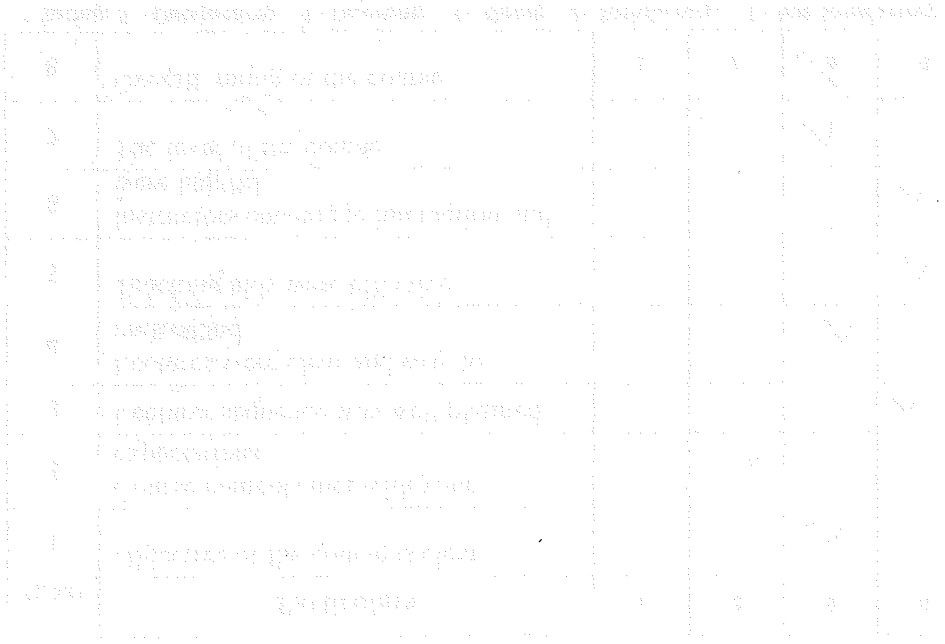
| Sl. NO | Particulars | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | Objective of the course is clear | | | ✓ | | |
| 2 | Course contents met with your expectations | | ✓ | | | |
| 3 | Lecturer sequence was well planned | | | | ✓ | |
| 4 | Lectures were clear and easy to understand | | | ✓ | | |
| 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: 10.8.2015



# COURSE COMPLETION

Date: 30.10.15

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: diagnosis and prevention strategies for dental caries**

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **DIAGNOSIS AND PREVENTION STRATEGIES FOR DENTAL CARIES** on 30.10.15. 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. BALAJI SUBRAMANIYAN
Associate Professor
Department of Dentistry
Sri Lakshmi Narayana
Institute of Medical Sciences
Osudu, Agaram, Puducherry.

DR. BALAJI SUBRAMANIYAN.R,

**Encl: Certificates**

**Photographs**



# Sri Lakshmi Narayana Institute of Medical Sciences

Date:05.09.2015

From

Dr. Tiroumourougane Serane
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 College
Bharath Institute of Higher Education and Research,
Chennai.

**Sub: Permission to conduct value-added course: Developmental Pediatircs Module for Undergraduate students.**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Developmental Pediatrics for II year MBBS students from Nov 2015- March 2016. Requesting your kind permission for the same.

Kind Regards

Dr. Tiroumourougane Serane

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: **Dr. Rajasekar**

The HOD: **Dr. Tiroumourougane Serane**

The Expert: **Dr. Abhijeet Shrivastava**

The committee has discussed about the course and is approved.

Dean

Resource person

HOD

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

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

(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

15.10.2015

**Sub: Organising Value-added Course: Developmental Pediatrics Module for Undergraduate students 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 **Pediatric Nutrition Module** for Undergraduate students.

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 Oct 2015. Applications received after the mentioned date shall not be entertained under any circumstances.

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

**Dean**

Encl: Copy of Course content

# Course Proposal

**Course Title: Pediatric Nutrition for Undergraduates**

**Course Objective: Understand about the uniqueness and importance of pediatric nutrition**

**Course Outcome: On successful completion of the course, the students will have skill in understanding the needs and counselling and managing various aspects of pediatirc nutrition.**

**Course Audience:II year MBBS students of 2016 Batch**

**Course Coordinator: Dr Tiroumourougane Serane**

**Course Faculties with Qualification and Designation:**

**1. Dr Tiroumourougane Serane – Head of Department**

**2. Dr. Abhijeet Shrivastava – DNB Paediatrics – Assistant professor**

| S.NO | DATE | TOPIC | COORDINATOR | TIME | HOURS |
|---|---|---|---|---|---|
| 1 | 20/8/2015 | Food pyramid | **Dr Tiroumourougane Serane** | 1pm-5pm | 4 hours |
| 2 | 21/8/2015 | Importance of nutrition | **Dr Tiroumourougane Serane** | 2pm-5pm | 3 hours |
| 3 | 24/8/2015 | Nutrition assessment | **Dr Tiroumourougane Serane** | 1pm-5pm | 4 hrs hours |
| 4 | 25/8/2015 | Anthropometry | **Dr Tiroumourougane Serane** | 1pm-5pm | 4 hrs |
| 5 | 26/8/2015 | ICMR guidelines | **Dr Tiroumourougane Serane** | 1pm-5pm | 4hrs |
| 6 | 27/8/2015 | Protein and calorie value | **Dr Tiroumourougane Serane** | 1pm-5pm | 4 hrs |

| | | | | | |
|---|---|---|---|---|---|
| 7 | 28/8/2015 | Protein energy malnutrition | **Dr Tiroumourougane Serane** | 1pm-5pm | 4 hrs |
| 8 | 29/8/2015 | Severe acute malnutrition | **Dr Tiroumourougane Serane** | 2pm-5pm | 3 hrs |
| | | | | Total Hours | 30 |

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

**REFERENCE BOOKS:**

1. **Nelson textbook of pediatrics – 20th edition**
2. **Elizabeth textbook of nutrition**

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Developmental Paediatrics (Module on developmental Paediatrics) , PECO2

**2. Duration & Period**

30 hrs , Nov 2015- March 2016

**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

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| **Value Added Course-** Nov 2015 – March 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | PECO2 | developmental paediatrics ( Module on developmental Paediatircs) | **Dr.Abijeeth** | II MBBS | 10 candidate November 2015 –March 2016 |

**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

DEVELOPMENTAL PEDIATRICS
Annexure -2



COURSE DETAILS

| | |
|---|---|
| Course title | Developmental paediatrics |
| Course code | PECO2 |
| Objective | 1. Laws of development<br>2. Neonatal reflexes<br>3. Motor development<br>4. Fine motor development<br>5. Language and social development<br>6. Vision and hearing assessment<br>7. History and examination<br>8. 360 degree examination<br>9. Developmental scales |

| | |
|---|---|
| | 10. Upper age limit for attainment of milestone |
| Further learning oppurtunities | Neurology assessment |
| Key competencies | On successful completion of course thr students willhave skill in assessment of development in children , and early identification of developmental delay |
| Target student | Second year MBBS |
| Duration | 30hrs , nov 2015-march 2016 |
| Theory / practical session | 30 hrs |
| Assessment procedure | Multiple choice questions |

Development is a continuous process beginning in utero and progressing till maturity.

Sequence of attainment of milestones is essentially the same in all children. (Variation only in time and manner of attainment)

Development proceeds in a cephalo caudal direction - head control precedes trunk control

which precedes limb control

Control of limbs in a proximo distal fashion where hand use is learnt before finger control.

Certainprimitivereflexeshavetobelostbefore appropriatemilestoneisachieved.

Initial disorganizedmassactivityisgraduallyreplacedby morespecificactivity

Controloflimbsinaproximodistalfashionwherehand useislearntbeforefingercontrol.

Certain primitive reflexes have to be abolished to achieve milestone

## REFLEXES

- *Palmargrasp* - appears28weeks,disappears2-3 months
- *Rooting* - appears32weeks,lessprominentafter 1month

- *Moro* - appears 28 - 32 weeks, disappears 5 - 6 months
- *Asymmetric Tonic neck reflex (ATNR)* - appears 35 weeks, disappears 2 - 3 months
- *Landau* - appears 3 months, disappears around 1 year
- *Parachute* - appears 6 - 9 months remains throughout life.

MORO's REFLEX







GRASP REFLEX







Developmental domains

# 1. Gross Motor

2. Fine motor
3. Personal and social development and general understanding
4. Language
5. Vision and hearing
6. Gross Motor
7. Fine motor
8. Personal and social development and general

understanding

9. Language and hearing

DEVELOPMENTAL ASSESSMENT

**Pull to sit-**

- Newborn complete head lag, back rounded
- 6 weeks - head control begins

**Ventral suspension-**

- Newborn head flops down
- 6 weeks momentarily holds in horizontal plane
- PULL TO SIT

Infantgentlypulled tosittingposition.

In newborns,head completely lags behind



# PULL TO SIT



DEVELOPMENTAT8WEEKS



- <u>Prone</u> position face lifted up to 45 degree
- <u>Ventral suspension</u>

–can maintain headin line withbody

- <u>Social</u>- Socialsmile



- Pull to sit- head steady
- Prone position -face, head and chest off the pouch
- Ventral suspension head above the plane of trunk
- Fine motor- Bidextrous approa



- Prone position can lift chin and greater part of chest while supporting weight on extended arms.
- Sits with support (tripod sitting)
- Fine Motor - Holds cube crudely – Unidextrous

DEVELOPMENTAT8WEEKS





- Pull to sit- head steady
- Prone position -face, head and chest off the pouch
- Ventral suspension head above the plane of trunk
- Fine motor- Bidextrous approach



PINCER GRASP

Gross motor–sitting without support.



- Gross motor: stands holds on (with support)
- Fine motor: immature pincer grasps
- Social : waves bye bye

PINCER GRASP

- Language: says bisyllables(mama,baba,



- Pick things up with thumb and index finger.
- Immature- at 9 months
- Mature- at 1 year

PEEK-A-BOO



DEVELOPMENTAT12MONTHS



Stands without support

Walks alone but falls

Mature pincer grasp

Play simple ball game

1-2 words with meaning

DEVELOPMENTAT18MONTHS



- Runs, explore drawers
- Domestic mimicry
- 8-10 words

DEVELOPMENTAT2YEARS



- Walks up and down stairs (2feet/step)
- Tower of 6 blocks
- Pulls people to show toys
- Sentences

DEVELOPMENTAT3YEARS



- Rides tricycle
- alternate foot going upstairs
- Tower of 9 blocks
- Copies circle
- Knows name and gender

DRAWINGACIRCLE





- Hops on one foot
- Alternate foot going downstairs
- Copies cross
- Group play
- Says poem

Fine Motor

- Can draw a rectangle
- Can copy a cross

DEVELOPMENT AT 5YEARS



- Gross motor- Play skipping rope
- Fine motor- Copies triangle
- Social- Dress and undress
- Language- Ask meaning of words
- Identify 4 colors

DETAILED HISTORY

A) Ask for risk factors affecting development

**B)** Attainment of milestones. **Differentiate between delay and regression**

C) Form a gross estimation of developmental age: Ask for attained milestones and ascertain if development age matches with chronological age.

EXAMINATION:

A. Physicalexamination:Lookfor stigmataof intrauterine infection,hypothyroidism.

A. Assessphysicalgrowthandheadcircumference.

C. Screen for vision and hearing

D. Neurological examination and primitive reflexes

KIT -

1. Red ring(diameter 6-7cm) tied to a string
2. Nine red cubes
3. Paper pellets
4. Spoon
5. Cup with handle
6. Book with thick pages
7. Picture book
8. Red pencil, paper
9. Doll, mirror

# 10. Developmental milestones list

Prerequisites -

1. Child should not be hungry or tired

2. Playful mood with mother around.

3. Adequate time to make the baby comfortable.

4. Observe for alertness, concentration and skills of the baby.

- After evaluation ascertain the child's developmental age.

- Check if development corresponds to chronological age. If not the developmental quotient can be applied for every sphere.

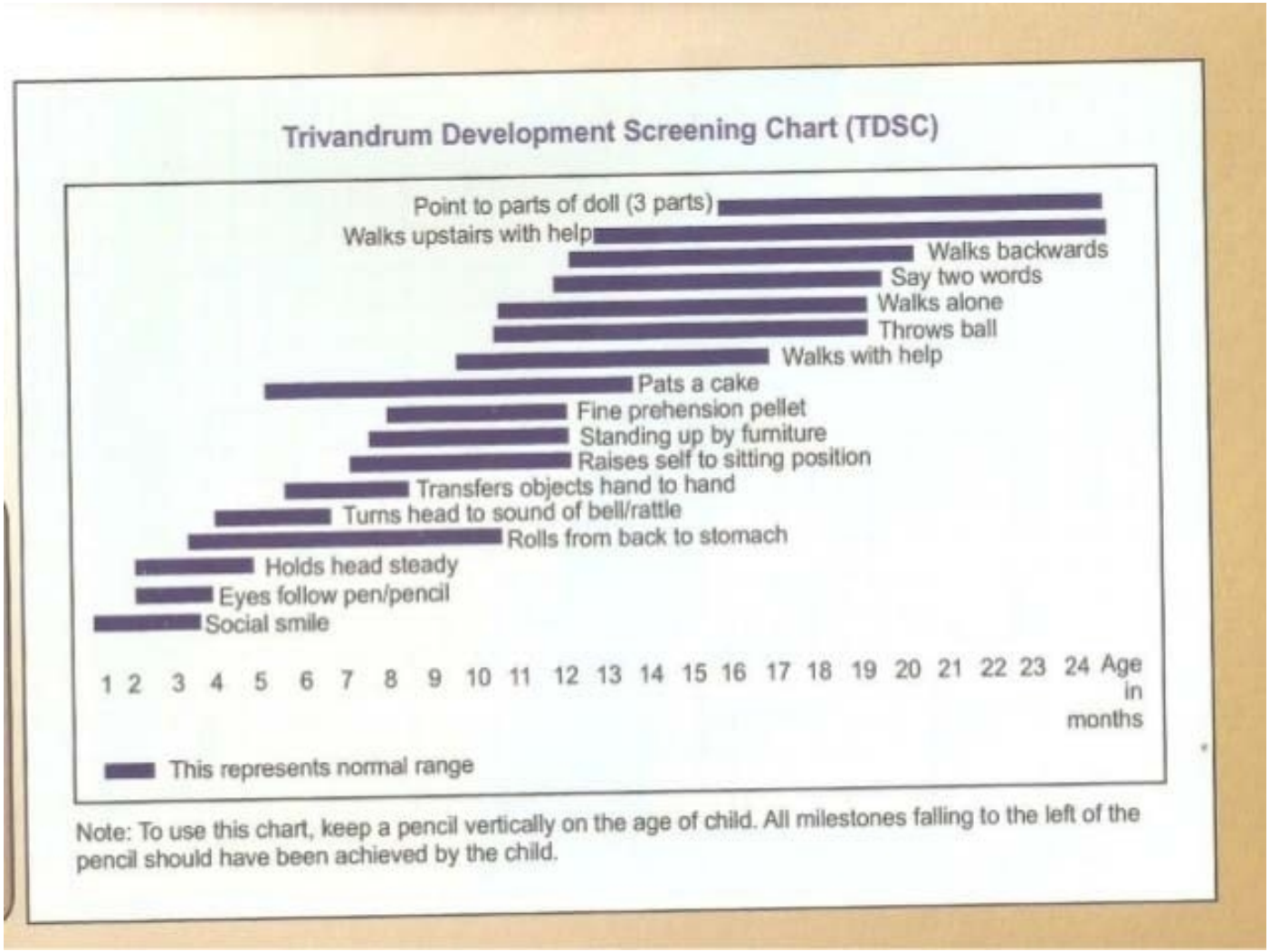
- DQ = [Developmental Age/Chronological age] x 100

| MILESTONE | AGE |
|---|---|
| • Visual fixation | • 2 months |
| • Vocalisation | • 6 months |
| • Sitting without support | • 10 months |
| • Standing with support | • 12 months |
| • Hands and knees crawling | • 14 months |
| • Standing alone | • 17 months |
| • Walking alone | • 18 months |
| • Single word | • 18 months |
| • Imaginative play | • 3 years |

Briefassessmentproceduredesignstoidentify childrenwhorequiremoreintensivediagnosisor assessment viz.,

- Phatak's Baroda screening tests
- Denver developmental screening test
- Trivandrum developmental screening tests
- Good enough screening tests

TRIVANDRUM DEVELOPMENT SCREENING CHART (TDSC)



# HIGH RISK CLINIC AT OUR HOSPITAL



## WHO ALL TO BE SCREENED

Ideally all children should be screened at periodic intervals

At least

- Children with perinatal risk factors
- Children with r

# Thank You



**Annexure- II**

# VALUE ADDED COURSE

**Developmental Paediatrics (Module on developmental Paediatrics) PECO2**

**List of Students Enrolled (November 2015-March 2016 )**

| 2nd Year MBBS Student | | | |
|---|---|---|---|
| **Sl. No** | **Name of the Student** | **Roll No** | **Signature** |
| 1 | AASHIK MUKESH. M. S | U14MB201 | |
| 2 | ABEETHA.M | U14MB202 | |
| 3 | ABHINAV. S | U14MB203 | |
| 4 | ABINAYA. M | U14MB204 | |
| 5 | ABISHEK. R | U14MB205 | |
| 6 | ABIRAMI. S | U14MB206 | |
| 7 | AGALYA. S | U14MB207 | |
| 8 | AJAY PANDIAN. V | U14MB208 | |
| 9 | AJEETH. R | U14MB209 | |
| 10 | AJITH KUMAR. M.K. | U14MB210 | |
| 11 | AKSHAI. S | U14MB211 | |
| 12 | ALLEN DANIEL XAVIER.J | U14MB212 | |
| 13 | ALTHAF AHMED | U14MB213 | |
| 14 | AMARA LOKESH | U14MB214 | |
| 15 | AMRESH. K | U14MB215 | |
| 16 | ANANT SURYA. R | U14MB216 | |
| 17 | ANDREW MARIE XAVIER.V | U14MB217 | |
| 18 | APSARA. P | U14MB218 | |
| 19 | ARPUDHA. A | U14MB219 | |
| 20 | ARUL PRABHA MADHIVADHANI. M | U14MB220 | |

**Dr. Abhijeet Shrivastava**

**RESOURCE PERSON**

**ASSISTANT PROFESSOR**
DEPARTMENT OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

**Dr. Tiroumourougane**

**COORDINATOR**

**PAEDIATRICS HEAD**
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

Abhinaya. M
U 14MB204

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

## ALL ABOUT DEVELOPMENTAL PEDIATRICS (MODULE ON DEVELOPMENTAL PAEDIATRICS)

## MULTIPLE CHOICE QUESTIONS

Course Code: PEC02

9/10

### I. ANSWER ALL THE QUESTIONS

Questions

1. Waves bye bye at --------- months

   A- 5 months
   B- 9 months
   C- 7 months
   D- 14 months

2. Roll over attained at -------- months

   A-5 months

   B-3 months

   C-7 months

3. Eye contact attained at -------- months

   A- 2months
   B- 6 months
   C- 4 months

4. Rides tricycle at ------- years

   A- 3 years
   B- 5 years
   C- 2 years

5. Upper age limit for walking ------- months

   a- 18 months
   b- 20 months
   c- 23 months

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Abhinav S.
VL4 MB 203

Annexure - III

**ALL ABOUT DEVELOPMENTAL PEDIATRICS (MODULE ON DEVELOPMENTAL PAEDIATRICS)**

**MULTIPLE CHOICE QUESTIONS**

Course Code: PEC02

8/10

I. **ANSWER ALL THE QUESTIONS**

Questions

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   B- -9 months
   C- 7 months
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2. Roll over attained at -------- months

   A-5 months

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   C-7 months

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   B- 5 years
   C- 2 years

5. Upper age limit for walking ------- months
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   c- 23 months

# 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 _____AMARA LOKESH_____ has actively participated in the Value Added Course on *Developmental Paediatrics (*held during Nov 2015 – March 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Abijeeth

**RESOURCE PERSON**

Dr. Tiroumourougane Serane

**COORDINATOR**

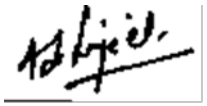
# Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

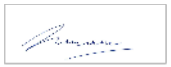
## CERTIFICATE OF MERIT

This is to certify that _____ARPUDHA. A U14MB219_____ has actively participated in the Value Added Course on *Developmental Paediatrics (*held during Nov 2015 – March 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.



Dr. Abijeeth

**RESOURCE PERSON**



Dr. Tiroumourougane Serane

**COORDINATOR**

**Student Feedback Form**

Course Name: **DEVELOPMENTAL PEDIATRICS**

ubject Code: **PEC02**

me of Student: Abhinav . S Roll No.: U14MB203

We are constantly looking to improve our classes and deliver the best training to you. Your

luations, comments and suggestions will help us to improve our performance

| | Particulars | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| | Objective of the course is clear | | | ✓ | | |
| | Course contents met with your expectations | | | | ✓ | |
| | Lecturer sequence was well planned | | | | ✓ | |
| | Lectures were clear and easy to understand | | | ✓ | | |
| | Teaching aids were effective | | | ✓ | ✓ | |
| | Instructors encourage interaction and were helpful | | | | ✓ | |
| | 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*

*gestions if any:*

–

**Student Feedback Form**

Course Name: **DEVELOPMENTAL PEDIATRICS**

Subject Code: **PEC02**

Name of Student: Abhinaya - M Roll No.: U14MB204

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*

*ggestions if any:*

Aishwarya S -

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

VI4 MB203

**Annexure - III**

## ALL ABOUT DEVELOPMENTAL PEDIATRICS (MODULE ON DEVELOPMENTAL PAEDIATRICS)

## MULTIPLE CHOICE QUESTIONS

**Course Code: PEC02**

**I. ANSWER ALL THE QUESTIONS**

Questions

1. Waves bye bye at --------- months

   A- 5 months
   B- -9 months
   C- 7 months
   D- 14 months

2. Roll over attained at -------- months

   A-5 months

   B-3 months

   C-7 months

3. Eye contact attained at -------- months

   A- 2months
   B- 6 months
   C- 4 months

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   a- 18 months
   b- 20 months
   c- 23 months

Abhinaya · M
U 14MB204

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - III**

## ALL ABOUT DEVELOPMENTAL PEDIATRICS (MODULE ON DEVELOPMENTAL PAEDIATRICS)

## MULTIPLE CHOICE QUESTIONS

**Course Code: PEC02**

**I. ANSWER ALL THE QUESTIONS**

Questions

1. Waves bye bye at --------- months

   A- 5 months
   B- 9 months
   C- 7 months
   D- 14 months

2. Roll over attained at -------- months

   A-5 months

   B-3 months

   C-7 months

3. Eye contact attained at -------- months

   A- 2months
   B- 6 months
   C- 4 months

4. Rides tricycle at ------- years

   A- 3 years
   B- 5 years
   C- 2 years

5. Upper age limit for walking ------- months

   a- 18 months
   b- 20 months
   c- 23 months

Date: 01.04.2016

From

Dr. Tiroumourougane Serane
Professor and Head,
Department of Paediatrics,
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: Developmental Pediatrics for Undergraduates**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: PediatricNutrition for II MBBS students from Nov 2015 to March 2016 for 10 Third 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. Tiroumourrougane Serane

PAEDIATRICS HEAD
DEPT. OF PAEDIATRICS
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY

**Encl: Certificates**

**Photographs**


PECO2 –DEVELOPMENTAL
PAEDIATRICS

**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

**OSSUDU AGARAM VILLAGE; KUDAPAKKAM POST,PONDICHERRY - 605003**

Date 1.7.2015

From
Dr. Sujatha Tripathi,
HOD in-charge
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: Blood banking technologies**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Blood banking technologies on August-october 2015. We solicit your kind permission for the same.

Kind Regard

Dr. Sujatha Tripathi

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**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr.Rajasekaran

The HOD in charge: Dr. Sujatha Tripathi

The Expert: Dr. Sujatha Tripathi

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
OSSUDU AGARAM VILLAGE,
KUDAPAKKAM POST,
PUDUCHERRY - 605 502

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**

8.7.15

**Sub: Organising Value-added Course: Blood banking technologies**

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**"_Blood banking technologies" from August 2015**. 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 31.7.2015 . Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Encl: Copy of Course content

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

# Course Proposal

Course Title: Blood banking technologies

**Course Objective:**

1. To understand the basics of immunohematology and blood group systems for better learning about blood banking
2. Should know in detail about pretransfusion testing
3. Should be able to perform blood grouping correctly under supervision

**Course Outcome:** Better understanding and knowledge about blood grouping and pretransfusion testings

**Course Audience: IInd year MBBS**

**Course Coordinator: Dr. Sujatha Tripati**

**Course Faculties with Qualification and Designation:**

**1. Dr. Sujatha Tripati , HOD-in-charge**

**2. Dr. Sivaganesh@ Porko.G, Assistant professor**

**Course Curriculum/Topics with schedule**

| SlNo | Date | Topic | Time | Faculty | Hours |
|---|---|---|---|---|---|
| 1. | 1.08.2015 | Introduction, Basics of immunohematology | 1.30-4 pm | **Dr. Sujatha Tripati** | 2.5 hrs |
| 2. | 8.08.2015 | Blood group system | 1.30-4 pm | **Dr. Sivaganesh@ Porko.G** | 2.5 hrs |
| 3. | 15.08.2015 | Blood group antigen and antibodies | 1.30-4 pm | **Dr. Sujatha Tripati** | 2.5 hrs |
| 4. | 22.08.2015 | Antigen- Antibody reactions, Factors influencing reaction | 1.30-4 pm | **Dr. Sivaganesh@ Porko.G** | 2.5 hrs |
| 5. | 29.08.2015 | Pretransfusion testing | 1.30-4 pm | **Dr. Sujatha Tripati** | 2.5 hrs |
| 6. | 5.09.2015 | Techniques of blood grouping | 1.30-4 pm | **Dr. Sivaganesh@ Porko.G** | 2.5 hrs |
| 7. | 12.09.2015 | Cross-matching | 1.30-4 pm | **Dr. Sujatha** | 2.5 hrs |

| | | | | | |
|---|---|---|---|---|---|
| | | | | **Tripati** | |
| 8. | 19.09.2015 | Transfusion Transmitted Infections | 1.30-4 pm | **Dr. Sivaganesh@ Porko.G** | 2.5 hrs |
| | | **Practical Class** | | | |
| 9. | 26.09.2015 | Blood grouping | 1.30-4 pm | **Dr. Sujatha Tripati** | 2.5 hrs |
| 10. | 03.10.2015 | Cross matching | 1.30-4 pm | **Dr. Sivaganesh@ Porko.G** | 2.5 hrs |
| 11. | 10.10.2015 | TTI | 1.30-4 pm | **Dr. Sujatha Tripati** | 2.5 hrs |
| 12 | 17.10.2015 | Assessment and g feedback | 1.30-4 pm | **Dr. Sivaganesh@ Porko.G** | 2.5 hrs |
| | | **Total** | | | 30 hrs |

**REFERENCE BOOKS:**


1. Medical laboratory technology, Methods and interpretations, by Ramnik Sood, Fifth edition
2. Atlas and textbook of hematology by Dr.Tejindar singh

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Blood banking technologies and PA01

**2. Duration & Period**

30 hrs & AUGUST - OCTOBER2015

**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

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- AUGUST - OCTOBER2015 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | PA01 | **Blood banking technologies** | Dr. Sujatha | 2nd MBBS | AUGUST - OCTOBER2015 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

DEPARTMENT OF PATHOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY

**COORDINATOR**

# BLOOD BANK TECHNOLOGIES




# PARTICIPANT HAND BOOK

BIHER

SLIMS

## COURSE DETAILS

| Particulars | Description |
|---|---|
| Course Title | Blood bank technologies |
| Course Code | PA01 |
| Objective | 1. Basics of immunohematology<br>2. Antigen and Antibodies<br>3. Blood group systems<br>4. Blood group antigen and antibodies<br>5. Antigen- antibody reaction<br>6. Factors influencing antigen-antibody reaction 1<br>7. Factors influencing antigen-antibody reaction 2<br>8. Pretransfusion testing<br>9. Blood grouping<br>10. Cross matching<br>11. Antibody screening<br>12. Recent trends |
| Key Competencies | On successful completion of the course the students will have knowledge and skill in regarding immunohematology and blood bank techniques |
| Target Student | 2nd MBBS Students |
| Duration | 30hrs AUGUST – OCTOBER 2015 |
| Theory Session | 20hrs |
| Practical Session | 10hrs |
| Assessment Procedure | Written assesment |

# Immunohaematology

- demonstration of red cell antigen (Ag)-red cell antibody (Ab) reactions is the key

• Landsteiner - blood antigens (ABO) present on RBCs would react with their respective Abs present in plasma

• Many different types of Ag-Ab reactions, blood bankers are often concerned with reactions between Ags on red blood cells and Abs in serum/ plasma.

Combination of Ag-Ab can result in observable reactions, most commonly – Agglutination, Hemolysis , Precipitation etc.....

**ANTIGENS**

Antigens are substances that can induce a specific immunologic response or can interact with specific antibody or immune cells "in vivo" or "in vitro".

(Immunogens)

• Epitope: structural chemical group in a specific 3-D arrangement, known as antigenic determinants, which is lacking or foreign to the immunized animal

• An Important factor affecting the immunogenicity of an antigen is its molecular size (>4,000 daltons)

• Smaller molecules (for example, drugs such as penicillin) can be immunogenic if coupled to a protein "carrier" of larger molecular weight. (Hapten)

**BLOOD GROUP ANTIGENS**

Present (predominantly) on RBCs & may be Carbohydrates / proteins / lipids

• 324 blood group Ags are recognized

• 33 blood group systems are known E.g. ABO, Rh, Kell, Duffy, Kidd, MNSs.....

• 40 blood group Ags unassigned

• Molecular biology of assigned Ags are known

• Detected by serologic techniques. (genotypes by molecular techniques)

**• A & B Ags:**

➢ Carbohydrates

➢ Present on cells, tissues, organs except CNS tissue & stem cells

➢ Detected on RBCs of embryos as early as 5-6 weeks of gestation

➢ Adult levels of ABO expression by age 2-4 years

**BIOLOGICAL ROLE OF BLOOD GROUP ANTIGENS**

• At present unknown & ABH Ags are widely distributed throughout the body

• Rh & Kell (K) - play a part in cell membrane integrity

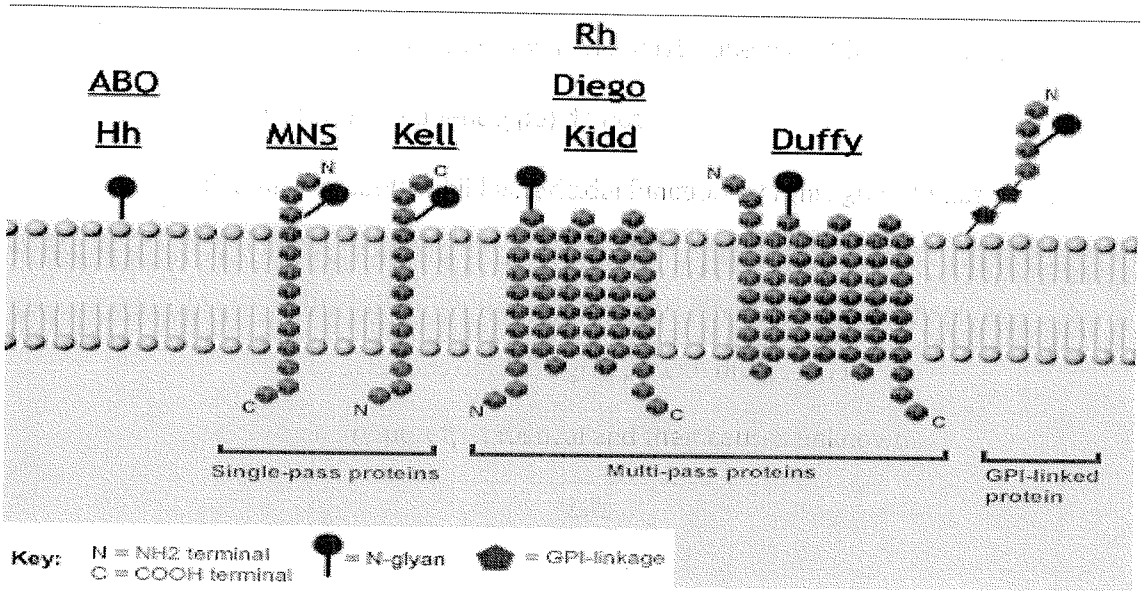
➢ Loss of Rh antigens (Rh null) on their RBCs - hemolytic anemia ("Rh-null syndrome)

➢ A, B, and H antigens (Bombay phenotype) do not

➢ Rare inherited defect of neutrophil bactericidal function (chronic granulomatous disease) -Kell blood group system

• Relationship between the Duffy blood group antigens and resistance to malaria.

• There are many other associations of blood groups with disease, particularly malignancy; many of them are purely statistical and their causes unknown.




BLOOD GROUP ANTIBODIES

Produce against immunization to blood-group Ag & present in plasma or serum

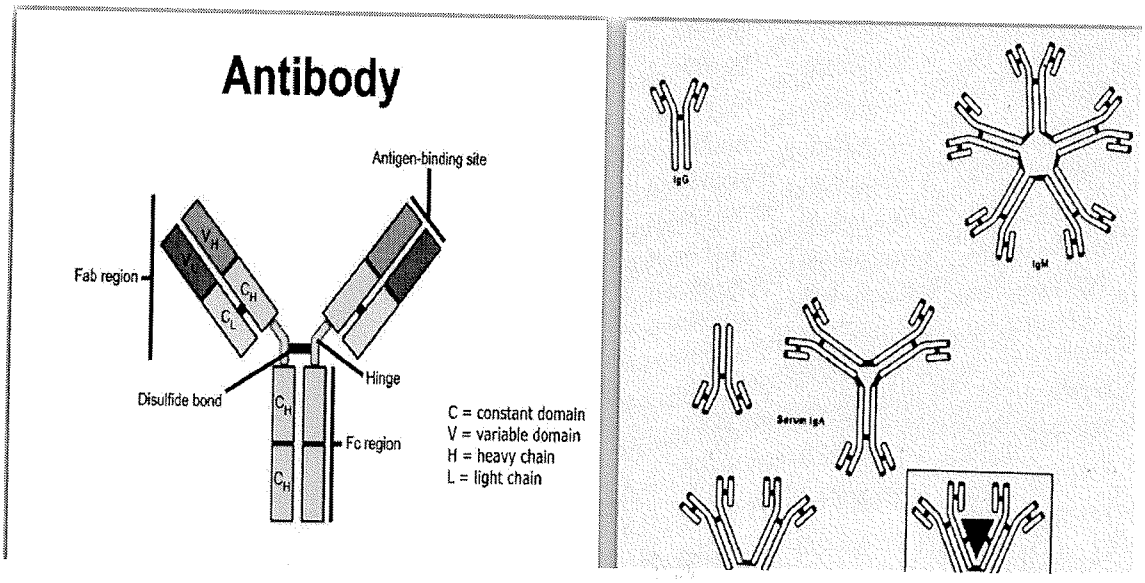
- Within a few months after birth, an infant makes anti-A and/or anti-B, if lacking those Ags on its RBCs - naturally occurring since they have no apparent antigenic stimulus.
- Naturally occurring antibodies to Ags other than ABO are also often encountered,particularly in the I, Lewis, P, and MN systems. (IgM)
- Immune antibodies to blood group Ags develop as a result of pregnancy, transfusion, or immunization (IgG). Following immunization, IgM Abs are often seen first, followed by IgG Abs, which often predominate
- Abs other than anti-A or anti-B are usually called "irregular", "atypical", or "unexpected" antibodies. The preferred term is unexpected

**IgG (Warm antibodies )**

- Binds at warm temp (37ºC)
- Fc portion carries macrophage receptor
- Only 2 Fab sites
- High concentration required to activate complement
- Extravascular hemolysis
- Ex -
  - *Rh antibodies*
  - *Kell*
  - *Duffy*
  - *Kidd*
  - *S,s*

**IgM (Cold Antibodies )**

- Binds at room or cold temp (4-24ºC)
- 10 Fab sites per molecule
- Efficient at activating complement
- Intravascular hemolysis
- Ex -
  - *Anti-$Le^a$*
  - *Anti-$Le^b$*
  - *Anti-I*
  - *Anti-P1*
  - *Anti-M*
  - *Anti-A, -B, -H*
  - *Anti-N*




Characteristics of antigen and antibody reactions

*First and second stages of antigen–antibody reactions:*

- **First stage – (Sensitization)**

- Ags & Abs randomly bumping into each other in the test environment, & when this occurs at the antigen site, the actual attachment of Ab to Ag takes place. (happens very quickly and not visible)

- ***Second stage – (Agglutination)***

- Demonstrable effect of attachment of Ab to Ag.

- This stage takes a longer time to develop & may need to be enhanced in the laboratory in order for it to become observable. (*Centrifugation*)

*Centrifugation*

- In this way agglutination may be enhanced, whereas cells that have not reacted with antibody remain unagglutinated.

Antigen-Antibody affinity;

The strength of the actual bond between a single Ab combining site and a single epitope (relates to its goodness of fit with the corresponding Ag)

The combined strength of multivalent Ab binding to many epitopes on the same carrier (such as a red blood cell)

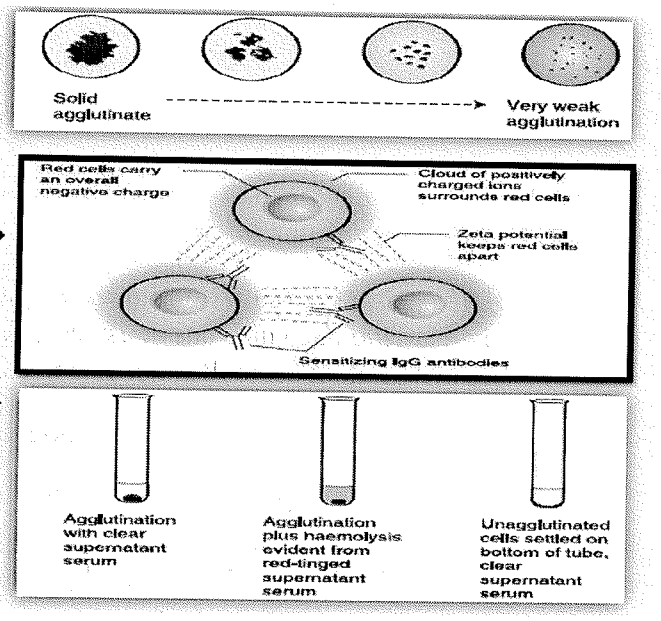
In blood banking, this condition could apply to IgM or IgG antibodies, as both have more than one binding site per molecule

- Prozoning: (Ab excess )

An undiluted Ab with high avidity, when mixed with a suspension of red cells containing the corresponding Ag, will fail to show any demonstrable reaction in vitro, but will do so when diluted and mixed with these same cells.

Common types of antigen- antibody reaction

- **Haemagglutination**
- **Sensitization**
- **Haemolysis**
- Neutralization
- Precipitation




Factors that influence antigen- antibody reaction;

1. Distance between reactive sites on Abs:

- IgM Ab molecules are 300 Å long & able to react observably by haemagglutination of red cells in saline.
- IgG Abs are 120 Å long & usually sensitize cells in saline.

2. Electric repulsion between red cells – zeta potential

- The repelling force between red cells that carry the same negative electrical charge is called zeta potential, which prevents the agglutination of sensitized red cells in saline.
- Zeta potential must therefore be reduced or altered in some way for the smaller IgG Abs to be able to achieve agglutination.

3. **Site of the antigenic determinants:**

- Some antigens (such as the A and B antigens) protrude from the red cell surface

farther than

others (such as the Rh antigens).

4. **Number of antigenic determinants:**

- It is easier for Abs to react with antigens, which are in abundance on each red cell, than sparsely located on the cells.
- Homozygous (more Ag sites) Vs heterozygous (Less Ag sites) - ***Dosage effect***. Ex. Kidd, Duffy , Rh & MNSs
- Ex. S positive red cells that are genetically *S/S* (with a double dose of *S*) may react more strongly with anti-S than cells which are heterozygous *S/s* (with a single dose of *S* ), depending on the anti-S used in the tests.

5. **Goodness of fit:** 'lock-and-key' way

- Combination between lock & key is precise – high goodness of fit, & stronger reaction
- The degree of goodness of fit is also k/n as *Ab affinity*. *Ab affinity*

6. Effects of time: (Incubation time - IP)

- Reactants should be incubated for the optimum time for a good Ag–Ab reaction to develop.
- Too short IP - Ag & Ab may not have had sufficient time to form a good reaction.
- Prolonged IP cause Ag– Ab complexes todissociate.
- The best balance should be determined, documented and followed each time tests are performed.
- Ex. – 60 minutes for NS & 10-15 minutes for LISS

7. Effects of temperature:

- Cold Abs (IgM) react well at 2°C - 10° C
- Abs usually dissociate from the cells when the temperature israised.
- Cold Abs may be eluted from red cells by raising the temperature from 2°C to 37°C.

- Most IgG (Warm) Abs react best at 37°C.
- To dissociate Ag-Ab complexes - raise the temperature to about 56°C - Ab would be eluted
    - (removed or forced to be released) from the cells
- Red cells however, become denatured at temperatures in excess of +50°C & would have to be discarded.

8. Effects of pH

- The optimal pH range - 6·5 to 7·0, with an acceptable range of pH of 6·0to 8·0
- Outside this range, results become unreliable.

9. Effects of ionic strength

- Negatively charged red blood cells attract a 'cloud' of positive ions from the surrounding medium (NS) - normal ionic strength saline solution is isotonic with blood (0·85% to 0·9% w/v of NaCl in water)
- Low ionic strength saline solutions (LISS) are commonly used to increase the sensitivity of Ag-Ab reaction
- POTENTIATORS AND ENHANCERS

1. **low ionic strength saline solution (LISS):**

- LISS - used for red cell suspensions
- Follow manufacturer's instructions are carefully, otherwise false results may occur. It has two major impacts:
- Reduces the incubation time
- Increases the amount of Ab uptake onto red cells Ags

2. **High molecular mass substances: Ex.** Bovine serum albumin, Polyethylene glycol (PEG), Polybrene (a polymer of hexadimethrine bromide), Polyvinylpyrrolidone, Gelatin & Gumacacia

3. **Proteolytic enzymes:** reduces sialic acid residues around the red cells - reduce the zeta potential. Commonly used are:

- Pineapple stem: source of *bromelin* - Dried

latex of fig tree: source of *ficin*

- Latex of papaya fruit: source of *papain* - Extract
  of pig stomach: source of *trypsin.*

## 10. Concentration of Ag & Ab:

- Best results, when a large number of Ab molecules are bound to each cell.

## 11. Number of fragment Ag binding (Fab) sites:

- IgM Abs 5-10 Fab sites > IgG Abs 2 Fab sites
- In both cases, many molecules of antibody are required to result in a demonstrable reaction, but the principle remains the same.

At present, 33 blood group systems representing over 300 antigens are listed by the International Society of Blood Transfusion.[2,3] Most of them have been cloned and sequenced. The genes of these blood group systems are autosomal, except XG and XK which are X-borne, and MIC2 which is present on both X and Y chromosomes. The antigens can be integral proteins where polymorphisms lie in the variation of amino acid sequence (e.g., rhesus [Rh], Kell), glycoproteins or glycolipids (e.g., ABO). Some of the important groups are mentioned here

• Pre-transfusion Testing in IHL lab:

➢ ABO/Rh typing

➢ Other blood group antigen typing

➢ Detection of red cell alloimmunization (unexpected antibodies)

➢ Compatibility testing (crossmatching)

➢ Direct /Indirect Antiglobulin Test

➢ Weak D testing etc.....

## Blood grouping and cross-matching

The most fatal of all transfusion-related reaction is ABO incompatibility causing complement-mediated intravascular hemolysis. Hence, correct blood grouping and typing, and cross-checking with the blood requisition form is of utmost importance. ABO typing is carried out by testing RBCs for the A and B antigens and the serum for the A and B antibodies before transfusion. The next step involves Rh typing with only 15% of the population being Rh-negative.

## Cross-matching

Cross-matching involves mixing of donor RBCs with the recipient serum to detect fatal reactions.[19] It has three phases in which the first phase (1-5 min) involves detection of ABO incompatibility and detection of antibody against MN, P, and Lewis systems. The second phase (30-45 min in albumin and 10-20 min in low ionic salt solution) involves incubation of first phase reactants at 37°C for detection of incomplete antibodies of Rh system. The third phase consists of the addition of antiglobulin sera to the incubated second phase reactants to detect incomplete antibodies of Rh, Kidd, Kell and Duffy. Among the three phases, the first two phases are more important as they detect those involved in fatal HTR. The total time taken for all the three phases is in between 45 and 60 min.

## Antibody screening

Here, commercially prepared RBCs with all the antigens, which direct production of antibodies causing hemolytic reactions, are mixed with the recipient's serum to detect the presence of those very antibodies. It is also carried out with the donor's serum.

Changing practices in blood grouping;

There are controversies regarding the best method for procurement of blood during elective and emergency situations: (a) It can be done by routinely asking for grouping and cross-matching in elective surgical patients. Many scientific articles disputed the relevance of preoperative arrangement of blood in surgeries where blood loss is not anticipated to be significant. (b) Blood may be ordered without full set of investigations. ABO-Rh typing alone results in a 99.8% chance of a compatible transfusion. Antibody screening increases this safety margin up to 99.94%, and an additional cross-match further increases the compatibility to 99.95%. In absence of cross-matching, there is a possibility of missing the antigens on donor cells, but in clinical practice, they are of less importance. Hence, "screening and typing" alone should be carried out. Other methods include "type and partial cross-match," which includes the immediate phase of cross-match; "type and uncross match," for those recipients who have never been transfused before, the chance of detection of antibody with each cross-match is 1:1000; "type O Rh-negative uncross match," it is performed in emergency situation when the time for these procedures is limited. In the latter condition, type O Rh-negative packed RBCs, that is, the universal donor can be used as they will have a negligible amount of hemolytic anti-A/anti-B antibodies against the recipient RBCs.

**Assessment Procedure**

Written assessment

# VALUE ADDED COURSE

## Blood banking technologies and PA01

**List of Students Enrolled** AUGUST - OCTOBER2015

| 2ND Year MBBS Student | | | |
|---|---|---|---|
| **Sl. No** | **Registration Number** | **NAME OF THE STUDENT** | **Signature** |
| 1 | U14MB255 | JEEVAHASHINI. S | |
| 2 | U14MB256 | JAYAPRIYA.J | |
| 3 | U14MB257 | JAYACHANDRAN. G | |
| 4 | U14MB258 | JIMS SAMGODWIN. S | |
| 5 | U14MB259 | KABITH VAJAN.A | |
| 6 | U14MB260 | KARPAGAM.S | |
| 7 | U14MB261 | KARTHIKA PRIYA. S.K | |
| 8 | U14MB262 | KAVYA. K | |
| 9 | U14MB263 | KAVYASHREE.P | |
| 10 | U14MB264 | KEERTHI.R | |
| 11 | U14MB265 | KELHOUNEIR TSEIKHANUO | |
| 12 | U14MB266 | KIRTHICK SARAN RAJA. V | |
| 13 | U14MB267 | KISHORE KANNA.A | |
| 14 | U14MB268 | LINGABARATHAN.A | |
| 15 | U14MB269 | LITHIGA. M | |
| 16 | U14MB270 | LOHISHVAR.A | |
| 17 | U14MB271 | LOKESHKUMAR. B | |
| 18 | U14MB272 | MADIMCHETTY SATHYA AASHEERV | |
| 19 | U14MB273 | MAHANMAHARAJ.A | |
| 20 | U14MB274 | MANOJ. R | |

**RESOURCE PERSON**

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

## BLOOD BANKING TECHNOLOGIES

**Course Code: PA01**

**5X3= 15**

**I. ANSWER ALL THE QUESTIONS**

1. **Define Immunohematology. What is antigen and antibody?**
2. **Discuss Factors affecting antigen antibody reaction**
3. **Enlist pre-transfusion tests**
4. **Short notes on blood grouping**
5. **Recent trends in grouping and crossmatching**

Jeevahashini
U14MB255

12½
15

# Blood Banking technologies

1) Define immunohematology. What is antigen and antibody?

Immunohematology is a branch of hematology and reactions transfusion medicine which studies antigen - antibody reactions and anologaus phenomena as they relate to the pathogenesis and clinical manifestation of blood disorder. A person employed in this field is reffered to as immuno hematologist.

antigen - A substance that enters the body and starts a process that can cause disease. The body then usually produces substance.

antibody - are Y-shaled protein that bind to the foreign invader and signal the immune system to get to work.

5) Discuss factors affecting antigen antibody reaction?

The strength of interaction between antibody & antigen at single antigenic site can be described by affinity of the antibody for antigen. He is controlled by three major factors.

Antibody epitope affinity, the valence of both the antigen and antibody and structural arrangement of interacting parts.

Keerthi R
U14MB264

# BLOOD BANKING TECHNOLOGIES

12/15

(1) Define Immunohematology. what is antigen and antibody?

- Immunohematology is a brach of hematology and transfusion medicine whiel studies antigen-antibody reactions and analogaus phenomena as they relate to the pathogenesis and clinical manifestations of blood disorder. A person employed in this field is reffered to as immuno-hematologist.

antigen – A substance that enters the body and starts a process that can cause disease. The body then usually produces substance that bind to the foreign invader and signal the immune system to get to work.

antibody - are Y-shaped protein that bind to the foreign invader and signal the immune system to get to work.

(2) Discuss factors affecting antigen antibody reaction?

The strength of interaction between antibody and antigen at single antigenic site can be described by the affinity of the antibody for an antigen. It is controlled by three major factors.

antibody epitope affinity, the valence of both the antigen and antibody and the steric structural arrangment of the interacting parts.

Blood banking Technologies

1. Define Immunohematology. What is antigen and antibody?

10/15

→ Immunohematology is a branch of Hematology and transfusion Medicine which studies antigen antibody reactions and analogous phenomena as they relate to the pathogenesis and Clinical Manifestations of blood disorders.

→ Antigen are Molecules capable of stimulating an immune response.

→ Each antigen has distinct surface features, or Epitopes, resulting in specific responses.

→ Antibodies (immunoglobins) are Y-shaped Proteins produced by B cells of the immune System in response to exposure to antigens.

2. Discuss factors affecting antigen antibody reaction?

→ The antigen-antibody reaction is widely used in laboratory diagnostics, including immunohaematology.

# 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 JEEVAHASHINI has actively participated in the Value Added Course on *Blood banking technologies* held during AUGUST - OCTOBER 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Sujatha

**RESOURCE PERSON**

Dr. Sujatha

**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 KEERTHI.R has actively participated in the Value Added Course on *Blood banking technologies* held during AUGUST- OCTOBER 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Sujatha
**RESOURCE PERSON**

DEPARTMENT OF PATHOLOGY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502.

Dr. Sujatha
**COORDINATOR**

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

# Student Feedback Form

Course Name: **BLOOD BANKING TECHNOLOGIES**

Subject Code: **PA01**

Name of Student: Jeevabashini Roll No.: U14MB255

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:*

# Student Feedback Form

Course Name: **BLOOD BANKING TECHNOLOGIES**

Subject Code: **PA01**

Name of Student: Keerthi. R Roll No.: U14MB264

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:*

Date: 17.10.2015

From

Dr.Sujata tripathi
HOD-in-charge
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:** Blood banking technologies

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: : Blood banking technologies for IInd MBBS during Aug- Oct 2015 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.

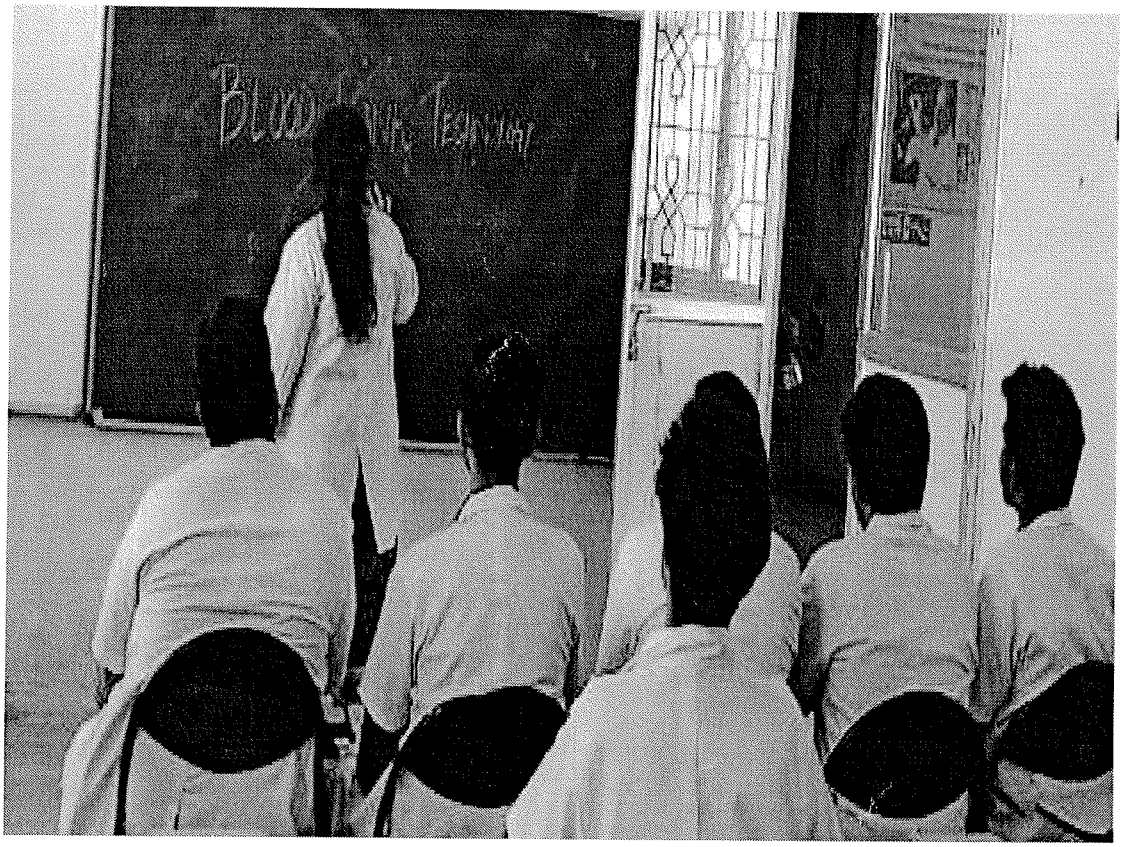
Kind Regards,

Dr. Sujata tripathi

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY 605 502.

**Encl: Certificates**

**Photographs**



# Sri Lakshmi Narayana Institute of Medical Sciences

Date:06.08.2015

From

Dr.Thangapaneerselvam,
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: Point of care testing**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Point of care testing in Aug to Sep 2015. We solicit your kind permission for the same.

Kind Regards

Dr.Thangapaneerselvam

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Rajasekar

The HOD: Dr. Thangapaneerselvam

The Expert: Dr. Santhosakumari

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 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

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

07.08.2015

**Sub: Organising Value-added Course: Point of care testing . 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 **"Point of care testing"**. 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 on or before Aug to Sep 2015. 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**

Point of care testing

**2. Duration & Period**

30 hrs & Aug to Sep 2015

**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 - *Enclosed as Annexure- III*

**6. Certificate model**

*Enclosed as Annexure- IV*

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

1, Aug to Sep 2015

**8. Year of discontinuation:** 2016

**9. Summary report of each program year-wise**

| **Value Added Course-** May – June 2017 & September -October 2017 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | BIO-01 | Point of care testing | Dr. Thangapaneerselvam<br>Dr.Santhosakumari | MBBS | 20 students ( Aug to Sep 2015 ) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

1. **Dr.Thangapaneerselvam**
2. **Dr.Santhosakumari**

**COORDINATOR**
**Dr.Thangapaneerselvam**

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

# Course Proposal

Course Title: **Point of care testing**

**Course Objective:**

1. Overview of what is a point of care testing
2. Errors in point of care testing
3. Methods to overcome the errors for better patient care
4. Advantages of point of care testing

To sensitise the medical students about the importance and manual mishandling and ignorance of point of care testing for screening and diagnosis of patients sample and improvement of patient care.

**Course Outcome: Gained knowledge on point of care testing for the future doctors has possibility of better usage of newer technologies for improving patient care in near future.**

**Course Audience: MBBS students of 2015 Batch**

**Course Coordinator: Dr.Thangapaneerselvam**

**Course Faculties with Qualification and Designation:**

**1.Dr. Thangapaneerselvam, Professor & HOD**

**2.Dr.Santhosakumari, Assistant Professor**

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 17.8.2015 | Introduction, Background, Objectives | 4-5 PM | 1 |
| 2 | 18.8.2015 | Synonyms for POCT | 4-5 PM | 1 |
| 3 | 19.8.2015 | Activities involved in different phases of analytical procedure | 4-5 PM | 1 |
| 4 | 20.8.2015 | Break down the turnaround time (TAT) | 4-5 PM | 1 |
| 5 | 21.8.2015 | basic requirements of poct | 4-5 PM | 1 |
| 6 | 22.8.2015 | The "Program / Policy" | 4-5 PM | 1 |
| 7 | 23.8.2015 | Key element of a training program | 4-5 PM | 1 |
| 8 | 24.8.2015 | Quality Requirements of a Point of Care Testing Service | 4-5 PM | 1 |
| 9 | 25.8.2015 | Main Function of POC tests | 4-5 PM | 1 |
| | 26.8.2015 | POCT instruments | 4-5 PM | 1 |
| 10 | 27.8.2015 | POCT examples | 4-5 PM | 1 |
| 11 | 28.8.2015 | POCT: Challenges | 4-5 PM | 1 |
| 12 | 29.8.2015 | Poct management team | 4-5 PM | 1 |
| 13 | 30.8.2015 | Compliance Review | 4-5 PM | 1 |

| | | | | |
|---|---|---|---|---|
| 14 | 31.8.2015 | The Procedure Manual | 4-5 PM | 1 |
| 15 | 1.9.2015 | The 3 Stages of a Diagnostic Test | 4-5 PM | 1 |
| 16 | 2.9.2015 | Training Users in POC Testing | 4-5 PM | 1 |
| 17 | 3.9.2015 | Challenges in Training… | 4-5 PM | 1 |
| 18 | 4.9.2015 | Peer to Peer Training | 4-5 PM | 1 |
| 19 | 5.9.2015 | Training Methods | 4-5 PM | 1 |
| 20 | 6.9.2015 | Competency Assessment of a trainee | 4-5 PM | 1 |
| 21 | 7.9.2015 | POCT – Quest for Quality | 4-5 PM | 1 |
| 22 | 8.9.2015 | Sources of Error - Preanalytical ,analytical and post analytical | 4-5 PM | 1 |
| 23 | 9.9.2015 | External Quality Assessment Schemes of POCT | 4-6 PM | 2 |
| 24 | 10.9.2015 | IQC of POCT and QC plan | 4-6 PM | 2 |
| 25 | 11.9.2015 | Conclusion and summary | 4-6 PM | 2 |
| 26 | 12.9.2015 | Manual training of various POCT instrument | 2-4 PM | 4 |
| | | Total | | 32 |

**REFERENCE BOOKS:**

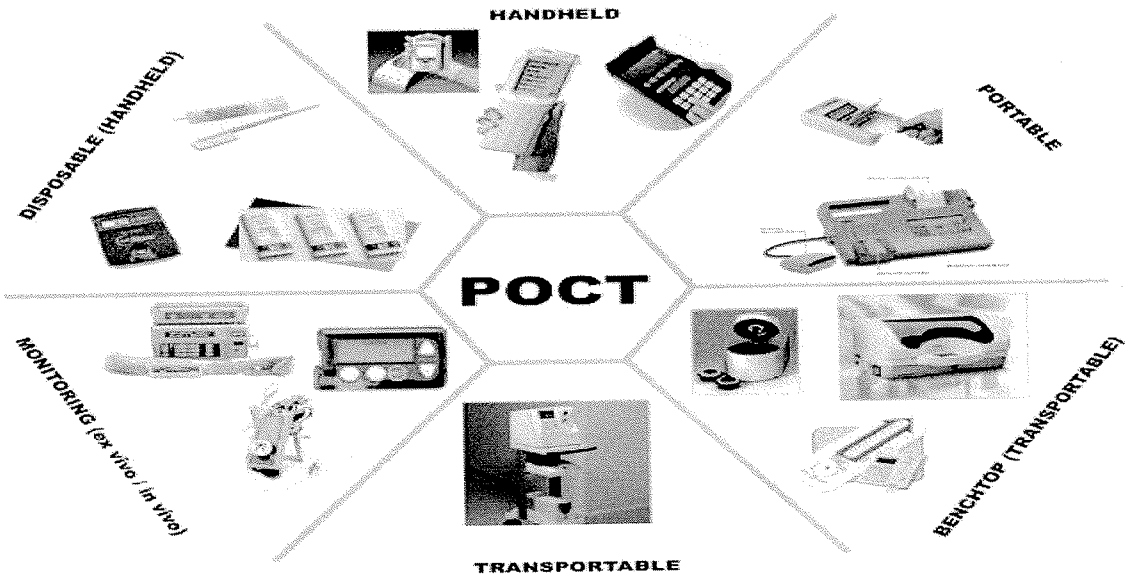

1. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics by Carl A. Burtis, David E Bruns, MD, and Edward R Ashwood, MD

2. Henry's Clinical Diagnosis and Management by Laboratory Methods

Annexure I

# POINT OF CARE TESTING

## PARTICIPANT'S HANDBOOK




BIHER

SLIDES

# POCT

- POC testing (POCT) is defined as medical diagnostic testing performed outside the clinical laboratory and in close proximity to where the patient is receiving care
- Typically performed by non-laboratory personnel and the results are used for clinical decision making.

## Table 1. Synonyms for POCT

| | |
|---|---|
| **POCT** | Home testing |
| **Ancillary testing** | Self-management |
| **Satellite testing** | Patient self-management |
| **Bedside testing** | Remote testing |
| **Near patient testing** | Physician's office laboratories |

## Table 2. Activities involved in different phases of analytical procedure

| |
|---|
| Identifying the correct test |
| Determining proper conditions (fasting, time of the day, resting, posture, taking of drugs |
| Request form with clinical data |
| Taking the sample |
| Labelling of the tubes |
| Transport of the sample |
| Preparation of the sample for instrument |
| Analysis |
| QC requirements |
| Comparing the result against reference ranges |
| Proceeding the result to the requesting personnel |
| Interpreting the results (in the case of abnormal results) |
| Interpretive comments |

## Break down the turnaround time (TAT)

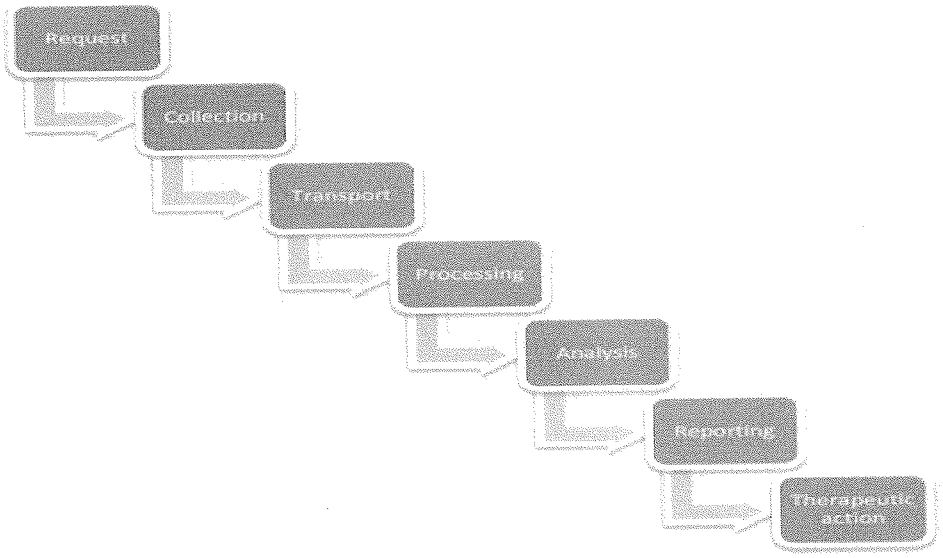



**Figure 1.** Step involved from doctor order of specific test to result from the laboratory

**basic requirements**:

- simple to use,
- reagents and consumables are robust in storage and usage,
- results should be concordant with an established laboratory method.

Here are several additional recommendations to manufacturers:

- minimize the number of parts and steps to obtain a result,
- avoid a confusing product design, such as colour-coded swabs, which can affect accuracy,
- eliminate manual specimen application with a metered dose
- make the results easy to interpret,
- make tests that withstand use, like cleaning with bleach or dropping.




**Figure5.** WHO developed guidelines

A written POC program / policy is important since POCT tends to expand rapidly and can get out of control unless guidelines or policies are in place.

The "Program / Policy" should clearly define:

1. Who is responsible for each part of the program naming the key people? For example:

a. Laboratory POC Coordinator: keep data base of testing personnel,coordinate the training of new personnel, choose testing methods, monitor QC and proficiency programs, provide ongoing coaching to testing personnel in response to daily monitoring, consulting on technical issues, and analysemeter/troubleshooting.

b. Nurse Manager: enforce policies, schedule new employee training, take disciplinary action, if necessary, and schedule annual POC competency evaluation of staff.

c. Education dept. (if it exists): new employee training and annual certification of testing personnel, support committee with agenda and minutes of meetings. Preferably training is done by those reviewing daily results and quality monitoring.

d. Laboratory staff: new employee training, aid in the annual certification of testing personnel, download and/or review QC data,verify equipment function and maintenance.

2. Where the testing will be performed and who will perform it?

3. For what purpose each type of POCT will be used, i.e., screening,diagnosis, treatment?

4. Who will chose the methodologies used, i.e., lab, Point of care Coordinator (POCC)?

5. What method validation procedures will be performed prior to implementation and who will perform the validation?

6. Reporting procedures.

7. Staff training, continued competency programs and feedback/communication with the end users.

8. Quality assurance monitoring protocols including QC protocols.

9. Proficiency testing program.

10. Obtain and maintain the appropriate licensure and compliance with regulations.

11. Protocol for requesting new/additional services.

12. Operational budget

**Table 4.** Key elements of a training program

| |
|---|
| Understanding the concept of text (pathophysiological, clinical requirements, action taken after performing the test, nature of the test) |
| Patient preparation (biological variability, lifestyle, therapy, diurnal variation) |
| Sample requirement and specimen collection |
| Preparation of instrument |
| Performance of test |
| QC |
| Documentation |
| Reporting the result |
| Interpretation of the result |
| Health and safety issues (specimen collection, disposal of sample, cleaning of the instrument) |

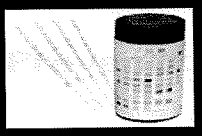
## Quality Requirements of a Point of Care Testing Service

Main Function of POC tests

1. To provide rapid results
2. Results should improve immediate patient management

## Some POCT instruments.....





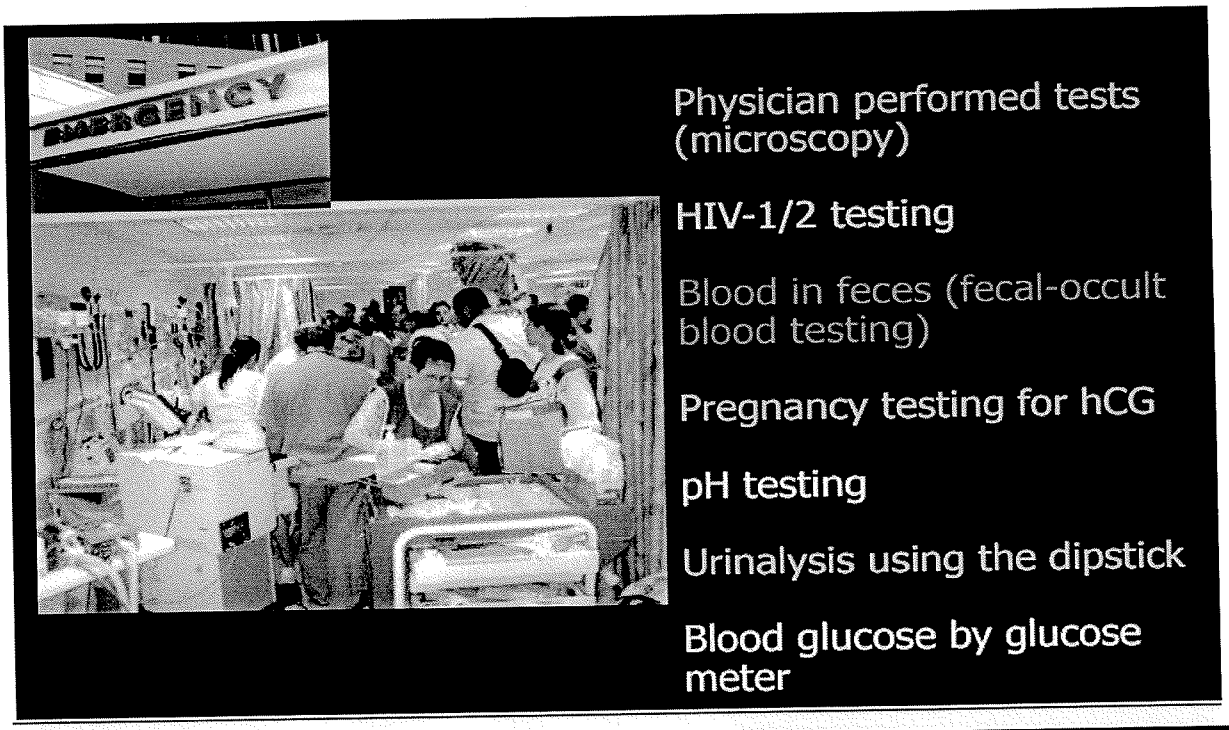


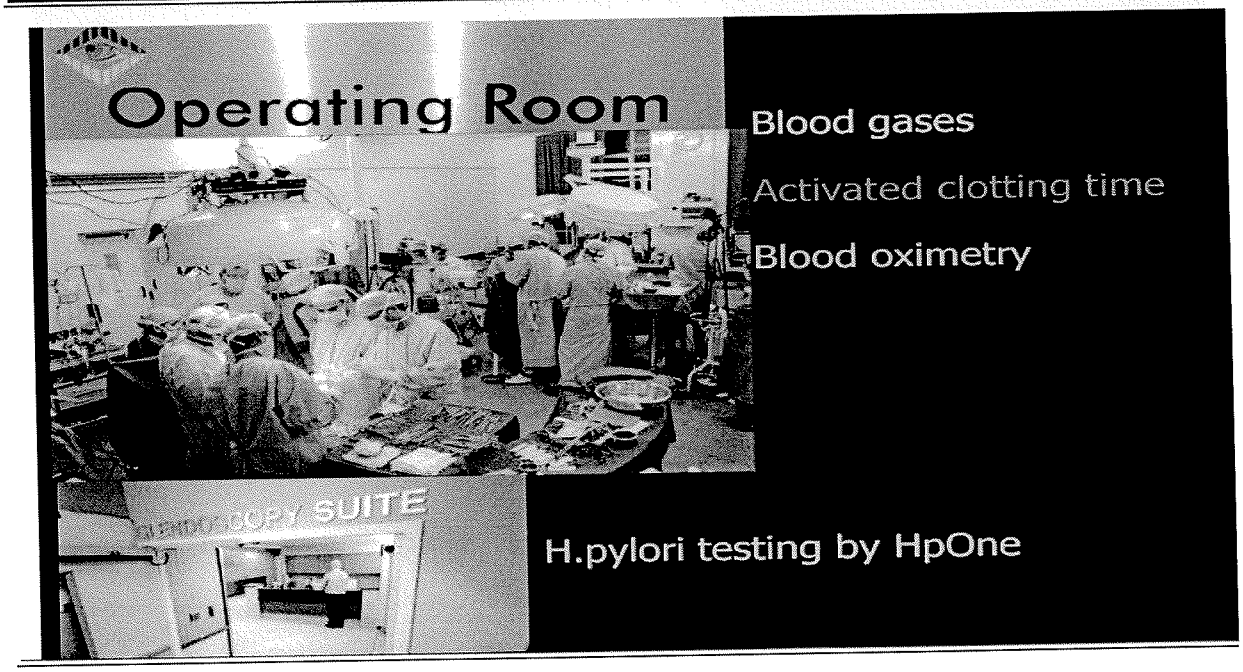

5

## Examples of Point of Care Tests

- pH
- Blood gases: pCO2, pO2
- Lactate
- Glucose
- HbA1c
- Urea, creatinine
- Cholesterol, TGs
- BNP,Troponin, CK-MB,
- Myoglobin
- Bilirubin
- PTH
- Drugs of abuse
- Occult blood (fecal or gastric)
- Urinalysis
- hCG, ketones, glucose,
- Leukocytes, pH, nitrite,
- Bacterial/viral Infections
- Coagulation
- Hemoglobin/ hematocrit

7



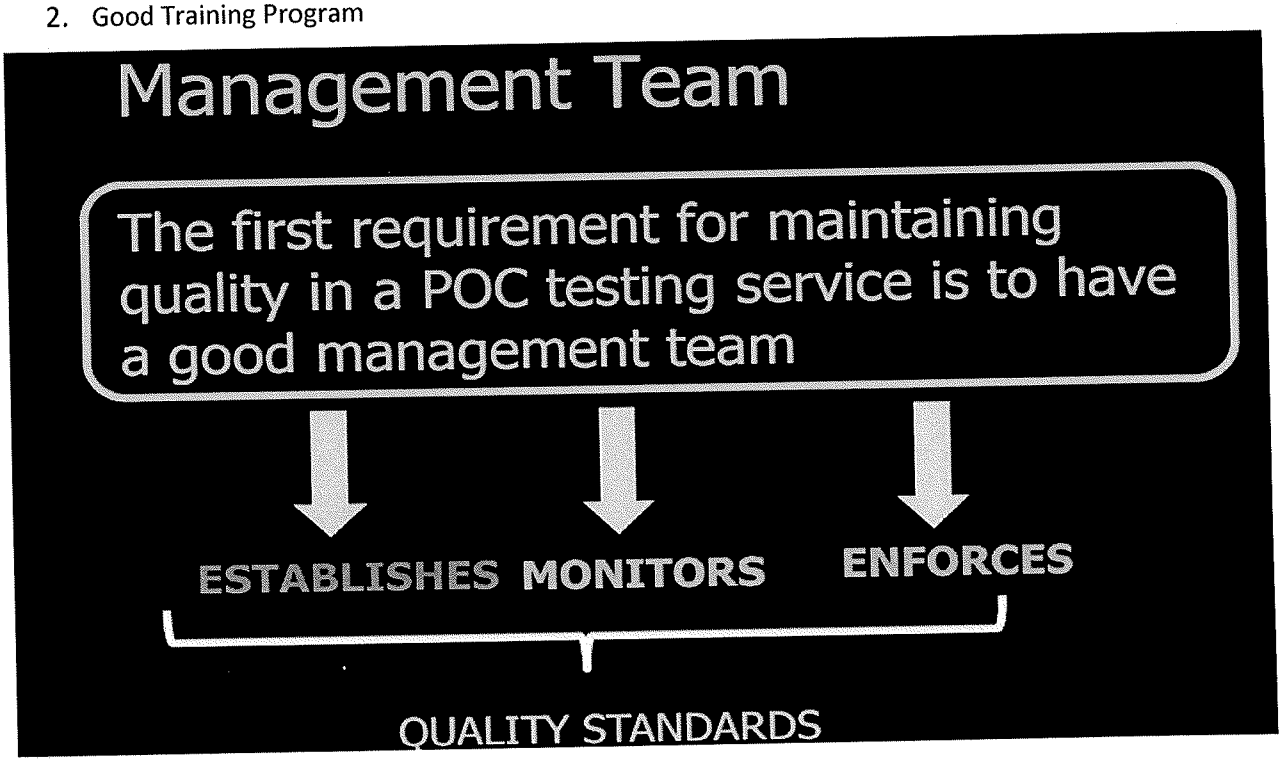




POCT: Challenges

1. Staff training and competency maintenance
2. Testing without institutional review or approval
3. Noncompliance with procedures (specimen labeling, QC, proficiency testing etc.)

So what does a POC Testing s Service need?

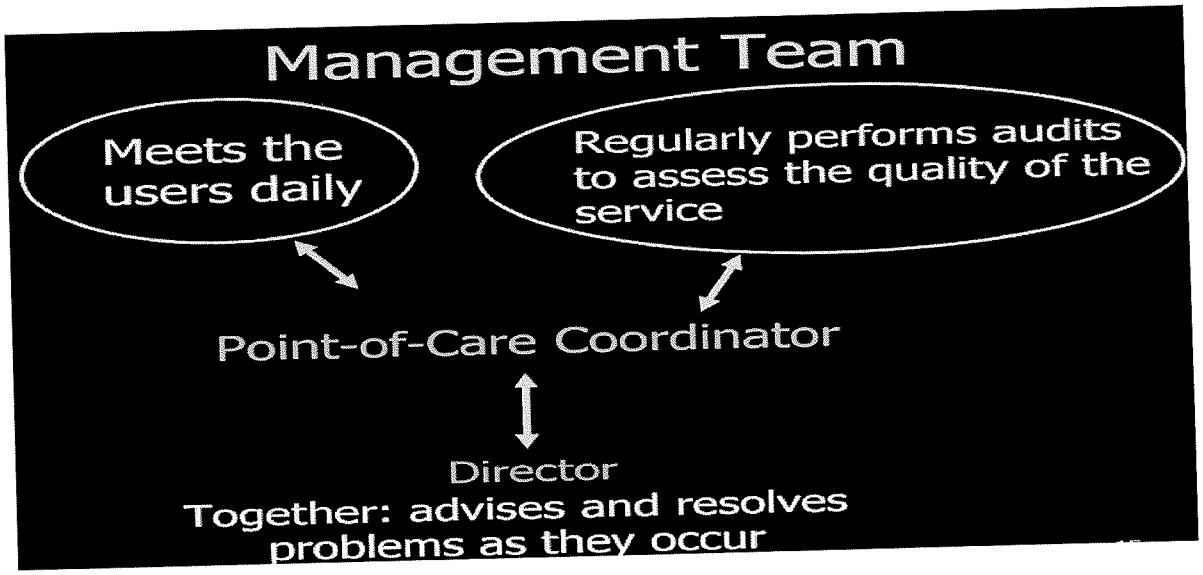
1. Good Management Team
2. Good Training Program




Management Team

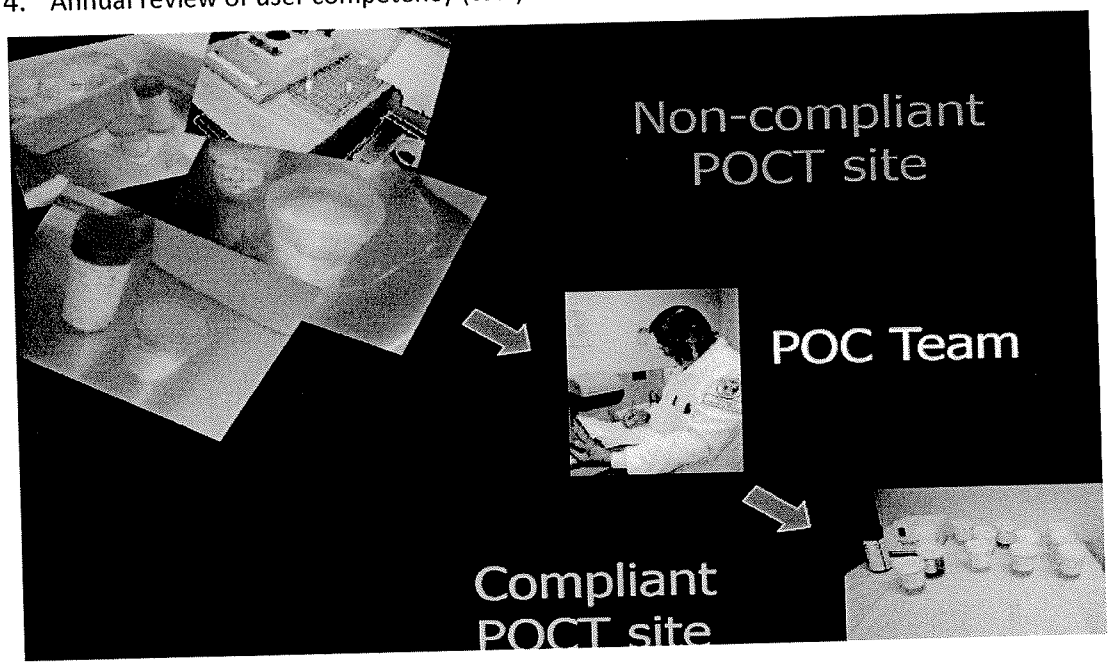
- At the bare minimum this team needs:

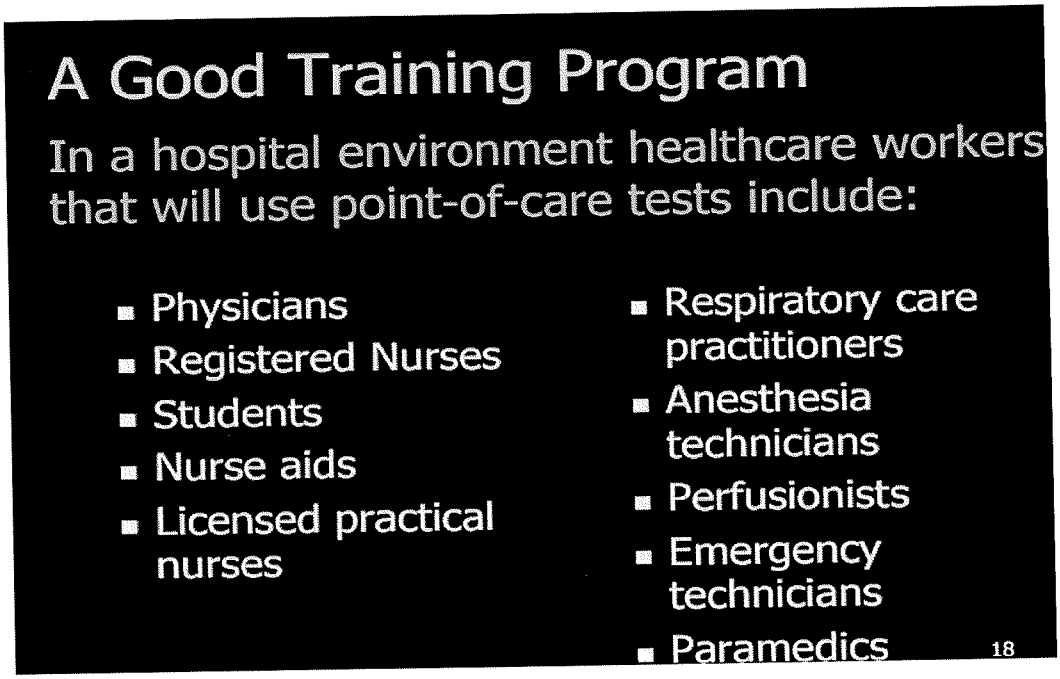
1. DIRECTOR or equivalent that has the authority to cause institutional change
2. POINT-OF-CARE COORDINATOR who is the instrument for implementing that change




Compliance Review

1. Weekly review of POCT test stations
2. Compliance with written protocol?
3. Corrective action for outlier results?
4. Annual review of user competency (test)






The Procedure Manual

- It is important that POCT users receive the same information regarding the test to ensure consistency of practice: This is the function of the: PROCEDURE MANUAL
- Written procedures reduce variability, and its variability in test procedures between operators that leads to errors and discrepant results.

The manual should not only mention the procedure but should be more comprehensive.

- Scope (who can perform the test)
- Principles of the test
- Specimen requirements
- Reagent/Kit storage conditions
- Procedure for performing Quality Control
- Instrument maintenance (if needed)
- Procedure for performing the test
- Safety precautions
- Test result interpretation
- Test limitations / interferences
- Documentation of the test result

The 3 Stages of a Diagnostic Test

A diagnostic test can be divided into three stages:

the pre-anlaytical stage

analytical stage

post analytical stage

Each step is susceptible to errors that can significantly affect the result.

This should be mentioned in the Procedure Manual

Training Users in POC Testing

- Once the procedure manual has been created it is necessary that all users have read it and this process should be documented.
- The salient features for each test need to be understood and demonstrated during training.
- This would be followed by a competency assessment which would be the exit examination before the healthcare worker can test patients.

Challenges in Training...

Management of Training:

1. Number of staff requiring training be in the thousands
2. A high turnover rate
3. Nursing staff can be transferred between different departments
4. Poor communication between nursing administration and POC coordinator.

Peer to Peer Training

1. Nurse trainer may not be aware of all the preanalytical, analytical and post-analytical errors that could occur when using the POC test.
2. They may also be performing the test in a different way that could be prone to a higher error rate.
3. Furthermore, from a regulatory standpoint, the trainer would need to have passed their competencies as well.

The Designated Trainer

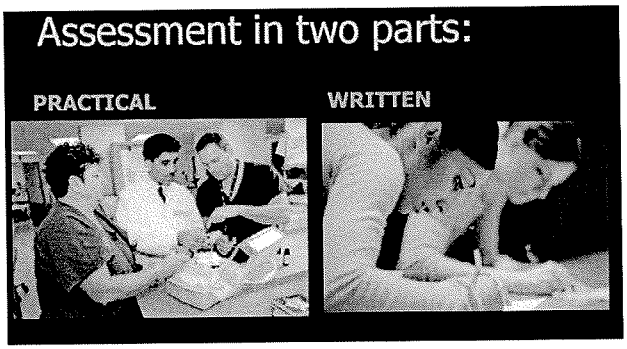
1. Better way to train new hires
2. This designated trainer would aware of all the issues that could occur with the test and would be up-to-date in their competencies.

Training Methods

1. Direct classroom demonstrations and observations
2. Supplemented with self-learning , elearning, lectures via webcam, power point, and a training kit containing manual, laminated posters/aids and CDROM.

Competency Assessment

The aim: To ensure healthcare workers can not only generate quality results consistently from the instrument but can correctly manage them in the decision making process.

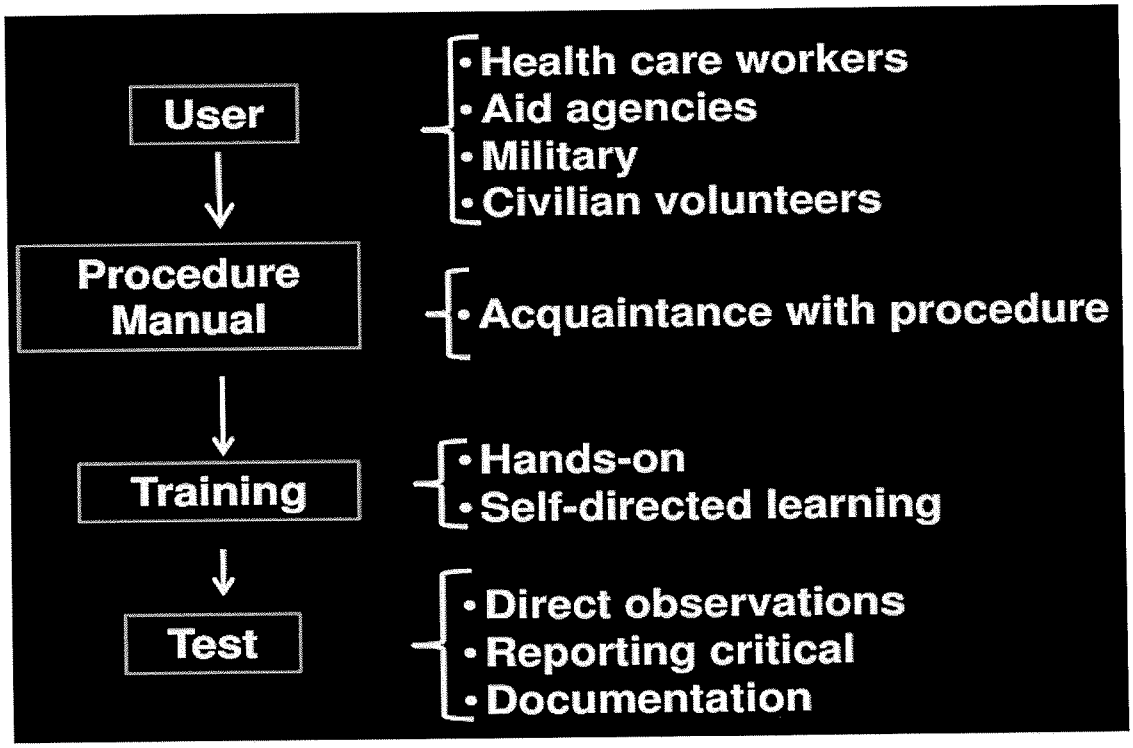



Practical Assessment

1. Direct observations of patient testing:
2. Using a specimen (previously analyzed specimen, external proficiency testing material, quality control material or calibrator)
3. if applicable include any patient preparation
4. if applicable include any specimen handling and processing
5. Recording and reporting test results.
6. If applicable, direct observation of instrument maintenance and function checks.
7. Assessment of problem solving skills (reviewing temperature and QC logs; knowledge of common error messages; knowing who to contact for help).

Written Assessment

1. Multiple Choice type questions
2. True / False
3. Determine what is the "pass" grade
4. Users must reach this satisfactory level in the written examination.




POCT – Quest for Quality

1. Results from POCT dictate the next step in a diagnostic algorithm
2. Errors in laboratory testing occur in preanalytical and postanalytical stages → also true for POCT
3. The same rigorous quality assurance procedures apply as if testing were performed in the main laboratory

Sources of Error - Preanalytical

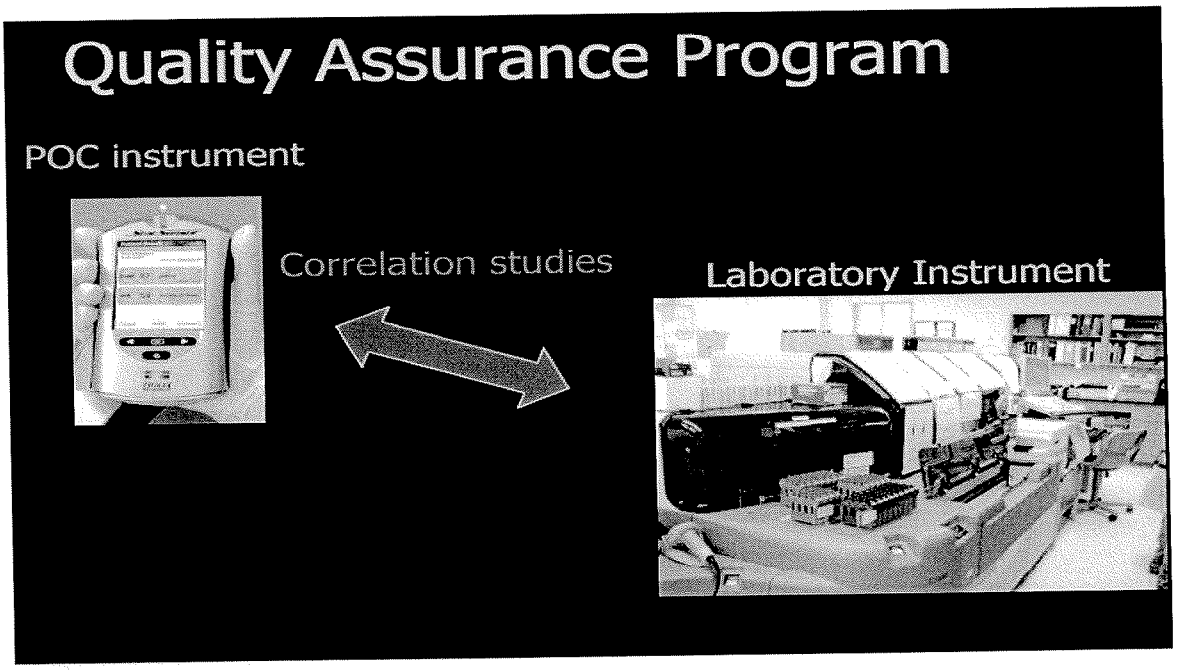
a. Test ordering
b. Patient identification
c. Specimen collection
    i. Arterial vs venous vs capillary
d. Specimen identification
e. Fasting vs non-fasting
f. Wrong anticoagulant
g. Contamination with IV fluid
h. Hemolysis
i. Inadequate sample

Sources of Error - Analytical

1. Inadequate mixing of sample
2. Air bubbles
3. Environmental conditions
4. Outdated reagents (deterioration)
5. Instrument failure
6. QC out of limits
7. Inadequate maintenance/calibration

Sources of Error - Postanalytical

1. Incorrect reading of results
2. Result outside the linear limit
3. Non-recognition of interferences
4. No result recorded
5. Result recorded on wrong patient chart




External Quality Assessment Schemes

EQA schemes are very useful in helping to:

- Identify if healthcare workers are adequately trained.
- Identify if there are procedural deficiencies mentioned in the product insert but omitted in the final procedure.
- Identify procedural deficiencies not mentioned in the product insert.

More on EQA Program

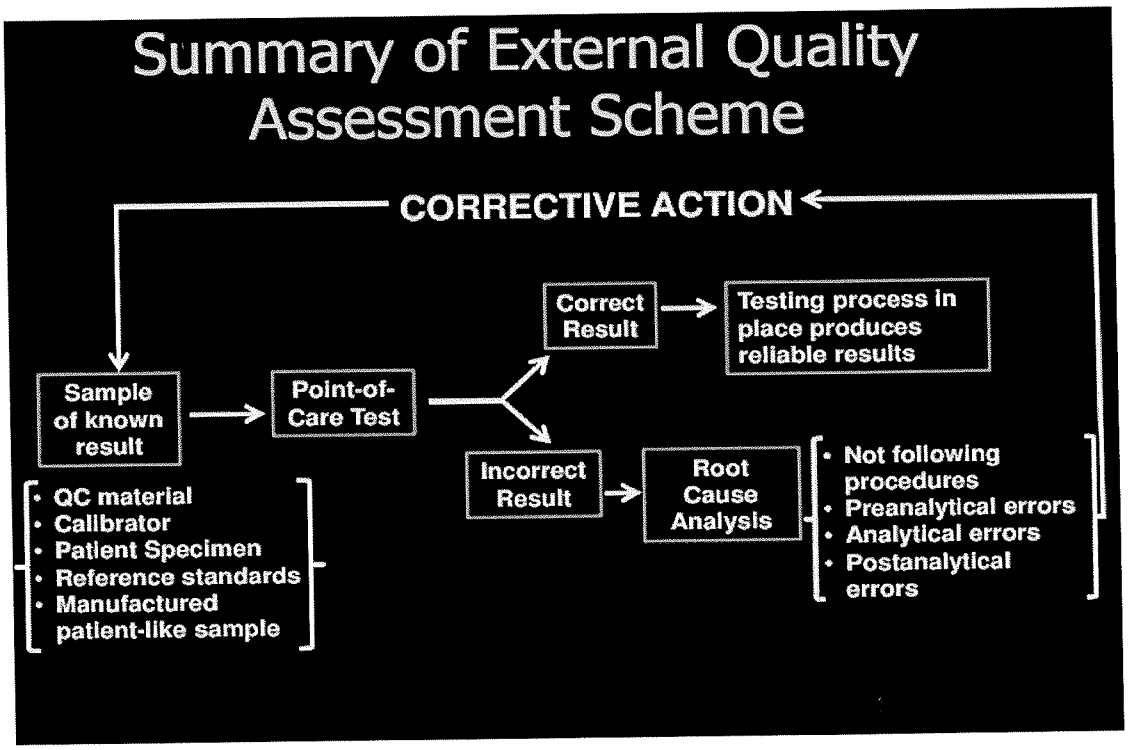
- Sample provided by e.g. College of American Pathologists (CAP)
- Sample is treated like a patient sample
- Results are sent to CAP
- Your result is compared to others using the same instrument

When External Samples are Not Available

- Patient samples can be split and either sent to another instrument or be used by another operator.
- The advantage of using patient samples is that matrix effects are eliminated as real patient samples are being used.

Criteria for Split Sample Studies

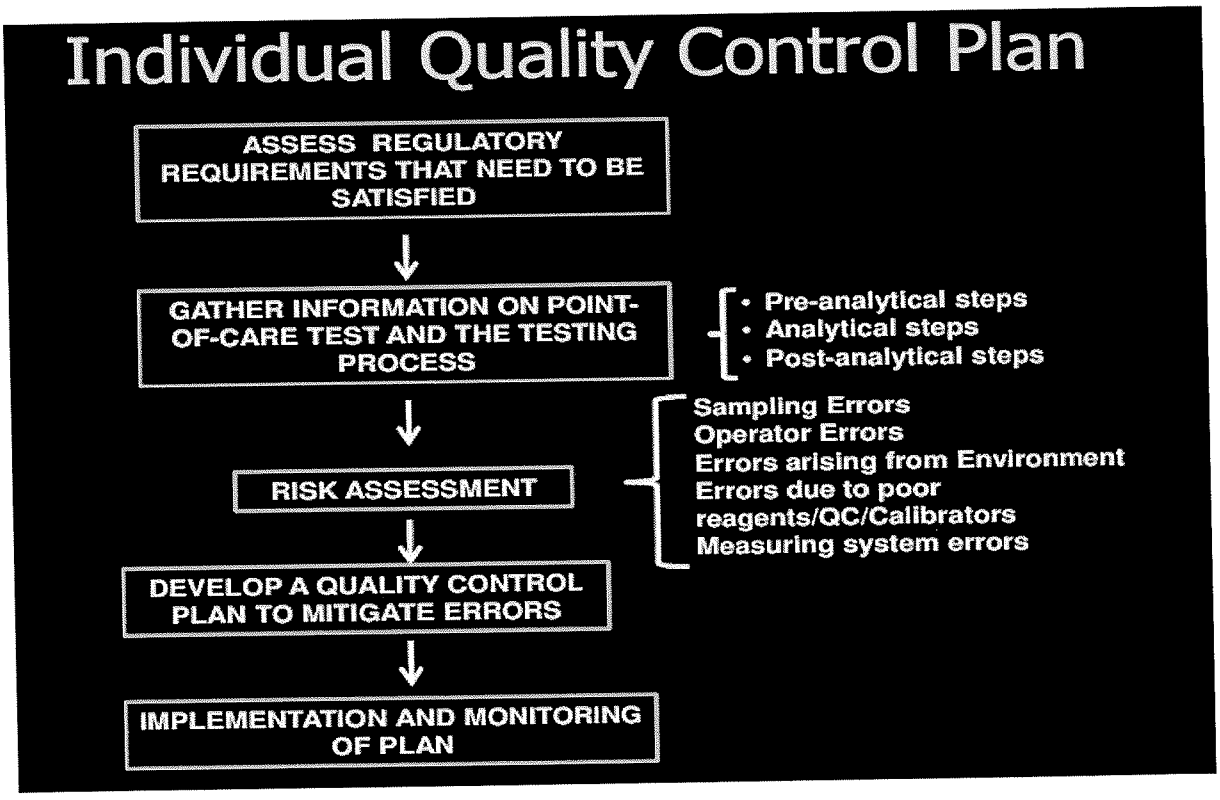
- It is important to define criteria for acceptability of the sample correlation. This can be obtained from published guidelines or using ± 2 or 3 standard deviations from the mean from quality control data for quantitative assays.




Quality Control

1. Running quality controls (QC) is a mandatory requirement for any point-of-care test because they are designed to detect problems in the test system.

2. They are tested before or alongside a patient test and should always be run according to the manufacturer's instructions in the product insert.
3. Their use monitors test kit and reagent integrity.
4. For example a QC failure could arise
    a. from incorrect storage of kits and/or also
    b. be due to poor techniques or procedures.
5. Thus QC gives assurance that the device is working and the testing is being performed correctly.
6. Non-instrumented qualitative point-of-care tests such as pregnancy tests, HIV tests, rapid strep A or flu tests typically have two types of controls:
7. Internal controls - built into the test system and are run whenever a patient sample is tested.
8. Confirm that the test system is working, and for lateral flow methods, sufficient specimen has been added to the well to allow the sample to migrate correctly through the strip.
9. External controls are run just like a patient sample
10. They test the entire testing process including:
    a. Specimen collection
    b. Specimen application
    c. Result documentation



Developing an IQC Plan

- Assessing any regulatory or accreditation requirements that need to be satisfied.
- Gathering information about the instrument and the testing process for the analyte (s) from the manufacturer.
- Risk Assessment - mapping the process to identifying procedural weaknesses.
- Developing a Quality Control Plan to mitigate errors identified in the risk assessment.
- Implementation and monitoring the Quality Control Plan to ensure that it is always appropriate, making adjustments as necessary

| Stage in which Failure Occurs | Problem | Effect | Remedy | Prevention | Monitor |
|---|---|---|---|---|---|
| **Pre analytical** | Wrong reagent lot used | Incorrect result | Repeat using the correct lot | Operator training | Audit frequency to target operator for training |
| **Analytical** | Reagents expired | Incorrect result or no reaction | Verify expiration date/storage conditions; rerun with non-expired reagents | Train operator to check dates and label any new expiration date as required by manufacturer | Audit reagents to ensure not being used beyond expiration date. Audit operators training |
| **Post analytical** | No indication on patient chart that physician was notified of critical or abnormal result | Delayed treatment | Give treatment or retest | Operator training on handling critical and abnormal results | Audit frequency of critical and corresponding notification |

50

ANNEXURES II

STUDENT LIST

DEPARTMENT OF BIOCHEMISTRY

| S.No | Reg No | Name | Signature |
|---|---|---|---|
| 1 | U15MB351 | SAKTHI RENGARAJAN. S | |
| 2 | U15MB352 | SAKTHIYANATHAN .S | |
| 3 | U15MB353 | SANDIYA. T | |
| 4 | U15MB354 | SARANKUMAR. B | |
| 5 | U15MB355 | SARANYA R.E | |
| 6 | U15MB336 | PADMA SUNDARI.P | |
| 7 | U15MB337 | PIRAI NILA. M | |
| 8 | U15MB338 | PRAJEETH BALAGE. B | |
| 9 | U15MB339 | PRAKASH .M | |
| 10 | U15MB340 | PRATIBA SHRUTHY. M | |
| 11 | U15MB344 | RAGHAVI .B.R | |
| 12 | U15MB345 | RAJESH .K | |
| 13 | U15MB346 | RAKESH.R | |
| 14 | U15MB331 | NAVEEN ANUSH .R | |
| 15 | U15MB332 | NAYANA.G.CHANDRAN | |
| 16 | U15MB333 | NIVEDHITHA .A.N | |
| 17 | U15MB334 | NIVETHA. S | |
| 18 | U15MB368 | SHIYAM. M | |
| 19 | U15MB369 | SHRIRAAM .K | |
| 20 | U15MB370 | SIVA SAKTHI VELAN .A.V | |

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY

Sandija . T

1. **Which of the following examples is considered point-of-care testing?**
   - Drawing blood in the ambulance and sending it to the hospital's lab.
   - Obtaining blood cultures in the emergency department.
   - Using a glucometer to obtain a whole blood glucose level.
   - Obtaining a rectal temperature during a patient transport.
2. **One of the greatest causes of errors in the accuracy of point-of-care testing is:**
   - improper equipment storage.
   - poor initial training.
   - inadequate record keeping.
   - failure to follow proper procedures.
3. **CLIA regulations have not been established to regulate:**
   - laboratory data result interpretation.
   - technician training requirements.
   - record keeping.
   - patient safety.
4. **Michael is using a CLIA-waived glucometer. What must he complete each day prior to using the glucometer for patient care?**
   - A written competency.
   - A temperature control log.
   - A correlation to another device.
   - High and low quality control testing.
5. **Which of the following lactate levels is considered an indication of serious illness when managing a patient with ongoing infections?**
   - 2.4 mmol/L
   - 1.9 mmol/L
   - 3.5 mmol/L
   - 4.6 mmol/L
6. **A patient experiencing a GI bleed could be expected to have an abnormal:**
   - potassium
   - serum lactate
   - hematocrit & hemoglobin
   - arterial blood gas
7. **Patients placed on diuretics as a result of heart failure risk developing an abnormal:**
   - potassium
   - serum lactate
   - arterial blood gas
   - hematocrit & hemoglobin

8. **During acute blood loss, the hematocrit and hemoglobin can be expected to begin dropping within about:**

- 15 minutes
- 45 minutes
- 1 hour
- 4-6 hours

9. **an elevation in which of the following is indicative of an acute coronary event?**

- Serum lactate
- Troponin-I
- Potassium
- Calcium

Rajesh. K

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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 **PRAKASH .M** has actively participated in the Value Added Course on **Point of care testing** held during Aug 2015 – Sep 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Santhosakumari

RESOURCE PERSON

Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502.

Dr. Thangapaneerselvam

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 **SAKTHI RENGARAJAN. S** has actively participated in the Value Added Course on **Point of care testing** held during Aug 2015 – Sep 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Santhosakumari

RESOURCE PERSON

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502.

Dr. Thangapaneerselvam

COORDINATOR

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

# Course feedback form

**Course title:**

Date : 31/8/2015

Course code: BIO - 01

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

# Course feedback form

**Course title:** Date 14-8-2015

Course code: BIO - 01

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

Date: 30.09.2015

From

Dr.Thangapaneerselvam
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: Point of care testing- reg.,**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Point of care testing from Aug to Sep 2015 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.Thangapaneerselvam

**Encl: Certificates**

**Photographs**

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

**Osudu, Agaram Village, Villianur commune, Kuduppakkam Post, Pudhucherry-605 502**

Date:13.05.2015

From

Dr.K.C.Malika Arjuna
Professor and Head,
Department of Anatomy,
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:** Micro Anatomy Tissue processing and H & D staining

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Micro Anatomy Tissue processing and H & D staining for first year M.B.B.S to 21 December 2015. We solicit your kind permission for the same.

Kind Regards

Dr.K.C.Malika Arjuna

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: **Dr. Rajasekar**

The HOD: **Dr.K.C.Malika Arjuna**

The Expert: **Mr.N.Anandramajayan**

The committee has discussed about the course and is approved.

Dean

(Sign & Seal)

Subject Expert

(Sign & Seal)

HOD

(Sign & Seal)

PROFESSOR & HOD
DEPARTMENT OF ANATOMY
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**

07.06.2020

**Sub: Organising Value-added Course: Micro Anatomy Tissue processing and H & D staining . 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 **"Micro Anatomy Tissue processing and H & D staining "**. 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 July to Augest 2015. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

Encl: Copy of Course content

# Course Proposal

**Course Title:**

Micro Anatomy Tissue processing and H & D staining

**Course Objective:**

1. Introduce the students to tissue processing
2. To learn basic principles of H& D staining
3. To learn the basic skills involved in H& D staining

**Course Outcome:**

Knowledge on the various aspects of histological tissue processing and the prospects of research

**Course Audience:** 1st year MBBS

**Course Coordinator:** Dr.Mallika Arjuna

**Course Faculties with Qualification and Designation:**

1. Dr. B Rajesh, M.Sc., Ph.D, Professor/Anatomy
2. Mr.N.Ananramajayan, M.Sc, Assistant Professor/Anatomy

**Course Curriculum/subtopics with schedule (30 hours)**

| Sl.No | Date | Topic | Time | Hours | Faculty Name |
|---|---|---|---|---|---|
| 1. | 15.9.15 | Introduction to micro anatomy | 4-5p.m | 1 | Dr. B Rajesh |
| 2. | 16.9.15 | microscope | 4-5p.m | 1 | Mr.N.Anandaramajayaan |
| 3. | 17.9.15 | Various reagent and it properties-1 | 4-5p.m | 1 | Dr. B Rajesh |
| 4. | 18.9.15 | Various reagent and it properties-2 | 4-5p.m | 1 | Dr. B Rajesh |
| 5. | 19.9.15 | Tissue fixation | 4-5p.m | 2 | Mr.N.Anandaramajayaan |
| 6. | 20.9.15 | Procurement of tissues | 4-5p.m | 1 | Dr. B Rajesh |
| 7. | 21.9.15 | Dehydration of tissue | 4-5p.m | 1 | Dr. B Rajesh |
| 8. | 22.9.15 | Tissue processing | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| 9. | 23.9.15 | Instrument used for tissue processing | 4-6p.m | 2 | Dr. B Rajesh |
| 10. | 24.9.15 | Preparation of hematoxylin | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| 11. | 25.9.15 | Preparation of eosin | 4-6p.m | 2 | Dr. B Rajesh |
| 12. | 26.9.15 | Preparation of different grades of solutions | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| 13. | 27.9.15 | Procedure of block preparation | 4-5p.m | 1 | Dr. B Rajesh |
| 14. | 28.9.15 | Principle of staining | 4-5p.m | 1 | Mr.N.Anandaramajayaan |
| 15. | 29.9.15 | Procedure for staining | 4-5p.m | 1 | Mr.N.Anandaramajayaan |
| 16. | 30.9.15 | Mounting slides | 4-6p.m | 2 | Dr. B Rajesh |
| 17. | 1.10.15 | Preservation and labeling of slides | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| 18. | 2.10.15 | Special staining | 4-5p.m | 1 | Dr. B Rajesh |
| 19. | 3.10.15 | Photography of slides | 4-6p.m | 2 | Mr.N.Anandaramajayaan |

| | | | | | |
|---|---|---|---|---|---|
| 20. | 04.10.15 | Recent advancements in micro anatomy | 4-6p.m | 2 | Dr. B Rajesh |
| | | | Total Hours | 30 | |

**REFERENCE BOOKS/ARTICLES:**

1.Text book of histology -Inderbir Singh

2.Tissue processing by bancraft

# VALUE ADDED COURSE

**1. Name of the programme & Code**

**Micro Anatomy Tissue processing and H & D staining and AN MA01**

**2. Duration & Period**

(30 hrs)from September 2015– to October 2015

**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's - *Enclosed as Annexure- III*

**6. Certificate model**

*Enclosed as Annexure- IV*

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

Once – September 2015– to October 2015

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- September 2015– to October 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | AN MA 01 | **Micro Anatomy Tissue processing and H & D staining and AN MA01** | **Dr.RAJESH.B**<br>**N.ANANDARAMAJAYAN** | 1st MBBS | 20 ( September 2015– to October 2015 ) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

PROFESSOR & HOD
DEPARTMENT OF ANATOMY
PONDICHERRY - 605 502

**RESOURCE PERSON**

**COORDINATOR**

# FUNDAMENTALS OF TISSUE PROCESSING AND STAINING

# Specimen Processing

## Introduction

Microscopic analysis of cells and tissues requires the preparation of very thin, high quality sections (slices) mounted on glass slides and appropriately stained to demonstrate normal and abnormal structures.

Most fresh tissue is very delicate and easily distorted and damaged, and it is thus impossible to prepare thin sections from it unless it is chemically preserved or "fixed" and supported in some way whilst it is being cut. Broadly there are two strategies that can be employed to provide this support.

1. We can freeze the tissue and keep it frozen while we cut our sections. These sections are called "frozen sections".
2. Alternatively we can infiltrate our tissue specimen with a liquid agent that can subsequently be converted into a solid that has appropriate physical properties which will allow thin sections to be cut from it. Paraffin wax is such an agent. This produces so-called "paraffin sections".

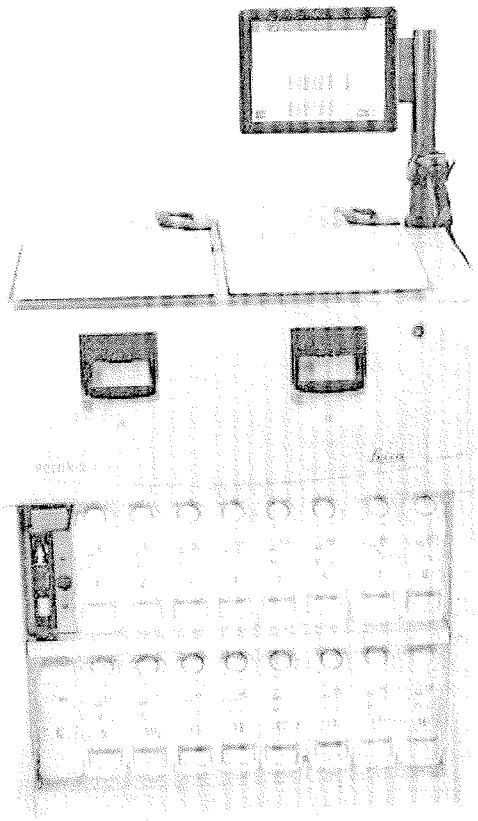
### Introduction

"Tissue processing" describes the steps required to take animal or human tissue from fixation to the state where it is completely infiltrated with a suitable histological wax and can be embedded ready for section cutting on the microtome.

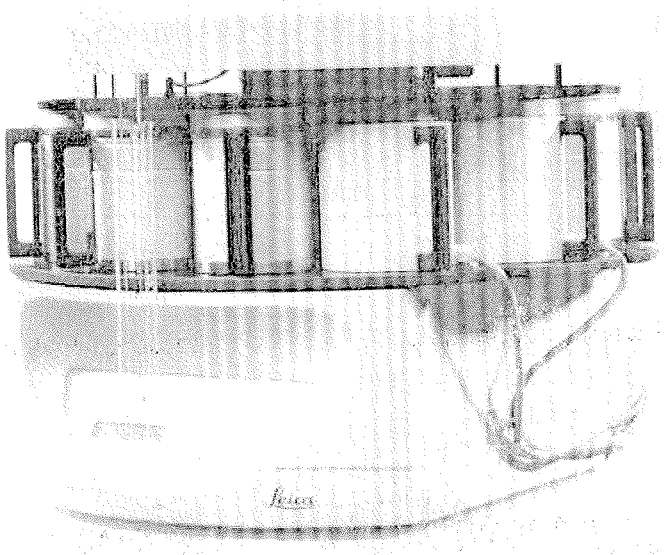
Tissue processing can be performed manually (hand processing), but where multiple specimens must be dealt with it is more convenient and much more efficient to use an automated tissue processing machine (a "tissue processor"). These devices have been available since the 1940's[1] and have slowly evolved to be safer in use, handle larger specimen numbers, process more quickly and to produce better quality outcomes. There are two main types of processors, the tissue-transfer (or "dip and dunk") machines where specimens are transferred from container to container to be processed, or the fluid-transfer (or "enclosed") types where specimens are held in a single process chamber or retort and fluids are pumped in and out as required. Most modern fluid-transfer processors employ raised temperatures, effective fluid circulation and incorporate vacuum/pressure cycles to enhance processing and reduce processing times.

Modern enclosed tissue processor

Modern enclosed tissue processor



"Dip and dunk" processors are still a good option for smaller labs.



The importance of tissue processing

Most laboratory supervisors would emphasise to their staff the importance of tissue processing. It is worthwhile to stress that use of an inappropriate processing schedule or the making of a fundamental mistake (perhaps in replenishing or sequencing of processing

reagents) can result in the production of tissue specimens that cannot be sectioned and therefore will not provide any useful microscopic information. This can be disastrous if you are dealing with diagnostic human tissue where the whole of the specimen has been processed ("all in"). There is no spare tissue. There is no diagnosis. There is however a patient to whom an explanation has to be provided.

Although mechanical or electrical faults occasionally occur in tissue processors, processing mishaps where tissues are actually compromised, mainly occur because of human error. It is important to emphasise the value of proper education and training for those carrying out tissue processing and the need to apply particular care when setting up a processor for any processing run.

## Overview of the steps in tissue processing for paraffin sections

### 1. Obtaining a fresh specimen

Fresh tissue specimens will come from various sources. It should be noted that they can very easily be damaged during removal from patient or experimental animal. It is important that they are handled carefully and appropriately fixed as soon as possible after dissection. Ideally fixation should take place at the site of removal, perhaps in the operating theatre, or, if this is not possible, immediately following transport to the laboratory.

### 2. Fixation

The specimen is placed in a liquid fixing agent (fixative) such as formaldehyde solution (formalin). This will slowly penetrate the tissue causing chemical and physical changes that will harden and preserve the tissue and protect it against subsequent processing steps.[2] There are a limited number of reagents that can be used for fixation as they must possess particular properties that make them suitable for this purpose. For example tissue components must retain some chemical reactivity so that specific staining techniques can be applied subsequently.[3] Formalin, usually as a phosphate-buffered solution, is the most popular fixative for preserving tissues that will be processed to prepare paraffin sections. Ideally specimens should remain in fixative for long enough for the fixative to penetrate into every part of the tissue and then for an additional period to allow the chemical reactions of fixation to reach equilibrium (fixation time). Generally this will mean that the specimen should fix for between 6 and 24 hours. Most laboratories will use a fixative step as the first station on their processor.

Following fixation the specimens may require further dissection to select appropriate areas for examination. Specimens that are to be processed will be placed in suitable labelled cassettes (small perforated baskets) to segregate them from other specimens. The duration of the processing schedule used to process the specimens will depend on the type and dimensions of the largest and smallest specimens, the particular processor employed, the solvents chosen, the solvent temperatures and other factors. The following example is based on a six hour schedule suitable for use on a Leica Peloris™ rapid tissue processor.

### 3. Dehydration

Because melted paraffin wax is hydrophobic (immiscible with water), most of the water in a specimen must be removed before it can be infiltrated with wax. This process is commonly carried out by immersing specimens in a series of ethanol (alcohol) solutions of increasing concentration until pure, water-free alcohol is reached. Ethanol is miscible with water in all

proportions so that the water in the specimen is progressively replaced by the alcohol. A series of increasing concentrations is used to avoid excessive distortion of the tissue.

A typical dehydration sequence for specimens not more than 4mm thick would be:

1. 70% ethanol 15 min
2. 90% ethanol 15 min
3. 100% ethanol 15 min
4. 100% ethanol 15 min
5. 100% ethanol 30 min
6. 100% ethanol 45 min

At this point all but a tiny residue of tightly bound (molecular) water should have been removed from the specimen.

4. Clearing

Unfortunately, although the tissue is now essentially water-free, we still cannot infiltrate it with wax because wax and ethanol are largely immiscible. We therefore have to use an intermediate solvent that is fully miscible with both ethanol and paraffin wax. This solvent will displace the ethanol in the tissue, then this in turn will be displaced by molten paraffin wax. This stage in the process is called "clearing" and the reagent used is called a "clearing agent". The term "clearing" was chosen because many (but not all) clearing agents impart an optical clarity or transparency to the tissue due to their relatively high refractive index. Another important role of the clearing agent is to remove a substantial amount of fat from the tissue which otherwise presents a barrier to wax infiltration.

A popular clearing agent is xylene and multiple changes are required to completely displace ethanol.

A typical clearing sequence for specimens not more than 4mm thick would be:

1. xylene 20 min
2. xylene 20 min
3. xylene 45 min

5. Wax infiltration

The tissue can now be infiltrated with a suitable histological wax. Although many different reagents have been evaluated and used for this purpose over many years, the paraffin wax-based histological waxes are the most popular. A typical wax is liquid at 60°C and can be infiltrated into tissue at this temperature then allowed to cool to 20°C where it solidifies to a consistency that allows sections to be consistently cut. These waxes are mixtures of purified paraffin wax and various additives that may include resins such as styrene or polyethylene. It should be appreciated that these wax formulations have very particular physical properties which allow tissues infiltrated with the wax to be sectioned at a thickness down to at least 2 µm, to form ribbons as the sections are cut on the microtome, and to retain sufficient elasticity to flatten fully during flotation on a warm water bath.

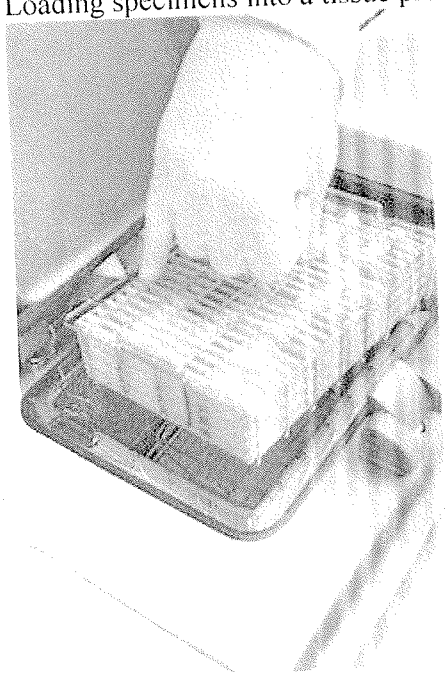
A typical infiltration sequence for specimens not more than 4mm thick would be:

1. wax 30 min
2. wax 30 min
3. wax 45 min

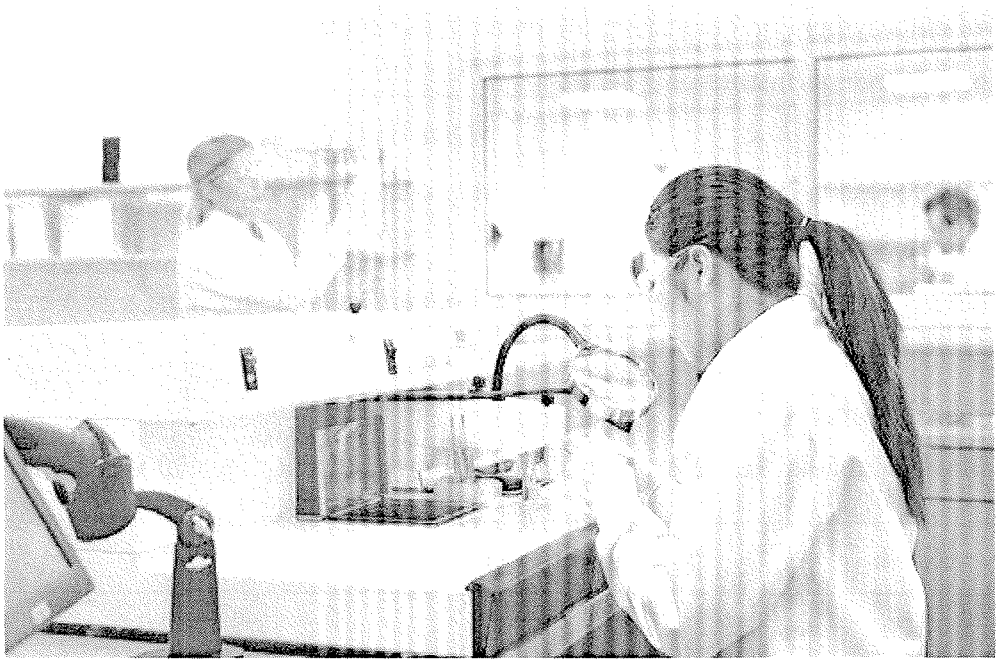
6. Embedding or blocking out

Now that the specimen is thoroughly infiltrated with wax it must be formed into a "block" which can be clamped into a microtome for section cutting. This step is carried out using an "embedding centre" where a mould is filled with molten wax and the specimen placed into it. The specimen is very carefully orientated in the mould because its placement will determine the "plane of section", an important consideration in both diagnostic and research histology. A cassette is placed on top of the mould, topped up with more wax and the whole thing is placed on a cold plate to solidify. When this is completed the block with its attached cassette can be removed from the mould and is ready for microtomy. It should be noted that, if tissue processing is properly carried out, the wax blocks containing the tissue specimens are very stable and represent an important source of archival material.

Loading specimens into a tissue processor



Embedding



"Xylene-free" processing

Although xylene is used widely as a clearing agent for tissue processing it is a toxic reagent and some laboratories prefer to use less-toxic alternatives such as isopropanol or other xylene substitutes. For this method to be successful higher wax temperatures are required so that isopropanol can be eliminated from specimens during infiltration.

The effect of tissue processing on specimens

High-quality tissue processing is critical for accurate diagnosis



The combined effects of fixation and processing is to harden the tissue and it is inevitable that shrinkage will also occur. It has been estimated that tissues shrink as much as 20% or more by the time they are infiltrated with wax[4]. Notwithstanding these effects, sections prepared from optimally processed tissues will consistently show excellent morphological

detail which allows comparisons to be made between specimens and accurate histopathological diagnoses to be determined.

In theory and in practice the paraffin blocks that will be easiest to section contain relatively homogenous tissue of uniform soft consistency (such as kidney), which, when infiltrated with wax, have a consistency similar to that of solidified wax alone (not containing tissue). Tissues of a dense or fibrous nature, or a specimen where both hard and soft tissue are present in discrete layers can pose more of a challenge because parts of them are not so well supported by the solidified wax. Differential shrinkage of the various elements in these blocks during fixation and processing contributes to the problems that might be experienced when they are being sectioned.

References


1. Clayden EC. *Practical section cutting and staining*. Edinburgh: Churchill Livingstone, 1971.
2. Hopwood D. Fixation and fixatives. In Bancroft J and Stevens A eds. *Theory and practice of histological techniques*. New York: Churchill Livingstone, 1996.
3. Carson FL. *Histotechnology*. 2nd ed. Chicago: ASCP Press, 2007.
4. Winsor L. Tissue processing. In Woods A and Ellis R eds. *Laboratory histopathology*. New York: Churchill Livingstone, 1994:4.2-1 - 4.2-39.


Steps to Better Processing and Embedding

From patient to pathologist, preparing tissue specimens for histological examination requires care, skill and sound procedures. This guide provides practical advice on best-practice techniques and simple ways to avoid common errors.

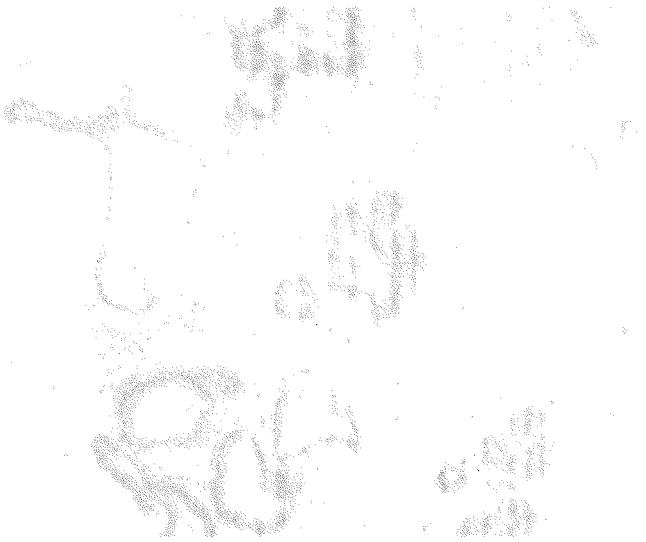
Tips for better tissue processing and embedding are highlighted in this guide. We hope each step provides a valuable reminder of good histology practice, and helps with troubleshooting when unacceptable results do occur.

Step 20 - Use an Appropriate Schedule

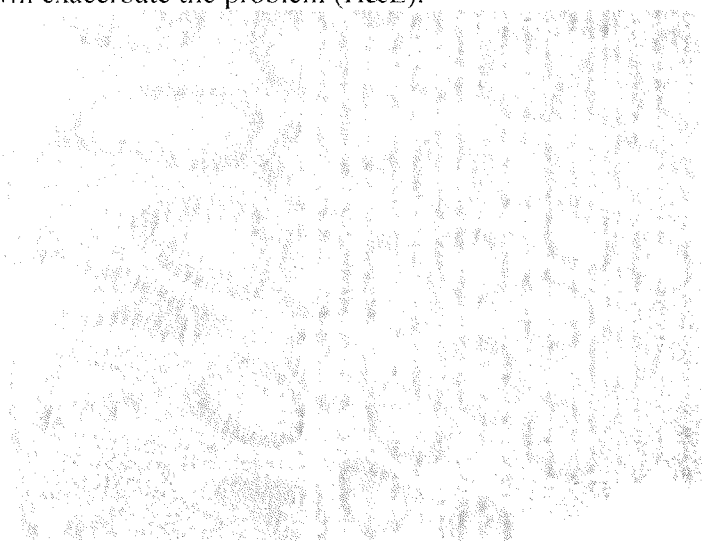
An appropriate schedule is chosen for the tissue type and size.

An inappropriate schedule is chosen. For example, a very long schedule for a small endoscopic biopsy or a very short schedule for a large, fatty breast specimen.

This micrograph of a small area of subcutaneous tissue from a large, fatty specimen shows the effects of under-processing. The fibro-fatty tissue is poorly supported and therefore fragmented while the epithelial tissue of the glands shows a lack of nuclear definition and peculiar staining due to retained solvent (H&E).



This endoscopic biopsy has been over-processed and has become very brittle. As a consequence many fine cracks are visible through out the section. Poor microtomy technique will exacerbate the problem (H&E).



Step 21 - Provide Additional Fixation

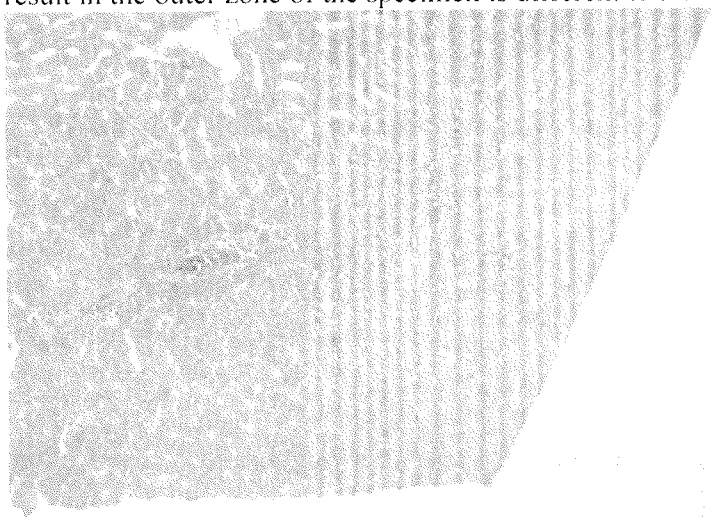
For optimal processing and good morphology tissue should be well fixed before processing. Where specimens are incompletely fixed additional formalin fixation is provided in the processing schedule.

Incompletely fixed specimens go directly into alcohol producing zonal fixation (formal in fixation for the outside of the specimen, alcohol fixation for deeper areas).

This micrograph shows the effects of zonal fixation on a section of a marrow aspirate (H&E). In the upper left portion the red cells are intact where as in the lower part they are hemolyzed.



This micrograph shows a low power view of liver stained with a trichrome stain. The staining result in the outer zone of the specimen is different to that of the inner.

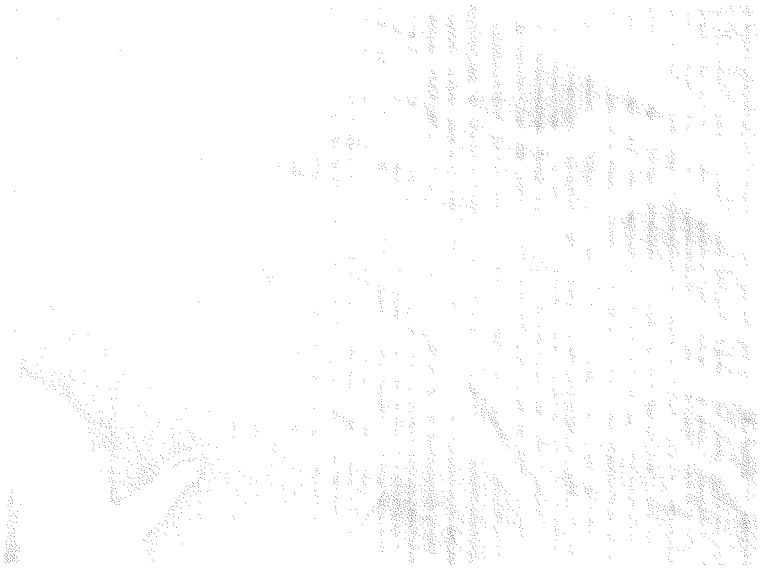


Step 22 - Maintain Reagent Quality

Processing reagents are replaced strictly according to established guidelines (ideally using are agent management system in an advanced tissue processor such as Leica Biosystem's PELORIS).

Guide lines for there placement of processing reagents are ignored, meaning that ineffective, contaminated or diluted reagents are used (e.g "out-of-threshold" warnings from the PELORIS reagent management system are ignored). This can cause poor processing quality.

In this section – from a large skin specimen – the poor preservation of the dense collagen is due to inadequate processing. In this case we believe it was due to the use of heavily contaminated reagent swell "out-of-threshold".

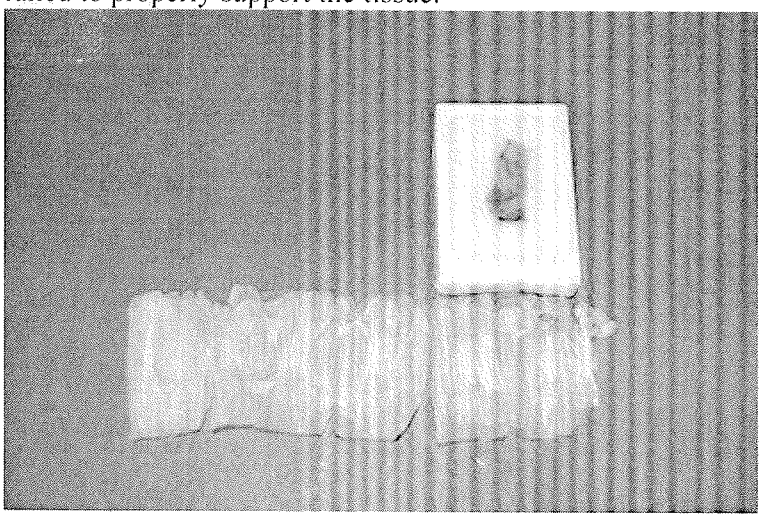


Step 23 - Use High Quality Wax

High quality wax is used for infiltration and especially for embedding (blocking out) to ensure high quality blocks that are easy to cut.

Cheap, poor quality wax from little-known sources is used for infiltration and embedding. Poor quality wax produces blocks that are difficult to cut.

A ribbon of sections was slowly cut from this block while the block was cold. The sections show considerable compression despite the low temperature used. Here the poor quality wax failed to properly support the tissue.

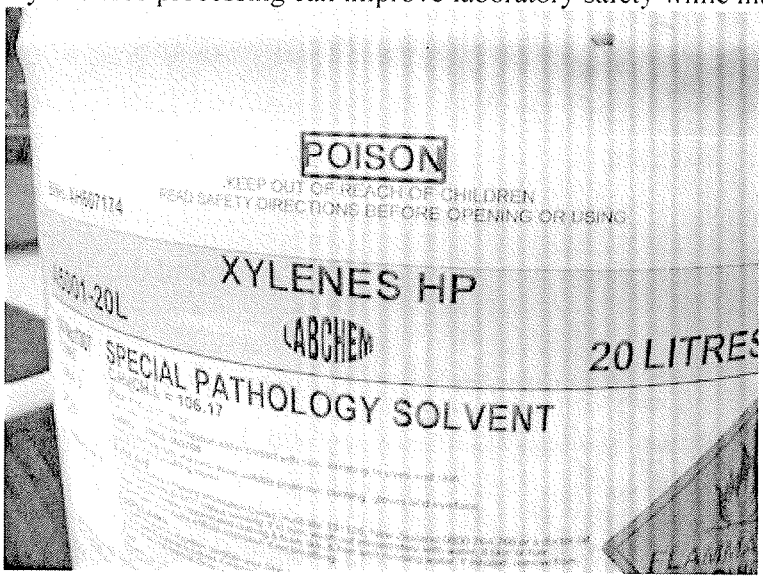


Step 24 - Avoid Hazardous Reagent

Where possible, xylene-free protocols are used (such as those available when using Leica Biosystems' PELORIS). This provides a safer laboratory environment without compromising processing quality.

No consideration is given to the health effects of xylene use. The possibility of using alternatives has not been considered.

Xylene-free processing can improve laboratory safety while maintaining quality.

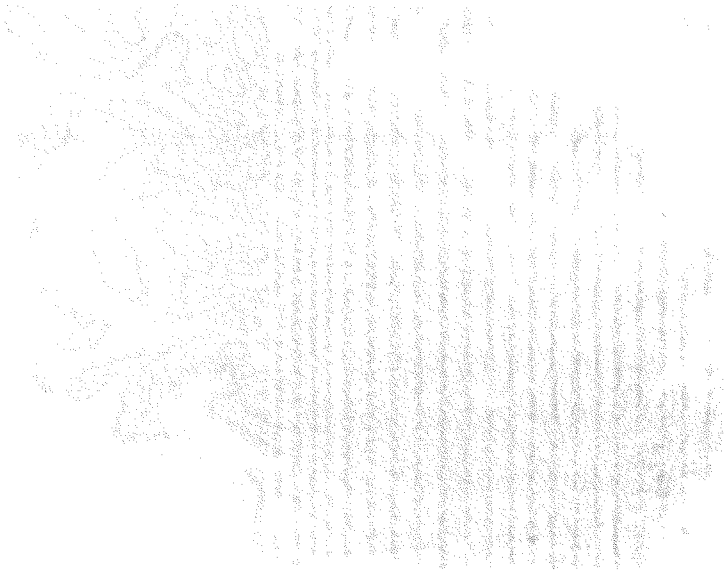



Step 25 - Orientate Specimens Carefully

Specimens are carefully orientated. Competent grossing ensures flat surfaces on most specimens. Staff performing embedding have ready access to each specimen description and are appropriately trained.

Orientation is incorrect. This can result in loss of tissue as re-embedding is required. Some poorly prepared specimens require extensive trimming on the microtome to obtain a full-face section.

This endoscopic biopsy has been orientated incorrectly and shows only the superficial level of the mucosa.

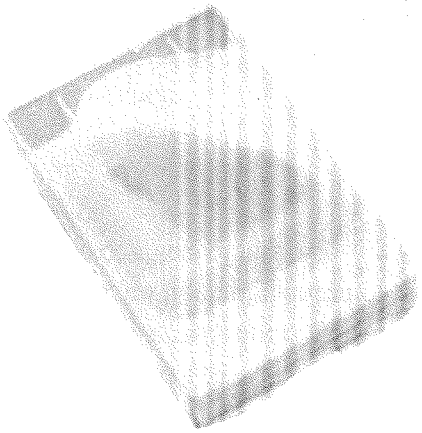


Step 26 - Choose an Appropriate Mold

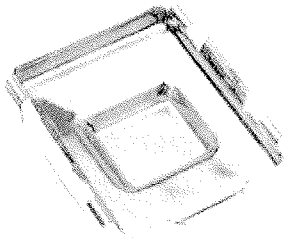
A mold of suitable size is always chosen for each specimen.

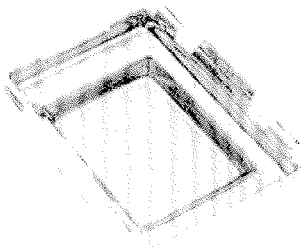
The same mold size is used for every specimen. Often the tissue touches the edge of the mold.

The mold used for this specimen was too small. The specimen is in contact with the edges of the block and may therefore be difficult to section.



Molds of different sizes are available for a variety of specimen sizes.



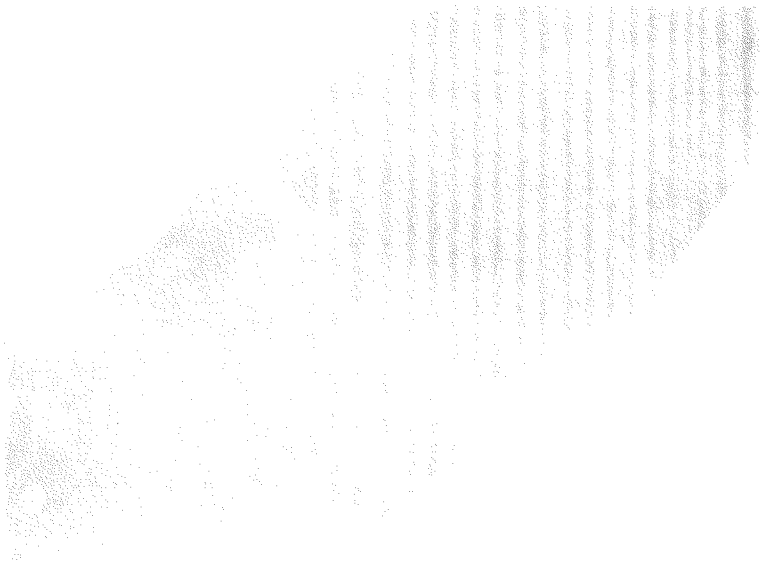


Step 27 - Handle Specimens Gently

Specimens are handled gently during embedding.

Specimens are handled forcefully during embedding to make them lie flat in the mold. Some tissue can be fractured by this process.

An H&E stained section of spleen which was fractured during embedding in an attempt to make the specimen lie flat on the base of the mold.



Step 28 - Avoid Excessive Heat

Before handling tissue, forceps are heated to the point where the wax just melts.

Forceps are heated well beyond the melting point of wax. This can cause local heat damage and a change in morphology in the area close to the contact point.

This micrograph shows the surface of a section of liver (H&E). Extreme local damage (making the tissue almost unrecognizable) has been caused by the application of heat to the tissue during embedding.

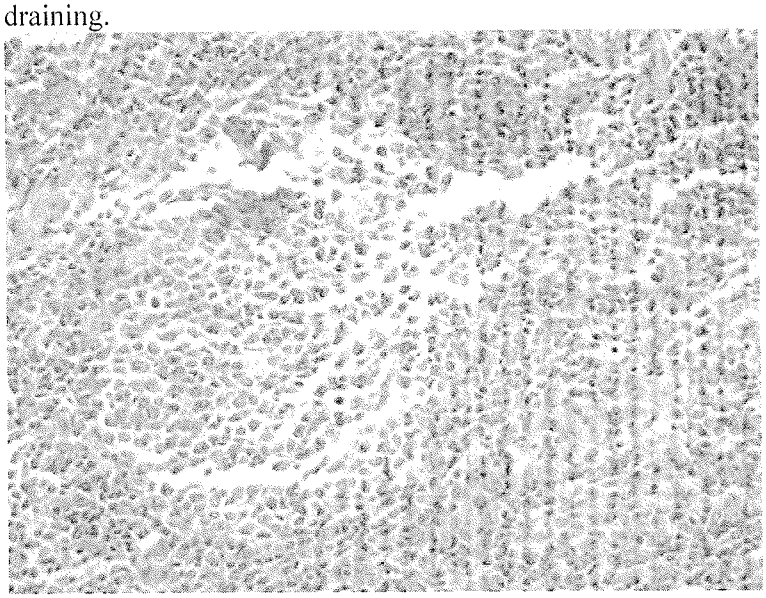


Step 29 - Check Temperatures Regularly

The temperature of the embedding center hot plate and wax reservoir is regularly checked.

The temperature of the embedding center hot plate is never checked. Even at this stage of processing specimens can be damaged by excessive local heat.

This lymph node was damaged by over-heating of the embedding center hot plate. Note the shriveled, pyknotic nuclei and extensive cracking. Cracking like this can also be caused by flotation on a water bath that is too warm, or by drying on a hot plate without sufficient draining.

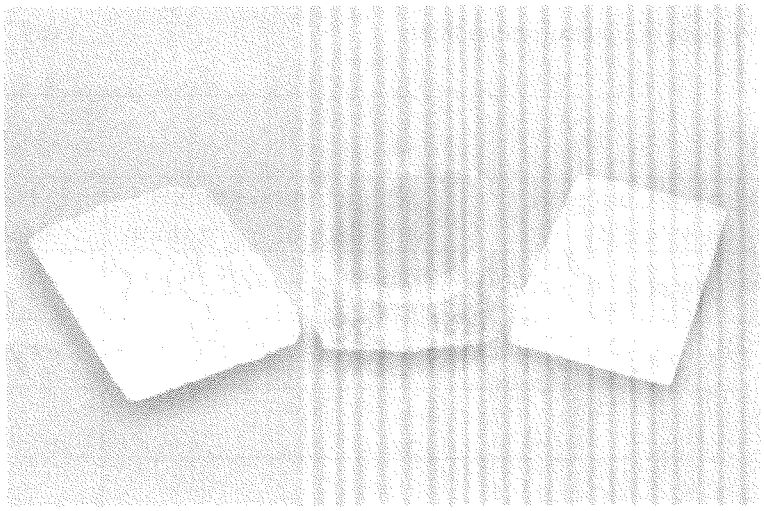


Step 30 - Do Not Over-fill Molds

Molds are filled to an optimum level and do not overflow.

Molds are over-filled, requiring scraping of the back and edges of the cassette prior to microtomy. Over-filled blocks may sit unevenly in the microtome chuck causing instability that may lead to the tissue becoming damaged during microtomy.

Priorities are important when delivering specimens to the laboratory. This is particularly so when frozen sections are involved.



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correctness. This document is not intended to be, and should not be construed as medical advice. For any use, the product information guides, inserts and operation manuals of the various drugs and devices should be consulted. Leica Biosystems and the editors disclaim any liability arising directly or indirectly from the use of drugs, devices, techniques or procedures described in this reference document.

BIHER SLIMS

## LIST OF PARTICIPANTS

| Sl. No. | Registration Number | Name of the Student |
|---|---|---|
| 1 | U15MB271 | BHALA KUMARAN .S |
| 2 | U15MB272 | CHELLAMARIAPPAN. S |
| 3 | U15MB273 | CIBIBALAA. D |
| 4 | U15MB274 | DEEPIKA DIVYA KUMARI. B |
| 5 | U15MB275 | DEEPIKA PRIYADHARSHINI. B |
| 6 | U15MB276 | DEVANAND .M |
| 7 | U15MB277 | DEVANATHAN. R |
| 8 | U15MB278 | DHANA PRIYA .P |
| 9 | U15MB279 | DHANALAKSHMI. M |
| 10 | U15MB280 | DHANUSH .R |
| 11 | U15MB281 | DHANUSH KODALI |
| 12 | U15MB282 | DHIVYA KUMARI .P |
| 13 | U15MB283 | DIVYA .S |
| 14 | U15MB284 | DIVYA DHARSHINI .N |
| 15 | U15MB285 | EVANGELINE PRETTY .G |
| 16 | U15MB286 | EZHILARASI. R |
| 17 | U15MB287 | FATHIMA BANU. A |
| 18 | U15MB288 | GAYATHRI .M |
| 19 | U15MB289 | GOGUL SUGAN. K |
| 20 | U15MB290 | GOKULA KRISHNAN. E |

Annexure II

# VALUE ADDED COURSE

**Micro Anatomy Tissue processing and H & D staining and AN MA01**

List of students Enrolled – September 2015– to October 2015

| Sl. No. | Registration Number | Name of the Student | Signature |
|---|---|---|---|
| 1 | U15MB271 | BHALA KUMARAN .S | |
| 2 | U15MB272 | CHELLAMARIAPPAN. S | |
| 3 | U15MB273 | CIBIBALAA. D | |
| 4 | U15MB274 | DEEPIKA DIVYA KUMARI. B | |
| 5 | U15MB275 | DEEPIKA PRIYADHARSHINI. B | |
| 6 | U15MB276 | DEVANAND .M | |
| 7 | U15MB277 | DEVANATHAN. R | |
| 8 | U15MB278 | DHANA PRIYA .P | |
| 9 | U15MB279 | DHANALAKSHMI. M | |
| 10 | U15MB280 | DHANUSH .R | |
| 11 | U15MB281 | DHANUSH KODALI | |
| 12 | U15MB282 | DHIVYA KUMARI .P | |
| 13 | U15MB283 | DIVYA .S | |
| 14 | U15MB284 | DIVYA DHARSHINI .N | |
| 15 | U15MB285 | EVANGELINE PRETTY .G | |
| 16 | U15MB286 | EZHILARASI. R | |
| 17 | U15MB287 | FATHIMA BANU. A | |
| 18 | U15MB288 | GAYATHRI .M | |
| 19 | U15MB289 | GOGUL SUGAN. K | |
| 20 | U15MB290 | GOKULA KRISHNAN. E | |

**RESOURCE PERSONS** **COORDINATOR**

1.

2.

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - IV**

## Micro Anatomy Tissue processing and H & D staining

### SHORT ANSWER QUESTIONS

**Course Code: AN MA01**

**I. ANSWER ALL THE QUESTIONS :** (10X2=20 marks)

1. Define dehydration
2. Dewaxing
3. Tissue fixation
4. Wax bath
5. Tissue processing
6. Procedure for preparation of haematoxylin stain
7. Procedure for preparation of Eosin stain
8. Mounting slide
9. Staining procedure
10. Diamond pencile

DEVANATHAN.
U15MB277

Micro Anatomy Tissues & H&S Stain

1. Root of Water from Xylem is called.
2 Dehydrant
2. Root of Water from the tissue is called Doming it is seen using Xylem.
2
3. Low tissue or Death tissue of the plant dry dried (10% formalin with H2O)
2
4. Water bath used to melt wax from the tissue the wax mold
2
5. Purpose of tissue for Death tissue the Stain
2 for & cell tissue for
6. Stain a man with DPX
2

# Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Sri Lakshmi 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 _____EZHILARASI.R_____ has actively participated in the Value Added Course on **Micro Anatomy Tissue processing and H & D staining** held during September 2015– to October 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

COORDINATOR

# Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
Deemed to be University under the Provisions of Sec 3, Act 1956

## CERTIFICATE OF MERIT

This is to certify that _____DEVANATHAN. R_____ has actively participated in the Value Added Course on **Micro Anatomy Tissue processing and H & D staining** held during September 2015– to October 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

COORDINATOR

**Annexure 5**

## Student Feedback Form

**Course Name:** Micro Anatomy Tissue processing and H & D staining

**Subject Code:** AN MA01

**Name of Student:** DEVANAND **Roll No.:** U15MB276

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 of Student

Date: 4/10/15

**Annexure 5**

## Student Feedback Form

**Course Name:** Micro Anatomy Tissue processing and H & D staining

**Subject Code:** AN MA01

**Name of Student:** DHANALAKSHMI.M **Roll No.:** U15MB279

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

M. Dhanalakshmi

Signature of Student

Date: 9/10/15

Date: 31-10-2015

From

Dr.K.C.Mallika Arjuna
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.

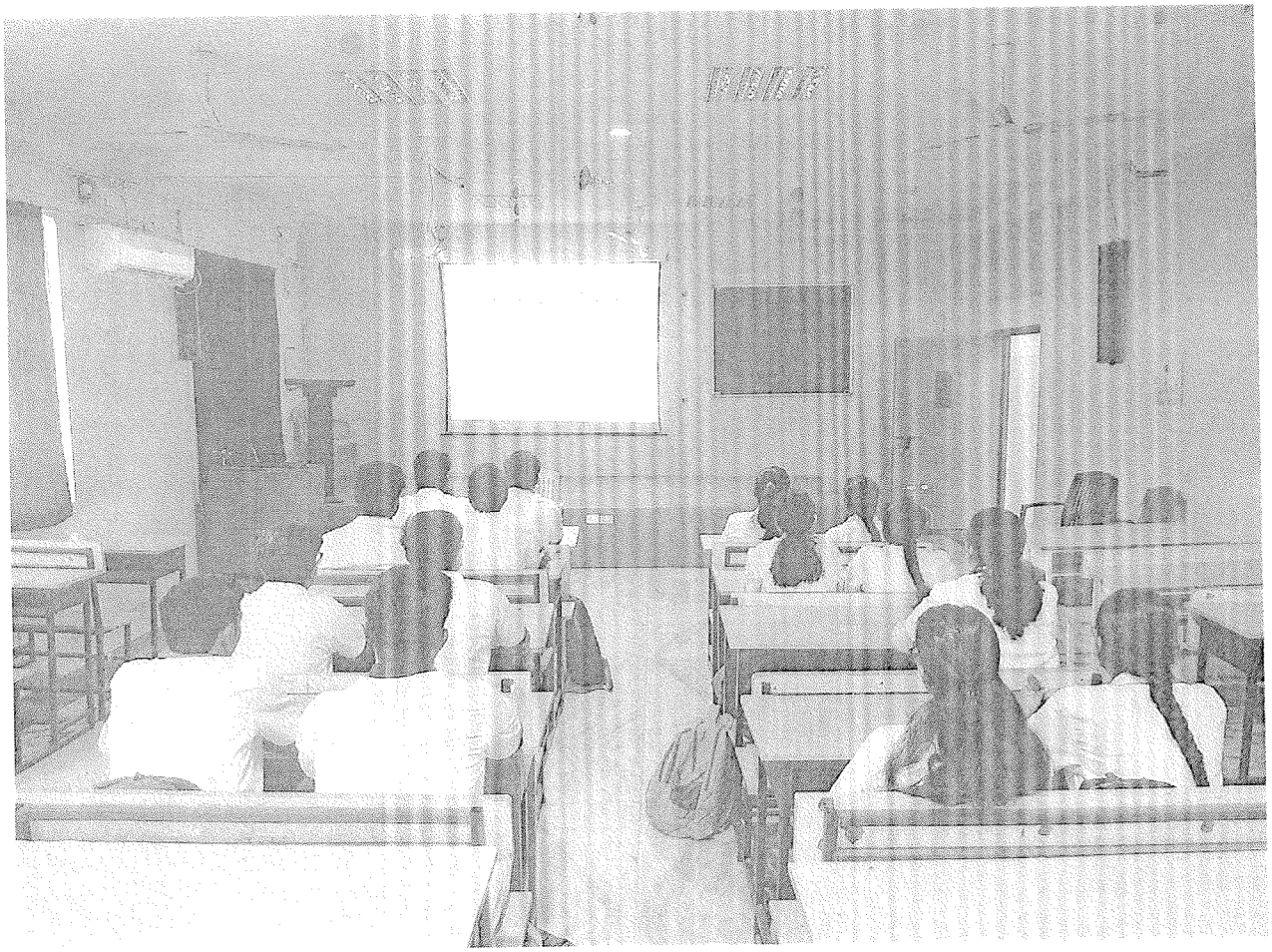
**Sub: Completion of value-added course: Micro Anatomy Tissue processing and H & D staining and AN MA01– Reg.**

Dear Sir,

With reference to the subject mentioned above, the Department of Anatomy has conducted the value-added course on **Micro Anatomy Tissue processing and H & D staining and AN MA01**during September 2015– to October 2015 for 1st year MBBS Students (2015-2016 Batch). We solicit your kind action to send certificates for the participants whose list is attached with this letter.

Kind Regards,

**Encl:** Participants List



**Sri Lakshmi Narayana Institute of Medical sciences**

Date- 21-08-2015

From
Dr. M. Basavaraj
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: cutaneous manifestations in diabetes mellitus**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **cutaneous manifestations in diabetes mellitus** on 21-09-2015. We solicit your kind permission for the same.

Kind Regards

Dr. M. Basavaraj

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayakumar

The HOD: Dr. M. Basavaraj

The Expert: Dr. A. Buvanaratchagan
The committee has discussed about the course and is approved.




DEAN Subject Expert HOD

**Sri Lakshmi Narayana Institute of Medical sciences**

Date- 21-08-2015

From
Dr. M. Basavaraj
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: cutaneous manifestations in diabetes mellitus**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **cutaneous manifestations in diabetes mellitus** on 21-09-2015. We solicit your kind permission for the same.

Kind Regards

Dr. M. Basavaraj

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayakumar

The HOD: Dr. M. Basavaraj

The Expert: Dr. A. Buvanaratchagan
The committee has discussed about the course and is approved.

Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502.
DEAN

Dr. A. BUVANARATCHAGAN, MD.,
Reg. No: 37150
Asso. Professor, Dermatology
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Osudu, Kudapakkam, Puducherry-605502.
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 ]
[ Affiliated to Bharath University, Chennai - TN ]

**Circular**

28.08.2015

**Sub: Organising Value-added Course: Cutaneous manifestations in Diabetes Mellitus (Sep 2015 to Jan 2016)**

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 **"Cutaneous manifestations in Diabetes Mellitus"**. 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 14-09-2015. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. P. JAYAKUMAR M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502

DEAN

Encl: Copy of Course content

# COURSE PROPOSAL

**Course Title:** **Cutaneous manifestations in diabetes mellitus**
**Course Objective:** **To elaborate about cutaneous manifestations of diabetes to 2nd year mbbs students**
**Course Outcome:** **Completed**
**Course Audience: second year mbbs students**
**Course Coordinator: Dr. M. Basavaraj**
**Course Faculties with Qualification and Designation:**

1. **Dr. M. Basavaraj**
   **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 | 21-9-15 | Acanthosis nigricans | 4 to 6 pm | 2 hours | Dr. M. Basavaraj |
| 2 | 23-9-15 | Acrochordons | 4:30 to 6:30 pm | 2 hours | Dr. M. Basavaraj |
| 3 | 26-10-15 | Diabetic dermopathy | 5 to 7 pm | 2 hours | Dr, Buvanaratchagan |
| 4 | 30-10-15 | Eruptive xanthomas | 4 to 6 pm | 2 hours | Dr, Buvanaratchagan |
| 5 | 3-11-15 | Necrobiosis lipoidica Diabeticorum | 4:30 to 6:30 pm | 2 hours | Dr, Buvanaratchagan |
| 6 | 27-11-15 | Rubeosis facei | 5 to 7 pm | 2 hours | Dr. M. Basavaraj |
| 7 | 30-11-15 | Steven Johnson syndrome | 4 to 6 pm | 2 hours | Dr, Buvanaratchagan Dr, Buvanaratchagan |
| 8 | 3-12-15 | Vitiligo | 4:30 to 6:30 pm | 2 hours | Dr. M. Basavaraj |
| 9 | 07-12-15 | Bullous diabeticorum | 5 to 7 pm | 2 hours | Dr, Buvanaratchagan |
| 10 | 14-12-15 | Diabetes related conditions | 4 to 6 pm | 2 hours | Dr, Buvanaratchagan |
| 11 | 21-12-15 | Diabetes associated infections | 4:30 to 6:30 pm | 2 hours | Dr. M. Basavaraj |
| 12 | 4-1-16 | Bacterial infections | 5 to 7 pm | 2 hours | Dr. M. Basavaraj |
| 13 | 11-1-16 | General skin care in diabetes | 4 to 6 pm | 2 hours | Dr, Buvanaratchagan |
| 14 | 18-1-16 | Care of diabetic foot | 4:30 to 6:30 pm | 2 hours | Dr. M. Basavaraj |
| 15 | 28-1-16 | Q&A, mcq | 5 to 7 pm | 2 hours | Dr, Buvanaratchagan |
| | | | 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**

Cutaneous manifestations in diabetes mellitus and DR01

**2. Duration & Period**

30 hrs & Sep 2015 to Jan 2016

**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**:

Sep 2015 to Jan 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| **Value Added Course-** Sep 2015 to Jan 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | DR01 | Cutaneous manifestations in diabetes mellitus | Dr. Buvanaratchagan | 2nd year MBBS | 15 (Sep 2015 to Jan 2016) |
| | | | | | |

**10. Certificate model**

*Enclosed as Annexure- V*

Dr. Buvanaratchagan — **RESOURCE PERSON**

Dr. M. Basavaraj — **COORDINATOR**

## ABSTRACT- VALUE ADDED COURSE

**1. Name of the programme & Code**

Cutaneous manifestations in diabetes mellitus and DR01

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30 hrs & Sep 2015 to Jan 2016

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**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:**

Sep 2015 to Jan 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- Sep 2015 to Jan 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | DR01 | Cutaneous manifestations in diabetes mellitus | Dr. Buvanaratchagan | 2nd year MBBS | 15 (Sep 2015 to Jan 2016) |
| | | | | | |

**10. Certificate model**

*Enclosed as Annexure- V*

Dr. Buvanaratchagan

**RESOURCE PERSON**

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**ANNEXURE 1**

# CUTANEOUS MANIFESTATIONS IN DIABETES MELLITUS



# PARTICIPANT HANDBOOK

**COURSE DETAILS**

| Particulars | Description |
|---|---|
| Course Title | CUTANEOUS MANIFESTATIONS IN DIABETES MELLITUS- An overview |
| Course Code | DR01 |
| Objective | 1. To learn about the clinical features<br>2. To learn about the diagnosis<br>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 MBBS Students |
| Duration | 30hrs sep 2015 to Jan 2016 |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | Multiple choice questions |

Diabetes is the most common endocrine disorder, affecting 8.3% of the population (1). Skin disorders will be present in 79.2% of people with diabetes (2). A study of 750 patients with diabetes found that the most common skin manifestations were cutaneous infections (47.5%), xerosis (26.4%), and inflammatory skin diseases (20.7%) (2). Individuals with type 2 diabetes are more likely than those with type 1 diabetes to develop cutaneous manifestations. Cutaneous disease can appear as the first sign of diabetes or may develop at any time in the course of the disease. This review provides a brief overview of skin conditions that primary care providers (PCPs) may encounter when treating patients with diabetes.

## Conditions Associated With Insulin Resistance

### Acanthosis Nigricans

Acanthosis nigricans (AN) is likely the most readily recognized skin manifestation of diabetes (3). It is present in up to 74% of obese adult patients and can be predictive of the existence of hyperinsulinemia (4). The presence of AN is a prognostic indicator for developing type 2 diabetes. There is also a possible genetic predisposition or increased sensitivity of the skin to hyperinsulinemia in different ethnic groups. At the same obesity rates, prevalence of AN is lowest in whites (0.5%), higher in Hispanics (5%), and even higher in African Americans (13%) (5).

AN is a hyperpigmented velvety thickening of skin folds, presenting predominantly in the neck, axilla, and groin areas (Fig. 1). Possible additional presentations could include skin tags and hyperkeratosis. Heredity, obesity, endocrine disorders, certain drugs, and malignancy are associated with AN. Benign AN type 2 is related to type 2 diabetes, and pseudo-AN type 3 is associated with the metabolic syndrome. Type 2 diabetes–related AN has an insidious onset and initially presents as hyperpigmentation. Both underlying conditions present with insulin resistance (3). Children aged 8–14 years who had AN were found to have insulin resistance, and 25% had disturbed glucose metabolism at the time of the study (6). Microscopically, AN presents as papillomatosis and hyperkeratosis (epidermis in irregular folds, exhibiting various degrees of acanthosis).



FIGURE 1.

Acanthosis nigricans and acrochordans.

Treatment consists of treating the underlying cause. Significant weight loss resolves AN type 2 and type 3. Topical or systemic retinoids and topical retinolytics may be used to manage symptoms (7).

Acrochordrons

Acrochordons, or fibroepithelial polyps, skin tags, and soft fibromas, are pedunculated outgrowths of normal skin on a narrow stalk, most commonly located on the eyelids, neck, axillae, and groin (Fig. 1). They are found in ~25% of adults, and their number and prevalence increases with age (6). Familial history, obesity and AN have been related to acrochordons; the relationship between hyperinsulinemia and skin tags has been well established (8).

Acrochordons are benign lesions, but may become symptomatic with abrasion or necrosis. Red or black skin tags are the result of twisting of the base, which cuts off the blood supply. The diagnosis of acrochordons is made by clinical appearance. Rarely, they may look suspicious for malignancy and should be sent for histological testing.

Treatment is usually cosmetic or for cases involving irritation. Excision may be performed with forceps, fine-grade scissors, cryosurgery with liquid nitrogen, or electrodesiccation (9).

Diabetic Dermopathy

Population studies from Sweden demonstrate that diabetic dermopathy (DD) affects 33% of patients with type 1 diabetes, 39% of patients with type 2 diabetes, and 2% of control subjects (9). However, a more recent study found that DD is present in only 0.2% of people with well-controlled type 2 diabetes (10).

This condition presents as small (<1 cm), well-demarcated, atrophic depressions, macules, or papules on the pretibia and is considered to be a sign of insulin resistance (Fig. 2). Lesions heal and disappear within 1–2 years on their own, leaving atrophic hypopigmentation at the site of origin (3). Little is known about the relationship of DD to diabetes. On cadaveric skin biopsy, 4 of 14 samples demonstrated moderate to severe arterial wall thickening, and 11 of 14 samples demonstrated mild basement membrane thickening. Stain findings suggested the presence of hemosiderin and melanin depositions in the epidermis of affected patients (11).



FIGURE 2.

Diabetic dermopathy.

No current treatment exists or is necessary for DD, which is asymptomatic and does not lead to morbidity (3).

Eruptive Xanthoma

Eruptive xanthoma (EX) presents on the buttocks, elbows, and knees as sudden onset crops of yellow papules with an erythematous base (Fig. 3) (12). EX is rare and occurs more often in patients with poorly controlled type 2 diabetes. The sudden appearance of EX can be worrisome to patients and may prompt a visit to the physician.



FIGURE 3.

Eruptive xanthomas.

These lesions can be the first sign of diabetes. The decrease in lipoprotein lipase activity seen in insulin-dependent diabetes results in an accumulation of serum triglycerides. Occasionally, when the serum triglyceride level reaches 2,000 mg/dL, lipids will deposit in the skin (13). Cutaneous presentation is associated with hypertriglyceridemia types I, III, IV, and V or secondary hyperlipidemias. Types I, III, IV, and V show high concentrations of very-low-density lipoprotein and chylomicrons. EX lesions tend to resolve spontaneously within weeks (14).

Diagnosis can be made clinically and confirmed with a biopsy of the lesions. It is important to obtain fasting lipid levels at presentation. People with EX are at higher risk from hypertriglyceridemia of early coronary artery disease and pancreatitis (13). Treatment should aim to lower the triglyceride concentration with diet modification and systemic medications to reverse this condition and decrease complications (15,16).

### Rubeosis Facei

Rubeosis facei (RF), a relatively common skin manifestation associated with diabetes, is a microangiopathic complication. It may go unnoticed by patients and physicians. However, if recognized, it should alert physicians to look for other microangiopathic complications such as retinopathy (17). RF presents as a flushing to the face. This condition is seen in 3–5% of people with diabetes. In a study of 150 participants comparing facial redness association with diabetes, Gitelson et al. (18) showed that 59% of patients with diabetes had markedly red faces compared to slightly red or not red (21 and 20%, respectively).

The appearance of RF correlates with poor glucose control. No treatment is needed. Strict glycemic control can improve the appearance and prevent complications of microangiopathy in other organ systems (12,19).

### Epidermal Necrolysis/Stevens-Johnson Syndrome

Stevens-Johnson syndrome is a rare mucocutaneous necrotizing condition diagnosed in 1–6 cases per million people annually worldwide (20). A more severe form called toxic epidermal necrolysis is diagnosed at a rate of 0.4–1.2 cases per million people per year (21). Because of their similar etiology, pathogenesis, and clinical and histological presentation, it has been proposed to refer to both conditions as epidermal necrolysis (EN) (22).

In most cases, EN begins on first exposure to an inciting drug, within 8 weeks of the first dose. The dipeptidyl peptidase-4 inhibitor sitagliptin has been associated with cases of Stevens-Johnson Syndrome (23). It could present with fever, headache, rhinitis, cough, malaise, burning eyes, and dysphagia (24). In 1–3 days, EN progresses to mucocutaneous ulcerations, necrosis and detachment of epidermis, severe stomatitis, and ocular involvement (25). Initial dusky red, pruritic macules are distributed symmetrically over the face, upper trunk, and proximal limbs, with distal limbs relatively spared (26). These lesions progressively coalesce and develop dark necrotic centers as they spread down the trunk. Nickolsky's sign—displacement of epidermis with lateral pressure—is positive over the blistering epidermis.

The pathophysiology of EN is under-investigated. Presence of a strong cell-mediated immunological response involving natural killer cells and $CD8^+$ T lymphocytes specific for the causative agent has been noted. This reaction also involves monocytes and granulocytes (27).

Other factors that amplify the reaction are still being investigated. The end result of hypersensitivity is a full-thickness keratinocyte apoptosis of the epidermis and mucous membranes (28). Although drugs and their components are the most common etiologies, viruses, *Mycoplasma pneumoniae*, and immunizations are also suspected. More than 100 medications have been identified as causes of EN (29). If a person develops EN while on sitagliptin, the drug's manufacturer recommends discontinuing therapy as soon as a hypersensitivity reaction is noted (30).

EN is a life-threatening emergency. Current treatments include withdrawal of all medications that would not be life-threatening. Discontinuation of medications started in the past 8 weeks is particularly important. EN is treated supportively as a massive burn, with emphasis on preservation of intact skin and supportive symptomatic measures. Patients presenting with EN should be transferred to a qualified intensive care unit as soon as possible (31). Immunosuppressive drugs have not proven to be helpful (24).

Go to:

## Conditions Associated With Type 1 Diabetes

### Necrobiosis Lipoidica

Necrobiosis lipoidica (NL) is rare, appearing in 0.3–1.6% of people with type 1 diabetes, more often in women than men (12,32). Typical lesions of NL occur in young and middle-aged patients and present most commonly on the pretibial skin as irregular, painless ovoid plaques with a yellow atrophic center and a red to purple periphery. The lesions are usually multiple and bilateral. Lesions may ulcerate spontaneously or from trauma (33,34). Of the patients with NL, 11–65% have type 1 diabetes at the time of cutaneous diagnosis (34). Ninety percent of people with NL who do not have diabetes eventually develop diabetes (mostly type 1 diabetes) (12). Glycemic control has no effect on the course of NL (16).

NL is a benign condition, and dermatology referral is not usually necessary. The cause of NL is currently unknown. Proposed causes are localized trauma, microangiopathy, immunoglobulins and fibrin deposition, and metabolic changes (32,35). Although NL is benign, its appearance is cosmetically distressing to patients (Fig. 4).



FIGURE 4.

Necrobiosis lipoidica.

The mainstay of treatment is currently steroids, either topical, intralesional, or, rarely, systemic. Steroids are cost-effective and have low side-effect profiles. Steroid use is beneficial to control the initial erythema in early lesions but fails to help with the atrophic component of the lesions and can worsen atrophy. Stockings are advised to help with stasis changes and protect from trauma (35). Other treatments that have been used include pentoxifyllin, cyclosporine, ticlopidine infliximab, and thalidomide. Some case reports have shown benefit from nicotinamide,

clofazimine, cloroquine, and topical tretanoin. These later treatments do require dermatology referral to manage medications and potential side effects (32,36).

Vitiligo

Vitiligo affects 0.3–0.5% of world population, making it the most common depigmenting disorder. Patients present with patches of depigmentation of skin and hair (Fig. 5).



FIGURE 5.

## Vitiligo.

Possible etiologies are both environmental and polygenetic. This condition affects males and females equally (37). Out of several subtypes, generalized vitiligo is most common. It is associated with autoimmune diseases in 20–30% of cases. The most common associations are with Hashimoto's thyroiditis, Grave's disease, rheumatoid arthritis, psoriasis, type 1 diabetes (usually adult-onset), pernicious anemia, systemic lupus erythematosus, and Addison's disease (38). A 2009 study of 50 patients with type 1 diabetes reported that 4% of subjects had vitiligo (39). Genetic vitiligo (GV) is most often a gradually progressive disorder and is unresponsive to treatment. However, some cases do stop progressing. GV complications are long duration, Koebner phenomenon, leukotrichia, and mucosal involvement (37).

Dermatological therapy attempts to reduce T-cell response and induce melanocyte migration and regeneration. Corticosteroids with ultraviolet B or calcineurin inhibitors or systemic psoralen and ultraviolet A (PUVA) light are first-line treatments. Calcipotriol, topical PUVA, excimer laser, corticosteroid pulse therapy, and surgical melanocyte grafting are some of the treatment options. These treatments are long and complicated by numerous side effects. Use of sunscreen is recommended but also controversial because of ultraviolet B stimulation of melanocytes and the possibility of repopulation, as well as photo-adaptation of vitiligo-affected skin. Moderate exposure to sun is recommended.

The psychosocial impact of vitiligo can be substantial, and patient support groups are available. Numerous nontraditional treatments are attempted by patients but should be investigated for safety before administration (40).

## Bullosis Diabeticorum

Bullosis diabeticorum, or diabetic bullae, are seen in 0.5% of individuals with type 1 diabetes. This condition is seen more often in men and in those with longstanding peripheral neuropathy. The lesions arise spontaneously and are primarily on the dorsa and the sides of the lower legs and feet. Occasionally, they are seen on the forearms and hands. The lesions present as clear bulla on non-inflamed bases. They are painless and contain sterile fluid. Lesion size can range from a few millimeters to a few centimeters (16).

Blister pathology is currently unknown. Diabetic bullae typically appear in individuals who have had type 1 diabetes for many years. However, this condition may be the first sign of diabetes (41). Lesions resolve on their own in 2–5 weeks. Differential diagnosis includes bullous pemphigoid, which can be ruled out by submitting a biopsy of the lesion for direct and indirect immunofluorescence. The lesions resemble those in acquired epidermolytic bullosa, porphyria cutanea tarda, autoimmune or impetiginous bullae, erythema multiforme, or drug eruption (42). Dermatologists often make the diagnosis of diabetic bulla; after diagnosis, this condition can be managed by PCPs.

The treatment is focused on infection prevention (19). If the bullae become large and symptomatic, they can be aspirated, leaving the roof intact to protect the skin barrier (16). Individuals may use saline compresses for symptomatic relief. Topical antibiotics or steroids are generally not necessary (41).

Go to:

## Other Diabetes-Related Conditions

### Psoriasis

Psoriasis is a chronic, inflammatory, polygenic skin disorder with environmental triggers such as trauma, medications, and infection. Psoriasis is characterized by erythematous scaly papules and plaques with pustular and erythrodermic eruptions occurring most commonly in areas of friction such as scalp, elbows, knees, hands, feet, trunk, and nails. Koebner phenomenon is a well-documented factor, in which a plaque develops on the site of the injury. Histologically, Koebner phenomenon presents with alterations in epidermal growth (elongated rete ridges with dilated blood vessels, thinned suprapapillary plate, and differentiation), intermittent parakeratosis, and multiple biochemical, immunological, and vascular abnormalities (e.g., lymphocyte and neutrophil infiltration).

This condition can develop at any age, with the most common onset between 15 and 30 years of age; it is uncommon in people <10 years of age. It affects 2–3% of the U.S. population. Approximately 9% of people with diabetes (type 1 or type 2) has psoriasis (42). Recent research shows that psoriasis may raise predisposition for developing diabetes mellitus, just as it does for heart attack and stroke. A 13-year study with 52,000 participants concluded that people with psoriasis have a 49–56% greater risk of developing type 2 diabetes later in life (43).

Most people with psoriasis will be treated by a dermatologist. Treatment consists of topical and systemic immunomodulators, as well as ultraviolet light and laser application. Topical treatments are effective in most cases; however, they carry a 40% adherence rate because of time-consuming application and cosmetic inappropriateness (44). Both cream and ointment should be prescribed. Phototherapy with ultraviolet A, ultraviolet B, and psoralein has been used for several decades and has shown good response in mild cases (45).

### Lichen Planus

Lichen planus is an uncommon disorder affecting <1% of the general population. Onset is common in middle age (30–60 years of age). However, the prevalence of lichen planus in people with type 1 or type 2 diabetes has been noted to be 2–4% (39,46). Lichen planus may affect the skin (termed "cutaneous," with several variants), the oral cavity ("oral"), the genitalia ("vulvar" or "penile"), the scalp ("lichen planopilaris"), the nails, or the esophagus (47,48).

Lichen planus presents as grouped, symmetric, erythematous to violaceous, flat-topped, polygonal papules distributed mainly in flexural aspects of arms and legs and rarely can appear on the trunk ("Blaschkoid" or "zosteriform") and inverse ("intertriginous") (48). Variants may include ulcerative and perforating types. Koebner phenomenon is common, and pruritus associated with lichen planus is intense and heals with postinflammatory hyperpigmentation.

Clinically, cutaneous lichen planus presents as flat-topped, violaceous papulosqamous eruptions on the skin. It is classically described as the "four Ps": pruritic, purple (violaceous), polygonal, and papules or plaques. Papules may be isolated and a few millimeters in diameter or may coalesce to form larger plaques (48). Fine white lines may be visible on the surface of papules or plaques and are known as "Wickham's striae." Diagnosis can be made based on clinical findings. If clinical recognition is questionable, a biopsy is indicated. Etiology of the condition is

unknown. It is suspected that CD8+ T cells and a Th1 immune response (cell-mediated mechanism against keratinocytes) is involved (49).

Most cases of lichen planus will be managed by a dermatologist. Treatment of cutaneous lichen planus is focused on pruritus control (47). The potency of topical steroids used depends on the site involved. On the trunk and extremities, high-potency corticosteroids are indicated, whereas on the face and intertriginous areas, medium- to low-potency ointments are used. This is because of steroid-induced atrophy. Treatment efficacy should to be checked in 3 weeks. With generalized involvement, light therapy may be added to the treatment plan. Intralesional corticosteroids are applied to thicker lesions (49). Systemic glucocorticoids, phototherapy with PUVA and ultraviolet B, and oral acitretin can be beneficial in people who are not candidates for topical steroid therapy. Few studies have been conducted on treatments because of the typical spontaneous remission of lichen planus (47,48).

### Xerosis

Xerosis is another name for dry skin. It is the second most common skin manifestation in people with diabetes. In a study of 100 patients with diabetes and skin lesions, xerosis was present in 44% of the patients (50). Patients with renal disease also frequently suffer from xerosis.

No referral to a dermatologist is necessary for xerosis. PCPs should educate patients about the importance of skin hygiene, including applying fragrance-free creams or lotions within 3 minutes of bathing to trap moisture within the skin.

### Sclerederma Diabeticorum

Sclerederma diabeticorum is a condition of thick, indurated, erythematous plaques occurring on the upper back and neck. Lesions may have erythema. This condition is seen in ~2.5–14% of individuals with diabetes (51). The condition is more common in obese middle-aged men with type 2 diabetes. Patients with scleroderma diabeticorum are often asymptomatic; however, neck and back pain may occur. The diagnosis is often made clinically, although a definitive diagnosis is confirmed by skin biopsy.

The pathogenesis of scleroderma diabeticorum is thought to be linked to increased stimulation of insulin and nonenzymatic glycosylation of collagen. This causes increased collagen cross-linking, rendering the collagen fibers resistant to degradation by collagenase and leading to increased amounts of collagen.

Treatments have showed limited benefits. Some treatment options include steroids, methotrexate, and ultraviolet light phototherapy (15,52). Differential diagnosis includes Sclerederma Buschke, also associated with type 1 diabetes. Sclerederma Buschke presents as thickening mainly on the neck, shoulders, and upper limbs, often after an upper-respiratory infection. This condition clears spontaneously in a period of months or years. Women are affected more often than men. Sclerederma diabeticorum involves the fingers, hands, and trunk. It is in the family of diabetic thick skin called morphea and is the most severe, systemic sclerederma (53).

### Granuloma Annulare

Granuloma annulare (GA) presents as erythematous to flesh-colored papules coalescing to form an oval or ring lesion. GA often presents asymptomatically but can cause pruritus or a burning sensation (54). The association between granuloma annulare and diabetes is controversial. One retrospective study showed a 12% association between GA and diabetes (55). Another study reported diabetes in 21% of 100 cases of generalized granuloma annulare (GGA) and in 9.7% of 1,350 cases of localized GA (56). Skin lesions may often precede diabetes. Struder et al. (55) suggest that patients with recurrent localized granuloma annulare or the disseminated form be given a glucose tolerance test.

The pathogenesis of GA is currently unknown. Treatment options are topical steroids, intralesional steroids, isotretinoin, dapsone, antimalarials, and phototherapy. Untreated lesions may spontaneously regress; this is more common in the localized form of GA than in the disseminated form (57). Localized forms can be treated easily and followed by PCPs. Recurrent GA or disseminated GA can be worked up by PCPs and referred to a dermatologist. GGA tends to be idiopathic. However, it has been associated with diabetes and with diseases such as autoimmune thyroiditis, HIV, hepatitis C, Epstein-Barr virus infection, sarcoidosis, and internal malignancies (58).

### Acquired Perforating Dermatosis

Acquired perforating dermatosis presents as dome-shaped papules and nodules with hyperkeratotic plugs. This condition is characterized by the transepidermal elimination of some component of the dermis. The cutaneous perforating disorders have classically been divided into four types: elastosis perforans serpiginosa, reactive perforating collagenosis, perforating folliculitis, and Kyrle's disease. Perforating disorders have been associated with chronic renal failure, dialysis, and diabetes. Acquired perforating dermatitis is seen in both type 1 and type 2 diabetes (15,16,59). In most cases, the renal disease is a complication of diabetic nephropathy (60). The lesions of acquired perforating dermatosis are most commonly seen on the trunk and extremities and tend to be pruritic.

It has been thought that the mechanism of action may be derived from epidermal trauma, a foreign-body reaction to the collagen in the dermis, or metabolic products from uremia (59,61). Dialysis has not shown therapeutic value, but renal transplant has been shown to be effective in clearing the lesions (60). Treatment options include avoidance of scratching, topical or systemic steroids, phototherapy, retinoid, and antihistamines.

### Onychodystrophy

Onychodystrophy presents as excessive nail thickening and deformity, which may cause accumulation of debris and subsequent infection of the toe that should be treated as a diabetic ulcer. Poorly fitting shoes may cause repeated trauma and worsening of the injured site (61). In patients with diabetes, onychodystrophy is the result of poor peripheral circulation and diabetic neuropathy. The condition itself may cause diabetic foot ulcers (62). Proper nail care, well-fitting shoes, and immediate attention to nail infections are important.

### Periungual Telangectasias

Periungual telangectasias present as nail fold erythema, dilated blood vessels visible to the naked eye, fingertip tenderness, and thick cuticles. Telangectasias arise in the nail beds of people with diabetes after loss of capillary loops and dilation of remaining capillaries. The condition is present in up to 49% of people with diabetes (63). Some patients also experience fingertip tenderness. No treatment is necessary for this condition.

Go to:

## Infections Associated With Diabetes

### Cutaneous Infections

Infections form the largest group of cutaneous conditions affecting people with diabetes. In a 2009 study of 50 patients, 55% of those with diabetes had infectious skin manifestations at some time (39). Another study reported a 61% prevalence rate in skin infections in people with diabetes (64). Cutaneous infections include candidiasis, dermatophytosis, and bacterial infections. These are described in more detail below.

Go to:

### Candidiasis

Mucocutaneous candidiasis is caused most commonly by Candida albicans and presents as red plaques with characteristic white adherent exudate and satellite pustules. The risk of infection is increased with hyperglycemia, which favors Candida proliferation. Candidal vulvovaginitis is the most common of all cases, and perianal candidiasis is also common in both males and females. Other presentations include thrush (infection of oral mucosa and perleche), angular cheilitis, intertrigo (infection of skinfolds and erosio interdigitalis blastomysetica chronica), finger web space infection, paronychia (infection of soft tissue around the nailplate), and onichomycosis (infection of the nail) (3).

Common Cutaneous Fungal Infections

| Infection | Definition |
| --- | --- |
| Candidal vulvovaginitis | Infection of vaginal mucosa |
| Perianal candidiasis | Infection of perineum and perianal area |

| Infection | Definition |
|---|---|
| Thrush | Infection of the oral mucosa |
| Perleche | Infection of labial commissures of mouth angles |
| Intertrigo | Infection of skinfolds |
| Erosion interdigitalis blastomysetica chronica | Infection of finger web space |
| Paronychia | Infection of the soft tissue around the nail plate |
| Onichomycosis | Infection of the nail |

Rarely, critically ill patients with diabetic ketoacidosis (DKA) may be diagnosed with mucormycosis, an acute, severe, soft-tissue infection caused by *Mucor*, *Rhizopus*, and *Absidia* species. Saprophytic fungi prefer the low pH environments seen during DKA and thrive in hyperglycemia. Some fungi also utilize ketones as nutritional substance (3). An estimated 50–75% of cases of rhinocerebral mucormycosis occur in patients with diabetes (65).

Mucormycosis is progressive and poorly responds to systemic antifungals. Treatment options include itraconazole, fluconazole, amphotericine B, and voriconazole. This condition is often fatal.

Go to:

## Dermatophytosis

Tinea or dermatophytoses are superficial infections of the skin, hair, and nails by fungus. Tinea corporis, tinea pedis (Fig. 6), and onychomycosis (Fig. 7) are common dermatophyte infections encountered in people with diabetes. In a 2013 study of 76 patients with tinea corporis, the main predisposing factor was xerosis (66). In a 2001 study of 171 people with diabetes compared with 276 control subjects, the most common infection in people with diabetes was tinea pedis, followed by distal subungual onychomycosis (65). This study did not show a correlation between dermatophytosis and duration or type of diabetes or its complications.



FIGURE 6.

Tinea pedis.



FIGURE 7.

Onchiomycosis.

*Trichophyton rubrum*, *Trichophyton mentagrophytes*, and *Trichophyton tonsurans* are the most common dermatophytes. Because dermatophyte infections are so common in the general population, no dermatology referral is necessary. Treatment consists of topical antifungals or systemic antifungal medication. Table 2 summarizes common fungal infections and the topical and oral antifungal therapies used to treat them.

TABLE 2.

Treatment Options for Common Fungal Infections

| Cutaneous Fungal Infections | Treatment Options |
|---|---|
| Candidal vulvovaginitis | Butoconazole vaginal 2% cream |
| | Clotrimazole vaginal 1% cream, 100 mg vaginal tablet |
| | Miconazole 2% cream, 100 mg vaginal suppository, 200 mg vaginal suppository, 1,200 mg vaginal suppository |
| | Ticonazole vaginal 6.5% ointment |
| | Fluconazole 150 mg × 1 dose |
| | Nystatin vaginal 100,000-unit vaginal tablet |
| Perianal candidiasis | Miconazole topical 2% cream, 4% cream |
| | Miconazole insert 100 mg, 200 mg, 1,200 mg |
| | Diflucan 150 mg by mouth × 1 |

| Cutaneous Fungal Infections | Treatment Options |
|---|---|
| Thrush | Nystatin 100,000 U/mL |
| | Clotrimazole 10 mg |
| | Miconazole 50 mg |
| | Gentian violet topical 1% |
| Perleche | Nystatin/triamcinolone topical 100,000 U/0.1% |
| | Clotrimazole topical 1% |
| | Miconazole topical 2% |
| | Ketoconazole topical 2% |
| Intertrigo | Fluconazole 200 mg daily × 2–4 weeks |

| Cutaneous Fungal Infections | Treatment Options |
|---|---|
| | Itraconazole 200 mg daily × 2–4 weeks |
| | Ketoconazole 200 mg daily × 2–4 weeks |
| | Terbinafine 500 mg by mouth twice daily × 6–8 weeks |
| | Nystatin topical 100,000 units/g ointment, powder, cream |
| Erosion interdigitalis blastomysetica chronica | Clotrimazole 1% cream or solution |
| Paronychia | Fluconazole 200 mg daily × 2–4 weeks |
| | Itraconazole 200 mg daily × 2–4 weeks |
| | Ketoconazole 200 mg daily × 2–4 weeks |
| Onichomycosis | Terbinafine 250 mg |

Go to:

## Bacterial Infections

Cutaneous bacterial infections are more common, as well as more severe, in people with diabetes. Diabetic foot ulcers are the leading type of morbidity in diabetes. They develop because of decreased sensation from diabetic neuropathy and unrecognized injury, with subsequent infection. White blood cell dysfunction resulting from increased glucose levels allows bacteria to proliferate. Staphylococcal folliculitis or skin abscesses are among the most common bacterial infections in uncontrolled diabetes. They respond well to antibiotics and surgical drainage. *Pseudomonas aeruginosa* is another common diabetic foot ulcer organism.

External ear canal infection caused by *Pseudomonas aeruginosa* is also frequent in people with diabetes. Pseudomonads thrive in moist environments full of oxygen. Lesions can be recognized by characteristic green-blue pigment, as well as fluorescence with Wood's lamp application. Microscopically, pseudomonads are identified as gram-negative rods. Patients may present with otalgia, otorrhea, hearing loss, and edema and erythema of the external ear canal.

Treatment consists of drying the area and applying topical antibiotics to uncomplicated infections. Malignant external otitis media requires immediate recognition and systemic antibiotics such as fluoroquinolones, plus an antipseudomonal antibiotic (e.g., antipseudomonal penicillin, antipseudomonal cephalosporin, monobactam, aminoglycoside, or carbapenem). Higher doses and surgical debridement are required to prevent spreading of the infection to bone and the nervous system (67). Urgent treatment of otitis externa is important because of its potential to rapidly spread to bone and cranial nerves, which could lead to mortality (68).

Go to:

## Summary

Diabetes is the most common endocrine disorder, and many cutaneous disorders are associated with diabetes. Knowledge of these skin conditions can aid PCPs in the diagnosis of diabetes and the treatment of its associated skin conditions. Most conditions can be managed by PCPs, but referral to a dermatologist may be warranted in some cases. As the incidence and prevalence of diabetes increases, skin manifestations associated with diabetes will become more common. Thus, PCPs should familiarize themselves with their presentation and treatment.

**Annexure 2**

**Bharath Institute of Higher Education and Research**

Sri Lakshmi Narayana Institute of Medical Sciences

Participant list of Value-added course: **CUTANEOUS MANIFESTATIONS IN DIABETES MELLITUS- DR01**

**(Sep 2015 to Jan 2016)**

| 2nd Year MBBS Student | | | |
|---|---|---|---|
| **Sl. No** | **Name of the Student** | **Reg No** | **Signature** |
| 1 | URVASHI PAL | U18MB391 | |
| 2 | VAISHNAVI TRIPATHI | U18MB392 | |
| 3 | VARSHITHA .N | U18MB393 | |
| 4 | VIKAASH .M | U18MB394 | |
| 5 | VIKAS SHORAN | U18MB395 | |
| 6 | VIKRANT SINGH | U18MB396 | |
| 7 | K. C VINITHA | U18MB397 | |
| 8 | VISWAS ANIL | U18MB398 | |
| 9 | YASHWANTH NAIK R | U18MB400 | |
| 10 | SUHAIL AHMED | U18MB381 | |
| 11 | SUMAN KALYAN SAHOO | U18MB382 | |
| 12 | SUSMITA KHAN | U18MB383 | |
| 13 | SWAPNIL | U18MB384 | |
| 14 | SWARNAB JANA | U18MB385 | |
| 15 | SWATI K | U18MB386 | |

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. M. Basavaraj

**COORDINATOR**

PROFESSOR & HEAD
DEPT OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

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**ANNEXURE-3**

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## Cutaneous manifestations in diabetes mellitus

MULTIPLE CHOICE QUESTIONS Annexure- III

ANSWER ALL QUESTIONS Course code: DR01

1. Which of these doesn't belong to dermatologic manifestation of diabetes?

   A. Vascular
   B. Necrobiotic
   C. Metabolic
   D. Cardiac

2. Other name of shin spots?

   A. diabetic dermopathy
   B. Melasma
   C. Lp
   D. Vitiligo

3. Shin spots must have more than or equal to?

   A. 4 lesions
   B. 3 lesions
   C. 2 lesions
   D. 1 lesion

4. Deposits present in shin spots?

A. PAS positive
B. PAS negative
C. Mucin positive
D. Mucin negative

5. Other name of rubeosis faces?

A. Diabeticorum
B. PR
C. Shin spots
D. Necrobiosis

6. Diabeticorum is a poor sign of  diabetic control- true or false?

A. True
B. False
C. None

7. Pigmented purpura is seen in ?

A. Vitiligo
B. Lp
C. PR
D. Diabeticorum

8. Ragged cuticles seen in ?

A. Cutaneous tb
B. Cutaneous DM
C. LP
D. Vitiligo

9.  Acanthosis nigricans are ?

A. Velvety texture
B. Hard
C. Hypopigmented
D. Depigmented

10. Acanthosis nigricans can be treated by all except?

A. Retinoic acids
B. Control of obesity
C. Keratolytics
D. Antidepressants

ANNEXURE-3

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## Cutaneous manifestations in diabetes mellitus

MULTIPLE CHOICE QUESTIONS Annexure- III

Name: Yashwanth Naik. R.
Rollno: U18MB400

ANSWER ALL QUESTIONS Course code: DR01

1. Which of these doesn't belong to dermatologic manifestation of diabetes?

   A. Vascular
   B. Necrobiotic
   C. Metabolic
   D. Cardiac

2. Other name of shin spots?

   A. diabetic dermopathy
   B. Melasma
   C. Lp
   D. Vitiligo

3. Shin spots must have more than or equal to?

   A. 4 lesions
   B. 3 lesions
   C. 2 lesions
   D. 1 lesion

7/10

Dr. Srinivas

28/1/2016

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4. Deposits present in shin spots?

A. PAS positive
B. PAS negative
C. Mucin positive
D. Mucin negative

5. Other name of rubeosis faces?

A. Diabeticorum
B. PR
C. Shin spots
D. Necrobiosis

6. Diabeticorum is a poor sign of diabetic control- true or false?

A. True
B. False
C. None

7. Pigmented purpura is seen in ?

A. Vitiligo
B. Lp
C. PR
D. Diabeticorum

8. Ragged cuticles seen in ?

A. Cutaneous tb
B. Cutaneous DM
C. LP
D. Vitiligo

9. Acanthosis nigricans are ?

A. Velvety texture
B. Hard
C. Hypopigmented
D. Depigmented

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10. Acanthosis nigricans can be treated by all except?

A. Retinoic acids
B. Control of obesity
C. Keratolytics
D. Antidepressants

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ANNEXURE-3

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## Cutaneous manifestations in diabetes mellitus

MULTIPLE CHOICE QUESTIONS Annexure- III

Name: Vikaash. M
U18MB394

ANSWER ALL QUESTIONS Course code: DR01

1. Which of these doesn't belong to dermatologic manifestation of diabetes?

A. Vascular
B. Necrobiotic
C. Metabolic
D. Cardiac

8/10

2. Other name of shin spots?

A. diabetic dermopathy
B. Melasma
C. Lp
D. Vitiligo

28/1/2016

3. Shin spots must have more than or equal to?

A. 4 lesions
B. 3 lesions
C. 2 lesions
D. 1 lesion

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4. Deposits present in shin spots?

A. PAS positive
B. PAS negative
C. Mucin positive
D. Mucin negative

5. Other name of rubeosis faces?

A. Diabeticorum
B. PR
C. Shin spots
D. Necrobiosis

6. Diabeticorum is a poor sign of diabetic control- true or false?

A. True
B. False
C. None

7. Pigmented purpura is seen in ?

A. Vitiligo
B. Lp
C. PR
D. Diabeticorum

8. Ragged cuticles seen in ?

A. Cutaneous tb
B. Cutaneous DM
C. LP
D. Vitiligo

9. Acanthosis nigricans are ?

A. Velvety texture
B. Hard
C. Hypopigmented
D. Depigmented

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10. Acanthosis nigricans can be treated by all except?

A. Retinoic acids
B. Control of obesity
C. Keratolytics
D. Antidepressants

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# ANNEXURE-4

## Student Feedback Form

Course Name: CUTANEOUS MANIFESTATIONS IN DIABETES.

Subject Code: **DR01**

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:28-01-2016*

# ANNEXURE-4

## Student Feedback Form

Course Name: CUTANEOUS MANIFESTATIONS IN DIABETES.

Subject Code: **DR01**

Name of Student: Yashwanth Naik R Roll No.: U18MB400

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:28-01-2016*

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# ANNEXURE-4

## Student Feedback Form

Course Name: CUTANEOUS MANIFESTATIONS IN DIABETES.

Subject Code: **DR01**

Name of Student: VIKAASH - M Roll No.: U18MB394

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:28-01-2016

Signature Vikaash

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Annexure-V

# 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 YASHWANTH NAIK R has actively participated in the Value Added Course on **Cutaneous manifestations in diabetes mellitus** held during Sep 2015 – Jan 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. A. BUVANARATCHAGAN, MD., Reg. No. 37150 Asso. Professor Dept. of Dermatology Sri Lakshmi Narayana Institute of Medical Sciences Osudu, Puducherry-605 502

Dr. A. Bhuvanaratchagan
RESOURCE PERSON

PROFESSOR & HEAD DEPT. OF DERMATOLOGY SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES OSUDU, PUDUCHERRY.

Dr. M. Basavaraj
COORDINATOR

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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 VIKAASH.M has actively participated in the Value Added Course on **Cutaneous manifestations in diabetes mellitus** held during Sep 2015 – Jan 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. A. BUVANARATCHAGAN, MD.,
Reg. No: 37159
Asso. Professor, Dermatology
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry

Dr. A. Bhuvanaratchagan
RESOURCE PERSON

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, PUDUCHERRY.

Dr. M. Basavaraj
COORDINATOR

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**Course completion letter**

Date- 01-02-2016

From
Dr. M. Basavaraj
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 Chennai.

**Sub: Completion of value-added course: cutaneous manifestations in diabetes mellitus**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **cutaneous manifestations in diabetes mellitus** on 21-09-2015. 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. M. Basavaraj

<HOD Sign and Seal>

**Encl: Certificates**

**Photographs**

**Course completion letter**

Date- 01-02-2016

From
Dr. M. Basavaraj
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 Chennai.

**Sub: Completion of value-added course: cutaneous manifestations in diabetes mellitus**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **cutaneous manifestations in diabetes mellitus** on 21-09-2015. 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. M. Basavaraj

<HOD Sign and Seal>

PROFESSOR & HEAD
DEPT. OF DERMATOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES

**Encl: Certificates**

**Photographs**

Scanned by TapScanner



# Sri Lakshmi Narayana Institute of Medical Sciences

Date:06.05.2015

From

Dr.Kamatchi
Professor and Head,
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: Hospital Infection Control & Academic writing**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Hospital Infection Control for July to August 2015& Academic writing for September to October 2015. We solicit your kind permission for the same.

Kind Regards

Dr.Kamatchi

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: **Dr. Rajasekar**

The HOD: **Dr. Kamatchi**

The Expert: **Dr. Abarna.V**

The committee has discussed about the course and is approved.

Dean (Sign & Seal)

Subject Expert (Sign & Seal)

HOD (Sign & Seal)

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

DEPT OF MICROBIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES-PONDICHERRY

PROFESSOR & HOD
DEPARTMENT OF MICROBIOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY.

**Sri Lakshmi Narayana Institute of Medical Sciences**

**Circular**

25.08.2015

**Sub: Organising Value-added Course:** Certificate course in Academic Writing **-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 "certificate course in Academic Writing". 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 August 30th 2015. 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 Academic Writing**

**Course Objective:**

1. Definition for Academic Writing
2. Importance of Good Academic Writing
3. Strategies for...Understanding Academic Writing and Its Jargon
4. Problems with Opaque Writing
5. Structure and Writing Style
6. Evaluating Quality of Writing
7. **Writing Tip**

**Course Outcome:** On successful completion of the course the students will be able to write research paper effectively

**Course Audience: Medical undergraduates**

**Course Coordinator: Dr. Kamatchi**

**Course Faculties with Qualification and Designation:**

1. **Dr.Abarna.V,MD, Assistant professor**
2. **Dr.Anitha, MD Assistant professor**

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

| Date | Time | Topic - | Hour | Lecture taken by |
|---|---|---|---|---|
| 2.09.2015 | 4-7pm | Introduction & Definition | 3hrs | Dr.Abarna.V |
| 9.09.2015 | 4-7pm | Importance of Good Academic Writing | 3hrs | Dr.Anitha |
| 16.09.2015 | 4-7pm | Strategies for...Understanding Academic Writing and Its Jargon | 3hrs | Dr.Kamatchi |
| 23.09.2015 | 4-7pm | Problems with Opaque Writing | 3hrs | Dr.Abarna.V |
| 30.09.2015 | 4-7pm | Structure and Writing Style I | 3hrs | Dr.Kamatchi |
| 7.10.2015 | 4-7pm | Structure and Writing Style II | 3hrs | Dr.Anitha |
| 14.10.2015 | 4-7pm | Evaluating Quality of Writing I | 3hrs | Dr.Abarna.V |

| | | | | |
|---|---|---|---|---|
| 21.10.2015 | 4-7pm | Evaluating Quality of Writing II | 3hrs | Dr.Abarna.V |
| 28.10.2015 | 4-7pm | Writing Tip | 3hrs | Dr.Kamatchi |
| 29.10.2015 | 4-7pm | Post test | 3hrs | Dr.Anitha |
| | | Total hours | 30hrs | |

**References**


1. A Step-by-Step Guide to Writing Academic Papers, by Anne Whitaker September 2009
2. On Writing a Thesis by C P Ravikumar,IETE Journal of Education, 2000
3. Microsoft Office 2016, by Joan Lambert and Curtis Frye, Microsoft Press, Washington98052-6399
4. LATEX for Beginners, Edition 5, March 2014 Document Reference: 3722-2014
5. Essential LATEX ++, Jon Warbrick with additions by David Carlisle, Michel Goossens, Sebastian Rahtz, Adrian Clark January 1994

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Certificate course in Academic Writing and MIC02

**2. Duration & Period**

30 hrs & September 2015– OCT 2015

**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:**

Questionnaire - *Enclosed as Annexure- III*

**6. Course Feed Back**

*Enclosed as Annexure- IV*

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

September 2015– OCT 2015

**8. Year of discontinuation: 2015**

**9. Summary report of each program year-wise**

| Value Added Course- September 2015– OCT 2015 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | MIC02 | **Certificate course in Academic Writing** | Dr. Abarna.V<br>Dr.Anitha | 2nd MBBS | 33 (Sept 2015– oct 2015) |

**10. Certificate model**

*Enclosed as Annexure- V*

**RESOURCE PERSON** **COORDINATOR**

## AnnexureI

## COURSE DETAILS

| Particulars | Description |
|---|---|
| Course Title | certificate course in Academic Writing |
| Course Code | MIC02 |
| Objective | **The students will be able**<br>1. Definition<br>2. Importance of Good Academic Writing<br>3. Strategies for...Understanding Academic Writing and Its Jargon<br>4. Problems with Opaque Writing<br>5. Structure and Writing Style<br>6. Evaluating Quality of Writing<br>7. Writing Tip |
| Further learning opportunities | Academic Writing |
| Key Competencies | On successful completion of the course the students will be able to write research paper effectively |
| Target Student | 2nd yr MBBS Students |
| Duration | 10hrs September 2015– OCT 2015 |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | Questionnaire |

| Date | Time | Topic | Resource faculty |
|---|---|---|---|
| 2.09.2015 | 4-7pm | Introduction & Definition | Dr.Abarna.V |
| 9.09.2015 | 4-7pm | Importance of Good Academic Writing | Dr.Anitha |
| 16.09.2015 | 4-7pm | Strategies for...Understanding Academic Writing and Its Jargon | Dr.Kamatchi |
| 23.09.2015 | 4-7pm | Problems with Opaque Writing | Dr.Abarna.V |
| 30.09.2015 | 4-7pm | Structure and Writing Style I | Dr.Kamatchi |
| 7.10.2015 | 4-7pm | Structure and Writing Style II | Dr.Anitha |
| 14.10.2015 | 4-7pm | Evaluating Quality of Writing I | Dr.Abarna.V |
| 21.10.2015 | 4-7pm | Evaluating Quality of Writing II | Dr.Abarna.V |
| 28.10.2015 | 4-7pm | Writing Tip | Dr.Kamatchi |
| 29.10.2015 | 4-7pm | Post test | Dr.Anitha |

**Definition**

Academic writing refers to a style of expression that researchers use to define the intellectual boundaries of their disciplines and specific areas of expertise. Characteristics of academic writing include a formal tone, use of the third-person rather than first-person perspective (usually), a clear focus on the research problem under investigation, and precise word choice. Like specialist languages adopted in other professions, such as, law or medicine, academic writing is designed to convey agreed meaning about complex ideas or concepts for a group of scholarly experts.

**Importance of Good Academic Writing**

The accepted form of academic writing in the social sciences can vary considerable depending on the methodological framework and the intended audience. However, most college-level research papers require careful attention to the following stylistic elements:

**I. The big picture**

Unlike fiction or journalistic writing, the overall structure of academic writing is formal and logical. It must be cohesive and possess a logically organized flow of ideas; this means that the various parts are connected to form a unified whole. There should be narrative links between sentences and paragraphs so that the reader is able to follow your argument. The introduction should include a description of how the rest of the paper is organized and all sources are **properly cited** throughout the paper.

**II. Tone**

The overall tone refers to the attitude conveyed in a piece of writing. Throughout your paper, it is important that you present the arguments of others fairly and with an appropriate narrative tone. When presenting a position or argument that you disagree with, describe this argument accurately and without loaded or biased language. In academic writing, the author is expected to investigate the research problem from an authoritative point of view. You should, therefore, state the strengths of your arguments confidently, using language that is neutral, not confrontational or dismissive.

**III. Diction**

Diction refers to the choice of words you use. Awareness of the words you use is important because words that have almost the same denotation [dictionary definition] can have very different connotations [implied meanings]. This is particularly true in academic writing because words and terminology can evolve a nuanced meaning that describes a particular idea, concept, or phenomenon derived from the epistemological culture of that discipline [e.g., the concept of rational choice in political science]. Therefore, use concrete words [not general] that convey a specific meaning. If this cannot be done without confusing the reader, then you need to explain what you mean within the context of how that word or phrase is used within a discipline.

**IV. Language**

The investigation of research problems in the social sciences is often complex and multi-dimensional. Therefore, it is important that you use unambiguous language. Well-structured paragraphs and clear topic sentences enable a reader to follow your line of thinking without difficulty. Your language should be concise, formal, and express precisely what you want it to mean. Do not use vague expressions that are not specific or precise enough for the reader to derive exact meaning ["they," "we," "people," "the organization," etc.], abbreviations like 'i.e.' ["in other words"], 'e.g.' ["for example"], or 'a.k.a.' ["also known as"], and the use of unspecific determinate words ["super," "very," "incredible," "huge," etc.].

**V. Punctuation**

Scholars rely on precise words and language to establish the narrative tone of their work and, therefore, punctuation marks are used very deliberately. For example, exclamation points are rarely used to express a heightened tone because it can come across as unsophisticated or over-excited. Dashes should be limited to the insertion of an explanatory comment in a sentence, while hyphens should be limited to connecting prefixes to words [e.g., multi-disciplinary] or when forming compound phrases [e.g., commander-in-chief]. Finally, understand that semi-colons represent a pause that is longer than a comma, but shorter than a period in a sentence. In general, there are four grammatical uses of semi-colons: when a second clause expands or explains the first clause; to describe a sequence of actions or different aspects of the same topic; placed before clauses which begin with "nevertheless", "therefore", "even so," and "for instance"; and, to mark off a series of phrases or clauses which contain commas. If you are not confident about when to use semi-colons [and most of the time, they are not required for proper punctuation], rewrite using shorter sentences or revise the paragraph.

**VI. Academicconventions**

Citing sources in the body of your paper and providing a list of references as either footnotes or endnotes is a very important aspect of academic writing. It is essential to always acknowledge the source of any ideas, research findings, data, paraphrased, or quoted text that you have used in your paper as a defense against allegations of plagiarism. Equally important, the scholarly convention of citing sources allow readers

to identify the resources you used in writing your paper so they can independently verify and assess the quality of findings and conclusions based on your review of the literature. Examples of other academic conventions to follow include the appropriate use of headings and subheadings, properly spelling out acronyms when first used in the text, avoiding slang or colloquial language, avoiding emotive language or unsupported declarative statements, avoiding contractions, and using first person and second person pronouns only when necessary.

**VII. Evidence-BasedReasoning**

Assignments often ask you to express your own point of view about the research problem. However, what is valued in academic writing is that opinions are based on what is often termed, evidence-based reasoning, a sound understanding of the pertinent body of knowledge and academic debates that exist within, and often external to, your discipline. You need to support your opinion with evidence from scholarly sources. It should be an objective stance presented as a logical argument. The quality of your evidence will determine the strength of your argument. The challenge is to convince the reader of the validity of your opinion through a well-documented, coherent, and logically structured piece of writing. This is particularly important when proposing solutions to problems or delineating recommended courses of action.

**VIII. Thesis-Driven**

Academic writing is "thesis-driven," meaning that the starting point is a particular perspective, idea, or position applied to the chosen topic of investigation, such as, establishing, proving, or disproving solutions to the research questions posed for the topic. Note that a problem statement without the research questions does not qualify as academic writing because simply identifying the research problem does not establish for the reader how you will contribute to solving the problem, what aspects you believe are most critical, or suggest a method for gathering data to better understand the problem.

**IX. ComplexityandHigher-OrderThinking**

Academic writing addresses complex issues that require higher-order thinking skills applied to understanding the research problem [e.g., critical, reflective, logical, and creative thinking as opposed to, for example, descriptive or prescriptive thinking]. Higher-order thinking skills include cognitive processes that are used to comprehend, solve problems, and express concepts or that describe abstract ideas that

cannot be easily acted out, pointed to, or shown with images. Think of your writing this way: One of the most important attributes of a good teacher is the ability to explain complexity in a way that is understandable and relatable to the topic being presented. This is also one of the main functions of academic writing--examining and explaining the significance of complex ideas as clearly as possible. As a writer, you must adopt the role of a good teacher by summarizing a lot of complex information into a well-organized synthesis of ideas, concepts, and recommendations that contribute to a better understanding of the research problem.

---

**Strategies for...**

**Understanding Academic Writing and Its Jargon**

**The very definition of jargon is language specific to a particular sub-group of people**. Therefore, in modern university life, jargon represents the specific language and meaning assigned to words and phrases specific to a discipline or area of study. For example, the idea of being rational may hold the same general meaning in both political science and psychology, but its application to understanding and explaining phenomena within the research domain of a each discipline may have subtle differences based upon how scholars in that discipline apply the concept to the theories and practice of their work.

Given this, **it is important that specialist terminology [i.e., jargon] must be used accurately and applied under the appropriate conditions**. Subject-specific dictionaries are the best places to confirm the meaning of terms within the context of a specific discipline. These can be found by either searching in the **USC Libraries catalog** by entering the disciplinary and the word dictionary [e.g., sociology and dictionary] or using a database such as **Credo Reference**. It is appropriate for you to use specialist language within your field of study, but you should avoid using such language when writing for non-academic or general audiences.

---

**Problems with Opaque Writing**

It's not unheard of for scholars to utilize needlessly complex syntax or overly expansive vocabulary that is impenetrable or not well-defined. When writing, avoid problems associated with opaque writing by keeping in mind the following:

**1. Excessive use of specialized terminology**. Yes, it is appropriate for you to use specialist language and a formal style of expression in academic writing, but it does not mean using "big words" just for the sake of doing so. Overuse of complex or obscure words or writing complicated sentence constructions gives readers the impression that your paper is more about style than substance; it leads the reader to question if you really know what you are talking about. Focus on creating clear and elegant prose that minimizes reliance on specialized terminology.

**2. Inappropriate use of specialized terminology**. Because you are dealing with concepts, research, and data within your discipline, you need to use the technical language appropriate to that area of study. However, nothing will undermine the validity of your study quicker than the inappropriate application of a term or concept. Avoid using terms whose meaning you are unsure of--don't just guess or assume! Consult the meaning of terms in specialized, discipline-specific dictionaries by searching the USC Libraries catalog or reference database [see above].

---

## Additional Problems to Avoid

**In addition to understanding the use of specialized language, there are other aspects of academic writing in the social sciences that you should be aware of. These problems include:**

- **Personal nouns**. Excessive use of personal nouns [e.g., I, me, you, us] may lead the reader to believe the study was overly subjective. These words can be interpreted as being used only to avoid presenting empirical evidence about the research problem. Limit the use of personal nouns to descriptions of things you actually did [e.g., "I interviewed ten teachers about classroom management techniques..."]. Note that personal nouns are generally found in the discussion section of a paper because this is where you as the author/researcher interpret and describe your work.
- **Directives**. Avoid directives that demand the reader to "do this" or "do that." Directives should be framed as evidence-based recommendations or goals leading to specific outcomes.
- **Informal, conversational tone using slang and idioms**. Academic writing relies on excellent grammar and precise word structure. Your narrative should not include regional dialects or slang terms because they can be open to interpretation; be direct and concise using standard English.

- **Wordiness.** Focus on being concise, straightforward, and developing a narrative that does not have confusing language. By doing so, you help eliminate the possibility of the reader misinterpreting the design and purpose of your study.
- **Vague expressions (e.g., "they," "we," "people," "the company," "that area," etc.).** Being concise in your writing also includes avoiding vague references to persons, places, or things. While proofreading your paper, be sure to look for and edit any vague or imprecise statements that lack context or specificity.
- **Numbered lists and bulleted items**. The use of bulleted items or lists should be used only if the narrative dictates a need for clarity. For example, it is fine to state, "The four main problems with hedge funds are:" and then list them as 1, 2, 3, 4. However, in academic writing, this must then be followed by detailed explanation and analysis of each item. Given this, the question you should ask yourself while proofreading is: why begin with a list in the first place rather than just starting with systematic analysis of each item arranged in separate paragraphs? Also, be careful using numbers because they can imply a ranked order of priority or importance. If none exists, use bullets and avoid checkmarks or other symbols.
- **Descriptive writing**. Describing a research problem is an important means of contextualizing a study. In fact, some description or background information may be needed because you can not assume the reader knows everything about the topic. However, the content of your paper should focus on methodology, the analysis and interpretation of findings, and their implications as they apply to the research problem rather than background information and descriptions of tangential issues.
- **Personal experience.** Drawing upon personal experience [e.g., traveling abroad; caring for someone with Alzheimer's disease] can be an effective way of introducing the research problem or engaging your readers in understanding its significance. Use personal experience only as an example, though, because academic writing relies on evidence-based research. To do otherwise is simply story-telling.

**NOTE: Rules concerning excellent grammar and precise word structure do not apply when quoting someone.** A quote should be inserted in the text of your paper exactly as it was stated. If the quote is especially vague or hard to understand, consider paraphrasing it or using a different quote to convey the same meaning. Consider inserting the term "sic" in brackets after the quoted word or phrase to indicate that the quotation has been transcribed exactly as found in the original source, but the source

has grammar, spelling, or other errors. The adverb sic informs the reader that the errors are not yours.

**Structure and Writing Style**

**I. Improving Academic Writing**

To improve your academic writing skills, you should focus your efforts on three key areas:

1. **Clear Writing**. The act of thinking about precedes the process of writing about. Good writers spend sufficient time distilling information and reviewing major points from the literature they have reviewed before creating their work. Writing detailed outlines can help you clearly organize your thoughts. Effective academic writing begins with solid planning, so manage your time carefully.

2. **Excellent Grammar**. Needless to say, English grammar can be difficult and complex; even the best scholars take many years before they have a command of the major points of good grammar. Take the time to learn the major and minor points of good grammar. Spend time practicing writing and seek detailed feedback from professors. Take advantage of the **Writing Center** on campus if you need help. Proper punctuation and good proofreading skills can significantly improve academic writing [see sub-tab for **proofreading you paper**].

**Refer to these three basic resources to help your grammar and writing skills:**

- A good writing reference book, such as, Strunk and White's book, **The Elements of Style** or the **St. Martin's Handbook**;
- A college-level dictionary, such as, **Merriam-Webster's Collegiate Dictionary;**
- The latest edition of **Roget's Thesaurus in Dictionary Form**.

3. **Consistent Stylistic Approach**. Whether your professor expresses a preference to use MLA, APA or the Chicago Manual of Style or not, choose one style manual and stick to it. Each of these style manuals provide rules on how to write out numbers, references, citations, footnotes, and lists. Consistent adherence to a style of writing helps with the narrative flow of your paper and improves its readability. Note that some disciplines require a particular style [e.g., education uses APA] so as you write more papers within your major, your familiarity with it will improve.

---

**II. Evaluating Quality of Writing**

A useful approach for evaluating the quality of your academic writing is to consider the following issues from the perspective of the reader. While proofreading your final draft, critically assess the following elements in your writing.

- It is shaped around one clear research problem, and it explains what that problem is from the outset.
- Your paper tells the reader why the problem is important and why people should know about it.
- You have accurately and thoroughly informed the reader what has already been published about this problem or others related to it and noted important gaps in the research.
- You have provided evidence to support your argument that the reader finds convincing.
- The paper includes a description of how and why particular evidence was collected and analyzed, and why specific theoretical arguments or concepts were used.
- The paper is made up of paragraphs, each containing only one controlling idea.
- You indicate how each section of the paper addresses the research problem.
- You have considered counter-arguments or counter-examples where they are relevant.
- Arguments, evidence, and their significance have been presented in the conclusion.
- Limitations of your research have been explained as evidence of the potential need for further study.
- The narrative flows in a clear, accurate, and well-organized way.

**Writing Tip**

**Seek Help from the USC Writing Center!**

The **Writing Center** is a service supported by the university that provides one-on-one consultations and small-group workshops to help students of all abilities improve their critical thinking and writing skills. If you are having problems writing your research papers, take advantage of this service! The Center is located in Taper Hall, room 216.

**Another Writing Tip**

**Considering the Passive Voice in Academic Writing**

In the English language, we are able to construct sentences in the following way:

1. "The policies of Congress caused the economic crisis."
2. "The economic crisis was caused by the policies of Congress."

The decision about which sentence to use is governed by whether you want to focus on "Congress" and what they did, or on "the economic crisis" and what caused it. This choice in focus is achieved with the use of either the active or the passive voice. When you want your readers to focus on the "doer" of an action, you can make the "doer"' the subject of the sentence and use the active form of the verb. When you want readers to focus on the person, place, or thing affected by the action, or the action itself, you can make the effect or the action the subject of the sentence by using the passive form of the verb.

Often in academic writing, scholars don't want to focus on who is doing an action, but on who is receiving or experiencing the consequences of that action. The passive voice is useful in academic writing because it allows writers to highlight the most important participants or events within sentences by placing them at the beginning of the sentence.

**Use the passive voice when:**

- You want to focus on the person, place, or thing affected by the action, or the action itself;
- It is not important who or what did the action;
- You want to be impersonal or more formal.

**Form the passive voice by:**

- Turning the object of the active sentence into the subject of the passive sentence.
- Changing the verb to a passive form by adding the appropriate form of the verb "to be" and the past participle of the main verb.

**NOTE: Consult with your professor about using the passive voice before submitting your research paper. Some strongly discourage its use!**

BIHER SLIMS

# Annexure- II

## VALUE ADDED COURSE

**Certificate course in Academic Writing and MIC02**

**List of Students Enrolled** September 2015– OCT 2015

| 2nd Year MBBS Student | | | |
|---|---|---|---|
| **Sl. No** | **Name of the Student** | **Roll No** | **Signature** |
| 1 | SENTAMIL SELVAN .P | U14MB310 | |
| 2 | SHALINI. T. C. | U14MB311 | |
| 3 | SHANMUGA RAJA. A | U14MB312 | |
| 4 | SHANMUHA PRIYA. S | U14MB313 | |
| 5 | SHAREEFA AKHTAR.S | U14MB314 | |
| 6 | SHEMBIYAN. R.M. | U14MB315 | |
| 7 | SIKKANDAR. A | U14MB316 | |
| 8 | SINDHU. M | U14MB317 | |
| 9 | SIVARAJ. S | U14MB318 | |
| 10 | SOUNDARYA. S | U14MB319 | |
| 11 | SOWMYA DEVI. N | U14MB320 | |
| 12 | SOWWMYA. S | U14MB321 | |
| 13 | SOWMYAMANJA MADHA.I | U14MB322 | |
| 14 | SREEDEVI. B | U14MB323 | |
| 15 | SREEPADMA PURUJITH. S.S. | U14MB324 | |
| 16 | SRI JAYALAKSHMI. A | U14MB325 | |
| 17 | SRITATA. S | U14MB326 | |
| 18 | SRRUTHII. N.M. | U14MB327 | |
| 19 | SUBRAMANI. B | U14MB328 | |
| 20 | SUDARSHNA. K | U14MB329 | |
| 21 | SUKIRTHA. K | U14MB330 | |
| 22 | SURYA PRABHA. B | U14MB331 | |
| 23 | SURYA NARAYANA. S | U14MB332 | |
| 24 | SWATHI .S | U14MB333 | |
| 25 | SWATHI. S D/O SHANMUGAM | U14MB334 | |

| | | | |
|---|---|---|---|
| 26 | SWATHY. M | U14MB335 | |
| 27 | THAMARAI SELVI. K | U14MB336 | |
| 28 | THAMEENA FATHIMA.A | U14MB337 | |
| 29 | THOMAS GIDEON RUSSEL.A | U14MB338 | |
| 30 | THULASI. N | U14MB339 | |
| 31 | UMMU SALMA. A.B | U14MB340 | |
| 32 | VAISHNAVI. R | U14MB341 | |
| 33 | VEERA RADHA KUMARI. M | U14MB342 | |

**RESOURCE PERSON**

**COORDINATOR**

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - III**

**Certificate course in Academic Writing**

**QUESTIONNAIRES**

**Course Code: MIC02**

**I. ANSWER ALL THE QUESTIONS**

Shalini. T.C.

1. Write Importance of Good Academic Writing

Academic writing in the Social Sciences can vary considerable depending on the methodological framework & the intended audience

2. Write Problems with Opaque Writing

→ personal nouns

→ Directives.

— Informal, conversational

3. How to Evaluate the Quality of Writing

— It is shaped around one clear research problem, and it explains what the problem is from the outset.

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - III**

**Certificate course in Academic Writing**

Shanmugapriya. S

**QUESTIONNAIRES**

**Course Code: MIC02**

**I. ANSWER ALL THE QUESTIONS**

1. Write Importance of Good Academic Writing

Academic writing is useful for academic activity purposes.

2. Write Problems with Opaque Writing

Opaque writing - is personal nouns

3. How to Evaluate the Quality of Writing

Problem which from outset.

## AnnexureIV

## Student Feedback Form

Course Name: **Certificate Course in Academic Writing**

Subject Code: **MIC02**

Name of Student: Shalini Roll No.: U14NB211

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: 29/10/2015

Signature

## AnnexureIV

## Student Feedback Form

Course Name: **Certificate Course in Academic Writing**

Subject Code: **MIC02**

Name of Student: Shanmuhapriya.S Roll No.: U1AMBB13

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: 29.10.2015

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. T.C has actively participated in the Value Added Course on certificate course in Academic Writing held during September 2015– OCT 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Abarna.v
RESOURCE PERSON

Dr. Kamatchi
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 Shanmukapriya .S has actively participated in the Value Added Course on certificate course in Academic Writing held during September 2015– OCT 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Abarna.v
RESOURCE PERSON

Dr. Kamatchi
COORDINATOR

Date : 30.10.2015

From
Dr.Abarna.V
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:** certificate course in Academic Writing

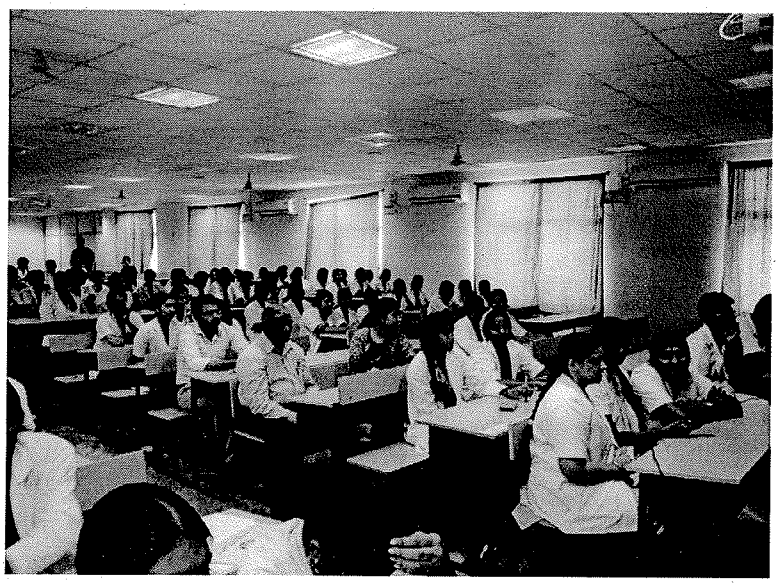
Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled certificate course in Academic Writing for 33 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.Abarna.V

**Encl: Certificates& photographs**



**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

**Osudu, Agaram Village, Koodapakkam post, Puducherry - 605502**

**Date: 06.08.2015**

From
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: Permission to conduct value-added course: Computing of Medicine**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Computing of medicine** on **September 2015– January 2016**. We solicit your kind permission for the same.

Kind Regards

Dr.Somasekar.HS

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:
Dean:Dr.Jayakumar HOD:Dr. Somasekar.HS Expert:Dr.Jaikumar, Dr.Balram
The committee has discussed about the course and is approved.

Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502.

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Dean Subject Expert HOD

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** (13.08.2015)

**Sub: Organising Value-added Course: Computing of Medicine**

With reference to the above mentioned subject, it is to bring to your notice that a Sri Lakshmi Narayana Institute of Medical science is organizing **"Computing of medicine" September 2015– January 2016.** 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 August 2015.
Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. P.JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Puducherry-605502.

Encl: Copy of Course content.

# Course Proposal

**Course Title: COMPUTING OF MEDICINE**

**Course Objective:**

1. Install different programming languages
2. Describe and discuss the difference between major families of computer programming languages
3. Install and use an Integrated Development Environment (IDE)
4. Describe how to structure a problem to allow the application of computational techniques
5. Find and use online resources on programming
6. Choose appropriate data types for simple computations
7. Describe and discuss difference in different control structures
8. Implement and test different control structures
9. Computing in forensic medicine
10. What are the stages of a forensic computing examination?
11. Regulatory compliances

**Course Outcome:** Opportunity to achieve computer literacy including language,syntax and fundamental computational ideas and acquire or strengthen algorithm and logical thinking for approaching problems.

**Course Audience: 2nd Year MBBS Students**

**Course Coordinator: Dr.Somasekar.HS**

**Course Faculties with Qualification and Designation:**

1. Dr.Jaikumar Assistant Prof Dept of Pharmacology
2. Dr.Balram Assistant Prof Dept of Pharmacology

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

| SlNo | Date | Topic | Time | Hours | Name of the Faculty |
|---|---|---|---|---|---|
| 1 | 08.09.2015 | Game and Introduction | 9 -12am | 3 | Dr.Balram |
| 2 | 09.09.2015 | Install different programming languages | 9-12 am | 3 | |
| 3 | 08.10.2015 | Describe and discuss the difference between major families of computer programming languages | 9-12 am | 3 | |
| 4 | 09.10.2015 | Install and use an Integrated Development Environment (IDE) | 9-12 am | 3 | |
| 5 | 09.11.2015 | Describe how to structure a problem to allow the application of computational techniques | 9-12 am | 3 | Dr.Jaikumar |
| 6 | 10.11.2015 | Find and use online resources on programming | 9-12 am | 3 | |
| 7 | 08.12.2015 | Choose appropriate data types for simple computations | 9-12 am | 3 | |
| 8 | 09.12.2015 | Describe and discuss difference in different control structures | 9-12 am | 3 | Dr.Balram |
| 9 | 11.01.2016 | Implement and test different control structures | 9-12 am | 3 | |
| 10 | 12.01.2016 | Computing in forensic medicine | 9-12 am | 3 | |
| | | | Total Hours | 30 | |

Reference books

1.Applied Computing in Medicine and Health

Authors: **Dhiya Al-Jumeily Abir Hussain Conor Mallucci Carol Oliver**

**2. Visual Computing for Medicine**
**Authors:** Bernhard Preim Charl Botha

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Computing of Medicine

**2. Duration & Period**

30 hrs & September 2015– January 2016

**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 2015– January 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- September 2015 - August 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | PH01 | **Computing of Medicine** | Dr.Jaikumar<br>Dr.Balram | 2nd MBBS | 20 (Sep 15 – Jan 16) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

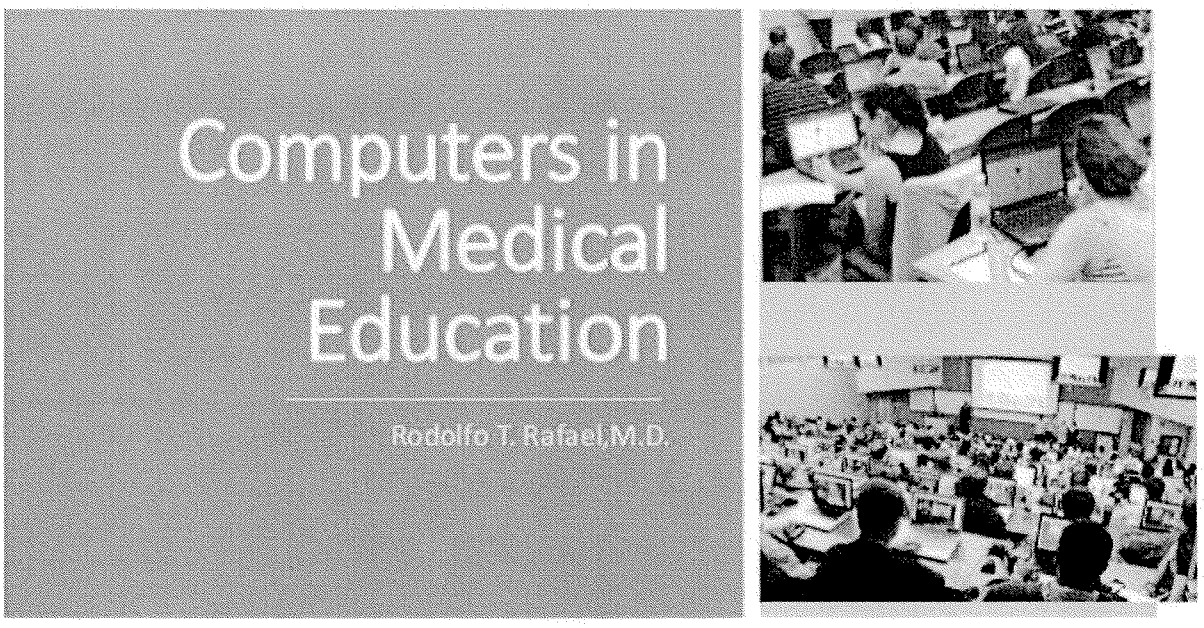
**RESOURCE PERSON** **COORDINATOR**

# Computing of medicine

| Particulars | Description |
|---|---|
| Course Title | Computing of medicine |
| Course Code | PH01 |
| Objective | 1. Install different programming languages<br>2. Describe and discuss the difference between major families of computer programming languages<br>3. Install and use an Integrated Development Environment (IDE)<br>4. Describe how to structure a problem to allow the application of computational techniques<br>5. Find and use online resources on programming<br>6. Choose appropriate data types for simple computations<br>7. Describe and discuss difference in different control structures<br>8. Implement and test different control structures<br>9. Control simple input and output from a program<br>10. Implement and test different control structures<br>11. Computing in forensic medicine<br>12. What are the stages of a forensic computing examination?<br>13. Regulatory compliances |
| Further learning opportunities | Opportunity to achieve computer literacy including language,syntax and fundamental computational ideas and acquire or strengthen algorithm and logical |

| | |
|---|---|
| | thinking for approaching problems |
| Key Competencies | On successful completion of the course the students will have skill in Handling the computer and able to apply the knowledge in forensic aspects |
| Target Student | II MBBS Students |
| Duration | 30hrs Every Sep 2015 to Jan 2016 |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | Short notes |

# PARTICIPANT HAND BOOK




## Introduction

Computers are becoming increasingly popular every passing day amongst a wide section of people. With the advent of microcomputers in late seventies and their subsequent performance enhancement in eighties, computers have reached our homes. Computers have undoubtedly revolutionized our whole life style. Computer techniques have tremendous applications in medical field, where it has the largest amount of social impact. Computers are playing an important role in the running of large hospitals.

Computer facilities are now regarded as integral to much diagnostic equipment. Major uses of computers in medicine include hospital information system, data analysis in medicine, medical imaging laboratory computing, computer assisted medical decision making, care of critically ill patients, computer assisted therapy and so on.

The word computer comes from the word "compute", which means to calculate. Computer can be defined as an electronic device that is designed to automatically accept data, store and process then producing output results. Computers are used to store and process large amount of data and provide information to the user and to perform large number of calculations rapidly and accurately. Charles Babbage is considered to be father of modern computer 1.

## Components of computers : Hardware, Software

Hardware is the term given to the physical components of the computer system. Hardware is basically divided into three units :

Input devices : Input devices convert the data to be processed into a format acceptable to the computer. The data is then passed on to the central

processing unit of the computer. The input devices include punch cards, magnetic tapes, key board and so on.

The central processing unit (CPU) : The CPU is the brain of the computer. All major calculations and comparisons are made here. It has three constituents, the memory units, the control unit and the arithmetical logic unit.

The output devices : The output devices accept the result produced by CPU and supply the results to users. Printers and visual display units are the popular output devices of computers.

Software are the set of programs that control the activity of processing by the computer. There are two types of software, system software and application software. System software are collection of programs which allow the user to interact with the computer hardware, e.g. operating system like DOS, UNIX and compilers like C, FORTRAN, COBOL and BASIC. Application software consists of programs which perform special functions for the user such as word processing, data processing and spreadsheet programs.

## Computer Techniques in Medicine

The application of computer techniques in various fields of medicine is briefly discussed below :

### Hospital information system

Medical informatics is a rapidly growing discipline. It seeks to organize and manage information in support of patient care, biomedical research and education through the aid of computer and information networks . A computerized hospital information system can establish consistent standards in the transmission and storage of data and continuously monitor all transactions. It provides easy access to valuable patient care information. The physicians can have direct access to all the information of his/her patient through the use of computer. A hospital information system generally covers areas like registration, admission/transfer/discharge, billing, medical record, index, wards, operation theater scheduling, stores/inventory, pharmacy, diet, CSSD, bio-medical maintenance, payroll, accounts, etc.

To date, several software vendors have developed hospital systems relating to managing hospitals . Generally hospital administrators prefer to buy readymade package and customize the same to suit their needs.

## Data Analysis in Medicine

In medical research large number of data is collected. This data is to be compiled, analyzed and interpreted. For this purpose, certain statistical methods are to be applied, these include calculation of standard deviation, standard error, application of tests of statistical significance like Z Test, unpaired and paired t test and chi-square test. Statistical methods are time consuming. With the help of computer, large number of statistical calculations can be performed in a very short time.

Several good quality statistical packages are available, which allow the use of many more methods than is practical using traditional paper calculations [4]. These statistical packages include the following :

1. The biomedical computer package (BMD) : This was the first package developed and provides a standard set of advanced statistical programs.

2. Statistical package for the social sciences (SPSS): It is used for wide range of medical problems. Many statistical options are available in SPSS varying from simple statistics to multivariant analysis.

3. Genstat: This is a powerful package with special emphasis on analysis of variance.

4. Epi-Info : This package is developed by WHO for epidemiological studies. This package has word processing, data analysis and graphical abilities. Questionnaire can be made directly by text editor. Data analysis is very simple and serves the need of most of investigators. The program is made available by WHO and CDC (Centre for Disease Control) and are not copyrighted. Making copies for others is permitted and encouraged.

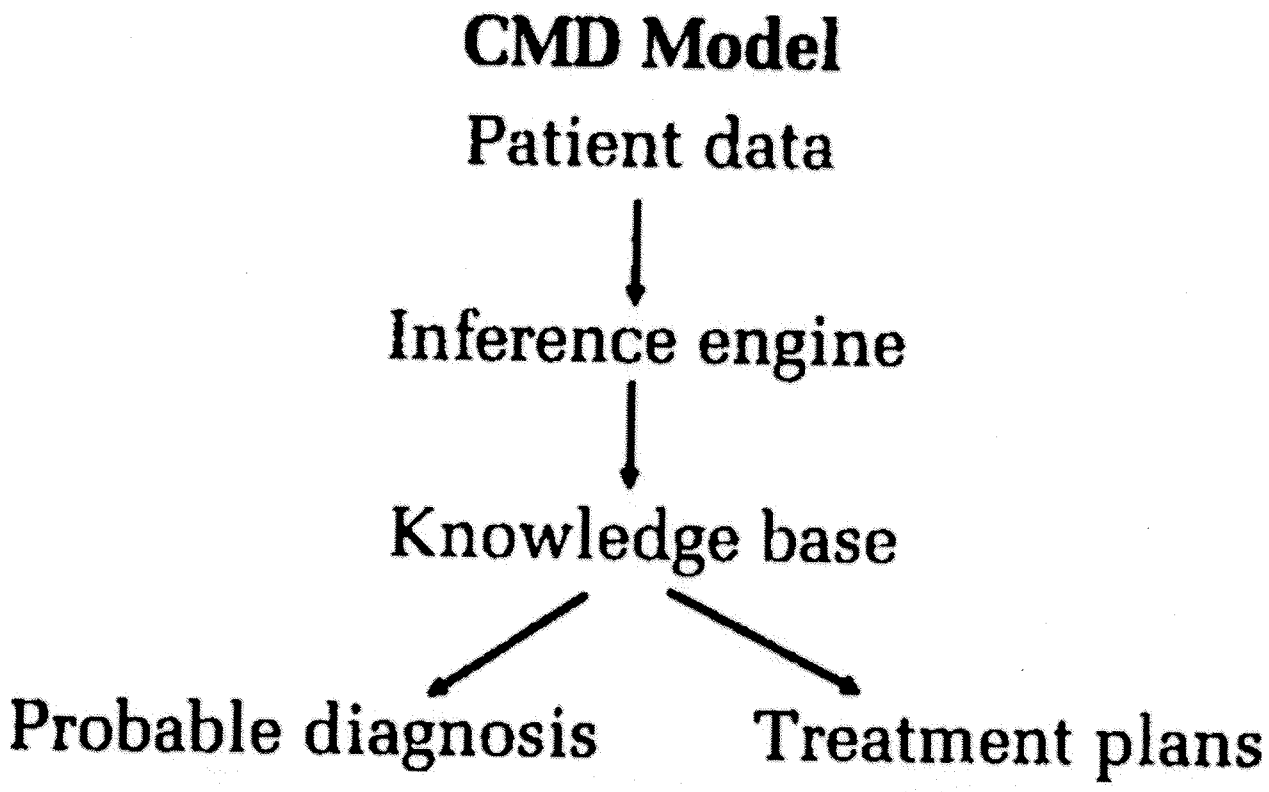
## Laboratory Computing

The primary objective of a clinical laboratory is to provide accurate results in short time. Laboratory analysis includes blood chemistry, photometry, microbiology, etc. Results must match with patient identification details and should be valid. Quick access to laboratory system can contribute to efficient patient care system.

## Computer Assisted Decision making (CMD)

It is an interactive computer system that directly assists doctors with clinical decision making task. The system is intended to support doctors, complementing their natural abilities to make judgment with computer's vast memory, reliability

and processing capabilities. A general model of computer assisted medical decision making has been developed [5].




Care of critically ill patients

Critically ill patients require large number of therapeutic interventions to optimize their chances of survival. For this, the variables must be collected frequently and the data derived therefrom made available to the clinicians and nursing staff. This results in a large quantity of information, which may loose its significance unless the data recorded is presented in a clear manner. In the intensive care unit it is now possible to computerise the total management of data recorded on the patients.

Data management includes the entry, integration and reporting of all vital signs, medications, intake and output volumes and laboratory values.

Closed loop system for the direct computer control of the infusions of vasodilator has been developed . An intraarterial canula connected to a suitable cardiovascular monitor provides the input signal to the computer. A pump which infuses the vasodilator drug to the patient is controlled by computer to maintain the arterial pressure within predetermined units.

### Computer assisted therapy

Methods for planning, monitoring and adjusting dosages regimens of powerful and potentially toxic drugs, e.g. digitalis and antibiotics like gentamicin have been developed. The physician can plan dosage regimens by selecting a target peak total body concentration of a drug.

### Medical imaging

During last decade computers were commonly used for high resolution image generation. Dedicated hardware and software is required to generate such images in CT scan, MRI, ultrasound, and gamma cameras. It is possible to integrate these workstations to the main hospital information system. Three dimensional images of

living human anatomy, regional physiology and biochemistry in health and diseases are in use.

Other applications of computer

In addition computers are being used in primary health care, psychiatry, physiological measurements, medical education, literature search, and as an aid to the handicapped.

Computers play a key role in almost every sphere of life. They facilitate storage of huge amounts of data, they enable speedy processing of information and they possess an inbuilt intelligence. Owing to these unique capabilities, computers function on levels close to that of a human brain. Computers can hence be employed in a wide variety of fields like engineering, data processing and storage, planning and scheduling, networking, education as well as health and medicine. You might want to take a look at the various uses of computers.

Computers are the excellent means for storage of patient related data. Big hospitals employ computer systems to maintain patient records. It is often necessary to maintain detailed records of the medical history of patients. Doctors often require the information about a patient's family history, physical ailments, already diagnosed diseases and prescribed medicines. This information can be effectively stored in a computer database. Computers can keep track of

prescriptions and billing information. They can be used to store the information about the medicines prescribed to a patient as well as those, which cannot be prescribed to him/her.

Computers enable an efficient storage of huge amounts of medical data. Medicine comprises vast base of knowledge. Computer storage can serve as the best means of housing this information. Medical journals, research and diagnosis papers, important medical documents and reference books can best be stored in an electronic format. Many of the modern-day medical equipment have small, programmed computers. Many of the medical appliances of today work on pre-programmed instructions. The circuitry and logic in most of the medical equipment is basically a computer.

The functioning of hospital-bed beeping systems, emergency alarm systems, X-ray machines and several such medical appliances is based on computer logic. Computer software is used for diagnosis of diseases. It can be used for the examination of internal organs of the body. Advanced computer-based systems are used to examine delicate organs of the body. Some of the complex surgeries can be performed with the aid of computers. The different types of monitoring equipment in hospitals are often based on computer programming. Medical imaging is a vast field that deals with the techniques to create images of the human body for medical purposes. Many of the modern methods of scanning and imaging are largely based

on the computer technology. We have been able to implement many of the advanced medical imaging techniques, thanks to the developments in computer science. Magnetic resonance imaging employs computer software. Computed tomography makes use of digital geometry processing techniques to obtain 3-D images. Sophisticated computers and infrared cameras are used for obtaining high-resolution images.

Computers are widely used for the generation of 3-D images in medicine. Computer networking enables quicker communication. Computers and Internet have proved to be a boon in all the spheres of life. In the field of medicine, computers allow for faster communication between a patient and a doctor. Doctors can collaborate better over the Internet. Today, it is possible to obtain experts' opinions within seconds by means of the Internet. Medical professionals sitting on opposite sides of the globe can communicate within minutes by means of the Internet. It is due to computer networking technology that network communication has become easy. Medical practitioners can discuss medical issues in medical forums.

They can exchange images and messages in seconds and derive conclusions speedily. They can seek advice and share knowledge in a convenient manner over the Internet. The importance of computers cannot be stressed enough as computer technology has revolutionized the field of medicine.

In many countries, forensic pharmacologists have been a valuable resource in different criminal and civil cases. They apply their knowledge of pharmacology to civil/legal issues such as resolving litigations, drug regulatory process, and the criminal justice system.

It has been proven through different research studies and case studies that comprehensive investigation plays an unflinching role in the determination of the cause of death in crime scenes with positive drug screens. Even the general public is aware of the role of forensic sciences in the legal system of justice. With increased exposure to the work of the forensic scientists, there has been an increased enrollment in criminal justice system and forensic science courses in schools and colleges in countries like United States of America and Australia. Forensic sciences encompasses the broader application of different branches of science to legal matters. The domain of Forensic Pharmacology focuses on the knowledge of action and interaction of different chemicals in the living beings and its application to legal matters.

## Role of Forensic Pharmacologist

Forensic Pharmacology answers the questions of association of chemicals with an individual's behavior, illness, injury, or death. It can be described as the

interpretation of the effects of drugs and their duration of action with the purpose of facilitating a medico-legal process.

The pharmacologist conducts an analysis of the body fluids and tissues and interprets the chemical data to help the attorneys in assessing the role of a drug or specific chemical in the behavior, illness, injury, or death of an individual. The forensic pharmacologist can be of great help in both criminal and civil cases. The exact role of a pharmacologist in forensic sciences is to analyze, assess, review, and support the attorney's position. He may be asked to provide a written report if his review positively supports the attorney's case. In the case of a trial, the forensic pharmacologist may be needed to testify and clearly explain the findings in the court. The role of a forensic pharmacologist also involves helping the attorney in preparing a cross-examination of the expert on the opposite side.

## Forensic Pharmacologist and Toxicologist

Many a time, a forensic pharmacologist and forensic toxicologist are considered to be the same. The forensic toxicologist is also involved in drug testing and in testifying for the attorney in criminal cases, but a forensic pharmacologist is engaged in forensics in a much broader way.His area of expertise includes a much broader range of cases such as adverse drug reactions to medicines, overdose of medicines, drug interactions, and personal injury resulting from an exposure to

medicines, effects from drug abuse or industrial chemicals, and induction of cancer by chemicals.

## Forensic Pharmacology: Need of the Hour

Forensic Pharmacology is not a new subspecialty. The only thing new about it is probably the use of the terminology "Forensic Pharmacology" to define a subspecialty of pharmacology that focuses on the legal application of the knowledge that a pharmacologist already possesses. And thus, such subspecialty needs recognition among the Indian pharmacologists.

Toxicology is concerned with the deleterious effects of the drugs and chemical agents on all living systems. Toxicology is included as a part of forensic medicine for medical curriculum in India. It is defined as the science that involves detection of drugs and poisons in biological specimens and its application for medico-legal purposes. However, it is much different from the interpretation of effects, use or abuse of drugs, and its duration of action for the medico-legal process which is referred to as Forensic Pharmacology. A fine line differentiates "Forensic Pharmacology" from "toxicology." Some textbooks use term such as "pharmacological toxicology" for assessing the toxicity of therapeutic agents (drugs). Forensic Pharmacology is included as a part of forensic medicine, which

discusses toxicities from the drugs in common therapeutic use, commonly abused drugs, drugs having no medicinal value and "street" or "designer drugs."

An important and extensively studied branch of pharmacy curriculum in India is "Forensic Pharmacy" or "Pharmaceutical Jurisprudence," which deals with various laws pertaining to drugs and pharmaceuticals and profession of pharmacy. It includes the knowledge of various acts, rules, and schedules which directly or indirectly influence various operations pertaining to procurement, manufacture, and distribution of drugs. The knowledge of Forensic Pharmacy is essential to understand the legal aspects pertaining to practice of pharmacy. The forensic pharmacist is required to profess and should also be engaged in manufacturing, sale, and distribution of drugs. Similarly, Forensic Pharmacology guides us to investigate whether a drug or a chemical was related to an individual's behavior, illness, injury, or death.

With continued new drug developments, there are multiple new drugs hitting the markets every year. Few of them are new molecules in the market and claim to contain "nonillegal" compounds although they may exhibit important psychoactive effects. Such drugs are called as "smart drugs." Also, in addition to new drugs or chemicals, new ways to abuse existing drugs are found, for example, scopolamine has become a drug of abuse for recreational and predatory purposes. Thus, the forensic pharmacologists need to keep themselves updated with the knowledge of

new legal and illegal drugs, their pharmacological or toxicological effects and also guide the community and regulatory authorities regarding the possible abuse of such drugs or chemicals to commit the crimes.

Application of the biotechnological advances to pharmacology and toxicology has widely extended our understanding and overall scope of these subjects. Similarly, advances in analytical techniques have made detection of drugs and chemicals much easier which can help resolving medico-legal cases with the guidance from experts such as a forensic pharmacologist. Some drugs can even alter the neurotransmitters and hence lead to a poor impulse control and subsequent aggression in behavior. The role of a forensic pharmacologist becomes significant in this case because he/she is needed to testify the truth of these claims. He/she has to observe, assess, and analyze the violent behavior and use of the drug and determine the likelihood of the relation of impulsive behavior to the drug use.

Pharmacology is evolving as a subject, and Indian pharmacologists need to look at different aspects of pharmacology beyond therapeutics. Forensic Pharmacology offers a unique opportunity to expand the existing knowledge of the drugs, their mechanisms, actions, and its medico-legal impacts. It adds additional dimension to forensic medicine and provides a scope for further research.

## The Science of "Drugs and Forensics"

Forensics as a science and profession is considered to be important for the investigation of illness, injury, or deaths. It is defined as the application of the sciences of drugs to the application of legal code of conduct.The pharmacologist as an expert in the science of drugs and is involved in the clinical, distributive, and administrative aspect of pharmacy.

## Scope of Forensic Pharmacology

There are many criminal and civil cases involving the use of drugs and other chemicals which come under the forensic law. The forensic pharmacologist needs a specific recognition in his profession because of the highly specific nature of his expertise, skill, and work. Various scenarios where the expertise of a forensic pharmacologist can be useful include:

### Drug abuse

A national survey conducted by the Indian Ministry of Social Justice and Empowerment in 2004 has brought forth the fact that drug abuse was quite commonly seen among Indian males aged 12–60 years. The most common abuse was in the use of tobacco (55.8%), alcohol (21.4%), cannabis (3.0%), opiate (0.7%), and sedatives (0.1%).

In criminal courts, crimes which are committed by the individuals under the influence of a drug or medication are one of the most frequently reported ones. These crimes could be the results of the effect of medicine resulting in a change in the behavior or thought process of the person. Forensic Pharmacology deals with the study of "drugs of abuse", examples of which are cannabinoids, central nervous system (CNS) stimulants such as cocaine, heroin, marijuana, tobacco, and amphetamine-related drugs, CNS depressants such as alcohol, benzodiazepines, and opioids, hallucinogens such as lysergic acid diethylamide, mescaline, and phencyclidine, dissociative anesthetics such as ketamine, inhalants such as chloroform and anabolic steroids.Such drugs are often involved in criminal and civil matters concerning personal injury, motor vehicle accidents, drug overdose, and murder. Also, their actions and addiction liability has profound medico-legal implications.

## Sports medicine and doping

The identification of androgens as ergogenic or performance enhancing agents dates back to the 1930's. Commonly used ergogenic drugs include anabolic steroids, narcotic analgesics, diuretics, beta blockers, growth hormone, oral peptide hormones, amphetamines, caffeine, cocaine, sympathomimetic agents, and erythropoietin. Several sportsperson have been found guilty of using such

ergogenic agents to enhance their performance in sports. World Anti-Doping Agency has stringent guidelines on the use of ergogenic drugs. National Anti-Doping Agency is the national organization responsible for promoting, coordinating, and monitoring the doping control program in sports with a vision of "dope free" sport in India. A forensic pharmacologist can help in achieving this vision with the better use of analytical methods to detect the doping and can also help in avoiding accidental use of ergogenic drugs by athletes. Additionally, they can also advise on the drug interactions and use of drugs for therapeutic purposes in athletes.

### Blood levels

The forensic pharmacologist can assess and analyze the blood samples of a person to determine high and borderline doses, signs of toxicity, lack of therapeutic effect, or a suspected case of poor adherence. A pharmacologist is well-versed to detect alterations in postmortem and ante-mortem blood levels. The pharmacologist can also closely monitor the narrow therapeutic range of different drugs such as digoxin, lithium, or theophylline.

### Drugs, alcohol, and driving

Forensic pharmacologist is armed with the knowledge of pharmacokinetics, pharmacodynamics, drug interactions, and adverse reactions. He is the most well-

suited to analyze the data collected and make an informed decision in favor of or against his attorney's case. The forensic pharmacologist can interpret the concentration of alcohol in blood and its typical effects. Pharmacokinetics is employed to measure the blood level of alcohol at the time of the alleged crime. Drug interactions, synergistic or antagonistic effect of different drugs on alcohol absorption or metabolism, and the disease state present in the individual can be easily assessed by the forensic pharmacologist and provide a great help to the medico-legal and judicial system.

## Criminal cases

Forensic pharmacologists play an important role in a wide range of criminal cases. There are many cases where a forensic pharmacologist can provide a testimonial such as use of drug or poison as a weapon, mental impairment caused due to the effect of a medication, or the use of a specific drug as the reason for criminal aggression. Drug use and their effect on the victim form a major reason for a large number of criminal events. Drugs are frequently used in suicide attempts and as a tool of homicide or sexual assault. The most commonly used date drugs are flunitrazepam, alcohol, gamma-hydroxybutyrate, and ketamine.

## Forensic pharmacovigilance

Commonly encountered problems with the use of medication in clinical practice are adverse drug reactions, drug interactions, systematic medical errors in use, unexpected failures of effectiveness, or quality problems by users. Considering the patient safety, such problems should be reported and scrutinized in detail.

Pharmacovigilance is the well-known science related to the adverse effects or any other drug-related problems. It helps in improving patient safety in therapeutics by detection, warning, management, and advice which can reduce the harm and benefit in practice. Pharmacovigilance can also be used as an important medical discipline in forensic cases in a variety of ways, e.g., establishing the effects of the drugs leading to crime, e.g., could this drug (or chemical) have caused this harmful effect in the person and did it really cause the effect either (criminal case)? Any injury or death in the form of adverse drug reactions that are caused by counterfeit, contamination, adulteration, or other substandard medicinal products which is identified by application of standard pharmacovigilance procedure is termed as "forensic pharmacovigilance" and it forms an integral part of Forensic Pharmacology.

In context of civil cases, Forensic Pharmacovigilance can play an important role when some previously unsuspected class effect emerges when the drug is available in public domain after licensing, as compared to the use in restricted group who took part in its clinical trials. The teratogenicity with Thalidomide is the classic

example. Recently, there were concerns of bladder cancer with use of anti-diabetic medication Pioglitazone, and it was banned in India for a brief period. It differs from Pharmacovigilance as it considers the medico-legal implications as well.

## Limitations

Although computers can store and retrieve large amount of data and perform complicated analysis in very short period, their major limitation is that they lack decision making power and are not sensitive like human brain. Data entry is major hindrance for using computers by medical professional.

*Computer virus* is a generic term used to describe any of a group of willfully destructive computer programs. Viruses can multiply with repeated use of a program and can be transmitted with executable programs. They can destroy program files, data files or erase all data from hard disk. Commonly found viruses in our country are Joshi, Michael Angelo, DirII, India etc. There are antivirus programs available to remove a virus from a file. Due to newer introduction of viruses it is difficult to completely eradicate viruses. Some of antivirus programs are Scan, CPAV (Central Point Anti Virus), and Norton anti virus.

Faculty of Computers, Military College of Telecommunications, Mhow is running regular courses for all ranks on applications of computers in different fields. In many garrisons, computer courses are being organized at station level. Although computers have tremendous scope in different field of medicine, the contrast between the apparent need for clinical computing systems and their slow establishment is well recognised. The ability of such systems to solve some of the problems associated with the traditional medical records is also well recognized. Yet after almost 30 years of endeavor and the development of many different systems the number in daily use is relatively small . There is urgent need to create computer awareness among medical professionals. They need to familiarize themselves with application of computer in medicine and make best use of it.

# VALUE ADDED COURSE
## COMPUTING OF MEDICINE

### List of Students Enrolled Sep 2015 – feb2016

| Sl. No | Name of the Student | Register No | Signature |
|---|---|---|---|
| 1 | MONISHA . S | U16MB331 | |
| 2 | MONISHA .M | U16MB332 | |
| 3 | MONISHDEVI .N | U16MB333 | |
| 4 | MOUNIKA .A | U16MB334 | |
| 5 | MOUNIKA.B | U16MB335 | |
| 6 | MUHAMMAD SHEBIN | U16MB336 | |
| 7 | MUSKAAN SHAMIM | U16MB337 | |
| 8 | MUSULURI SHYAM SINDHU | U16MB338 | |
| 9 | NAMITA YADAV | U16MB339 | |
| 10 | NAMRATA GHORAI | U16MB340 | |
| 11 | NANDU ARAVIND | U16MB341 | |
| 12 | NEELU.S.P | U16MB343 | |
| 13 | NEITOUNUO MARY PIENYII | U16MB342 | |
| 14 | NIKITA VERMA | U16MB344 | |
| 15 | NISHA AGRAWAL | U16MB345 | |
| 16 | NOUNETSHUNUO KELIO | U16MB346 | |
| 17 | PALAYULLA VALAPPIL VARUN | U16MB347 | |
| 18 | PARTHASARATHY .S | U16MB348 | |
| 19 | PATIL NAMRATA YASHANAND | U16MB349 | |
| 20 | RAJAGOPAL R | U16MB350 | |

RESOURCE PERSONS

CO-ORDINATOR

PROFESSOR & HOD
DEPARTMENT OF PHARMAC...
Sri Lakshmi Narayana Institute Of ...
PONDICHERRY - 60...

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
Osudu, Agaram Village, Koodapakkam post, Puducherry - 605502

# COMPUTING IN MEDICINE

## SHORT ANSWERS

**Course Code: PH 01**

## I. ANSWER THE QUESTIONS

1. Components of Computer

2.Role of computer in hospital information system

3.Role of computer in lab diagnosis

4.Computer Assisted Decision making (CMD)

5.Computer Assisted therapy

Annexure - IV

COMPUTING IN MEDICINE

SHORT ANSWERS

Course Code: PH 01

I. ANSWER THE QUESTIONS

1. Components of Computer

- motherboard
- Central processing unit
- Random access memory (RAM)
- Random read only memory (ROM)

2. Role of computer in hospital information system

- For maintaining patient records
- For maintaining medical history of patients
- Doctor often require the information about a patient family history, physical already

3. Role of computer in lab diagnosis

Computer program are more powerful in manner of workload, large areas of medicine with much underlying pathophysiologic understanding and advice. Decision are based largely or hard to handle data

4. Computer Assisted Decision making (CMD)

- clinical algorithms
- statistical analysis of collection of patient data
- mathematical models of physical processes

5. Computer Assisted therapy

- It is used to deliver some aspects of psychotherapy
- behavioral treatment directly to patients.

6. Role of computer in forensic medicine. Give five examples

- Autopsy report software
- autopsy diagram software
- autopsy third party modules

# 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 MONISHA.S has actively participated in the Value Added Course on"COMPUTING OF MEDICINE"held during September 2015 to January 2016.Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. S.Jaikumar
Dr.Balram Sai prasanna
RESOURCE PERSONS

Dr.Somasekar.HS
COORDINATOR

## Student Feedback Form

Course Name: Computing & Medicine.

Subject Code: PH01

Name of Student: S. Monisha Roll No.: U16MB331

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: 12.01.2016

From
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: Computing of medicine**

Dear Sir,

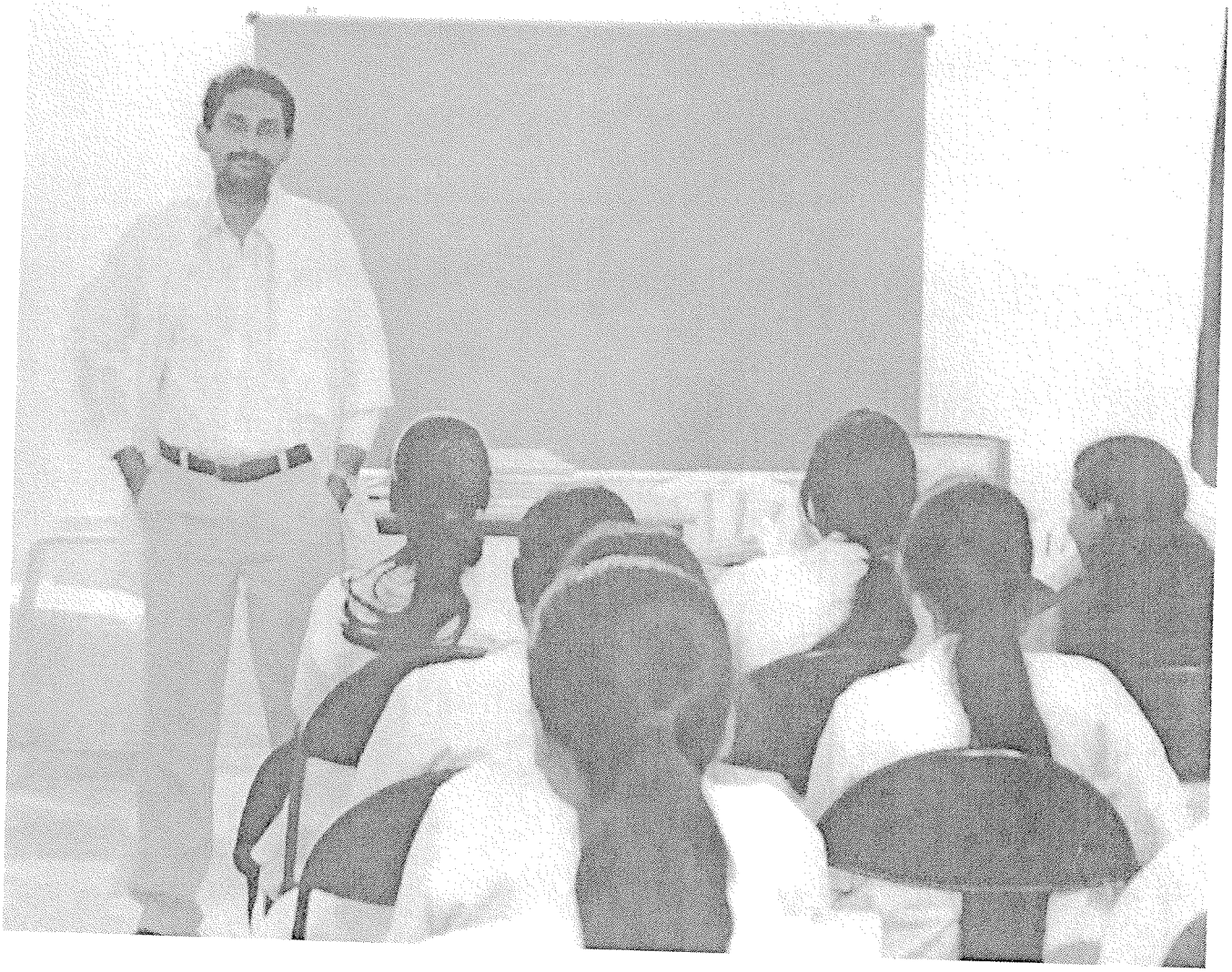
With reference to the subject mentioned above, the department has conducted the value-added course titled: **Computing of Medicine** on **September 2015– January 2016**. We solicit your kind action to send certificates for the participants which is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY.
Sri Lakshmi Narayana Institute Of Medical Sciences,
PONDICHERRY - 605 502.

Dr.Somasekar.HS

**Encl:** **Certificates**
**Photographs**



# Sri Lakshmi Narayana Institute of Medical Sciences

Date:06.10.2015

From

Dr.Thangapaneerselvam,
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: Hospital Infection and control – reg.,**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Hospital Infection and control** in Oct to Nov 2015 . We solicit your kind permission for the same.

Kind Regards

Dr.Thangapaneerselvam

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayakumari

The HOD: Dr. Thangapaneerselvam

The Expert: Dr. Santhosakumari

The committee has discussed about the course and is approved.

Dean (Sign & Seal)

Subject Expert (Sign & Seal)

HOD (Sign & Seal)

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

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

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

07.10.2015

**Sub: Organising Value-added Course: Hospital Infection and control - 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 **"Hospital Infection and control"**. 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 on or before Aug to Sep 2015. 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**

Point of care testing

**2. Duration & Period**

30 hrs & Oct to Nov 2015

**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 - *Enclosed as Annexure- III*

**6. Certificate model**

*Enclosed as Annexure- IV*

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

1, Oct to Nov 2015

**8. Year of discontinuation:** 2016

**9. Summary report of each program year-wise**

| **Value Added Course-** May – June 2017 & September -October 2017 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | BIO-02 | Point of care testing | Dr. Thangapaneerselvam<br>Dr.Santhosakumari | MBBS | 20 students ( Oct to Nov 2015 ) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

1. **Dr.Thangapaneerselvam**
2. **Dr.Santhosakumari**

**COORDINATOR**
**Dr.Thangapaneerselvam**

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

## Course Proposal

Course Title: **Hospital infection and control**

**Course Objective:**

1. Overview of hospital infection
2. Sources of infections
3. Ways to prevent and treat the HAI

To sensitise the medical students about the Hospital acquired infections and the precautionary measures to be taken for prevention and control of HAI

**Course Outcome: Gained knowledge on HAI and CAI precipitated in hospital and the difference between the two for rationale treatment and improvement of health care in a tertiary care hospital**

**Course Audience: MBBS students of 2015 Batch**

**Course Coordinator: Dr.Thangapaneerselvam**

**Course Faculties with Qualification and Designation:**

**1.Dr.Thangapaneerselvam, Professor & HOD**

**2.Dr.Prabhakar reddy, Associate Professor**

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 13.10.2015 | Introduction, Background, Objectives | 4-5 PM | 1 |
| 2 | 14.10.2015 | What is HCAI? | 4-6 PM | 2 |
| 3 | 15.10.2015 | Mode of transmission | 4-6 PM | 2 |
| 4 | 16.10.2015 | Hospital infection control program – objectives,components,universal precautions | 4-7 PM | 3 |
| 5 | 17.10.2015 | HCAI control team and its responsibilities | 4-6 PM | 2 |
| 6 | 18.10.2015 | Infection control process standard precautions | 4-7 PM | 3 |
| 7 | 19.10.2015 | 5 moments of hand hygiene | 4-6 PM | 2 |
| 8 | 20.10.2015 | Personal protective equipment | 4-7 PM | 3 |
| 9 | 21.10.2015 | Cleaning, disinfection & sterilisation | 4-7 PM | 3 |
| 10 | 22.10.2015 | Isolation precautions | 4-7 PM | 3 |
| 11 | 23.10.2015 | Exposure management | 4-6 PM | 2 |
| 12 | 24.10.2015 | Survey of prevalence of HCAI in your tertiary care hospital – in ICU | 4-6 PM | 2 |
| 13 | 25.10.2015 | Survey of prevalence of HCAI in your tertiary care hospital – Wards(medical) | 4-6 PM | 2 |
| 14 | 26.10.2015 | Survey of prevalence of HCAI in your tertiary care hospital – wards(surgical) | 4-6 PM | 2 |

| | | | | |
|---|---|---|---|---|
| 15 | 27.10.2015 | Compiling of overall data | 4-6 PM | 2 |
| 16 | 1.11.2015 | Elaborate presentation on current status of rate of HCAI in your hospital with methods to reduce it for better patient care | 2-6 PM | 4 |
| | | Total | | 38 |

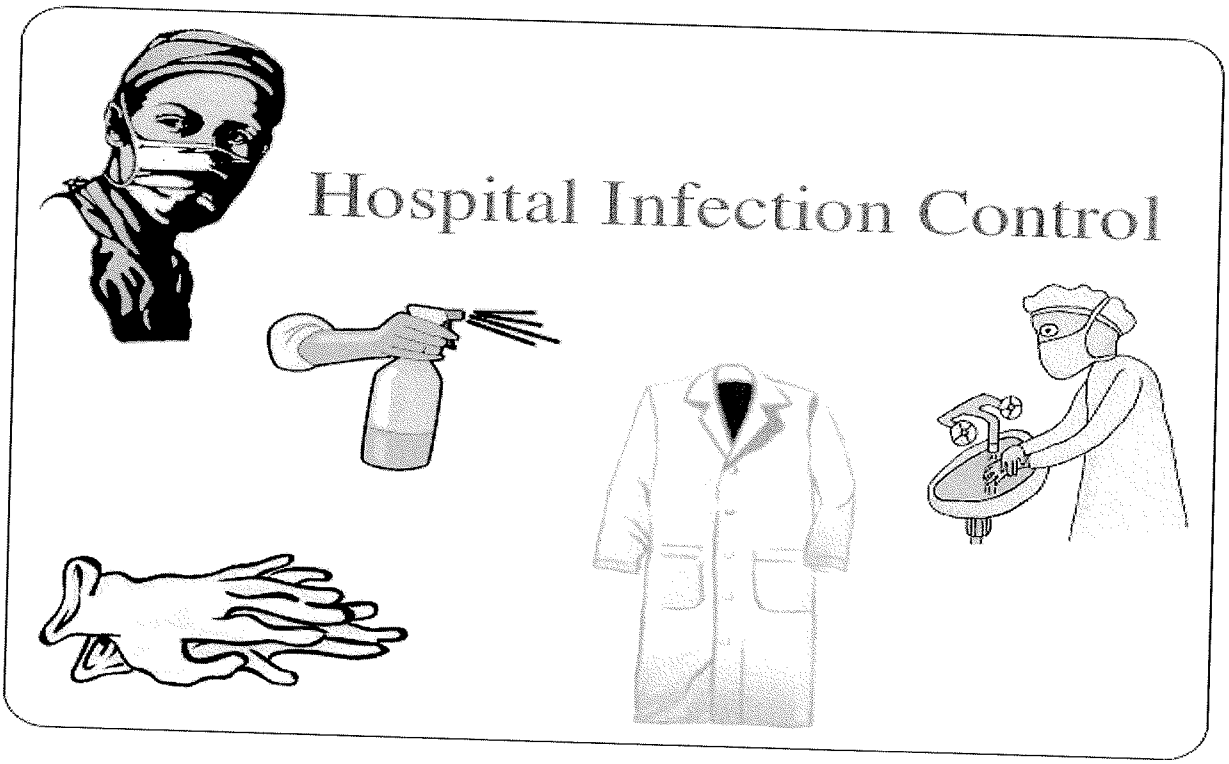
**REFERENCE BOOKS:**


1. Guidelines for prevention of hospital acquired infections - ncbi

2. Hospital Infection Control - JAPI

3. Revised Hospital Infection Prevention and Control Guidelines - ncdc

# HOSPITAL INFECTION AND CONTROL




## PARTICIPANT'S HANDBOOK

# HOSPITAL INFECTION AND CONTROL

Healthcare-associated infection (HCAI) is one of the most common complications of health care management. • Nosocomial infections / hospital-acquired infections / hospital-associated infections / hospital infections.

They are a serious health hazard. Lead to increased patients' morbidity and mortality, length of hospital stay the costs associated with hospital stay.

COMMON HEALTHCARE ASSOCIATED INFECTIONS

Catheter associated urinary tract infection (CAUTI)

Surgical site Infection (SSI)

Catheter related blood stream infection (CRBSI)

Ventilator Associated Pneumonia (VAP)

HOW ARE INFECTIONS TRANSMITTED:

i. Direct contact between healthy and unhealthy person
ii. Airborne Viruses and bacteria spread through coughing and sneezing
iii. Ingestion Usually through water and food
iv. Insect or animal bite are the routes of transmission

What leads to hcais ?

1. Sources of microorganisms Surfaces- Hands, Devices Water, Food Blood Pharmaceutical agents
2. Patients at risk Frequent hospital admissions IVDUs, Immunocompromised
3. Acute wounds Using equipments internal to patients e.g. Catheters

4. Transmission of pathogens between staff, patients and among patients patients at risk for BBIs Sharing infected equipment.
5. Contaminated skin puncture.
6. From mother to child.
7. Contamination of wounds.
8. Blood transfusion HCAIs

Breaking the Chain of infection

- Breaking the Chain of infection is central to providing high quality health care for patients and a safe working environment for those that work in healthcare settings.
- It is important to minimize the risk of spread of infection to patients and staff in hospital by implementing good infection control programme.
- Infection prevention responsibility . Employers/ Organizations Employees Patients Attendants Visitors.

HOSPITAL INFECTION CONTROL PROGRAM

• Prevention of HCAI in patients is a concern of everyone in the facility and is the responsibility of all individuals and services providing health care.

• Risk prevention for patients and staff must be supported at the level of senior administration.

Components of infection control programme

1. Basic measure for infection control-standard and additional precaution
2. Education and training of health care workers.
3. Protection of health care workers
4. Identification of hazards and minimizing risks.

5. Aseptic techniques
6. Use of single use device, reproccessing of instrumental and equipment
7. Antibiotic usage,management of body/blood fluid,exposure handling of blood/blood product and hospital waste management.
8. Surveillance
9. Outbreak investigation
10. Incident monitoring

OBJECTIVES

• The main objectives of these guidelines is to prevent the health care workers and the environment from the transmission of infections:
• Facilities, equipment, and procedures necessary to implement standard precautions.
• Cleaning, disinfecting and reprocessing of reusable equipment.
• Waste management , prevention of HAI in patients

Universal precautions

• Universal precautions are the set of guidelines designed to protect the health care worker from exposure to infections such as HIV< Hepatitis B and C which are transmitted by blood and certain body fluids of patient.

COMPONENTS; Universal precautions consider only certain body fluids as capable of transmitting blood borne disease

Precaution related to body fluids

• Universal precaution applies to:
    • Blood

- Semen
- Vaginal secretions
- CSF
- Pleural/peritoneal/pericardial/amniotic fluids

• Universal precaution does not apply:

1. Feaces
2. Nasal secretions
3. Sputum
4. Sweat
5. Tears/urine/vomitus
6. Saliva

The role of the hospital infection control committee (HICC) is to implement the annual infection control Programme and policies.

1. Commitment towards Maintenance of Surveillance over HCAIs.
2. Develop a system for identifying, reporting, analyzing, investigating and controlling HCAIs.
3. Develop and implement preventive and corrective programs in specific situations where infection hazards exist.
4. Advice the Medical Superintendent on matters related to the proper use of antibiotics, develop antibiotic policies and recommend remedial measures when antibiotic resistant strains are detected.
5. Review and update hospital infection control policies and procedures from time to time.
6. Help to provide employee health education regarding matters related to HCAIs.
7. HICC shall meet regularly - once a month and as often as required

8. Hospital Infection Control Committee (HICC) Is responsible for establishing and maintaining infection prevention and control, its monitoring, surveillance, reporting, research and education The Committee is an integral component of the patient safety programme of the health care facility

9. Structure of Hospital infection control committee Chairperson: Hospital administrator Member Secretary: Senior Microbiologist Members: Representation from Management/Administration (Dean/Director of Hospital; Nursing Services; Medical Services; Operations) Relevant Medical Faculties Support Services: (OT/CSSD, House- keeping/Sanitation, Engineering, Pharmacologist, Store Officer / Materials Department) Infection Control Nurse (s) Infection Control officer

10. Infection Control Team

• The Infection control team should comprise of at minimum

1. An infection control officer,
2. A microbiologist (if ICO is not a microbiologist),
3. And infection control nurse. ICT takes daily measures for the prevention and control of infection in hospital.

11. Responsibilities of the hict

- Develop a manual of policies and procedures for aseptic, isolation and antiseptic techniques.
- Carry out targeted surveillance of HAIs, data analysis and take corrective steps
- Advise staff on all aspects of infection control and maintain a safe environment for patients and staff.
- Supervise and monitor cleanliness and hygienic practices

- Oversee sterilization and disinfection.
- Monitor the use and quality control of disinfectants
- Advise management of at risk patients.
- Supervision of isolation procedures.
- Investigate outbreaks and take corrective measures for control and prevention of outbreak Waste management
- Training of all new employees as to the importance of infection control and the relevant policies and procedures.
- Regular training programme for the staff to ensure implementation of infection control practices
- Audit infection control procedures and antimicrobial usage
- Monitor Health care workers safety Programme.
-

INFECTION CONTROL PROCESSES Standard Precautions

- Standard Precautions are designed to reduce the risk of transmission of micro-organisms from both recognized and unrecognized sources of infection in the hospital.
- Standard Precautions applies to all patients regardless of their diagnosis.
- Standard Precautions shall be implemented when contact with any of the following are anticipated:
    - 1. Blood
    - 2. All body fluids, secretions and excretions, with the exception of sweat regardless of whether or not they contain visible blood.
    - 3. Non-intact skin (this includes rashes)
    - 4. Mucous membranes

Standard Precautions Requirements

- ✓ Hand hygiene:
- ✓ Pathogenic organisms from colonized and infected patients (and sometimes from the environment) transiently contaminate the hands of staff during normal clinical activities and can then be transferred to other patients.
- ✓ Proper hand hygiene is an effective method for preventing the transfer of microbes between staff and patients.
- ✓ Increasing hand-washing compliance by 1.5 – 2 folds would result in a 25-50-% decrease in the incidence of healthcare associated infections.

Five (5) Moments in Hand Hygiene-

Hand hygiene must be practiced:

1. Before touching a patient.
2. Immediately before performing a clean or aseptic procedure, including handling an invasive device for patient care, regardless of whether or not gloves are used.
3. Promptly after contact with body fluids, excretions, mucous membranes, non-intact skin, or wound dressings regardless of whether or not gloves were used.
4. After touching a patient and his/her immediate surroundings, even when leaving the patient's side.
5. After contact with inanimate objects (including medical equipment and furniture) in the immediate vicinity of the patient.

Hand hygiene Positives

- Use between patients.
- Quick, easy & effective.

• Can use when going in and out of wards, houses or rooms.
• Use after gloves kills 99.8% of bacteria. Negative
• Don't work to kill diarrhoea causing viruses.
• Only use if hands look clean.
• If in doubt use soap and water. Alcohol gels 20-30 sec
Hand washing 40-60 sec

Personal protective equipment-

1. Use of Gloves: Clean gloves must be worn when touching blood, body fluids, excretions, secretions and contaminated items and when performing venipuncture.
2. Face Mask, eye protection & face shield: Face Mask must be worn during procedures or patient care activities that are expected to generate splashes or sprays of blood, body fluids.
3. N95 Respirators-
    - Respirators are masks specifically designed to filter small particles spread by the airborne route, such as tuberculosis, measles and varicella. They are used for aerosol generating procedures that have been shown to expose staff, including:
    - Sputum induction
    - Diagnostic bronchoscopy
    - Autopsy examination
    - Laboratory handling of Mycobacterium tuberculosis such as concentrating respiratory samples for smear and culture.

Respirators

Respirators rely on an airtight seal and have tiny pores which block droplet nuclei.

Face / surgical masks

Masks have large pores and do not have an airtight seal to around the edge, permitting inflow of droplet nuclei

Gown or Apron:

Gown/apron must be worn to protect skin and to prevent soiling of clothing during procedures or patient care activities that are expected to generate splashes or sprays of blood, body fluid, secretions and excretions.

Instruct symptomatic persons and health care workers to cover their mouths/noses when coughing or sneezing, use and dispose of tissues, perform hand hygiene after hands have been in contact with respiratory secretions and wear surgical mask if tolerated or maintain spatial separation, >3 feet if possible.

Respiratory hygiene/cough etiquette: Instruct symptomatic persons and health care workers to cover their mouths/noses when coughing or sneezing, use and dispose of tissues, perform hand hygiene after hands have been in contact with respiratory secretions and wear surgical mask if tolerated or maintain spatial separation, >3 feet if possible.

CLEANING, DISINFECTION AND STERILIZATION

CLEANING OF ENVIRONMENTAL SURFACES

□ Clean housekeeping surfaces (e.g., floors, walls, tabletops) on a regular basis, when spills occur, and when these surfaces are visibly soiled.

 Disinfect environmental surfaces (e.g., bedside tables, bedrails, and laboratory surfaces)

 Clean walls, blinds, and window curtains.

 Decontaminate mops heads and cleaning cloths regularly to prevent contamination (e.g., launder and dry at least daily).

CLEANING OF BEDDING AND BLANKET

- Clean and disinfect mattress impermeable covers.
- Launder pillow covers, washable pillows, and blankets between patients or when they become contaminated with body substances.

DISINFECTION

Most microbes are removed from defined object or surface, except spores. Classified according to their ability to destroy different categories of microorganisms:

- High Level disinfectants: Glutaraldehyde 2%, Ethylene Oxide
- Intermediate Level disinfectant: Alcohols, chlorine compounds, hydrogen peroxide, chlorhexidine,
- Low level disinfectants: Benzalkonium chloride, some soaps

GENERALGUIDELINES FOR DISINFECTION:

• Critical instruments/equipment (that are those penetrating skin or mucous membrane) should undergo sterilization before and after use. E.g. surgical instruments.

• Semi-critical instruments /equipments (that are those in contact with intact mucous membrane without penetration) should undergo high level disinfection before use and intermediate level disinfection after use. E.g. endotracheal tubes.

• Non-critical instruments /equipments (that are those in contact with intact skin and no contact with mucous membrane) require only intermediate or low level disinfection before and after use. E.g. ECG electrodes.

ISOLATION PRECAUTIONS

Isolation precautions are needed to prevent the transmission of pathogenic microorganisms within the healthcare setting.

□ The patients of following disease categories should be treated under isolation. Severe influenza cases, Subacute respiratory Syndrome (SARS), Open case of tuberculosis, Anthrax, diphtheria, Pertussis, Pneumonic plague, Chicken pox, and patients infected with multidrug resistant bacterial pathogens.

ISOLATION PRECAUTIONS

Contact precautions Airborne precautions: Droplet precautions Enteric infections, diarrhea that cannot be controlled, or skin lesions that cannot be contained. Pathogens transmitted by respiratory droplets generated by a patient by coughing, sneezing, or talking, Acute respiratory infection, undiagnosed or meningitis and/or sepsis with petechial rash . Infectious agents transmitted person-to- person by the airborne route, such as M. tuberculosis, measles, chickenpox, disseminated herpes zoster.

Patient placement

• Appropriate patient placement is a significant component of isolation precautions.

□ Determine patient placement based on the following principles:

• Route(s) of transmission of the infectious agent

• Risk factors for transmission in the infected patient
• Risk factors for adverse outcomes resulting from healthcare- associated infection in other patients in the area.
• Availability of single-patient rooms
• Patient options for room-sharing

Contact Precautions:

1. Required for patients with enteric infections, diarrhea that cannot be controlled or skin lesions that cannot be contained.

Droplet precautions:

Required for patients known or Suspected to be infected with pathogens transmitted by respiratory droplets that are generated by a patient who is coughing, sneezing, or talking, Acute respiratory infection, undiagnosed or meningitis and/or sepsis with petechial rash.

Patient placement:

a. Place patients who require Contact Precautions in a single-patient room when available; if single-patient rooms are unavailable, and then place patients infected with the same pathogen in the same room.

b. If it becomes necessary to place a patient who requires Contact Precautions in a room with a patient who is not infected or colonized with the same infectious agent

i. Avoid placing patients on Contact Precautions in the same room with patients who have conditions that may increase the risk of adverse outcome from infection or that may facilitate transmission.

ii. Ensure that patients are physically separated (i.e., >3 feet apart) from each other. Draw the privacy curtain between beds to minimize opportunities for direct contact.

iii. Change protective attire and perform hand hygiene between contacts with patients in the same room, regardless of whether one or both patients are on Contact Precautions

Use of personal protective equipment:

• Don a mask upon entry into the patient room or cubicle.

Patient transport

a. Limit transport and movement of patients outside of the room to medically-necessary purposes.

b. When transport or movement in any healthcare setting is necessary, ensure that infected or colonized areas of the patient's body are contained and covered.

c. Remove and dispose of contaminated PPE and perform hand hygiene prior to transporting patients on Contact Precautions.

Airborne precautions:

1. Required for patients known or suspected to be infected with infectious agents transmitted person-to-person by the airborne route, such as M. tuberculosis, measles, chickenpox, disseminated herpes zoster.

2. Develop systems (e.g., triage, signage) to identify patients with known or suspected infections that requires Airborne Precautions upon entry into the health facility.

Patient placement

a. Place patients who require Airborne Precautions in an airborne infection isolation room (AIIR) that has been constructed with the following conditions

i. Provides 6-12 air changes per hour.

ii. Directs exhaust or air to the outside, or through HEPA filters if exhausting to the outside is not possible.

iii. Has a monitor for air pressure with visual indicators.

iv. Can be closed with a door when not required for entry and exit.

b. If an AIIR is not available and transfer to a facility with AIIR is not possible, place a surgical mask on the patient and place him/her in a single room.

Once the patient leaves, the room should remain vacant for the appropriate time, generally one hour, to allow for a full exchange of air.

c. Instruct patients with a known or suspected airborne infection to wear a surgical mask and observe Respiratory Hygiene/Cough Etiquette.

Once in AIIR, the mask may be removed

Personnel restrictions

a. Restrict susceptible healthcare personnel from entering the rooms of patients known or suspected to have measles, varicella, disseminated zoster, or smallpox if other immune healthcare personnel are available.

Use of personal protective equipment

a. Healthcare personnel should use a fit- tested respiratory, such as an N95, before entering the room of a patient with known or suspected tuberculosis or smallpox.

b. A fit-tested N95 or surgical mask may be appropriate for healthcare personnel to wear while caring for patients with known or suspected measles, chickenpox, or disseminated herpes zoster.

Patient transport

a. Limit transport and movement of patients outside of the room to medically-necessary purposes.

b. If transport or movement outside an AIIR is necessary, instruct patients to wear a surgical mask, if possible, and observe Respiratory Hygiene/Coug h Etiquette.

c. For patients with skin lesions associated with varicella or smallpox or draining skin lesions caused by M. tuberculosis, cover the affected areas to prevent aerosolization or contact with the infectious agent in skin lesions.

d. Healthcare personnel transporting patients who are on Airborne Precautions do not need to wear a mask or respirator during transport if the patient is wearing a mask and infectious skin lesions are covered.

Exposure management

a. Administer measles vaccine to exposed susceptible persons within 72 h after the exposure or administer immune globulin within six days of the exposure event for high-risk persons in whom vaccine is contraindicated.

b. Administer varicella vaccine to exposed susceptible persons within 120 h after the exposure or administer varicella immune globulin, when available, within 96 h for high-risk persons in whom vaccine is contraindicated (e.g., immunocompromised patients, pregnant women, newborns whose mother's varicella onset was <5 d before or within 48 h after delivery).

c. Administer smallpox vaccine to exposed susceptible persons within 4 days after exposure

Annexure II

DEPARTMENT OF BIOCHEMISTRY

STUDENT LIST

| S.No | Reg No | Name | Signature |
|---|---|---|---|
| 1 | U15MB356 | SARANYA. E | |
| 2 | U15MB357 | SARATH KUMAR. A | |
| 3 | U15MB358 | SATHESH. B | |
| 4 | U15MB359 | SATHIYA NARAYANA .S | |
| 5 | U15MB362 | SENTHILKUMARAN. A | |
| 6 | U15MB363 | SHAHARA ZAD .S | |
| 7 | U15MB364 | SHAKTHI. K | |
| 8 | U15MB347 | RAM KUMAR. S | |
| 9 | U15MB348 | RAMRAJ. D | |
| 10 | U15MB349 | RATCHAKESH. R | |
| 11 | U15MB350 | REVANTH. C | |
| 12 | U15MB341 | PRAVEEN. R | |
| 13 | U15MB342 | PREETHIKA. R | |
| 14 | U15MB343 | PRIYADHARSHINI .R | |
| 15 | U15MB335 | NIVETHITHA. R.N. | |
| 16 | U15MB356 | SARANYA. E | |
| 17 | U15MB357 | SARATH KUMAR. A | |
| 18 | U15MB358 | SATHESH. B | |
| 19 | U15MB359 | SATHIYA NARAYANA .S | |
| 20 | U15MB360 | SEDHUPATHY. S | |

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana ... Medical Sciences

Sathiskumar

1. Hand washing is critical to infection control. Which of these is not considered a cleaning agent?
   a) Water
   b) Alcohol hand gel
   c) Liquid soap

2. When handling items which are soiled with bodily fluids, it's important to wear gloves. Which of these would not be suitable?
   a) Latex
   b) Neoprene
   c) Polythene

3. Which colour bag should you use when disposing of clinical waste?
   a) Red
   b) Yellow
   c) Green

4. Which of the following can be worn on hands during patient care?
   a) A ring with a plain band
   b) False nails
   c) Rings with stones
   d) None of the above

5. Do you need to wash your hands after wearing gloves?
   a) Yes
   b) No
   c) Only if hands are visibly soiled

6. Which of the following is not included in Standard Infection Control Precautions?
   a) Management of blood and bodily fluid spillage
   b) Patient's personal hygiene
   c) Safe handling of linen
   d) Cleanliness of care equipment

7. How long should hands be washed for after wetting hands and applying soap?
   a) 5 seconds
   b) 2-3 minutes

c) For as long as you feel appropriate
d) 15-20 seconds

8. Which of the following should be avoided during hand washing?
   a) Paper towels
   b) Liquid soap
   c) Nail brushes

9. When should you dispose of a plastic disposable apron?
   a) At the end of each shift
   b) Every hour
   c) Between caring for each patient
   d) After it's been washed once

10. Which of the following would not be advisable when cleaning a faeces spillage?
   a) Discarding disposables as household waste
   b) Washing hands
   c) Putting on an apron and gloves
   d) Removing the spillage with disposable paper towels

11. Disinfection is a process in addition to cleaning. When is it necessary?
   a) When a patient touches a door handle
   b) When an item comes into contact with mucous membranes
   c) When you re-use a bedpan made of pulp
   d) It isn't necessary unless you know a patient has an HCAI

12. What is the definition of a 'single use' item?
   a) An item that can be used by a single patient, multiple times
   b) An item that can only be used once before it needs disinfecting
   c) An item that can only be used once before being disposed of
   d) An item that can only be used for a single day

Ethiopia

1. Hand washing is critical to infection control. Which of these is not considered a cleaning agent?
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   b) Alcohol hand gel
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   d) It isn't necessary unless you know a patient has an HCAI

12. What is the definition of a 'single use' item?
   a) An item that can be used by a single patient, multiple times
   b) An item that can only be used once before it needs disinfecting
   c) An item that can only be used once before being disposed of
   d) An item that can only be used for a single day

# 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 **REVANTH. C** has actively participated in the Value Added Course on **Hospital Infection and control** held during Oct 2015 – Nov 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Santhosakumari

**RESOURCE PERSON**

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Dr. Thangapaneerselvam

**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 **SATHESH. B** has actively participated in the Value Added Course on **Hospital Infection and control** held during Oct 2015 – Nov 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Santhosakumari

**RESOURCE PERSON**

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Dr. Thangapaneerselvam

**COORDINATOR**

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY

# Course feedback form

**Course title:**

Date : 31.10.15

Course code: BIO - 02

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

# Course feedback form

**Course title:**

Date : 31/10/2015

Course code: BIO - 02

Department: Biochemistry

| S.no | Design of the course | 1 | 2 | 3 | 4 | 5 |
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| 2 | The course contents met with your expectations | | | | ✓ | |
| 3 | The lecture sequence were well planned | | | | | ✓ |
| 4 | The lectures were clear and easy to understand | | | | ✓ | |
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| 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

Date: 30.11.2015

From

Dr.Thangapaneerselvam
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: Hospital Infection and control - reg.,**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Point of care testing from Oct to Nov 2015 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.Thangapaneerselvam

**Encl: Certificates**

**Photographs**

**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

**Osudu, Agaram Village, Villianur commune, Kuduppakkam Post, Pudhucherry-605 502**

Date:08.05.2015

From

Dr.K.C.Malika Arjuna
Professor and Head,
Department of Anatomy,
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:Photogaphy**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Photography** for first year M.B.B.S to 16 December 2015. We solicit your kind permission for the same.

Kind Regards

Dr.K.C.Malika Arjuna

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**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: **Dr. Rajasekar**

The HOD: **Dr.K.C.Malika Arjuna**

The Expert: **Mr.N.Anandramajayan**

The committee has discussed about the course and is approved.

Dean Subject Expert HOD

(Sign & Seal) (Sign & Seal) (Sign & Seal)

PROFESSOR & HOD
DEPARTMENT OF ANATOMY
Pondicherry 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

07.06.2020

**Sub: Organising Value-added Course: Photogaphy. 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 **"Photogaphy "**. 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 July to Augest 2015. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

Encl: Copy of Course content

# Course Proposal

**Course Title**:

Photography

**Course Objective:**

1. Introduce the students to Photography in studies
2. To learn basic Photography and its important
3. To learn the basic skills involved in Photography

**Course Outcome:**

Knowledge on the various aspects of Photography and the prospects of research

**Course Audience:** 1st year MBBS

**Course Coordinator:** Dr.Mallika Arjuna

**Course Faculties with Qualification and Designation:**

1. Dr. B Rajesh, M.Sc., Ph.D, Professor/Anatomy
2. Mr.N.Ananramajayan, M.Sc, Assistant Professor/Anatomy

**Course Curriculum/subtopics with schedule (30 hours)**

| Sl.No | Date | Topic | Time | Hours | Faculty Name |
|---|---|---|---|---|---|
| 1. | 1.11.15 | Introduction to Digital Photography | 4-5p.m | 1 | Dr. B Rajesh |
| 2. | 2.11.15 | Understanding film and paper photography | 4-5p.m | 1 | Mr.N.Anandaramajayaan |
| 3. | 3.11.15 | Learning about the digital revolution | 4-5p.m | 1 | Dr. B Rajesh |
| 4. | 4.11.15 | Advantages and disadvantages of digital photography over film photography | 4-5p.m | 1 | Dr. B Rajesh |
| 5. | 5.11.15 | Computers as photographic tools | 4-5p.m | 2 | Mr.N.Anandaramajayaan |
| 6. | 6.11.15 | How photos are used today. | 4-5p.m | 1 | Dr. B Rajesh |
| 7. | 7.11.15 | Digital Capture | 4-5p.m | 1 | Dr. B Rajesh |
| 8. | 8.11.15 | Digital Image formation | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| 9. | 9.11.15 | Image Sensors | 4-6p.m | 2 | Dr. B Rajesh |
| 10. | 10.11.15 | Different | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| 11. | 11.11.15 | Capturing Method: Digital camera | 4-6p.m | 2 | Dr. B Rajesh |
| 12. | 12.11.15 | Scanner | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| 13. | 13.11.15 | Frame | 4-5p.m | 1 | Dr. B Rajesh |

| | | | | | |
|---|---|---|---|---|---|
| 14. | 14.11.15 | Placing photos in other documents – Using photos on the web. | 4-5p.m | 1 | Mr.N.Anandaramajayaan |
| 15. | 15.11.15 | Printers as output devices | 4-5p.m | 1 | Mr.N.Anandaramajayaan |
| 16. | 16.11.15 | Different types of Print, | 4-6p.m | 2 | Dr. B Rajesh |
| 17. | 17.11.15 | Proofing, Photo quality printing. | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| 18. | 18.11.15 | How can a digital image be printed? | 4-5p.m | 1 | Dr. B Rajesh |
| 19. | 19.11.15 | Placing photos in other documents – Using photos on the web. | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| 20. | 20.11.15 | Resent updates | 4-6p.m | 2 | Dr. B Rajesh |
| | | | Total Hours | 30 | |

**REFERENCE BOOKS/ARTICLES:**


1. Phillip Krejcarek Digital Photography-A hands on Introduction Delmer Publishers
2. Adrian Davies and PhillFennessy Digital for photographers Focal Press
3. Jon Torrant Understanding Digital Cameras Focal Press
4. Carla Rose Teach Yourself Digital Photography in 14 Days Techmedia, 1997

# VALUE ADDED COURSE

**1. Name of the programme & Code**

**Photography and AN Ph01**

**2. Duration & Period**

(30 hrs) November 2015

**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's - *Enclosed as Annexure- III*

**6. Certificate model**

*Enclosed as Annexure- IV*

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

Once – November 2015

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- November 2015 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | AN PH 01 | **Photography and AN PH 01** | **N.ANANDARAMAJAYAN Dr.RAJESH.B** | 1st MBBS | 20 (November-2015) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

PROFESSOR & HOD
DEPARTMENT OF ANATOMY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

**RESOURCE PERSON** **COORDINATOR**

# PHOTOGRAPHY

# PHOTOGRAPHY

# Introduction:

**Photography** is the art, application, and practice of creating durable images by recording light, either electronically by means of an image sensor, or chemically by means of a light-sensitive material such as photographic film. It is employed in many fields of science, manufacturing (e.g., photolithography), and business, as well as its more direct uses for art, film and video production, recreational purposes, hobby, and mass communication

Typically, a lens is used to focus the light reflected or emitted from objects into a real image on the light-sensitive surface inside a camera during a timed exposure. With an electronic image sensor, this produces an electrical charge at each pixel, which is electronically processed and stored in a digital image file for subsequent display or processing. The result with photographic emulsion is an invisible latent image, which is later chemically "developed" into a visible image, either negative or positive depending on the purpose of the photographic material and the method of processing. A negative image on film is traditionally used to photographically create a positive image on a paper base, known as a print, either by using an enlarger or by contact printing.

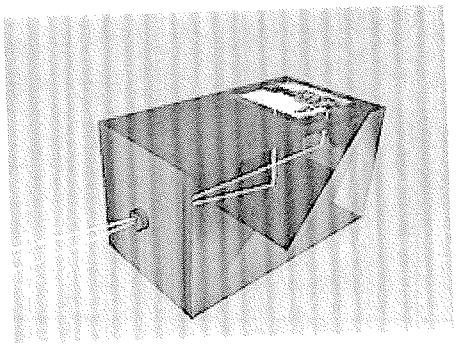
## Etymology

Several people may have coined the same new term from these roots independently. Hercules Florence, a French painter and inventor living in Campinas, Brazil, used the French form of the word, *photographie*, in private notes which a Brazilian historian believes were written in 1834. This claim is widely reported but is not yet largely recognized internationally. The first use of the word by the Franco-Brazilian inventor became widely known after the research of Boris Kossoy in 1980.

The German newspaper *Vossische Zeitung* of 25 February 1839 contained an article entitled *Photographie*, discussing several priority claims – especially Henry Fox Talbot's – regarding Daguerre's claim of invention. The article is the earliest known occurrence of the word in public print. It was signed "J.M.", believed to have been Berlin astronomer Johann von Maedler.[1] The astronomer Sir John Herschel is also credited with coining the word, independent of Talbot, in 1839.

# History

## Precursor technologies



Photography is the result of combining several technical discoveries, relating to seeing an image and capturing the image. The discovery of the camera obscura ("dark chamber" in Latin) that provides an image of a scene dates back to ancient China. Greek mathematicians Aristotle and Euclid independently described a camera obscura in the 5th and 4th centuries BCE. In the 6th century CE, Byzantine mathematician Anthemius of Tralles used a type of camera obscura in his experiments.

The Arab physicist Ibn al-Haytham (Alhazen) (965–1040) also invented a camera obscura as well as the first true pinhole camera. The invention of the camera has been traced back to the work of Ibn al-Haytham. While the effects of a single light passing through a pinhole had been described earlier, Ibn al-Haytham gave the first correct analysis of the camera obscura, including the first geometrical and quantitative descriptions of the phenomenon, and was the first to use a screen in a dark room so that an image from one side of a hole in the surface could be projected onto a screen on the other side. He also first understood the relationship between the focal point and the pinhole, and performed early experiments with afterimages, laying the foundations for the invention of photography in the 19th century.

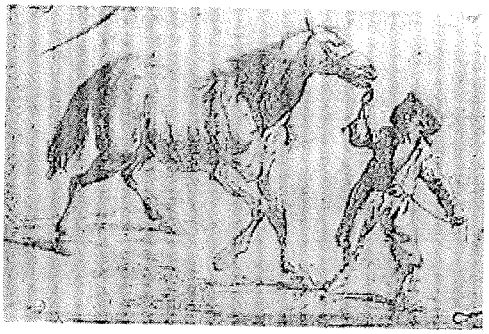
Leonardo da Vinci mentions natural camera obscura that are formed by dark caves on the edge of a sunlit valley. A hole in the cave wall will act as a pinhole camera and project a laterally reversed, upside down image on a piece of paper. Renaissance painters used the camera obscura which, in fact, gives the optical rendering in color that dominates Western Art. It is a box with a small hole in one side, which allows specific light rays to enter, projecting an inverted image onto a viewing screen or paper.

The birth of photography was then concerned with inventing means to capture and keep the image produced by the camera obscura. Albertus Magnus (1193–1280) discovered silver nitrate, and Georg Fabricius (1516–1571) discovered silver chloride, and the techniques described in Ibn al-Haytham's Book of Optics are capable of producing primitive photographs using medieval materials.

Daniele Barbaro described a diaphragm in 1566. Wilhelm Homberg described how light darkened some chemicals (photochemical effect) in 1694. The fiction book *Giphantie*, published in 1760, by French author Tiphaigne de la Roche, described what can be interpreted as photography.

Around the year 1800, British inventor Thomas Wedgwood made the first known attempt to capture the image in a camera obscura by means of a light-sensitive substance. He used paper or white leather treated with silver nitrate. Although he succeeded in capturing the shadows of objects placed on the surface in direct sunlight, and even made shadow copies of paintings on glass, it was reported in 1802 that "the images formed by means of a camera obscura have been found too faint to produce, in any moderate time, an effect upon the nitrate of silver." The shadow images eventually darkened all over.

# Invention

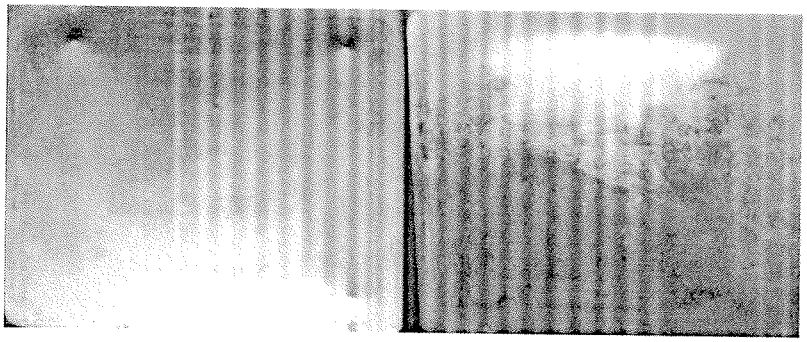


Earliest known surviving heliographic engraving, 1825, printed from a metal plate made by Nicéphore Niépce. The plate was exposed under an ordinary engraving and copied it by photographic means. This was a step towards the first permanent photograph taken with a camera.



*View of the Boulevard du Temple*, a daguerreotype made by Louis Daguerre in 1838, is generally accepted as the earliest photograph to include people. It is a view of a busy street, but because the exposure lasted for several minutes the moving traffic left no trace. Only the two men near the bottom left corner, one of them apparently having his boots polished by the other, remained in one place long enough to be visible.

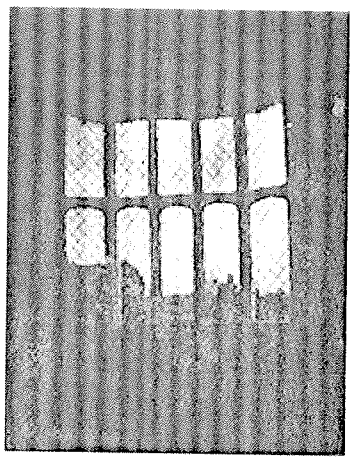
The first permanent photoetching was an image produced in 1822 by the French inventor Nicéphore Niépce, but it was destroyed in a later attempt to make prints from it. Niépce was successful again in 1825. In 1826 or 1827, he made the *View from the Window at Le Gras*, the earliest surviving photograph from nature (i.e., of the image of a real-world scene, as formed in a camera obscura by a lens).



*View from the Window at Le Gras*, 1826 or 1827, the earliest surviving camera photograph. Original plate (left) & colorized reoriented enhancement (right).

Because Niépce's camera photographs required an extremely long exposure (at least eight hours and probably several days), he sought to greatly improve his bitumen process or replace it with one that was more practical. In partnership with Louis Daguerre, he worked out post-exposure processing methods that produced visually superior results and replaced the bitumen with a more light-sensitive resin, but hours of exposure in the camera were still required. With an eye to eventual commercial exploitation, the partners opted for total secrecy.

Niépce died in 1833 and Daguerre then redirected the experiments toward the light-sensitive silver halides, which Niépce had abandoned many years earlier because of his inability to make the images he captured with them light-fast and permanent. Daguerre's efforts culminated in what would later be named the daguerreotype process. The essential elements—a silver-plated surface sensitized by iodine vapor, developed by mercury vapor, and "fixed" with hot saturated salt water—were in place in 1837. The required exposure time was measured in minutes instead of hours. Daguerre took the earliest confirmed photograph of a person in 1838 while capturing a view of a Paris street: unlike the other pedestrian and horse-drawn traffic on the busy boulevard, which appears deserted, one man having his boots polished stood sufficiently still throughout the several-minutes-long exposure to be visible. The existence of Daguerre's process was publicly announced, without details, on 7 January 1839. The news created an international sensation. France soon agreed to pay Daguerre a pension in exchange for the right to present his invention to the world as the gift of France, which occurred when complete working instructions were unveiled on 19 August 1839. In that same year, American photographer Robert Cornelius is credited with taking the earliest surviving photographic self-portrait.



A latticed window in Lacock Abbey, England, photographed by William Fox Talbot in 1835. Shown here in positive form, this may be the oldest extant photographic negative made in a camera.

In Brazil, Hercules Florence had apparently started working out a silver-salt-based paper process in 1832, later naming it *Photographie*.

Meanwhile, a British inventor, William Fox Talbot, had succeeded in making crude but reasonably light-fast silver images on paper as early as 1834 but had kept his work secret. After reading about Daguerre's invention in January 1839, Talbot published his hitherto secret method and set about improving on it. At first, like other pre-daguerreotype processes, Talbot's paper-based photography typically required hours-long exposures in the camera, but in 1840 he created the calotype process, which used the chemical development of a latent image to greatly reduce the exposure needed and compete with the daguerreotype. In both its original and calotype forms, Talbot's process, unlike Daguerre's, created a translucent negative which could be used to print multiple positive copies; this is the basis of most modern chemical photography up to the present day, as daguerreotypes could only be replicated by rephotographing them with a camera. Talbot's famous tiny paper negative of the Oriel window in Lacock Abbey, one of a number of camera photographs he made in the summer of 1835, may be the oldest camera negative in existence.

In France, Hippolyte Bayard invented his own process for producing direct positive paper prints and claimed to have invented photography earlier than Daguerre or Talbot.

British chemist John Herschel made many contributions to the new field. He invented the cyanotype process, later familiar as the "blueprint". He was the first to use the terms "photography", "negative" and "positive". He had discovered in 1819 that sodium thiosulphate was a solvent of silver halides, and in 1839 he informed Talbot (and, indirectly, Daguerre) that it could be used to "fix" silver-halide-based photographs and make them completely light-fast. He made the first glass negative in late 1839.

In the March 1851 issue of *The Chemist*, Frederick Scott Archer published his wet plate collodion process. It became the most widely used photographic medium until the gelatin dry plate, introduced in the 1870s, eventually replaced it. There are three subsets to the collodion process; the Ambrotype (a positive image on glass), the Ferrotype or Tintype (a positive image on metal) and the glass negative, which was used to make positive prints on albumen or salted paper.

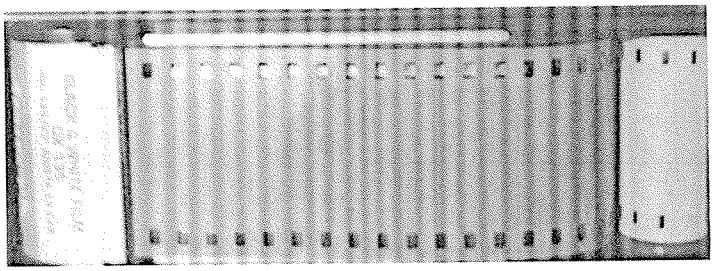
Many advances in photographic glass plates and printing were made during the rest of the 19th century. In 1891, Gabriel Lippmann introduced a process for making natural-color photographs based on the optical phenomenon of the interference of light waves. His scientifically elegant and important but ultimately impractical invention earned him the Nobel Prize in Physics in 1908.

Glass plates were the medium for most original camera photography from the late 1850s until the general introduction of flexible plastic films during the 1890s. Although the convenience of the film greatly popularized amateur photography, early films were somewhat more expensive and of markedly lower optical quality than their glass plate equivalents, and until the late 1910s they were not available in the large formats preferred by most professional photographers, so the new

medium did not immediately or completely replace the old. Because of the superior dimensional stability of glass, the use of plates for some scientific applications, such as astrophotography, continued into the 1990s, and in the niche field of laser holography, it has persisted into the 2010s.

# Film

*Photographic film*



Undeveloped Arista black-and-white film, ISO 125/22°

Hurter and Driffield began pioneering work on the light sensitivity of photographic emulsions in 1876. Their work enabled the first quantitative measure of film speed to be devised.

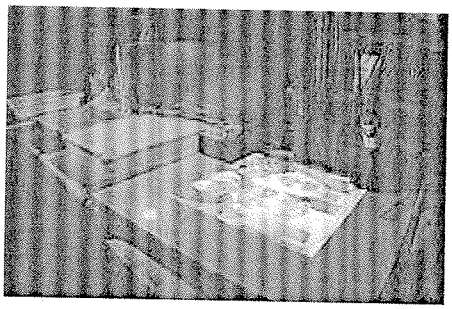
The first flexible photographic roll film was marketed by George Eastman, founder of Kodak in 1885, but this original "film" was actually a coating on a paper base. As part of the processing, the image-bearing layer was stripped from the paper and transferred to a hardened gelatin support. The first transparent plastic roll film followed in 1889. It was made from highly flammable nitrocellulose known as nitrate film.

Although cellulose acetate or "safety film" had been introduced by Kodak in 1908,[34] at first it found only a few special applications as an alternative to the hazardous nitrate film, which had the advantages of being considerably tougher, slightly more transparent, and cheaper. The changeover was not completed for X-ray films until 1933, and although safety film was always used for 16 mm and 8 mm home movies, nitrate film remained standard for theatrical 35 mm motion pictures until it was finally discontinued in 1951.

Films remained the dominant form of photography until the early 21st century when advances in digital photography drew consumers to digital formats. Although modern photography is dominated by digital users, film continues to be used by enthusiasts and professional photographers. The distinctive "look" of film based photographs compared to digital images is likely due to a combination of factors, including: (1) differences in spectral and tonal sensitivity (S-shaped density-to-exposure (H&D curve) with film vs. linear response curve for digital CCD sensors) (2) resolution and (3) continuity of tone.

# Black-and-white

*Monochrome photography*



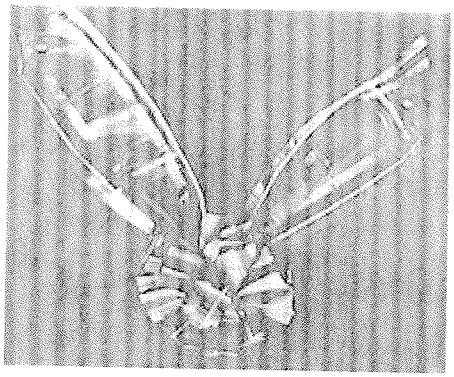
A photographic darkroom with safelight

Originally, all photography was monochrome, or *black-and-white*. Even after color film was readily available, black-and-white photography continued to dominate for decades, due to its lower cost, chemical stability, and its "classic" photographic look. The tones and contrast between light and dark areas define black-and-white photography. It is important to note that monochromatic pictures are not necessarily composed of pure blacks, whites, and intermediate shades of gray but can involve shades of one particular hue depending on the process. The cyanotype process, for example, produces an image composed of blue tones. The albumen print process first used more than 170 years ago, produces brownish tones.

Many photographers continue to produce some monochrome images, sometimes because of the established archival permanence of well-processed silver-halide-based materials. Some full-color digital images are processed using a variety of techniques to create black-and-white results, and some manufacturers produce digital cameras that exclusively shoot monochrome. Monochrome printing or electronic display can be used to salvage certain photographs taken in color which are unsatisfactory in their original form; sometimes when presented as black-and-white or single-color-toned images they are found to be more effective. Although color photography has long predominated, monochrome images are still produced, mostly for artistic reasons. Almost all digital cameras have an option to shoot in monochrome, and almost all image editing software can combine or selectively discard RGB color channels to produce a monochrome image from one shot in color.

# Color

*Color photography*



The first color photograph made by the three-color method suggested by James Clerk Maxwell in 1855, taken in 1861 by Thomas Sutton. The subject is a colored, tartan patterned ribbon.

Color photography was explored beginning in the 1840s. Early experiments in color required extremely long exposures (hours or days for camera images) and could not "fix" the photograph to prevent the color from quickly fading when exposed to white light.

The first permanent color photograph was taken in 1861 using the three-color-separation principle first published by Scottish physicist James Clerk Maxwell in 1855. The foundation of virtually all practical color processes, Maxwell's idea was to take three separate black-and-white photographs through red, green and blue filters. This provides the photographer with the three basic channels required to recreate a color image. Transparent prints of the images could be projected through similar color filters and superimposed on the projection screen, an additive method of color reproduction. A color print on paper could be produced by superimposing carbon prints of the three images made in their complementary colors, a subtractive method of color reproduction pioneered by Louis Ducos du Hauron in the late 1860s.



Color photography was possible long before Kodachrome, as this 1903 portrait by Sarah Angelina Acland demonstrates, but in its earliest years, the need for special equipment, long exposures, and complicated printing processes made it extremely rare.

Russian photographer Sergei Mikhailovich Prokudin-Gorskii made extensive use of this color separation technique, employing a special camera which successively exposed the three color-filtered images on different parts of an oblong plate. Because his exposures were not simultaneous, unsteady subjects exhibited color "fringes" or, if rapidly moving through the scene, appeared as brightly colored ghosts in the resulting projected or printed images.

Implementation of color photography was hindered by the limited sensitivity of early photographic materials, which were mostly sensitive to blue, only slightly sensitive to green, and virtually insensitive to red. The discovery of dye sensitization by photochemist Hermann Vogel in 1873 suddenly made it possible to add sensitivity to green, yellow and even red. Improved color sensitizers and ongoing improvements in the overall sensitivity

of emulsions steadily reduced the once-prohibitive long exposure times required for color, bringing it ever closer to commercial viability.

Autochrome, the first commercially successful color process, was introduced by the Lumière brothers in 1907. Autochrome plates incorporated a mosaic color filter layer made of dyed grains of potato starch, which allowed the three color components to be recorded as adjacent microscopic image fragments. After an Autochrome plate was reversal processed to produce a positive transparency, the starch grains served to illuminate each fragment with the correct color and the tiny colored points blended together in the eye, synthesizing the color of the subject by the additive method. Autochrome plates were one of several varieties of additive color screen plates and films marketed between the 1890s and the 1950s.

Kodachrome, the first modern "integral tripack" (or "monopack") color film, was introduced by Kodak in 1935. It captured the three color components in a multi-layer emulsion. One layer was sensitized to record the red-dominated part of the spectrum, another layer recorded only the green part and a third recorded only the blue. Without special film processing, the result would simply be three superimposed black-and-white images, but complementary cyan, magenta, and yellow dye images were created in those layers by adding color couplers during a complex processing procedure.

Agfa's similarly structured Agfacolor Neu was introduced in 1936. Unlike Kodachrome, the color couplers in Agfacolor Neu were incorporated into the emulsion layers during manufacture, which greatly simplified the processing. Currently, available color films still employ a multi-layer emulsion and the same principles, most closely resembling Agfa's product.

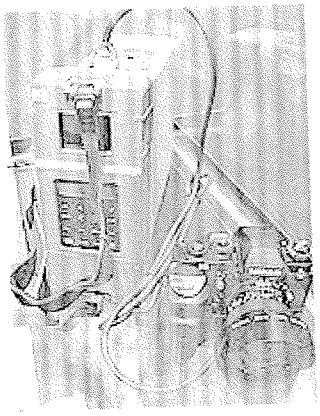
Instant color film, used in a special camera which yielded a unique finished color print only a minute or two after the exposure, was introduced by Polaroid in 1963.

Color photography may form images as positive transparencies, which can be used in a slide projector, or as color negatives intended for use in creating positive color enlargements on specially coated paper. The latter is now the most common form of film (non-digital) color photography owing to the introduction of automated photo printing equipment. After a transition period centered around 1995–2005, color film was relegated to a niche market by inexpensive multi-megapixel digital cameras. Film continues to be the preference of some photographers because of its distinctive "look".

**Digital**

*Digital photography*

*Digital camera*



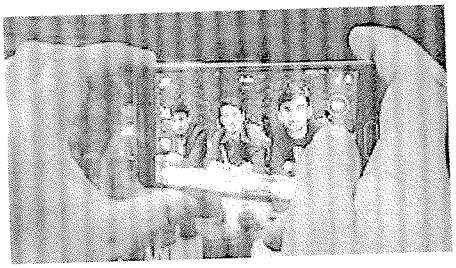
Kodak DCS 100, based on a Nikon F3 body with Digital Storage Unit

In 1981, Sony unveiled the first consumer camera to use a charge-coupled device for imaging, eliminating the need for film: the Sony Mavica. While the Mavica saved images to disk, the images were displayed on television, and the camera was not fully digital.

The first digital camera to both record and save images in a digital format was the Fujix DS-1P created by Fujfilm in 1988.

In 1991, Kodak unveiled the DCS 100, the first commercially available digital single lens reflex camera. Although its high cost precluded uses other than photojournalism and professional photography, commercial digital photography was born.

Digital imaging uses an electronic image sensor to record the image as a set of electronic data rather than as chemical changes on film. An important difference between digital and chemical photography is that chemical photography resists photo manipulation because it involves film and photographic paper, while digital imaging is a highly manipulative medium. This difference allows for a degree of image post-processing that is comparatively difficult in film-based photography and permits different communicative potentials and applications.



Photography on a smartphone

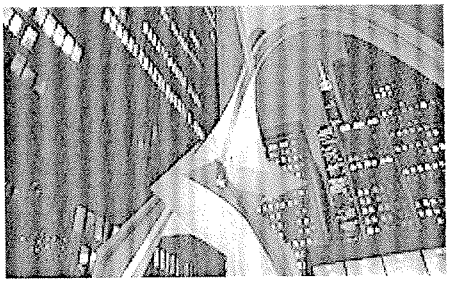
Digital photography dominates the 21st century. More than 99% of photographs taken around the world are through digital cameras, increasingly through smartphones.

**Synthesis**

Synthesis photography is part of computer-generated imagery (CGI) where the shooting process is modeled on real photography. The CGI, creating digital copies of real universe, requires a visual representation process of these universes. Synthesis photography is the application of analog and digital photography in digital space. With the characteristics of the real

photography but not being constrained by the physical limits of real world, synthesis photography allows artists to move into areas beyond the grasp of real photography.

Techniques



Angles such as vertical, horizontal, or as pictured here diagonal are considered important photographic techniques

A large variety of photographic techniques and media are used in the process of capturing images for photography. These include the camera; dualphotography; full-spectrum, ultraviolet and infrared media; light field photography; and other imaging techniques.

**Cameras**

The camera is the image-forming device, and a photographic plate, photographic film or a silicon electronic image sensor is the capture medium. The respective recording medium can be the plate or film itself, or a digital magnetic or electronic memory.

Photographers control the camera and lens to "expose" the light recording material to the required amount of light to form a "latent image" (on plate or film) or RAW file (in digital cameras) which, after appropriate processing, is converted to a usable image. Digital cameras use an electronic image sensor based on light-sensitive electronics such as charge-coupled device (CCD) or complementary metal-oxide-semiconductor (CMOS) technology. The resulting digital image is stored electronically, but can be reproduced on a paper.

The camera (or 'camera obscura') is a dark room or chamber from which, as far as possible, all light is excluded except the light that forms the image. It was discovered and used in the 16th century by painters. The subject being photographed, however, must be illuminated. Cameras can range from small to very large, a whole room that is kept dark while the object to be photographed is in another room where it is properly illuminated. This was common for reproduction photography of flat copy when large film negatives were used (see Process camera).

As soon as photographic materials became "fast" (sensitive) enough for taking candid or surreptitious pictures, small "detective" cameras were made, some actually disguised as a book or handbag or pocket watch (the *Ticka* camera) or even worn hidden behind an Ascot necktie with a tie pin that was really the lens.

The movie camera is a type of photographic camera which takes a rapid sequence of photographs on recording medium. In contrast to a still camera, which captures a single snapshot at a time, the movie camera takes a series of images, each called a "frame". This is accomplished through an intermittent mechanism. The frames are later played back in a movie projector at a specific

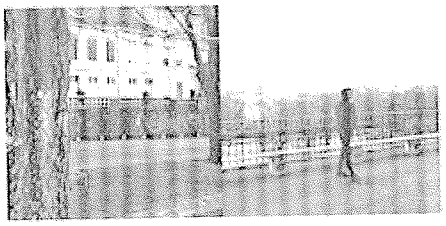
speed, called the "frame rate" (number of frames per second). While viewing, a person's eyes and brain merge the separate pictures to create the illusion of motion.

**Stereoscopic**

Photographs, both monochrome and color, can be captured and displayed through two side-by-side images that emulate human stereoscopic vision. Stereoscopic photography was the first that captured figures in motion.[46] While known colloquially as "3-D" photography, the more accurate term is stereoscopy. Such cameras have long been realized by using film and more recently in digital electronic methods (including cell phone cameras).

**Dualphotography**

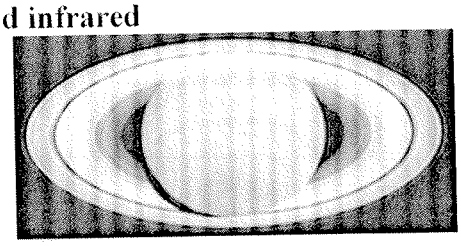
*Dualphotography*



An example of a dualphoto using a smartphone based app

Dualphotography consists of photographing a scene from both sides of a photographic device at once (e.g. camera for back-to-back dualphotography, or two networked cameras for portal-plane dualphotography). The dualphoto apparatus can be used to simultaneously capture both the subject and the photographer, or both sides of a geographical place at once, thus adding a supplementary narrative layer to that of a single image.

**Full-spectrum, ultraviolet and infrared**



This image of the rings of Saturn is an example of the application of ultraviolet photography in astronomy

Ultraviolet and infrared films have been available for many decades and employed in a variety of photographic avenues since the 1960s. New technological trends in digital photography have opened a new direction in full spectrum photography, where careful filtering choices across the ultraviolet, visible and infrared lead to new artistic visions.

Modified digital cameras can detect some ultraviolet, all of the visible and much of the near infrared spectrum, as most digital imaging sensors are sensitive from about 350 nm to 1000 nm.

An off-the-shelf digital camera contains an infrared hot mirror filter that blocks most of the infrared and a bit of the ultraviolet that would otherwise be detected by the sensor, narrowing the accepted range from about 400 nm to 700 nm.

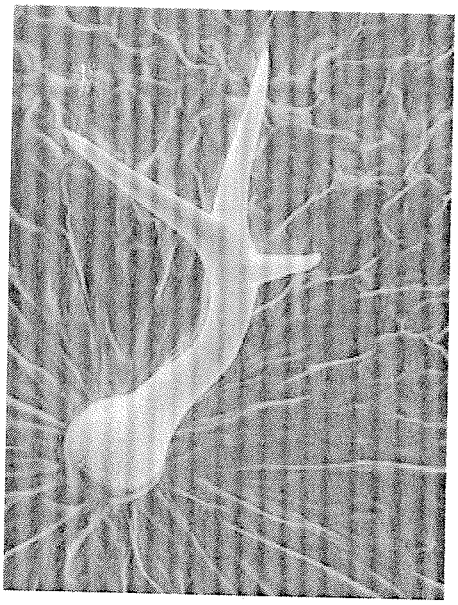
Replacing a hot mirror or infrared blocking filter with an infrared pass or a wide spectrally transmitting filter allows the camera to detect the wider spectrum light at greater sensitivity. Without the hot-mirror, the red, green and blue (or cyan, yellow and magenta) colored micro-filters placed over the sensor elements pass varying amounts of ultraviolet (blue window) and infrared (primarily red and somewhat lesser the green and blue micro-filters).

Uses of full spectrum photography are for fine art photography, geology, forensics and law enforcement.

# Light field

Digital methods of image capture and display processing have enabled the new technology of "light field photography" (also known as synthetic aperture photography). This process allows focusing at various depths of field to be selected *after* the photograph has been captured. As explained by Michael Faraday in 1846, the "light field" is understood as 5-dimensional, with each point in 3-D space having attributes of two more angles that define the direction of each ray passing through that point.

These additional vector attributes can be captured optically through the use of microlenses at each pixel point within the 2-dimensional image sensor. Every pixel of the final image is actually a selection from each sub-array located under each microlens, as identified by a post-image capture focus algorithm.



Devices other than cameras can be used to record images. Trichome of *Arabidopsis thaliana* seen via scanning electron microscope. Note that image has been edited by adding colors to clarify structure or to add an aesthetic effect. Heiti Paves from Tallinn University of Technology.

Types of photography

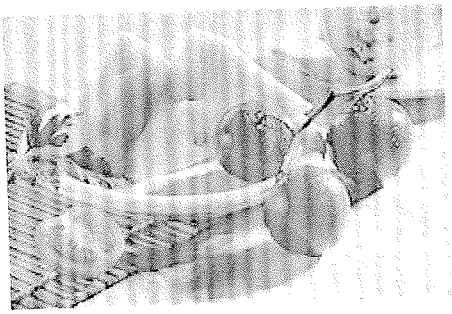
## Amateur

An amateur photographer is one who practices photography as a hobby/passion and not necessarily for profit. The quality of some amateur work is comparable to that of many professionals and may be highly specialized or eclectic in choice of subjects. Amateur photography is often pre-eminent in photographic subjects which have little prospect of commercial use or reward. Amateur photography grew during the late 19th century due to the popularization of the hand-held camera. Nowadays it has spread widely through social media and is carried out throughout different platforms and equipment, switching to the use of cell phone. Good pictures can now be taken with a cell phone which is a key tool for making photography more accessible to everyone.

## Commercial

Commercial photography is probably best defined as any photography for which the photographer is paid for images rather than works of art. In this light, money could be paid for the subject of the photograph or the photograph itself. Wholesale, retail, and professional uses of photography would fall under this definition. The commercial photographic world could include:

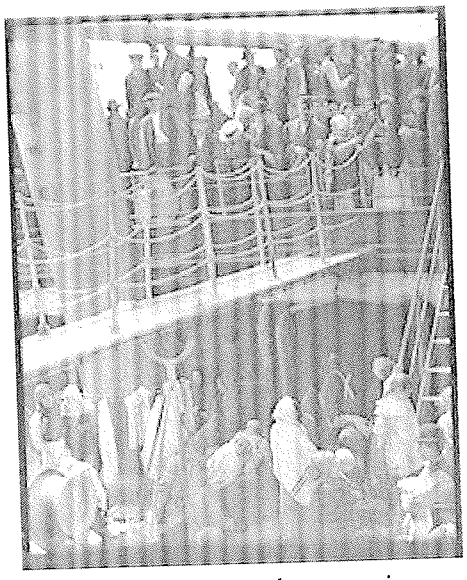
- Advertising photography: photographs made to illustrate and usually sell a service or product. These images, such as packshots, are generally done with an advertising agency, design firm or with an in-house corporate design team.
- Fashion and glamour photography usually incorporates models and is a form of advertising photography. Fashion photography, like the work featured in *Harper's Bazaar*, emphasizes clothes and other products; glamour emphasizes the model and body form. Glamour photography is popular in advertising and men's magazines. Models in glamour photography sometimes work nude.
- 360 product photography displays a series of photos to give the impression of a rotating object. This technique is commonly used by ecommerce websites to help shoppers visualise products.
- Concert photography focuses on capturing candid images of both the artist or band as well as the atmosphere (including the crowd). Many of these photographers work freelance and are contracted through an artist or their management to cover a specific show. Concert photographs are often used to promote the artist or band in addition to the venue.
- Crime scene photography consists of photographing scenes of crime such as robberies and murders. A black and white camera or an infrared camera may be used to capture specific details.
- Still life photography usually depicts inanimate subject matter, typically commonplace objects which may be either natural or man-made. Still life is a broader category for food and some natural photography and can be used for advertising purposes.
- Real Estate photography focuses on the production of photographs showcasing a property that is for sale, such photographs requires the use of wide-lens and extensive knowledge in High-dynamic-range imaging photography.



Example of a studio-made food photograph.

- Food photography can be used for editorial, packaging or advertising use. Food photography is similar to still life photography but requires some special skills.
- Photojournalism can be considered a subset of editorial photography. Photographs made in this context are accepted as a documentation of a news story.
- Paparazzi is a form of photojournalism in which the photographer captures candid images of athletes, celebrities, politicians, and other prominent people.
- Portrait and wedding photography: photographs made and sold directly to the end user of the images.
- Landscape photography depicts locations.
- Wildlife photography demonstrates the life of animals.

## Art



Classic Alfred Stieglitz photograph, *The Steerage* shows unique aesthetic of black-and-white photos.

During the 20th century, both fine art photography and documentary photography became accepted by the English-speaking art world and the gallery system. In the United States, a handful of photographers, including Alfred Stieglitz, Edward Steichen, John Szarkowski, F. Holland Day, and Edward Weston, spent their lives advocating for photography as a fine art. At

first, fine art photographers tried to imitate painting styles. This movement is called Pictorialism, often using soft focus for a dreamy, 'romantic' look. In reaction to that, Weston, Ansel Adams, and others formed the Group f/64 to advocate 'straight photography', the photograph as a (sharply focused) thing in itself and not an imitation of something else.

The aesthetics of photography is a matter that continues to be discussed regularly, especially in artistic circles. Many artists argued that photography was the mechanical reproduction of an image. If photography is authentically art, then photography in the context of art would need redefinition, such as determining what component of a photograph makes it beautiful to the viewer. The controversy began with the earliest images "written with light"; Nicéphore Niépce, Louis Daguerre, and others among the very earliest photographers were met with acclaim, but some questioned if their work met the definitions and purposes of art.

Clive Bell in his classic essay *Art* states that only "significant form" can distinguish art from what is not art.

There must be some one quality without which a work of art cannot exist; possessing which, in the least degree, no work is altogether worthless. What is this quality? What quality is shared by all objects that provoke our aesthetic emotions? What quality is common to Sta. Sophia and the windows at Chartres, Mexican sculpture, a Persian bowl, Chinese carpets, Giotto's frescoes at Padua, and the masterpieces of Poussin, Piero della Francesca, and Cezanne? Only one answer seems possible – significant form. In each, lines and colors combined in a particular way, certain forms and relations of forms, stir our aesthetic emotions.

On 7 February 2007, Sotheby's London sold the 2001 photograph *99 Cent II Diptychon* for an unprecedented $3,346,456 to an anonymous bidder, making it the most expensive at the time.[53]

Conceptual photography turns a concept or idea into a photograph. Even though what is depicted in the photographs are real objects, the subject is strictly abstract.

## Photojournalism

Photojournalism is a particular form of photography (the collecting, editing, and presenting of news material for publication or broadcast) that employs images in order to tell a news story. It is now usually understood to refer only to still images, but in some cases the term also refers to video used in broadcast journalism. Photojournalism is distinguished from other close branches of photography (e.g., documentary photography, social documentary photography, street photography or celebrity photography) by complying with a rigid ethical framework which demands that the work be both honest and impartial whilst telling the story in strictly journalistic terms. Photojournalists create pictures that contribute to the news media, and help communities connect with one other. Photojournalists must be well informed and knowledgeable about events happening right outside their door. They deliver news in a creative format that is not only informative, but also entertaining.

## REFERENCE BOOKS/ARTICLES:


1. Phillip Krejcarek Digital Photography-A hands on Introduction Delmer Publishers

2. Adrian Davies and PhillFennessy Digital for photographers Focal Press

3. Jon Torrant Understanding Digital Cameras Focal Press

4. Carla Rose Teach Yourself Digital Photography in 14 Days Techmedia, 1997

## LIST OF PARTICIPANTS

| Sl. No. | Registration Number | Name of the Student |
|---|---|---|
| 1 | U15MB371 | SIVAKUMAR. S |
| 2 | U15MB372 | SIVANAMBI .S |
| 3 | U15MB373 | SOPHIYA .L |
| 4 | U15MB374 | SOUNDARIYA.M |
| 5 | U15MB375 | SOWMYA LAKSHMI .I |
| 6 | U15MB376 | SREERAM.M |
| 7 | U15MB377 | SRINIVASAN.R |
| 8 | U15MB378 | SRUTHI .S |
| 9 | U15MB379 | SUBALAKSHMI .C |
| 10 | U15MB380 | SUBASHINI. G |
| 11 | U15MB381 | SUJI RAKSHANAA.K |
| 12 | U15MB382 | SUMATHI .B |
| 13 | U15MB383 | SURESHKRISHNAN.R |
| 14 | U15MB384 | SURIYA.S |
| 15 | U15MB385 | SUSHMITHA .K |
| 16 | U15MB386 | SUWATHI .R |
| 17 | U15MB387 | SYLVIA MARY. S |
| 18 | U15MB388 | THAJES KENCY.F |
| 19 | U15MB389 | THIRUNAVUKARASU .S |
| 20 | U15MB390 | UTHISH. R |

Annexure II

# VALUE ADDED COURSE

## Photography and AN Ph01

List of students Enrolled – November 2015

| Sl. No. | Registration Number | Name of the Student | Signature |
|---|---|---|---|
| 1 | U15MB371 | SIVAKUMAR. S | |
| 2 | U15MB372 | SIVANAMBI .S | |
| 3 | U15MB373 | SOPHIYA .L | |
| 4 | U15MB374 | SOUNDARIYA.M | |
| 5 | U15MB375 | SOWMYA LAKSHMI .I | |
| 6 | U15MB376 | SREERAM.M | |
| 7 | U15MB377 | SRINIVASAN.R | |
| 8 | U15MB378 | SRUTHI .S | |
| 9 | U15MB379 | SUBALAKSHMI .C | |
| 10 | U15MB380 | SUBASHINI. G | |
| 11 | U15MB381 | SUJI RAKSHANAA.K | |
| 12 | U15MB382 | SUMATHI .B | |
| 13 | U15MB383 | SURESHKRISHNAN.R | |
| 14 | U15MB384 | SURIYA.S | |
| 15 | U15MB385 | SUSHMITHA .K | |
| 16 | U15MB386 | SUWATHI .R | |
| 17 | U15MB387 | SYLVIA MARY. S | |
| 18 | U15MB388 | THAJES KENCY.F | |
| 19 | U15MB389 | THIRUNAVUKARASU .S | |
| 20 | U15MB390 | UTHISH. R | |

**RESOURCE PERSONS**

1.

2.

**COORDINATOR**

Annexure III

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

## VALUE ADDED COURSES

**Photography**

**Course Code: AN PH 03**

**I. ANSWER ALL THE QUESTIONS (5 x 4 = 20 marks)** **Duration – 30 minutes**

1. What is flim
2. Mention the basic principles in photography
3. List any 4 types photography
4. Name the types of lences with is uses
5. Lists the applications of photography in anatatomy

Smith S.
U15MB378

16/20

1. A thin flexible strip of plastic or other material coated with light sensitive emulsion for exposure in a camera used to produce photographic motion picture

4

2. Seven principles of Art & design in photography. Balance. Rhythm, pattern, emphasis Contrast Unity & movement are the foundation of Visual Arts. Using the seven principles allows you to take greater control of your photographic practice. This will lead to better photos

4

# Sri Lakshmi Narayana Institute of Medical Sciences

## CERTIFICATE OF MERIT

This is to certify that _____THAJES KENCY.F_____ has actively participated in the Value Added Course on **PHOTOGRAPHY** held during November 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

COORDINATOR

# Sri Lakshmi Narayana Institute of Medical Sciences

## CERTIFICATE OF MERIT

This is to certify that _____SRUTHI.S_____ has actively participated in the Value Added Course on **PHOTOGRAPHY** held during November 2015 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

COORDINATOR

**Annexure 5**

## Student Feedback Form

**Course Name:** Photography

**Subject Code:** AN Ph01

**Name of Student:** SOPHIYA.L **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:

NIL

Signature of ~~Student~~

Date: 20/11/15

**Annexure 5**

## Student Feedback Form

**Course Name:** Photography

**Subject Code:** AN Ph01

**Name of Student:** SUMATHI . B. **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:

NIL

B. Sumathi
Signature of Student
Date: 20/11/15

Date: 31-11-2015

From

Dr.K.C.Mallika Arjuna
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: Photography and AN Ph01– Reg.**

Dear Sir,

With reference to the subject mentioned above, the Department of Anatomy has conducted the value-added course on **Photography and AN Ph01** November 2015 for 1st year MBBS Students (2015-2016 Batch). We solicit your kind action to send certificates for the participants whose list is attached with this letter.

Kind Regards,

**Encl:** Participants List



# Sri Lakshmi Narayana Institute of Medical Sciences

Date 3/10/2015

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: BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING , 30 hrs course** on **NOV 2015 TO JAN 2016**. 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. JAYAKUMAR

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, Kudapakkam, Puducherry-605 502.

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dean DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF
AGARAM
KUDAPAKKAM
PUDUCHERRY - 605 502

(Sign & Seal)

Subject Expert

(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

06.10.2015

**Sub: Organising Value-added Course: BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING**

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 **"BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING"**.

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 NOV 2015. 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

# Course Proposal

**Course Title: BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING**

**Course Objective:**

1. **Introduction**
2. **Preparation**
3. **Fiberoptic endoscopy**
4. **Assessment**
5. **Therapeutic uses**
6. **Hands on training**
7. **Laparoscopy basics**
8. **Indications and contraindications of laparoscopy**
9. **Preoperative evaluation**
10. **Basic laparoscopic equipment**

**Course Outcome:**

**Course Audience: MBBS UNDERGRADUATES**

**Course Coordinator: DR ASAYAS BOSCO CHANDRA KUMAR**

**Course Faculties with Qualification and Designation:**

1. **Dr Balagurunathan , Prof and HOD General Surgery**
2. **Dr Asayas Bosco Chandra Kumar, Prof General Surgery**

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

| SlNo | Date | Topic | Time | Hours | Faculty |
|---|---|---|---|---|---|
| 1. | 15/11/2015 | 1. Introduction | 4-6PM | 2 | **Dr Asayas Bosco Chandra Kumar** |
| 2. | 17/11/2015 | 1. Introduction | 4-5PM | 1 | **Dr Balagurunathan** |
| 3. | 21/11/2015 | 2. Preparation of patient | 4-6PM | 2 | **Dr Asayas Bosco Chandra** |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | **Kumar** |
| 4. | 25/11/2015 | 3.Fiberoptic endoscopy | 4-6PM | 2 | **Dr Balagurunathan** |
| 5. | 28/11/2015 | 3.Fiberoptic endoscopy | 4-7PM | 3 | **Dr Asayas Bosco Chandra Kumar** |
| 6. | 3/12/2015 | 4.laparoscopy basics | 4-7PM | 3 | **Dr Balagurunathan** |
| 7. | 4/12/2015 | 4. laparoscopy basics | 4-7PM | 3 | **Dr Asayas Bosco Chandra Kumar** |
| 8. | 7/12/2015 | 5. basic laparoscopic equipment | 4-6PM | 2 | **Dr Balagurunathan** |
| 9. | 9/12/2015 | 5. basic laparoscopic equipment | 4-6 | 2 | **Dr Asayas Bosco Chandra Kumar** |
| 10. | 13/12/2015 | 6. laparoscopy indications and contraindications | 4-7PM | 2 | **Dr Balagurunathan** |
| 11. | 16/12/2015 | 7. Therapeutic uses and Assessment | 4-7PM | 2 | **Dr Asayas Bosco Chandra Kumar** |
| 12.. | 18/12/2015 | 8. Hands on training | 4-7PM | 3 | **Dr Balagurunathan** |
| 13. | 22/12/2015 | 8. Hands on training | 4-7PM | 3 | **Dr Asayas Bosco Chandra Kumar** |
| | | | TOTAL HOURS | 30 | |

**REFERENCE BOOKS: (Minimum 2)**


1. **Schwartz's Principles of Surgery, 11th Edition**
2. **Bailey And Love's Short Practice of Surgery 27th Ed**
3. **Masteryof Endoscopic and Laparoscopic surgery – Lee L.Swanstrom, Nathaniel.J.Soper**

## VALUE ADDED COURSE

**1. Name of the programme & Code**

**BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING** GS02

**2. Duration & Period**

30 hrs & NOV 2015 – JAN 2016

**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- NOV 2015 – JAN 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course NOV 2015 – JAN 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | GS02 | BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING | Dr. ASAYAS BOSCO CHANDRA KUMAR | MBBS | 20 (NOV 2015 – JAN 2016) |

**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)**

# BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING

## PARTICIPANT HAND BOOK

BIHER SLIMS

## COURSE DETAILS

| Particulars | Description |
|---|---|
| Course Title | **BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING** |
| Course Code | GS02 |
| Objective | 1. Introduction<br>2. Preparation<br>3. Fiberoptic endoscopy<br>4. Assessment<br>5. Therapeutic uses<br>6. Hands on training<br>7. Laparoscopy basics<br>8. indications and contraindications of laparoscopy<br>9. preoperative evaluation<br>10. basic laparoscopic equipment |
| Further learning opportunities | Recent advances in endoluminal surgery |
| Key Competencies | On successful completion of the course the students will have skill in handling surgical patients for endoscopy and laparoscpy |
| Target Student | Final year MBBS Students |
| Duration | 30hrs , NOV 2015- JAN 2016 |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | Multiple choice questions |

## INDICATIONS

- Endoscope every patient with dysphagia except when this is full explained by the presence of neurological or neuromuscular disease.
- Endoscope patients with suspected disease in the oesophagus producing pain on swallowing (odynophagia), heartburn not responding to simple medication or arising de novo in patients over 50 years, bleeding, or if accidental and iatrogenic damage are suspected.

PREPARATION

1. Ensure that the endoscope, the ancillary equipment and necessary spares are available, function correctly and are appropriately sterile. The endoscope must be thoroughly prepared between procedures according to the maker's instructions. Fibreoptic instruments, biopsy forceps and similar instruments are scrupulously cleaned using neutral detergent and usually disinfected with 2% alkaline glutaraldehyde. This is capable of eliminating all infective organisms, including HIV. Washing and sterilization are performed mechanically in an automatic machine to avoid exposure of endoscopy room staff to glutaraldehyde fumes.

2. Modern gastrointestinal endoscopes are slim, versatile, have remarkably flexible tips and can be passed with pharyngeal anaesthesia alone in most patients. They are safe, relatively comfortable for the patient and allow examination of the stomach and duodenum beyond. Use the end-viewing instrument routinely since it gives the best general view. Through it can be passed biopsy forceps, cytology brushes, snares, guidewires for dilators and needles for injection. Argon plasma coagulation or Nd-YAG laser may be applied through it for the palliation of inoperable neoplasms or for the treatment of Barrett's oesophagus. The technology of endoscopes is steadily improving and the rigid oesophagoscope is, to all intents and purposes, obsolete.
3. Obtain signed informed consent from the patient.
4. Remove dentures from the patient.
5. Except in an emergency, have the patient starved of food and fluids for at least 5 hours. In an emergency, especially in patients with upper gastrointestinal haemorrhage who cannot wait 5 hours for the stomach to empty, a crash general anaesthetic with cricoid pressure is the safest means of securing the airway and preventing aspiration.
6. Obtain a preliminary barium swallow X-ray if there is a suspected pharyngeal pouch.
7. Attach a pulse oximeter probe to the patient's finger if sedation is being used, and ensure that there are sufficient numbers of staff in the endoscopy room for safe care of a sedated patient.
8. Spray the pharynx with lidocaine solution just before passing the endoscope.

9. In anxious patients, or those in whom intervention (e.g. dilatation) is required, insert a small plastic cannula into a peripheral vein and through it inject slowly 1–2 mg of midazolam until the patient's eyelids just begin to droop. Remember that it takes 2 minutes for the full effect of midazolam to develop.

FIBREOPTIC ENDOSCOPY

- Lay the patient on the left side with hips and knees flexed. Place a plastic hollow gag between the teeth. Ensure that the patient's head is in the midline and that the chin is lowered on to the chest.

- Lubricate the previously checked end-viewing instrument with water-soluble jelly.

- Pass the endoscope tip through the plastic gag, over the tongue to the posterior pharyngeal wall. Depress the tip control slightly so that the instrument tip passes down towards the cricopharyngeal sphincter. Do not overflex the tip or it will be directed anteriorly and enter the larynx. Visualize the larynx and pass the endoscope just behind it.

- Ask the patient to swallow. Do not resist the slight extrusion of the endoscope as the larynx rises, but maintain gentle pressure so that it will advance as the larynx descends and the cricopharyngeal sphincter relaxes. Advance the endoscope under vision, insufflating air gently to open up the passage. Aspirate any fluid. Spray water across the lens if it becomes obscured. If no holdup is encountered, pass the tip through the stomach into the duodenum then withdraw it slowly, noting the features. Remove biopsy specimens and take cytology brushings from any ulcers, tumours or other lesions.

- If a stricture is encountered note its distance from the incisor teeth. Sometimes the instrument will pass through, allowing the length of the stricture to be determined. Always remove biopsy specimens and cytology brushings from within the stricture. If the stricture is benign in appearance, gentle dilatation to 12 mm can be attempted if the patient is symptomatic.

- Dilatation of malignant strictures is not indicated as any benefit is

short-lasting and the risk of perforation is high (6–8%). Get biopsies and confirm the diagnosis prior to intervention. If nutritional support is required, fluoroscopic passage of a feeding nasogastric tube can be performed.

Assess

1. Note the level of each feature. The cricopharyngeal sphincter is approximately 16 cm from the incisor teeth. The deviation around the aortic arch is 28–30 cm, the cardia lies at 40 cm and here the lining changes abruptly from the pale, bluish, stratified oesophageal epithelium to the florid, pinker, gastric columnar-cell epithelium.

2. Oesophagitis is usually from gastro-oesophageal reflux, but is not necessarily associated with hiatal hernia. Consult a colour chart that illustrates the grades of oesophagitis. Most commonly there are red streaking erosions just above the cardia. Oesophagitis may be seen above a benign stricture. Occasionally, in advanced achalasia, one may see a mild diffuse oesophagitis from contact with fermenting food residues. Thick white plaques indicate monilial infection, usually in association with oral involvement. Confirm the diagnosis by taking mucosal scrapings.

3. Sliding hiatal hernia produces a loculus of stomach above the constriction of the crura with a raised gastro-oesophageal mucosal junction. To determine the level of the hiatus, ask the patient to sniff, and note the level at which the crura momentarily narrow the lumen. Reflux and oesophagitis may be visible. A rolling hernia is visible only from within the stomach by inverting the tip of a flexible instrument to view the apparent fundic diverticulum. If the diagnosis is a possibility, confirm with a barium study.

4. Frank ulceration in the oesophagus is unusual, but may be due to severe reflux disease. In Barrett's oesophagus the lower gullet is lined with modified gastric mucosa and an ulcer may develop in the columnar-lined segment. In all cases of Barrett's take biopsies of the columnar segment from all four quadrants at 2-cm intervals In patients with dysplasia even more biopsies are required for accurate assessment. Use 'jumbo' forceps. Ulcerating carcinomas may develop at any level. In most Western countries the majority of cancers comprise adenocarcinomas and these

arise in the lower oesophagus in association with Barrett's oesophagus. Take multiple biopsies and cytological brushings from a number of areas of all ulcers

5. Strictures from peptic oesophagitis or, rarely, ulceration in a Barrett's oesophagus develop at any time from birth onwards,but more frequently occur in middle or old age. Almost always there is a coincidental hiatal hernia. If there is no hernia below the stricture, suspect cancer. Also suspect cancer if there is food residue above a stricture. Food residue may also be seen in achalasia and may be the only diagnostic clue. Take multiple biopsies and brushings for cytology. The cause of Schatzki's ring is unknown. It is usually asymptomatic, seen radiologically at the junction between gastric and oesophageal mucosa. Caustic strictures develop at the sites of hold-up of swallowed liquids at the cricopharyngeus, at the aortic arch crossing and at the cardia. Webs or strictures in the upper oesophagus are uncommon. However, it is not unusual to see a patch or ring of ectopic gastric mucosa in the upper oesophagus 1–2 cm below the cricopharyngeus, the so-called 'inlet patch'. Stricture may arise from external pressure, of which by far the most common cause is bronchogenic carcinoma.

6. Mega-oesophagus may be seen in achalasia of the cardia, but is now uncommon as most cases are diagnosed long before dilatation takes place. Mega-oesophagus may also be seen in the South American Chagas' disease and in some cases of advanced scleroderma.

7. Pulsion diverticula are related to abnormal oesophageal motility and are seen above the cricopharyngeus muscle (Zenker's diverticulum or pharyngeal pouch) and above segments of presumed spasm. Traction diverticula in the mid-oesophagus develop as a result of chronic inflammation of mediastinal glands, especially from tuberculosis.

8. Oesophageal varices are usually recognized just above the cardia as convoluted varicose veins, which may extend into the upper stomach.

**Aftercare**

1. Make sure the patient does not have chest pain, air emphysema in the neck, or a raised temperature. Have a plain chest radiograph taken or perform a contrast swallow.

2. If there is evidence of a leak, confirm it and identify the site with X-rays using a water-soluble contrast medium. If an expanding stent is not sealing a leak consider inserting a second stent. Start the patient on broad-spectrum antibiotics and withhold food and fluids until the patient is entirely comfortable and a contrast swallow shows no leak.

3. Following stent insertion, warn the patient against swallowing unchewed food, particularly lumps of meat, fruit skins and stones, and to wash down the food with sips of water. Aerated drinks such as sodium bicarbonate solution (half a teaspoonful in half a glass of water half an hour before meals) or fresh pineapple juice help to wash away adherent mucus that may block the tube.

4. It is now extraordinarily uncommon to fail to intubate a tumour. If it cannot be done, a feeding gastrostomy or jejunostomy may be inserted after full discussion with the patient. This poses ethical and philosophical dilemmas, but these must be faced. However, always remember that the aim of palliation is to improve the quality of remaining life. If a particular therapy will not improve the quality of life in an individual patient, donot use it.

# LAPAROSCOPY IN GENERAL SURGERY

## I. INTRODUCTION

No surgical procedure is without risk. Despite the minimally invasive nature of laparoscopic surgery, the potential for adverse outcome is present and should be taken as seriously as in a traditional open procedure. Patients must be carefully evaluated preoperatively to determine their eligibility for a laparoscopic approach. In addition to the patient characteristics and the nature of the disease process that must be considered for open surgery, the surgeon must also consider factors specific to the execution of the procedure laparoscopically. Patient selection and preparation for a laparoscopic procedure is the first step in ensuring a successful outcome.

## II. PREOPERATIVE EVALUATION

A careful history and physical examination are the cornerstones of patient selection for surgery. Preexisting conditions that predispose patients to both anesthetic and surgical complications must be identified. Signs and symptoms suggestive of cardiac or pulmonary disease should be specifically sought, even if a previous diagnosis has not been established. Preoperative laboratory evaluation depends on the nature of the surgery, the patient's past medical history, and the preferences of both the surgeon and anesthesiologist. In general, this may include a complete blood cell count, serum electrolyte determination, and urinalysis. In patients older than 40, a screening chest radiograph and an electrocardiogram may be indicated. Coagulation studies are needed in patients with a personal or family history of a bleeding diathesis is important to carefully evaluate the patient with known or suspected pulmonary disease prior to undertaking a laparoscopic procedure, as pneumoperitoneum and hypercarbia may be poorly tolerated. Pulmonary function testing with arterial blood gas determination may be helpful in deciding if the patient can tolerate the planned procedure.

It is important to determine the baseline pC02 in patients with known pulmonary disease so that the extent of hyperventilation can be better evaluated intraoperatively. Similarly, patients with known or suspected cardiac disease need adequate preoperative risk evaluation because of the effect of pneumoperitoneum on cardiac function (i.e., decreased venous return secondary to inferior vena cava compression with a resulting drop in cardiac output) and the fact that some laparoscopic procedures may take longer than their open counterparts. This evaluation may involve cardiac stress testing and should be done in consultation with a cardiologist.

Several other factors specific to a laparoscopic procedure should be considered preoperatively.
Prior incisions-
The past surgical history and the location of prior incisions should be specifically considered as this will aid in the planning of access method and trocar placement.

Umbilical abnormalities-The patient should be specifically examined for an umbilical hernia or urachal cyst as this may also affect trocar placement.

Positioning limitations-The ability to abduct the arms and hips should be assessed, as many laparoscopic procedures are performed in the lithotomy position.

Presence of ascites-The presence of ascites will complicate abdominal access and may complicate the postoperative course if the fluid becomes infected or leaks from the trocar sites.

History of deep venous thrombosis (DVT)-Patients with a history of a DVT should be carefully evaluated preoperatively, as many laparoscopic procedures are lengthy, require the reverse Trendelenberg position, and can have significant inferior vena cava compression secondary to the pneumoperitoneum. All patients should have compression stockings in place before the induction of general anesthesia; those patients at higher risk (e.g., prior DVT or cancer) may need additional measures including pneumatic compression devices.

## III. CONTRAINDICATIONS TO LAPAROSCOPIC SURGERY

As time has passed and experience has accumulated, the contraindications to laparoscopic procedures have been modified. It is important to emphasize that the documented benefits of the laparoscopic approach-a hastened postoperative recovery and improved cosmesis-do not warrant placing the patient at increased risk for adverse surgical outcome. Thus, good judgment must be exercised in any circumstance where a condition exists that may make the laparoscopic procedure more risky than open surgery.

### A. Absolute Contraindications

In the following clinical situations, the use of laparoscopy is either prohibitively unsafe for the patient or is almost certain to lead to conversion to laparotomy.
1. Hypoovolemic shock-Patients showing signs of shock due to hypovolemia are unlikely to tolerate the further decrease in venous return caused by the

pneumoperitoneum. In addition, these patients will benefit from the most expeditious operation, as their end organ perfusion will only be further challenged by a period of general anesthesia.
A laparoscopic procedure is contraindicated in patients with significant ongoing abdominal bleeding due to both hypovolemia and technical issues. Significant bleeding makes a laparoscopic procedure difficult to perform because the view is obscured and the surgeon cannot rapidly identify or easily correct the problem.

2. Hemodynamic instability-Patients with hemodynamic instability for any reason (hypovolemia, depressed cardiac function, sepsis) are poor candidates for laparoscopy. The effects of pneumoperitoneum as well as the extremes in patient position that are sometimes required during laparoscopy will be poorly tolerated by patients already compromised from a cardiovascular standpoint.

3. Massive abdominal distention-In patients with extremely dilated intestine, it is unsafe to attempt to establish pneumoperitoneum due to the likelihood of bowel puncture. In addition, there will not be sufficient working room in which to operate.

4. Inability to tolerate a laparotomy-Patients who are not candidates for a laparotomy due to severe systemic disease should not be considered for laparoscopic procedures.

5. Surgeon inexperience-As with any surgical procedure, if the surgeon is not adequately trained, the procedure should not be attempted. Advanced laparoscopic skills are required to successfully complete many procedures, and without them the procedure should not be done laparoscopically.

**B. Relative Contraindications**
In the following clinical situations the use of laparoscopy is not generally advised but may be attempted in specific clinical scenarios by highly trained surgeons.

1. Generalized peritonitis of unclear origin-Patients with diffuse peritonitis, particularly when the etiology is unclear, are not ideal candidates for a laparoscopic exploration. Because of the difficulty involved with an adequate and expeditious abdominal exploration in this setting, these patients are best approached by laparotomy.

2. Advanced cardiopulmonary disease-Patients with severe cardiac or pulmonary disease are poor candidates for surgery in general and can be further compromised by a laparoscopic approach. The cardiopulmonary effects of pneumoperitoneum and the duration of the procedure may make an open approach more suitable for these patients.

3. Advanced pregnancy-Laparoscopic procedures, particularly in the lower abdomen, are particularly difficult in a near-term gravida. The uterus in late pregnancy simply makes access to the appendix or pelvic organs impossible. Laparoscopic procedures in the first and second trimesters have been shown in several series to be safe for both mother and fetus when performed with proper precautions by experienced individuals

4. Uncorrectable coagulopathy-In most cases patients with an uncorrectable coagulopathy are more safely approached through a traditional laparotomy where bleeding complications may be more easily and quickly controlled.

## BASIC LAPAROSCOPIC EQUIPMENT

The basic laparoscopic equipment includes four essential constituents:
the insufflation system
imaging system
irrigation/aspiration unit
electrocautery unit.

Familiarity with the function and use of these systems by the operating team is essential. The presence and functionality of all necessary equipment must be assessed before the patient arrives in the operating room.

### A. Insufflation System

The insufflation system allows the surgeon to create a working space in the abdomen in which to see and operate. Pneumoperitoneum is then maintained throughout the procedure, and it should easily be controlled directly by the surgeon as well as the circulating nurse. In most hospitals, a laparoscopy cart is used to house the insufflator system directly below the video monitor. The insufflation system should be continuously in direct view so the surgeon can monitor its minute-to-minute function.
The major components of an insufflation system are the insufflant, the insufflator, and the insufflation needle or trocar.

For laparoscopic procedures, the insufflant medium is

a gas. Various gases have been evaluated for laparoscopic surgery, including air, oxygen, carbon dioxide (C02), nitrous oxide, and inert gases such as xenon, argon, and krypton.
Air and inert gases are insoluble in blood and therefore carry a risk of air embolus. Oxygen is flammable and therefore is not used. The preferred agent in the majority of cases is CO2, because it is not flammable and rapidly dissolves in blood, thus greatly reducing the risk of gas embolus.

The insufflator is a device that allows the flow of gas from the tank into the spacebeing insufflated. Standard functions include adjustable rate of flow (in L/rnin), an intraperitoneal pressure gauge (in mmHg), display of total amount of gas administered (in L), and the tank pressure of the insufflant.

Most units offer variable flow rate settings (low, 1-5 L/min; medium, 6-10 L/min; and high, IllS L/rnin), whereas others have an adjustable range of flow in 0.5 L increments or less.

Typically, during initiation of insufflation to obtain a Pneumoperitoneum, low flow rates are used. If initial insufflation pressures are not excessive and a Pneumoperitoneum is being properly attained, the flow rate is then increased. Pressure should be maintained between 10 and 15 mmHg during laparoscopic procedures. At high pressures ( > 25 mmHg) the risk of gas absorption and embolism is greatly increased. Furthermore, there is increased risk of decreased venous return resulting from compression of the inferior vena cava, impaired ventilation secondary to pressure on the diaphragm, and the development of systemic acidosis.

**B. Imaging System**

The quality of the imaging system is extremely important as it functions as the "eyes" of the operating team. Components include the laparoscope, camera, monitor, and lightsource. The laparoscope allows light transmission into the peritoneal cavity to the surgical field and image transmission out of the peritoneal cavity to the camera. Most laparoscopes consist of a rigid rod-lens imaging system, an eyepiece, and a flexible fiberoptic lightconducting cable .

The most common sizes of laparoscopes used are the 5 and 10 mm scopes; the larger-diameter scopes are capable of transmitting greater amount of
light, provide a wider field of vision, and offer better image resolution than do smallerdiameter scopes.
Both 5 and 10 mm laparoscopes are available with either straight or angled lenses.

The angled scopes enable the surgeon to look around and over tissues. The direction of tilt of the objective lens for an angled scope is usually opposite to the position of the light cable attachment on the circumference of the scope .There are also multiple angled laparoscopes: 30-degree, 45-degree, and 50-degree scopes.

Direct vision laparoscopy has been replaced by modem camera/video systems. The camera magnifies the endoscopic view IS-fold, allowing high-resolution imaging of anatomical details.

The camera attaches to the eyepiece of the laparoscope and transmits digitized optical information from the scope via cable to the video box; the digital image data are then reconstructed and displayed on the monitor. The camera should be focused, and the camera/video system should be white-balanced to optimize image color representation. Insertion of a room-temperature laparoscope into the peritoneum will result in fogging of the lens because of the temperature differential and condensation on the lens.

This can be avoided by warming the time of the scope in hot saline solution before it is inserted. Commercially available antifog agents may also be useful to minimize lens fogging problems.

Poor image quality is more commonly the result of malfunction of an instrument or improper assembly of components rather than malfunction of the monitor itself.

Frequent causes of poor image quality include inadequate light input from the light source, malfunction of the video or light cable, or incorrect attachment of these components to their respective units.

Light sources consist of high-intensity bulbs filled with xenon, mercury, or halogen vapor to provide bright illumination. The output intensity is adjustable and can be controlled at the source. Too much illumination may result in imagewashout. Some units are equipped with automatic light level adjustment to avoid this problem and optimize illumination. Light is transported from the light source to the laparoscope by a fiberoptic cable. Light cables are flexible and have both laparoscope- and light source-specific couplers. Connections should fit properly and tightly. Rough handling of the light cable may fracture the delicate optical fibers, thus decreasing overall light transmission. The light cord should be checked before the procedure by plugging it into the light source; any dark areas visible in the end of the light cord indicate broken

fibers.

**c. Irrigation/Aspiration System**

In any laparoscopic procedure, a surgeon will benefit by using an irrigation and aspiration device to keep the operating site clean. In most operating rooms, wall suction units with adjustable degrees of suction pressure are used for aspiration. Irrigation units vary, but most hospitals use 1-3 L crystalloid bags, similar to those used for intravenous fluid.

The irrigation fluid can flow by gravity, but use of a pressurized bag provides more active flow and is preferred. The most commonly used irrigants are saline solution with 5000 units of heparin added per liter or lactated Ringer's solution.

Activation of the suction instrument close to fatty of other mobile tissues may lead to occlusion of the channel. When this occurs the irrigation switch can be briefly depressed to the clear the channel.

If the aspirator valve is opened when the instrument tip is not immersed in fluid, the Pneumoperitoneum can be lost quickly. However, this maneuver is sometime deliberately perfonned to evacuate entrapped electrocautery smoke in the peritoneal cavity when it
obscures vision.

**D. Electrocautery**

Tissue cutting and coagulation is best achieved with an electrocautery unit, which is usually controlled by a foot pedal when used laparoscopically. The most commonly used tip configurations are spatula, J hook, and right-angle (L) hook. Other electrocautery attachable instruments include scissors, dissectors, and graspers, all of which are insulated with a thin nonconductive coating and have an incorporated terminal for the electrosurgical cord so that electrical current can be passed through the instrument and delivered at its tip.

The combination of suction/irrigation and electrocautery functions in
the same instrument is also commonly used. The cautery instrument should not be activated until the tip is in contact with the tissue. The entire uninsulated tip of the electrode should always be visible during use, because inadvertent injury to surrounding structures can easily occur. Caution should be exercised when using the electrode near metal clips or other uninsulated metal instruments because of the risk of electrical coupling and passage of current through these objects.

## II. ROOM SETUP

Different laparoscopic procedures will require slightly different room setups. In general, the surgeon stands on the side of the table opposite the pathological process, whereas the assistant stands on the ipsilateral side. It is common practice for the camera operator to stand close to the surgeon and view the operation on the same monitor.

Typically the monitor is placed in a direct line with the surgeon and the surgical field; this has been called the *coaxial setup.* In this arrangement, visualization is maximal and instrument manipulation is easiest. The coaxial alignment can vary during the procedure as the operating site changes. Ideally, the surgeon should change position to keep in the prope line.

If the deviation becomes large enough, an adjacent instrument may obstruct the view of the operating site. If this occurs, the surgeon should establish a different viewing axis by moving the laparoscope to a position at which the angle between the camera and the instrument port is wider.

Occasionally this may require placement of an additional access port if satisfactory arrangement is not possible using the existing port locations.
When a monitor is used, the video is always opposite the surgeon. In this arrangement, hand-eye coordination is extremely difficult for the assistant, for whom the view is a mirror image. Although not ideal, mirror-image operating skills are readily attainable with advanced training and habituation. If the surgeon and assistant are on opposite sides of the table, typically two monitors are used, one opposite each person. This
is the most commonly used monitor arrangement and is preferred by most surgeons for cholecystectomy and other advanced procedures. Both surgeon and assistant have comfortable views directly in front of them. For pelvic operations the video monitor is usually placed at or near the foot of the table.

Once the monitors are positioned, the remaining basic equipment systems are positioned around the operating table at the most convenient sites. A variety of arrangements may be used to suit the particular needs of the procedure. As a general rule, the particular piece of equipment and its associated lines coming onto or off of the operating table should be situated on the same side as the person who will be using that
equipment.
All lines and tubes should be carefully anchored to the surgical drape. **In** many

institutions prefabricated drapes with pockets and/or gutters are used along which lines may be secured; instruments that are not in use can be securely stored in these pockets until needed.

**PATIENT POSITIONING**

Pneumatic sequential compression stockings are placed on the lower extremities before anesthetic is administered after the patient has been placed on the operating table.

The patient is also tightly secured to the operating table with a restraint. After induction of anesthesia, an orogastric or nasogastric tube and urethral catheter are routinely placed to decompress the stomach and urinary bladder so that they are not inadvertently injured during trocar insertion or during the operation. The arms may be tucked at the patient's side, depending on the particular procedure being performed.

**It** is essential that the operating table is readily maneuverable. The patient should be positioned with the target organ elevated so that gravity pulls adjacent organs out of the way. The Trendelenburg position is used for procedures in the pelvis and lower abdomen. The reverse Trendelenburg position if used for procedures on the upper gastrointestinal tract and the biliary tree. The patient should be repositioned often to take advantage of gravity for optimal exposure. **In** addition, elevation of the operative field also helps to avoid pooling of blood in the surgical site.

**Assessment Procedure**

Multiple choice questions based assessment after successful completion of theory and practical sessions

**Annexure- II**

# VALUE ADDED COURSE

## BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING GS02

**List of Students Enrolled NOV 2015- JAN 2016**

| MBBS Student | | | |
|---|---|---|---|
| Sl. No | Name of the Student | Register no. | Signature |
| 1 | THOTA SHARMILA JANAKI | U13MB281 | |
| 2 | UMA MAHESHWARI D | U13MB282 | |
| 3 | UMAYAL @ UMA | U13MB283 | |
| 4 | VANAJA KATE GARFINSUNDARAM B | U13MB284 | |
| 5 | VANI V | U13MB285 | |
| 6 | VEDARATHINAM S | U13MB286 | |
| 7 | VELMURUGANE E | U13MB287 | |
| 8 | VENKADESH V S | U13MB288 | |
| 9 | VENNILA T | U13MB289 | |
| 10 | VIGNESH V | U13MB290 | |
| 11 | VIGNESHWARAN M | U13MB291 | |
| 12 | VIKRAMAN J | U13MB292 | |
| 13 | VINITHA R | U13MB293 | |
| 14 | VINOTH KUMAR M | U13MB294 | |
| 15 | VINOTH KUMAR M | U13MB295 | |
| 16 | VINOTHINI M | U13MB296 | |
| 17 | VINOTHINI S | U13MB297 | |
| 18 | VISHNUPRASATH S | U13MB298 | |
| 19 | VISHVABRUNDHA R | U13MB299 | |
| 20 | YENDETIAMRUTHA | U13MB230 | |

UMA MAHESHWARI D
U13MA282

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - IV**

## BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING

### MULTIPLE CHOICE QUESTIONS

**Course Code: GS02**

**I. ANSWER ALL THE QUESTIONS**

1. indications for endoscopy

a. suspected disease in the oesophagus producing

b. every patient with dysphagia

c.both a and b

d.none

2. all are indications of endoscopy except

a. heartburn not responding to simple medication

b. arising de novo in patients over 50 years,

c.bleeding, or if accidental and iatrogenic damage are suspected.

d. none

3. advantages of endoscopy

a. biopsy

b. direct visualisation of lesion

c. tumor staging

d. all the above

4. advantages of endoscopy when compared to ct

a. tumor staging

b. biopsy

c. both

d. none of the above

5. complications of endoscopy

a. perforation

b. ulceration

c. both a and b

d. noneof the above

5. Numbering f suture material

a. 9-0 thinner suture

b. 2-0 is thicker

c. Both A & B are Correct

d. None of the above

6.. uses of endoscopy in variceal bleeding

a. can identify bleeding varices

b. variceal banding can be done with endoscopy

c. both are correct

d. None of the above

6/7

7. management of esophageal stricture

a.ballon dilation

b. endoluminal stenting

c. both a and b

d. none of the above are correct

ASSESSOR NAME

SIGNATURE

23/12/2015

DATE :

Dr. M. SENTHILVELAN, MS.,
Reg. No. 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

THOTA SHARMILA JANAKI
U13MB281

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - IV**

## BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING

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c. both a and b

d. none of the above are correct

ASSESSOR NAME : Dr ASAYAS BOSCO CHANDRA KUMAR

DATE : 23/12/2015

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 VENNILA T has actively participated in the Value Added Course on BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING held during NOV 2015 – JAN 2016 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.

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 THOTA SHARMILA JANAKI has actively participated in the Value Added Course on BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING held during NOV 2015 – JAN 2016 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: **BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING**

Subject Code: **GS02**

Name of Student: UMA MAHESHWARI Roll No.: U13MB282

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: 22/12/15

Uma
Signature

# Student Feedback Form

Course Name: **BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING**

Subject Code: **GS02**

Name of Student: Vani. V Roll No.: U13MB285

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: 22/12/15

Vani. V.

Signature

Date 6/01/2016

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: BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING**

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **BASIC ENDOSCOPY AND LAPAROSCOPY TRAINING** for 20students In NOV 2015- JAN 2016. 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**

## SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

**From** **Date:14.05.2015**

Dr.Ambigai meena,
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: Physiotherapy**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Physiotherapy** on NOV 2015-JAN 2016. We solicit your kind permission for the same.

Kind Regards

Dr.Ambigai meena

---

### FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean : Dr. Rajasekaran

The HOD: Dr. Padma

The Expert: Dr. Nivethana aarthi

The committee has discussed about the course and is approved.

| Dean | Subject Expert | HOD |
|---|---|---|
| Prof. S. RAJASEKARAN, M.S., (Gen.) DEAN Sri Lakshmi Narayana Institute of Medical Sciences Osudu, Agaram Post, Pondicherry-605 502. | ASSISTANT PROFESSOR DEPT. OF OBSTETRICS & GYNAECOLOGY Sri Lakshmi Narayana Institute of Medical Sciences OSUDU, PUDUCHERRY. | PROFESSOR & HEAD DEPT. OF OBSTETRICS & GYNAECOLOGY 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**

**DATE : 23.05.2015**

**Sub: Organising Value-added Course: PHYSIOTHERAPY- 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 **"PHYSIOTHERAPY"**. 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 23.05.2018**.** Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

Encl: Copy of Course content and Registration form.

# Course Proposal

Course Title: **Physiotherapy**

**Course Objective:**

1. Overview in Physiotheraphy
2. To Learn Basics Of surgeries done in OBG.
3. To understand importance of Physiotherapy.
4. Role of Physiotherapy in antenatal care.
5. Role of Physiotherapy in Postnatal care
6. Role of physiotherapy in an adult life
7. Benefits
8. DO's and DONT's

**Course Outcome: knowledge about physiotherapy**

**Course Audience: Final MBBS Undergraduates**

**Course Coordinator: Dr.Nivedhana arthi**
**Course Faculties with Qualification and Designation:**

1. **Dr.Padma. Prof and HOD, OG**

2. **Dr.Nivedhana arthi , Assistant Professor, OG**

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 3.11.2015 | Overview in Physiotheraphy | 4.00pm -7.00pm | 3 |
| 2 | 7.11.2015 | Learn basics of surgeries done in OBG | 4.00pm -7.00pm | 3 |
| 3 | 14.11.2015 | Understand importance of Physiotherapy | 4.00pm -8.00pm | 4 |
| 4 | 20.11.2015 | Physiotherapy in an adult life | 4.00pm -8.00pm | 4 |
| 5 | 2.12.2015 | Physiotherapy in antenatal care | 4.00pm -8.00pm | 4 |
| 6 | 10.12.2015 | Physiotherapy in post natal care | 4.00pm-8.00pm | 4 |
| 7 | 26.12.2015 | Benefits | 4.00pm -8.00pm | 4 |
| 8 | 8.1.2016 | DO's and DON'T's | 4.00pm -8.00pm | 4 |
| | | | Total Hours | 30 |

**REFERENCE BOOKS: (Minimum 2)**

**Willaims Obstetrics Edition 21**

**Bailey and Love**

# VALUE ADDED COURSE

**1. Name of the programme& Code**

Physiotherapy, OBGY 2

**2. Duration& Period**

30 hrs & NOVEMBER 2015 - JANUARY 2016

**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 - NOVEMBER 2015 - JANUARY 2016

**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** | OBGY 2 | PHYSIOTHERAPY | **Dr. Nivethana arthi** | Final year MBBS | NOVEMBER 2015 - JANUARY 2016 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

ASSOCIATE PROFESS
DEPT. OF OBSTETRICS & GYNAEC
Sri Lakshmi Narayana Instit
Medical Sciences
OSUDU, PUDUCHERRY

**COORDINATOR**

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

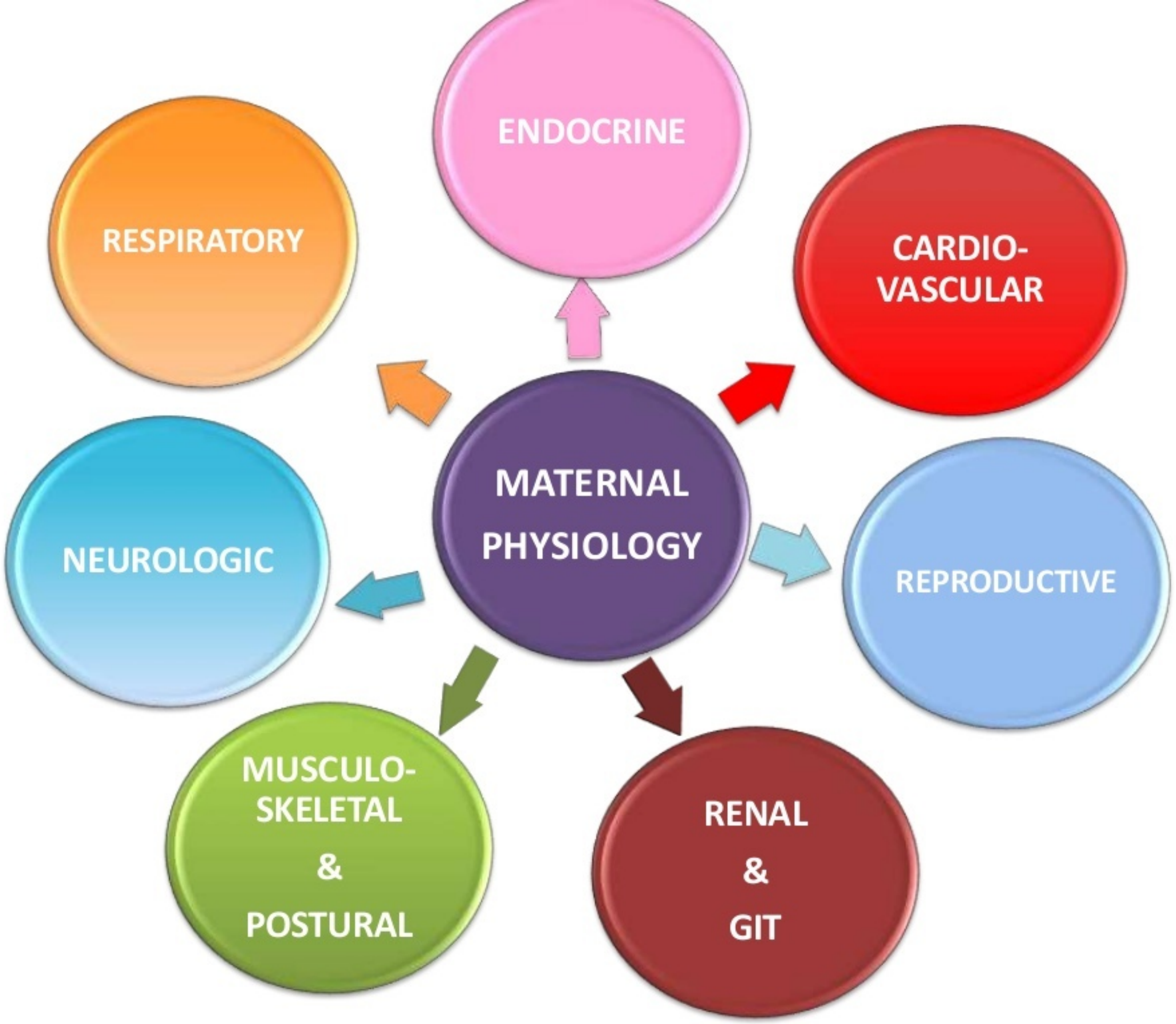
# CONTENTS



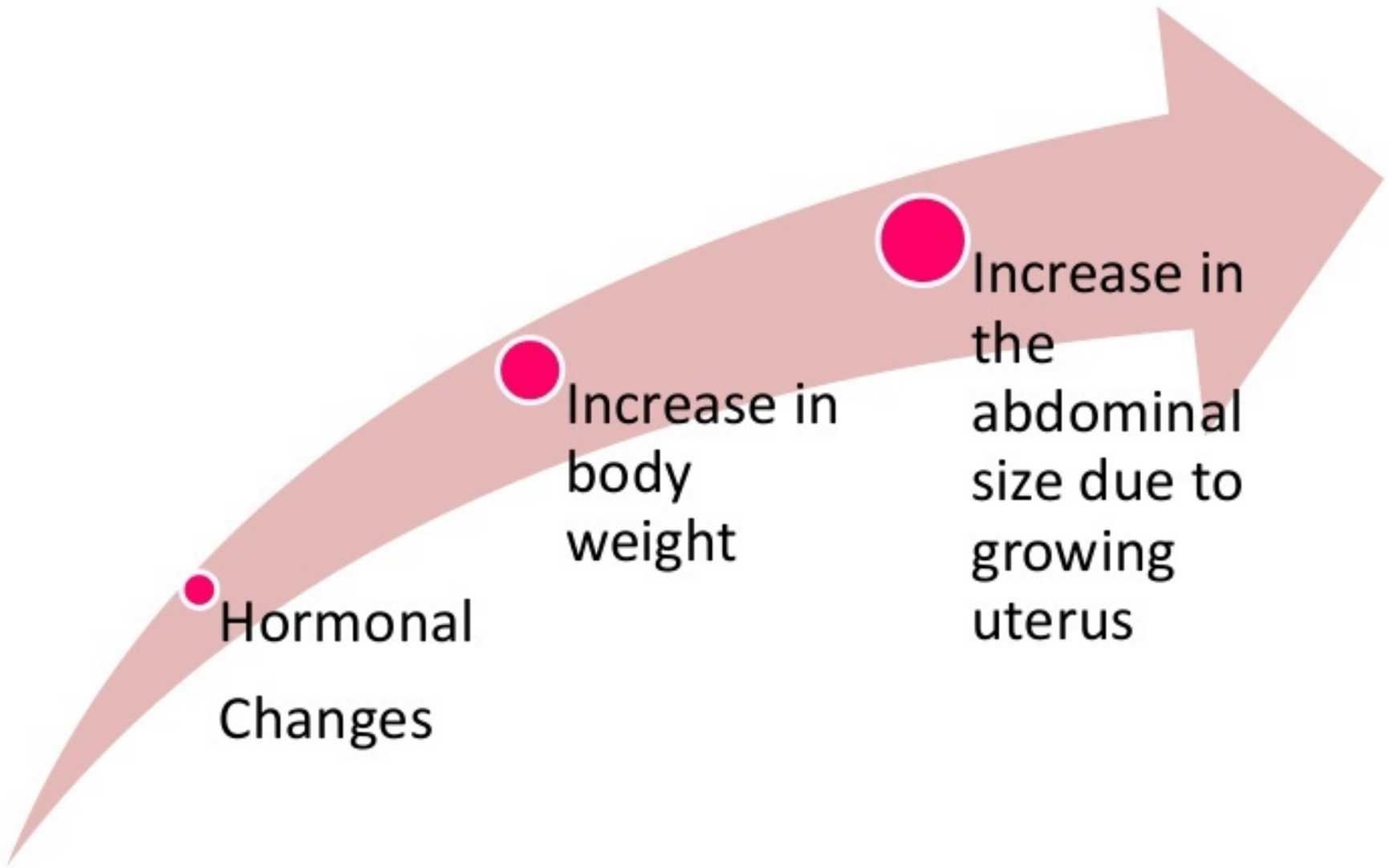
- Introduction
- Maternal Physiology
- Antenatal care:
  - Objectives
  - Members
  - Role of physiotherapy
  - Women with special needs
- Post-natal care:
  - Role of physiotherapy
  - Physiotherapy and post-natal problems
- References

# INTRODUCTION

- Pregnancy is one of the most important period in the life of a woman, a family and a society. Therefore, great attention is given to antenatal care by the health care systems of most countries.

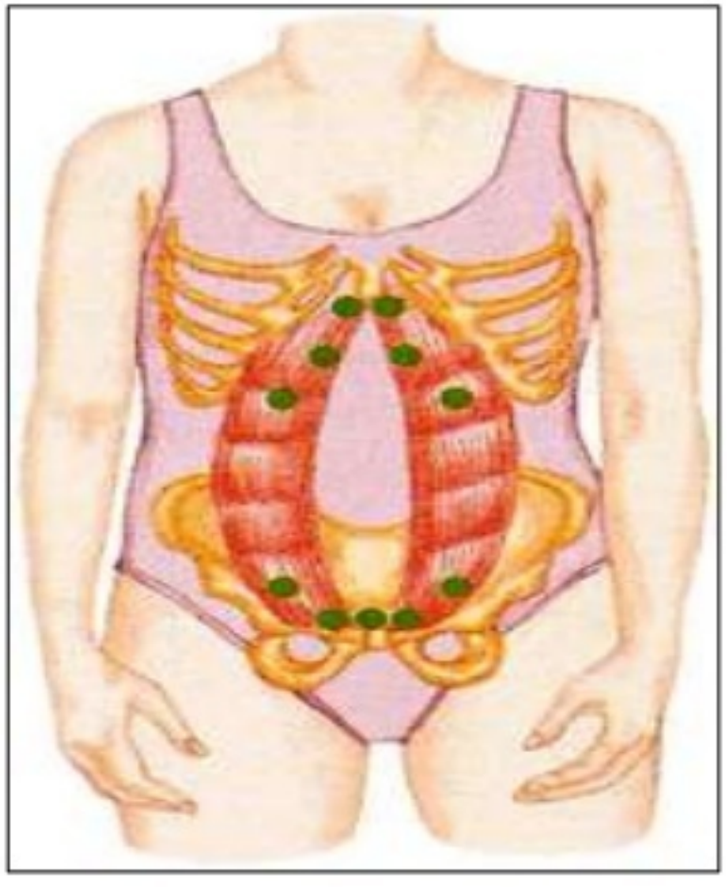

ENDOCRINE
RESPIRATORY
CARDIO-
VASCULAR
MATERNAL
PHYSIOLOGY
NEUROLOGIC
REPRODUCTIVE
MUSCULO-
SKELETAL
&
POSTURAL
RENAL
&
GIT

# MUSCULOSKELETAL CHANGES

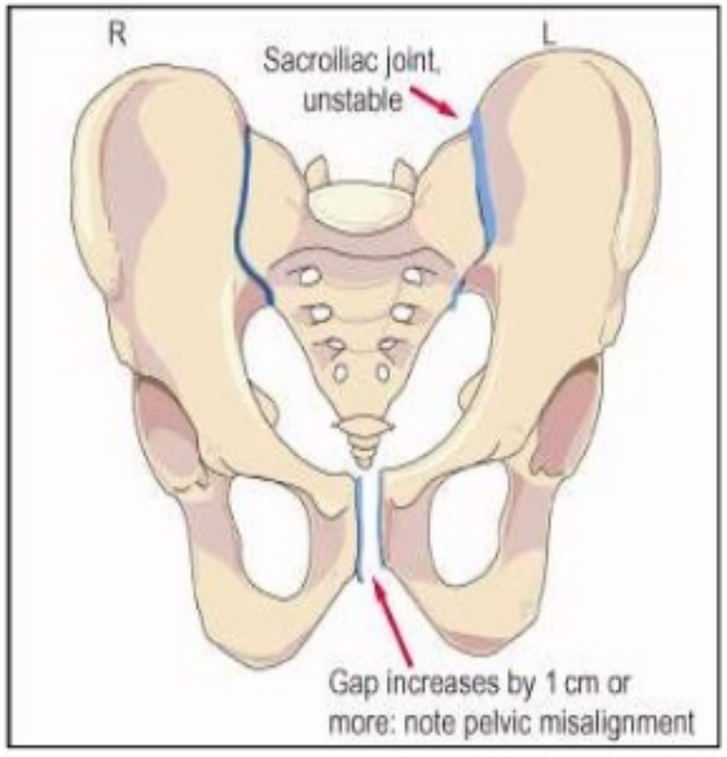


- Increase in joint laxity & joint ranges
- Increased water retention ⇒ oedema & nerve compressions
- Drop in the pelvic floor ⇒ Pelvic floor dysfunction
- Painful muscle cramps
- Pregnancy associated osteoporosis (PAO)

Diastesis Recti



Diastesis pubis



# POSTURAL CHANGES

Increase in the abdominal size

Protraction of the shoulders

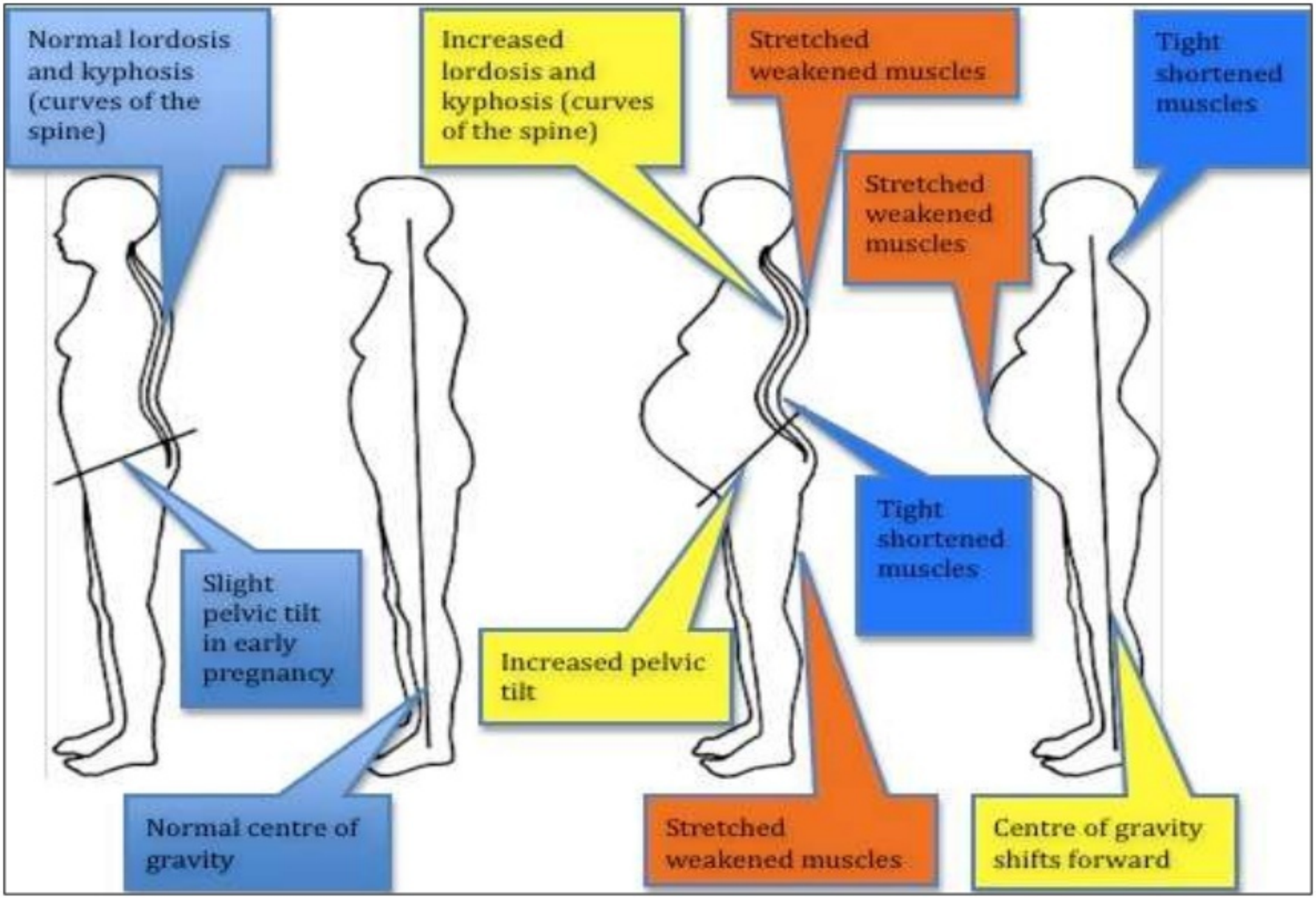
&

Hyperextension of the knee

COG shifts anteriorly

Counter-balanced by:

* Increase of lumbosacral angle
* Increase of lumbar lordosis and thoracic kyphosis
* Bending forward over the enlarging uterus


Normal lordosis and kyphosis (curves of the spine)
Increased lordosis and kyphosis (curves of the spine)
Stretched weakened muscles
Stretched weakened muscles
Tight shortened muscles
Slight pelvic tilt in early pregnancy
Normal centre of gravity
Increased pelvic tilt
Tight shortened muscles
Stretched weakened muscles
Centre of gravity shifts forward

## INCORRECT UPRIGHT POSTURE

HEAD
Chin pushing forward. Eyes focus down

SHOULDERS AND CHEST
Slouching constricts the ribcage, makes breathing more difficult and causes indigestion

ABS, BUTT & UTERUS
Slack muscles ollow out the back and tilts pelvis forward causing backache, strained abdominals, and excess pressure on the bladder.

KNEES
If pressed back you strain joints and push pelvis forward

FEET
Weight on inner borders strains arches and calves causing leg aches.

## CORRECT UPRIGHT POSTURE

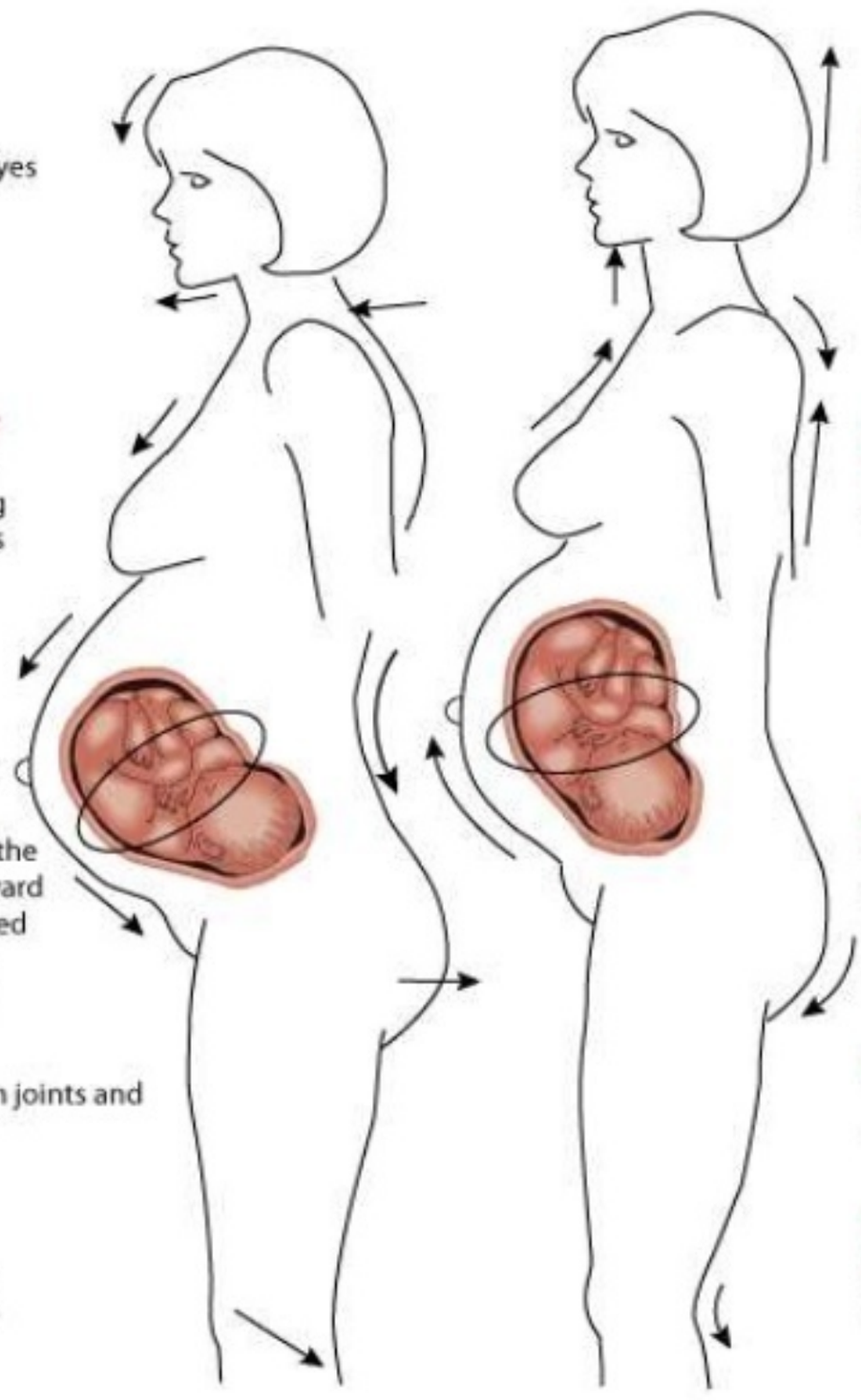
HEAD
Lift through the crown of the head and keep chin lifted and ears in line with neck.

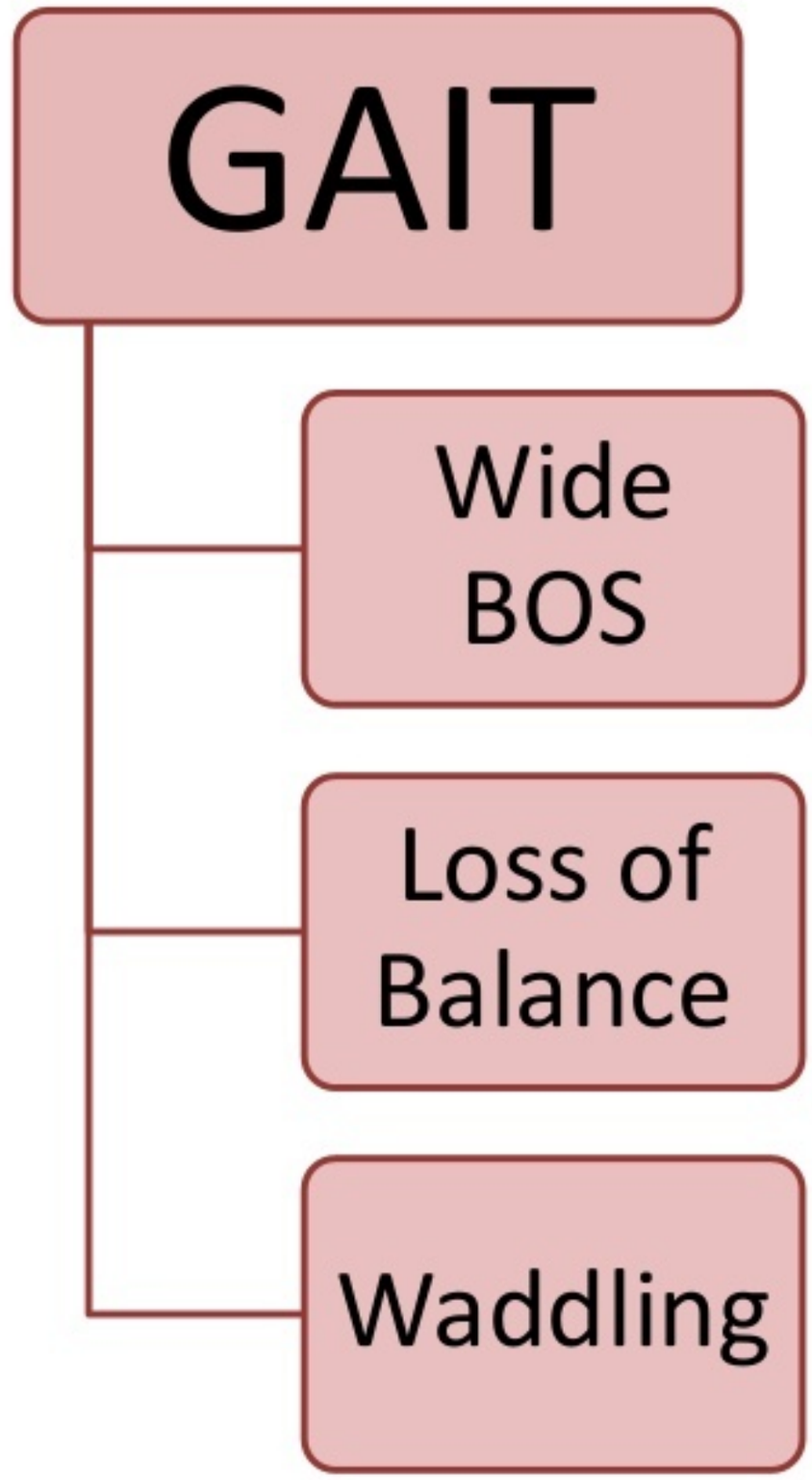
SHOULDERS AND CHEST
Draw shoulders back and down while you lift the rib cage up.

ABS, BUTT & UTERUS
Contract abdominals to suport baby, tuck butt under and tilt pubic bone slightly forward to center pelvic bowl.

KNEES
Bend knees to ease body weight over feet.

FEET
Distribute body weight over center of each foot.




GAIT
Wide BOS
Loss of Balance
Waddling

# ANTENATAL CARE

- It is care of the woman during pregnancy
- Primary aim is to achieve at the end of the pregnancy, a healthy mother and a healthy baby
- Starts immediately from the time of conception

# HISTORY OF ANTENATAL CARE

- Prenatal care started in Edinburgh at the turn of the 20th century

- During the 1920s a few midwifery departments of hospitals and interested general practitioners saw women at intervals to check their urine for protein and some palpated abdomen.

- Most pregnant women had only a medical or midwifery consultation once before labour

- Doctors were concerned with antenatal care only “if any of the complications of pregnancy should be noticed”

- During the late 1920s a wider recognition emerged of the maternal problems of pregnancy as well as those of labour

- The medical profession and the then Ministry of Health woke up to realise that events of labour had their precursors in pregnancy

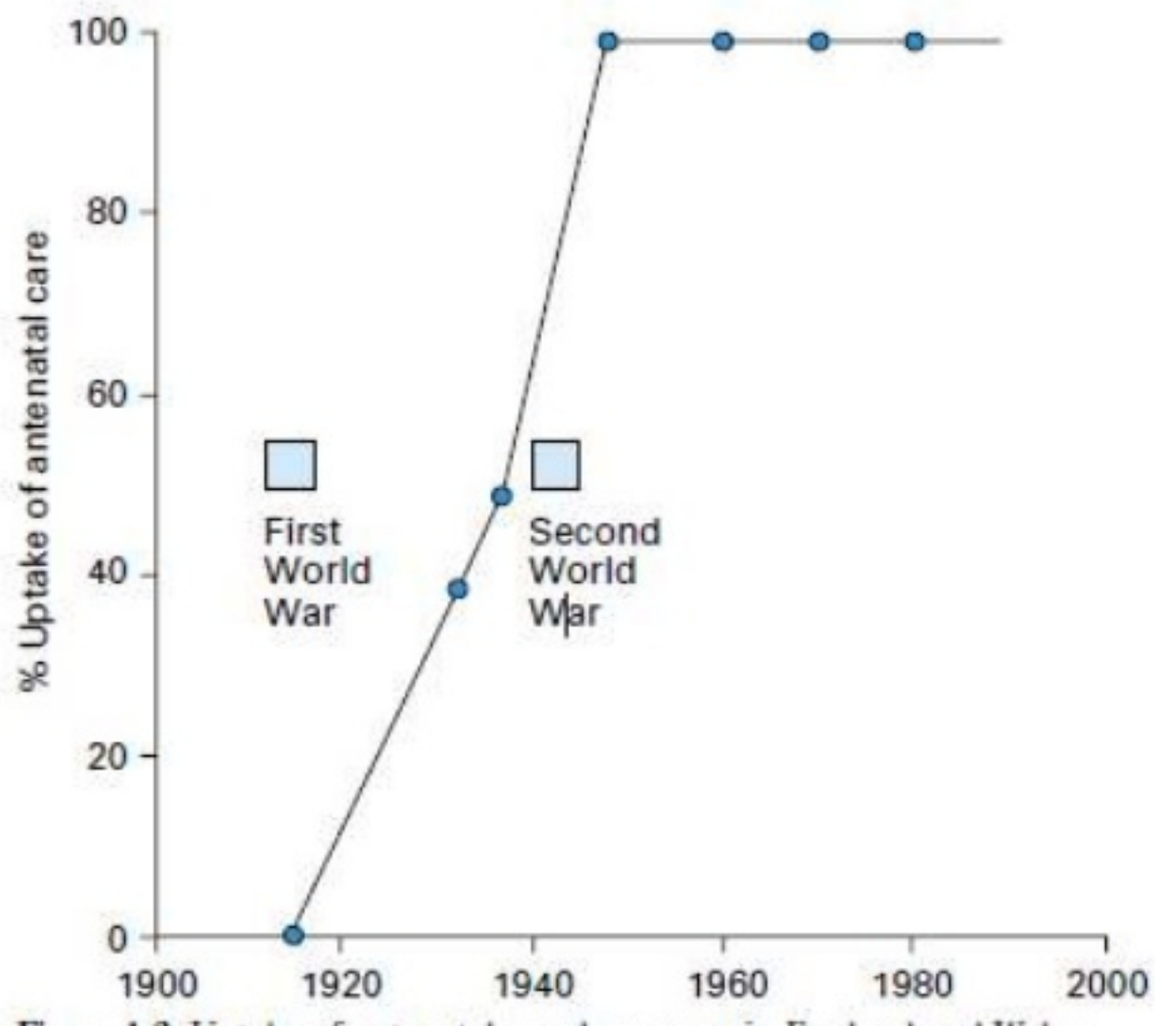



**Figure 1.3** Uptake of antenatal care by women in England and Wales

- Janet Campbell, one of the most farsighted and clear thinking women in medicine, started a national system of antenatal clinics with a uniform pattern of visits and procedures



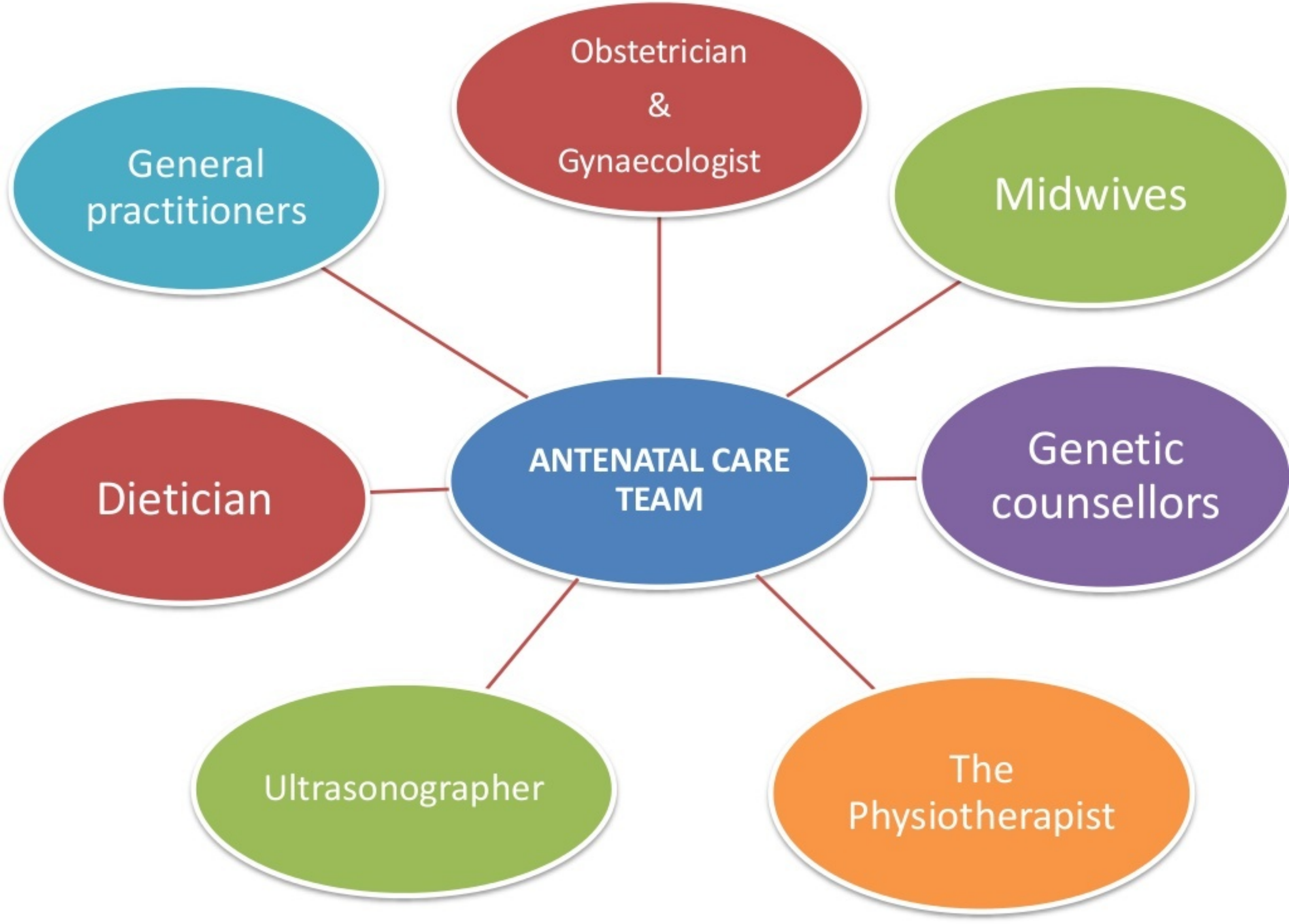
Dame Janet Campbell

- Based on her work in India in the 1930s, Vaughan instituted antenatal exercise classes in England. She wrote that “flexible hips and spine are conducive to ease of labor,” and women were encouraged to squat

- During the mid-1950s, “keep fit” exercises introduced by obstetric physiotherapist Helen Heardman in Britain were included with relaxation and breathing skills in Grantly Dick-Read's book on pain management for labor.

# Objectives

- Screening for foetal abnormalities
- Early identification of complications and their treatment
- Promote muscle tone, strength and endurance
- Enhance relaxation
- Prepare for post-natal program
- Providing education on nutrition, personal hygiene, birthing process


Obstetrician
&
Gynaecologist
General practitioners
Midwives
Dietician
ANTENATAL CARE TEAM
Genetic counsellors
Ultrasonographer
The Physiotherapist

# ROLE OF PHYSIOTHERAPY IN ANTENATAL CARE

- Prevention/Treatment of musculoskeletal problems
- Promoting healthy lifestyles
- Postural and Ergonomic advice
- Preparing for labour
- Teaching relaxation techniques
- Optimal physical fitness

# Prevention/Treatment of musculoskeletal problems

## 1. Back and pelvic girdle pain

- Prevention
- Activities that reproduce the symptoms should be avoided
- Proper postural education
- For relief of pain:

  Gentle massage,

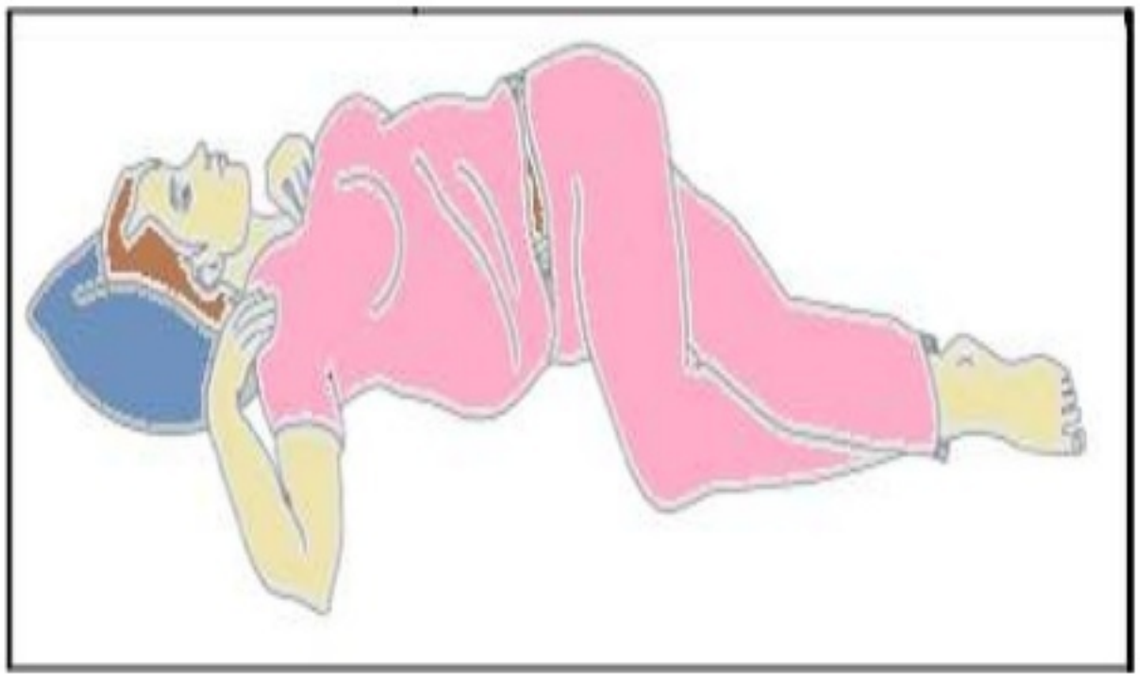
  Hot pack

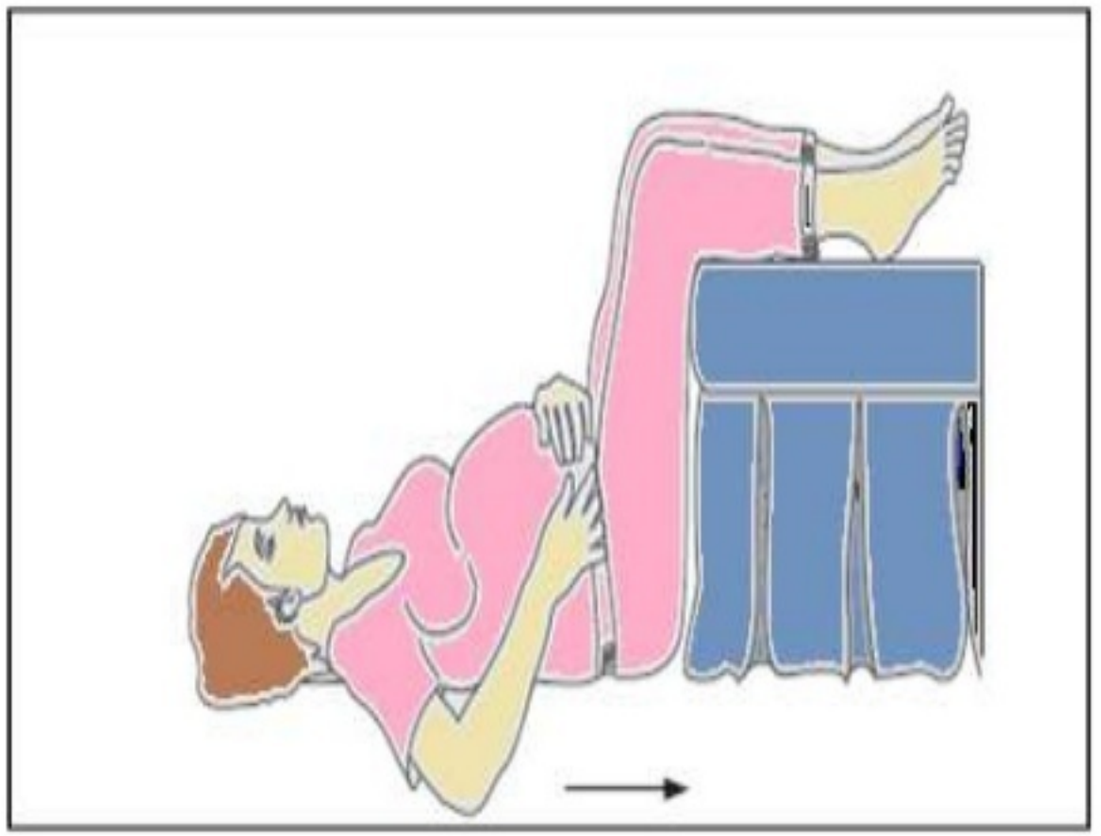
  TENS



## 2. <u>Sacroiliac joint dysfunction</u>

- Support belt
- Various self-help maneuvers can be taught to relieve sacroiliac joint pain





3. **Symphysis pubis dysfunction**

- Diastesis Pubis
- Rest and reduction of non essential chores
- Keeping the leg adducted
- Avoiding single-leg stance.
- Avoid long strides when walking, walking on uneven surfaces and excessive use of steps
- Gentle isometrics of hip adductors
- Pelvic support belts
- Ice pack

4. **Coccydynia**

- A cushion can be placed while sitting
- Gentle mobilisations
- Ice packs/heat, US and TENS



5. **Pelvic floor dysfunction**

- ❖ Stress incontinence
- ❖ Increased risk of pelvic organ prolapse

- Kegel's exercise
- Kegel balls or weights, vaginal cones, electronic kegel exerciser
- Electrical stimulation
- Electromyography can be used to train control
- Interferential therapy
- Bladder retraining programs

6. **Nerve compression syndromes**

a. Carpal tunnel syndrome

- Ice packs
- Resting with the hands in elevation
- Ultrasound
- Splinting limiting wrist  flexion




b. Posterior tibial nerve compression

c. Meralgia paraesthetica

7. **<u>Varicose veins</u>**

- Avoid standing or sitting for long periods, with the legs dependent
- Frequent and *vigorous* ankle dorsiflexion and plantar flexion may be performed
- Brisk walking
- Elevate feet when sitting or lying.
- Elastic stockings may be worn



8. **Sciatica**

- Reducing the activity levels; within pain-free range.
- Advice on positioning, back care and posture correction.

9. **Muscle cramps**

- Calf stretches
- Massage – deep kneading,
- Vigorous foot exercises
- A pre-bedtime brisk walk, vigorous foot exercises, and a warm bath may be prophylactic.

10. **Chondromalacia patellae**

- Ice packs 2-3 times per day,
- Strengthening of quadriceps

11. **Restless Leg Syndrome**

- Bed rest
- A period of reduced activity, e.g. giving up work may give some relief

12. **Uterine ligament pain**

- Warmth or cold, massaging or stroking, over the site of the pain

# Promoting healthy lifestyle

❖ Prenatal advice and education regarding :

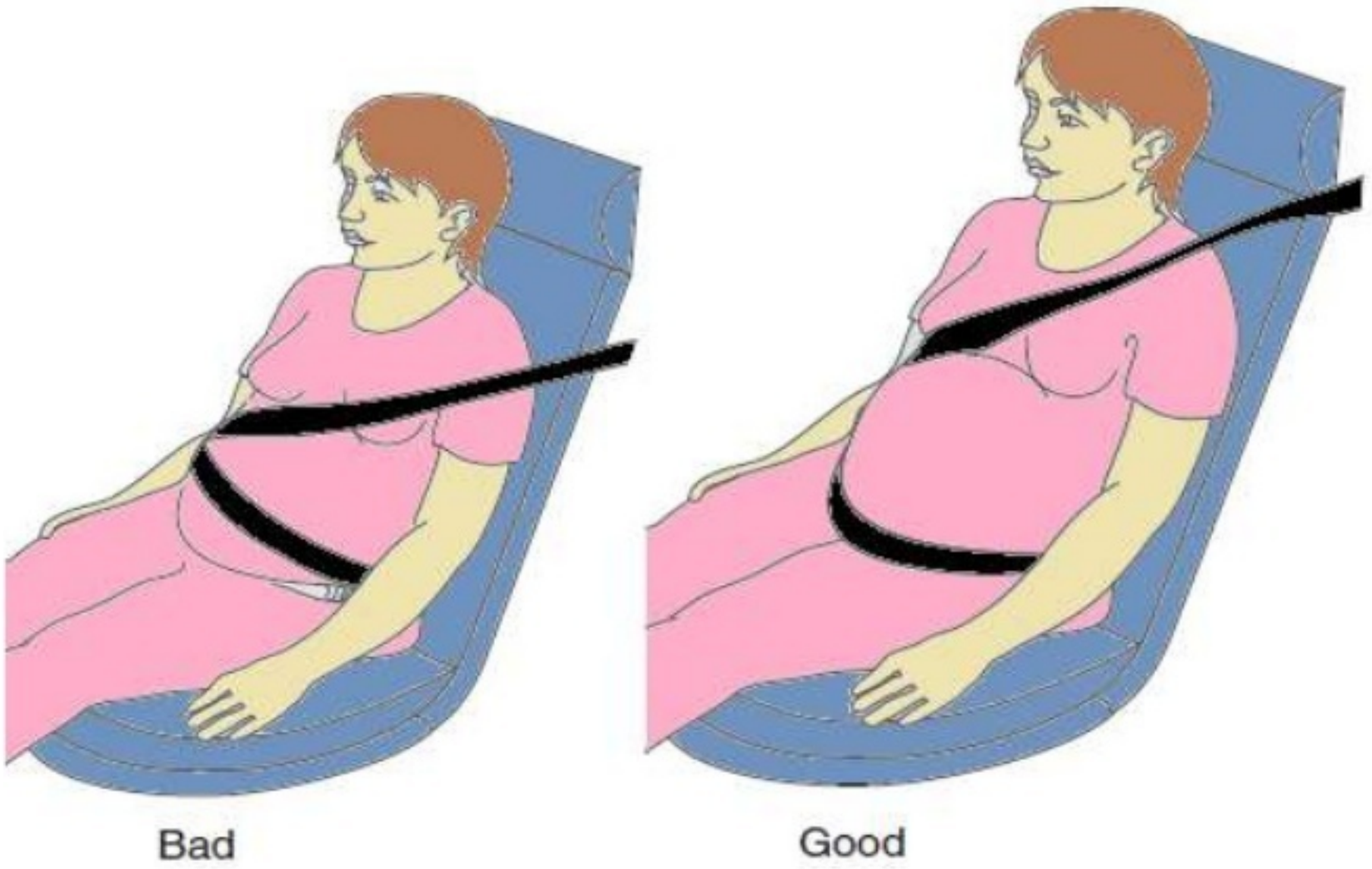
- Diet
- Personal hygiene
- Use of drug 
- Alcohol and Smoking  
- Air travel- can fly safely up to 36 weeks

ACOG Committee Opinion 2001 #264

# Seat belt

- Above and below the bump, not over it
- Three-point seat belts should be worn throughout

(Why mothers die:  a report on confidential enquiries into maternal deaths in the UK 1997-1999)



Bad

Good

# Posture and Ergonomic advice

## 1. Lying:



*Fig. 45.3* Half back-lying supported with pillows.



## 2. Rolling:

- Effective, safe and efficient (ESE) roll

## 3. **Sitting:**



Bad Posture

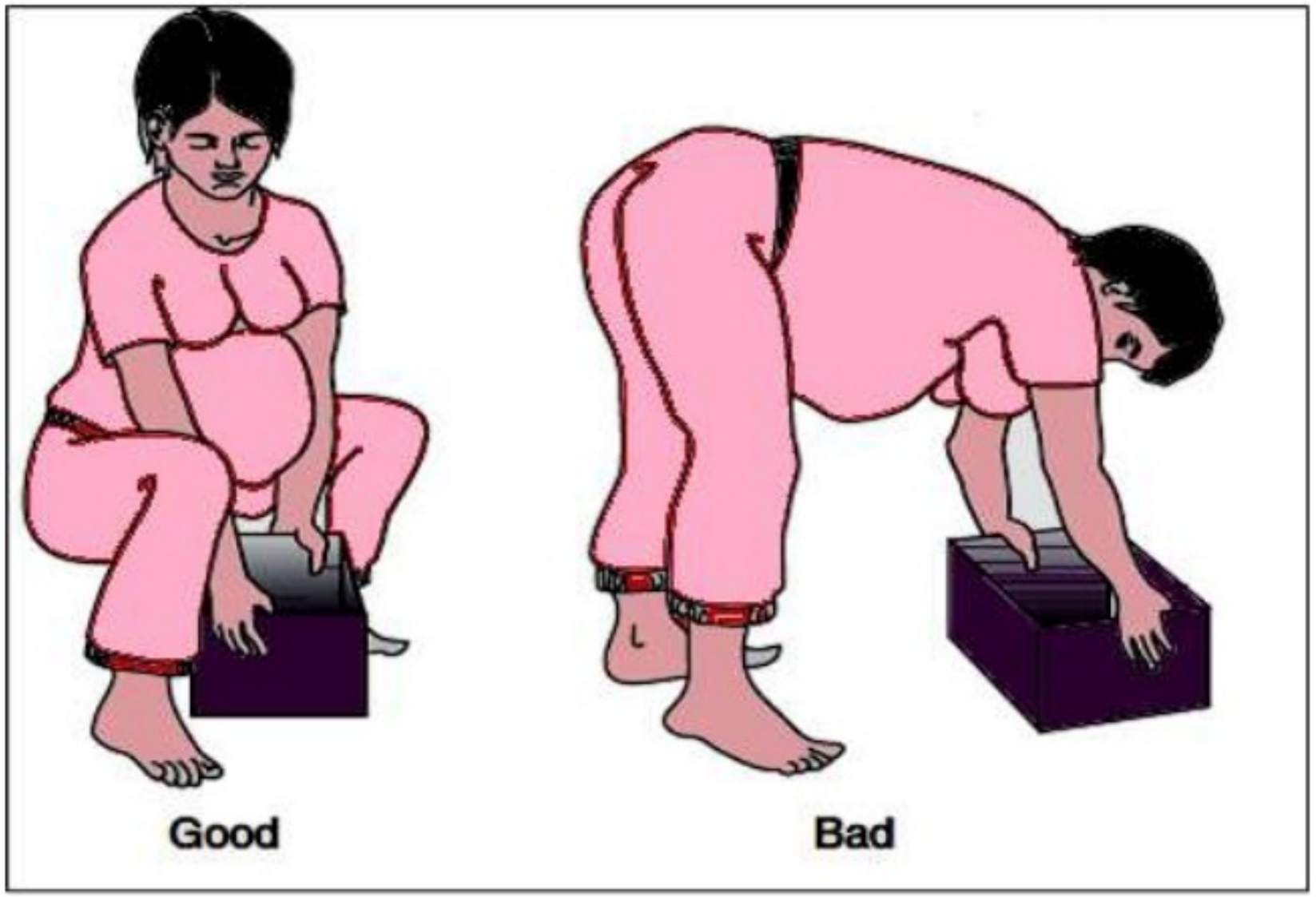


Good Posture

## 4. **Standing and walking:**



# 5. **Ergonomic education:**



# Preparing for labour

- Birthing options that are available to the woman:
  water births, home based or hospital based delivery.



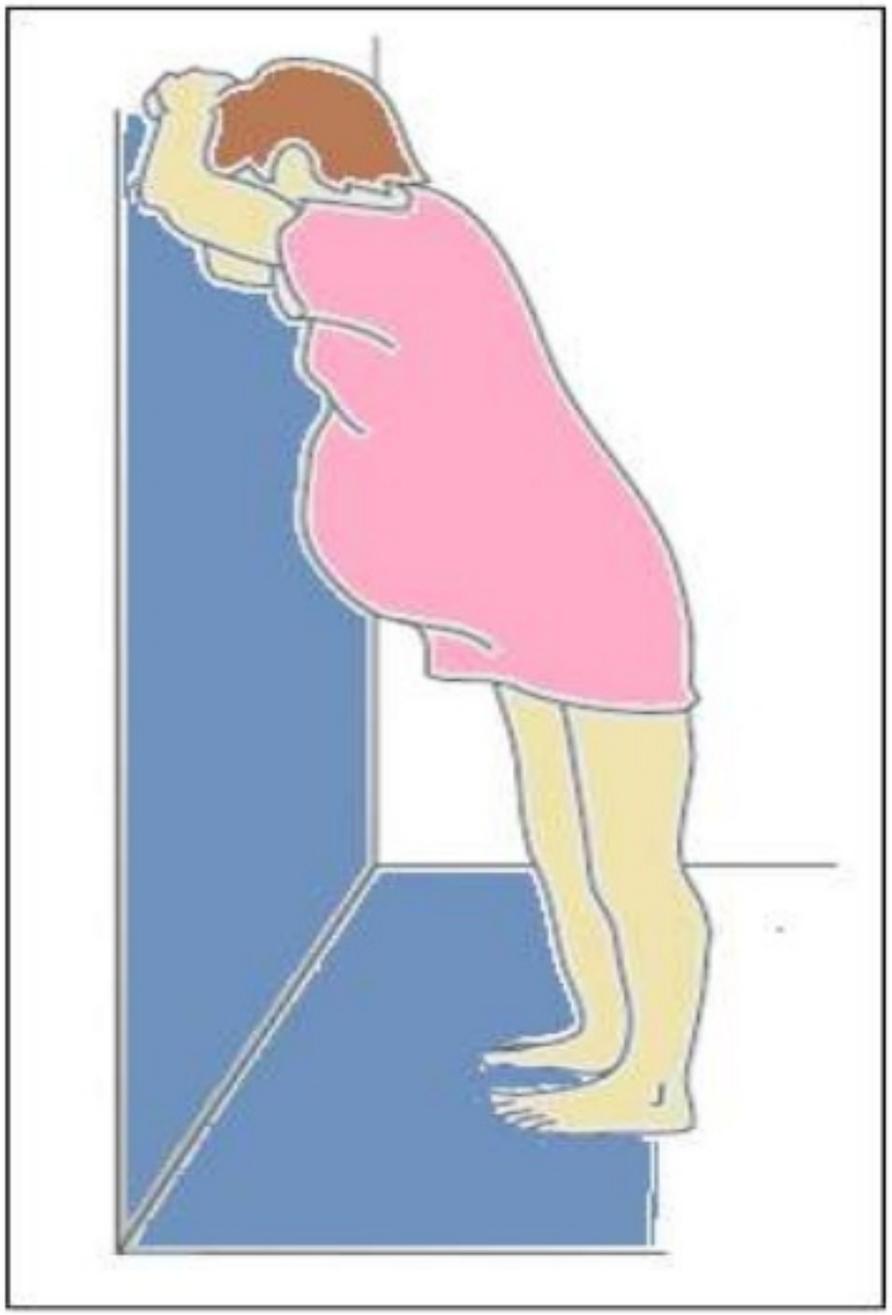
# Labor and Delivery

## Labor Positions

## 1ST STAGE:









- Stage 2





- Stage 3

# Pain relief in labour

**Pharmacologic**

- Oral analgesics
- Inhalational agents eg. Nitrous oxide
- Parentral analgesic eg. Pethidine
- Regional analgesia: epidural analgesia

**Non-Pharmacologic**

- Relaxation and body awareness
- Breathing
- Massage
- Music
- TENS

# Relaxation techniques

1. The Mitchell Method

- Physiological relaxation
- Reciprocal relaxation of muscles

2. Contrast method/Jacobson's technique

- Alternately contracting and relaxing muscle groups

3. Breathing exercises

- Pursed lip breathing, deep breathing exercises

4. Visualization and imagery

5. Touch and massage

## *6.* **Optimal physical fitness by exercising**

- Exercise is safe for both mother and fetus during pregnancy.

# Benefits of exercise in pregnancy

- Reduces common complaints of pregnancy such as fatigue, varicosities and swelling of extremities

- Reduces insomnia, stress, anxiety and depression.

- Weight-bearing exercises reduce the length of labour and prepares the woman for physical demands of labour

- Improves core stability and pelvic floor muscle strength

- Improves glycaemic control

- Protective effect on coronary heart disease, osteoporosis and hypertension

- Improves posture, strengthens muscles, and maintains muscle length and flexibility

- Decreased birth weight and less maternal weight gain

- Improves the feeling of wellbeing

- Helps in achieving the pre-pregnancy fitness levels

# Absolute Contraindications

- Haemo-dynamically significant heart disease like IHD, RHD, CHF
- Placenta praevia
- Preterm rupture of membranes
- Pregnancy-induced hypertension
- History of preterm labour

- Incompetent cervix
- Acute infection
- Thromboembolism or pulmonary embolism
- Persistent second- or third-trimester bleeding
- Intrauterine growth retardation

# Relative Contraindications

- Chronic hypertension
- Extreme morbid obesity
- Poorly controlled seizure disorder
- Mild to moderate cardiac disease
- Severe anaemia
- Twin pregnancy after 28$^{th}$ week
- Exercise induced asthma

# Signs to terminate Physiotherapy Exercise

1. Excessive shortness of breath

2. Chest pain or palpitations

3. Painful uterine contraction

4. Presyncope or dizziness

5. Vaginal bleeding

6. Excessive fatigue

7. Abdominal pain

8. Reduced fetal movement

9. Leakage of amniotic fluid

# Exercise Risks During Pregnancy

## Maternal Risks

- Musculo-skeletal trauma
- Supine hypotension syndrome
- Fall
- Hypoglycaemia

## Foetal Risks

- Foetal Distress
- Preterm labour
- Abnormal rise in the temperature

# Exercise Prescription in pregnancy

- Assessment of fitness status and individual goals

## Type of exercise

Aerobic exercises eg: walking, swimming

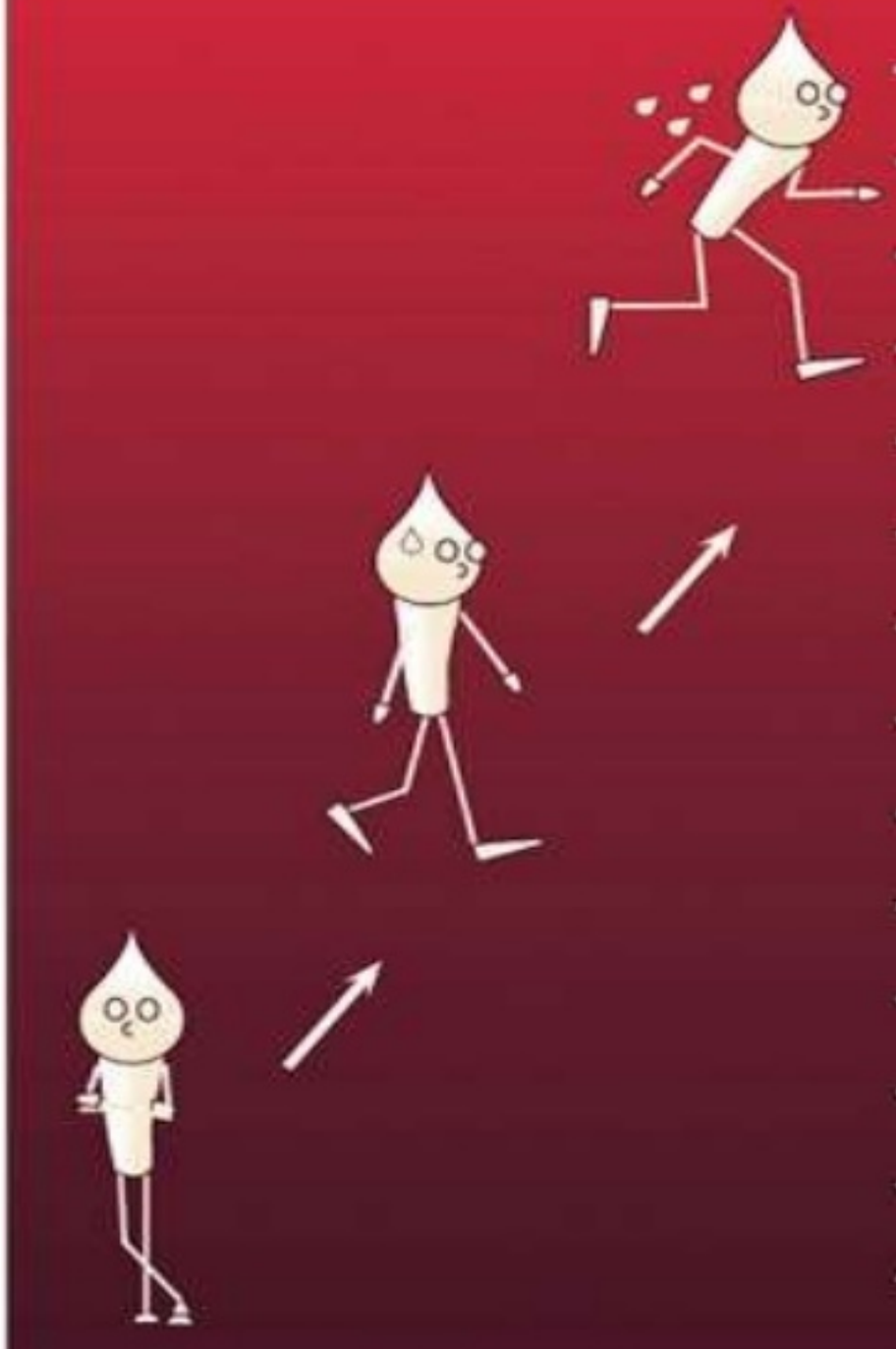
Resistive and flexibility exercises

## Intensity

Maximal heart rate of 60–70% for women who were sedentary

60–90% for women wishing to maintain fitness during pregnancy.

Borg scale of perceived exertion.



| LEVEL | DESCRIPTION |
|---|---|
| 20 | Maximum |
| 19 | Very, very hard |
| 18 | |
| 17 | Very hard |
| 16 | |
| 15 | Hard |
| 14 | ⇦ |
| 13 | Somewhat hard |
| 12 | ⇦ |
| 11 | Fairly light |
| 10 | |
| 9 | Very light |
| 8 | |
| 7 | Very, very light |
| 6 | |

# Duration

Starting from 15 mins and progressing to 30 mins

Proper warm up and cool down periods of 5 – 10 mins each

# Frequency

Minimum of 3 times a week

Progressing to 4-5 times a week

# General Guidelines for Exercise in Pregnancy

- Physical examination is a must
- Jerky, bouncing, ballistic movements/activities should be avoided
- Warm up should precede ex. session followed by a cool down or gradual decline in activity
- Maternal HR should not exceed 140 bpm
- Do not overextend, overstretch joint or rapidly change directions

- Avoid valsalva maneuver and avoid contact sports
- No prone position after 1st trimester
- Avoid exercises in  supine after 4th month
- **“No pain, no gain” does not apply**
- Fluid must be taken before, during, & after exercise to avoid dehydration

- Empty bladder before exercise and avoid GI discomfort by eating atleast 1 hr prior to exercise
- Strenous exercise must be avoided in hot, humid weather or when pregnant woman is pyrexial
- Horseback riding, gymnastics and cycling during pregnancy are not allowed

# Exercises according to the trimesters

Pregnancy is often divided into ‘trimesters’ each equating to approximately three months. The exercises permitted in each trimester differ.

- Exercises in the 1st Trimester.docx
- Exercises in the 2nd Trimester.docx
- Exercises in the 3rd Trimester.docx

# Women with special needs

## 1. Gestational diabetes

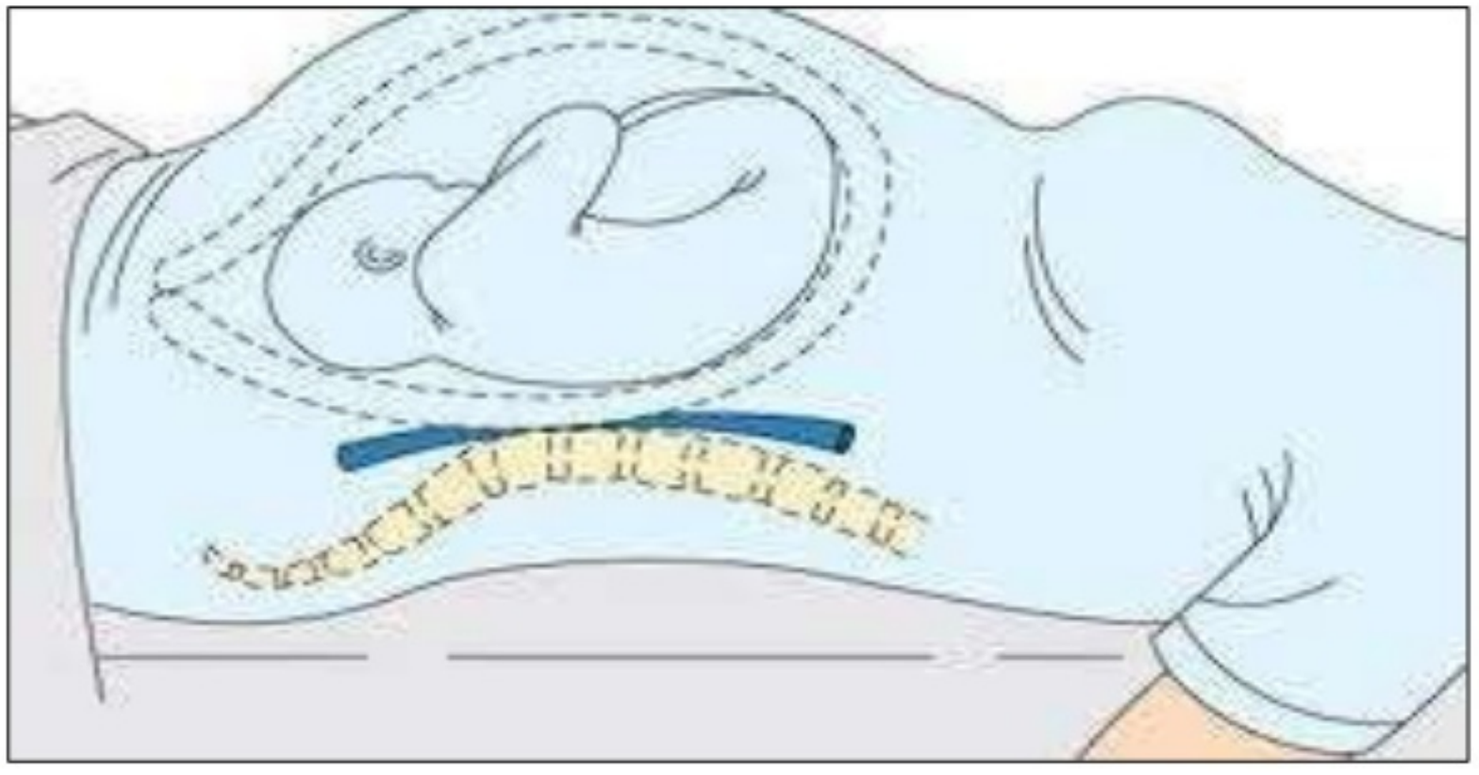
- Walking, stationary bicycling, low-impact aerobics, and swimming

- 5- to 10-minutes of warm-up and cool down period involving some flexibility exercises

- Precautions including monitoring blood glucose, scheduling rest periods and carefully tracking fetal activity and uterine contractions.

2. **Pregnancy-induced hypertension (PIH) /pre-eclampsia and eclampsia**

- Bed rest is advised
- Left side lying position so that there is no compromise of the venous return



# 3. **Competitive athletes**

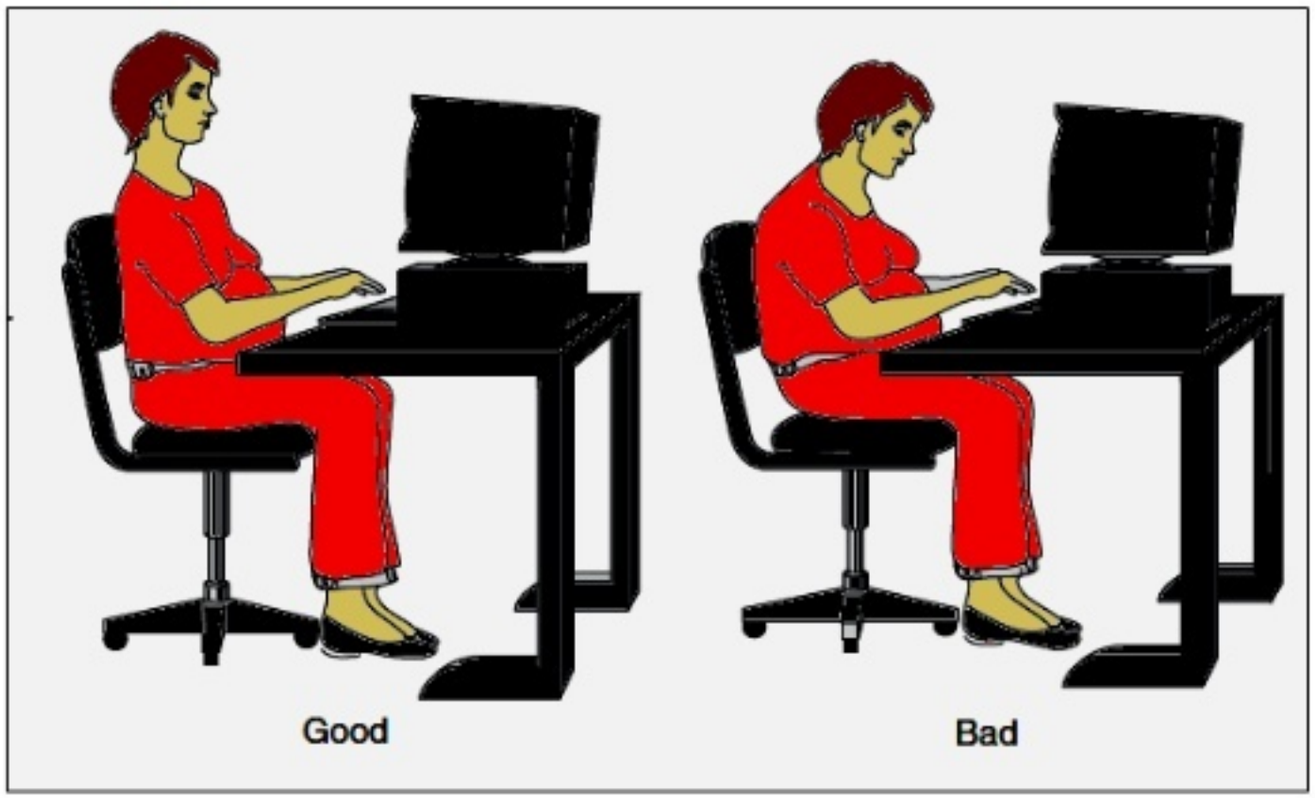
The major concerns are:

- The effects of pregnancy on competitive ability;
- The effects of strenuous training on pregnancy

- Constant supervision by an obstetric care provider
- Additional evaluation to assess fetal growth and wellbeing

## 4. **Women in the workplace**

- Special consideration should be given
- Ergonomic analysis so as to reduce work-related stress, injuries, disease or discomfort.
- Control of the risk factors by making modifications in the task or the working technique.
- Ergonomic advice and postural correction



# POST-NATAL CARE

Post-natal period is the period following delivery, during which the new mother's body begins to recover and returns to normal.

# Role Of Physiotherapy In Post-natal Care

The main aims of physiotherapy during this period are:

- Introducing an exercise and relaxation program, thereby assisting the new mother's in physical recovery
- Restoration of the muscle strength and tone
- Treatment of musculoskeletal problems
- Teaching correct ergonomics for breast-feeding, handling the baby and house-hold chores

- Using this opportunity to educate the mother regarding the various family planning methods and its importance.

- Providing support and counselling and helping to cope with the stress

- Education regarding importance of post-natal exercises and breastfeeding

# Physiotherapy following a normal vaginal delivery

## Exercise program

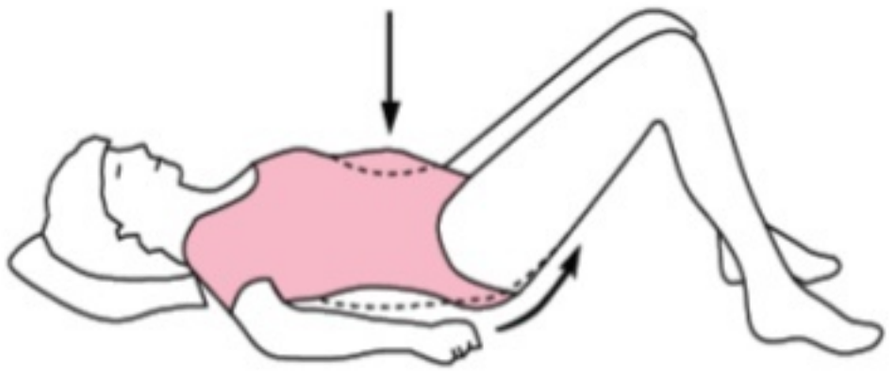
- Active movements of the limbs eg: ATMs and Heel slides



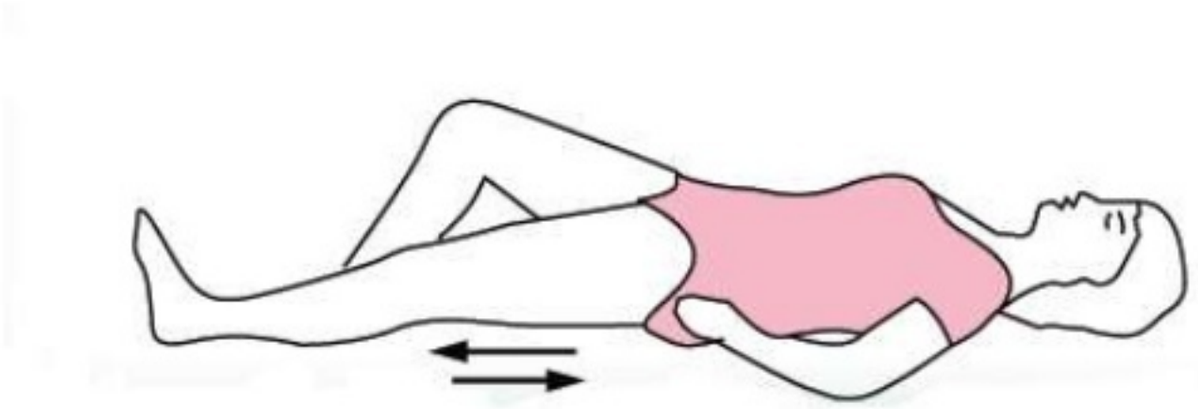


- Deep beathing exercises
- Pelvic floor exercises

- Pelvic tilts



- Gluteal sets



- Single knee to chest



- Cat-camel exercise



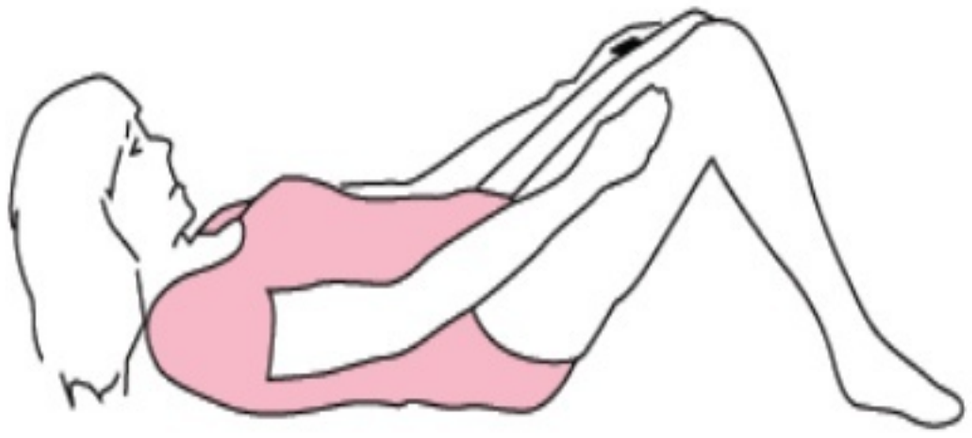
- Single straight leg raise

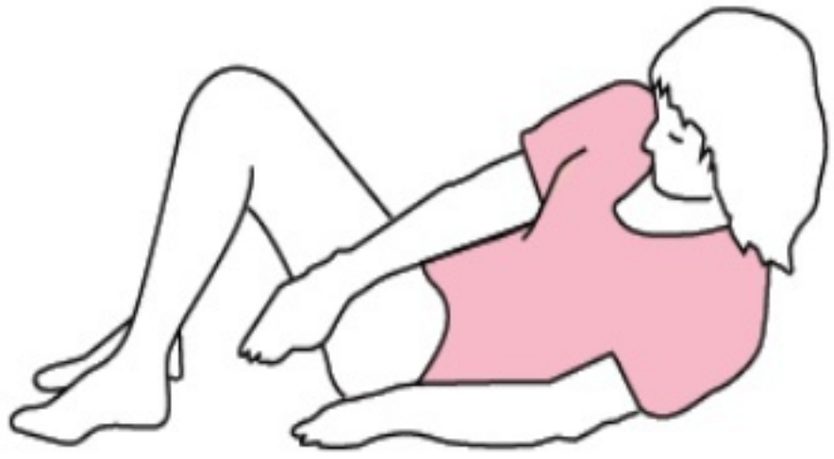






- Abdominal curl-ups: straight curl ups  and diagonal curl ups

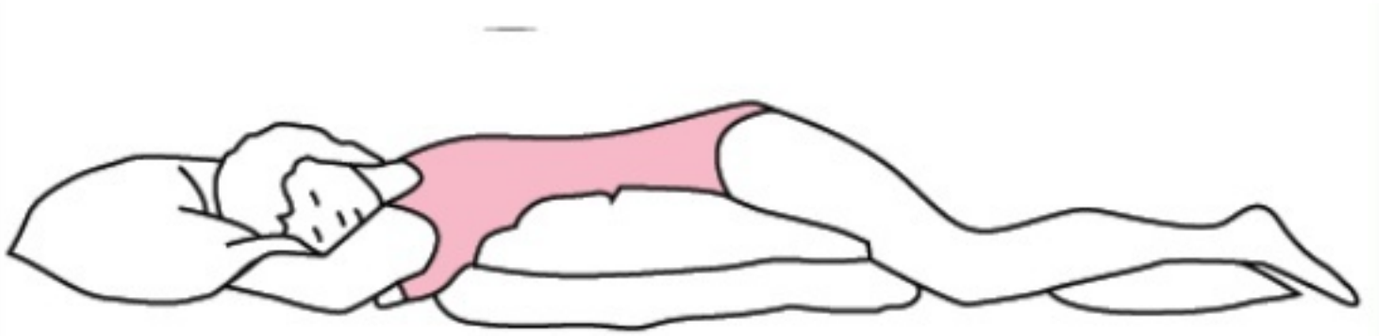




- Bridging

# Teaching  Posture and Ergonomic principles

- Correct posture in standing, sitting, lying and kneeling should be taught



- Special emphasis on:
  feeding,
  nappy changing,
  baby bathing,
  carrying/lifting



- various feeding positions of comfort













Appropriate use of
carrying slings
to avoid back problems.



Pram handles at the
correct height
to avoid back problems.

## DON'T



## DO



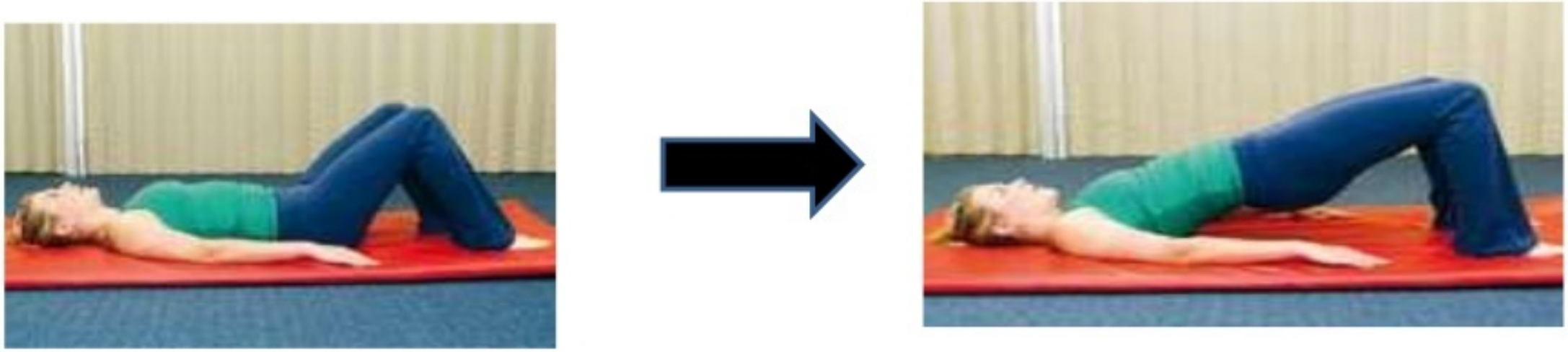
# Physiotherapy following a cesarean delivery

- TENS for pain
- Diaphragmatic breathing and segmental expansion exercises
- Splinted coughing
- Knee rolling





- Movements of the limbs
- Pelvic floor exercises
- Pelvic tilts
- Bridging exercises



- Posture correction
- Ambulation should be initiated as early as possible
- Core stability exercises
- Vigorous exercises should be done after 6-8 weeks

# Post-natal Problems and Physiotherapy

## MUSCULOSKELETAL PROBLEMS

### 1. Perineal pain

- Rest and apply ice for 10 to 15 mins, every 2-4 hours
- Pelvic floor exercises using contract-relax technique improves circulation and reduces swelling
- Use of cushion when sitting
- Electrotherapy: ultrasound, Pulsed electromagnetic energy (PEME), low level laser therapy, infrared or surface heat

## 2. Diastasis of recti abdomini muscles (DRAM)

- A gap between the recti abdomini muscles of greater than 25 mm, palpated just superior to the umbilicus





The corrective exercises include:

- Isometric abdominal exercise
- Head lifts
- Head lifts with pelvic tilts
- Leg sliding with pelvic tilts
- Pelvic tilts in quadraped position

- If the diastasis is large, its recommended to use a temporary abdominal support like abdominal binder

3. Back pain

- Strengthening of the weak muscles by low load, endurance exercises.
- Mobilization for the sacro-iliac, lumbar or lumbo-acral regions in case of low back pain
- Teaching to maintain correct postures and correct ergonomics
- Hot pack

4. Thoracic pain

- Postural correction
- Gentle exercises
- Hot or ice packs

5. <u>Symphysis pubis</u>

In addition to treatments used antenatally, other methods that can be used are:

- Trochanter belts or a full pelvic binder
- Drawing the abdomen in is encouraged before moving around the bed.
- TENS, US
- Orthopaedic aids

6. <u>After pains</u>

- TENS over T10-L1 and S2-S4 that innervates the uterus and perineum may relieve pain
- Exercises

7. <u>Abdominal induration</u>

- Moist pack or SWD can be given to resolve the intramuscular haematoma

# CIRCULATORY PROBLEMS

## 9. Varicose veins

- Vigorous and frequent, dorsiflexion and plantarflexion
- Pressure stockings
- Sitting or lying with the legs raised

## 10. Oedema

- Vigorous ankle-toe movements
- Resting with legs elevated
- Pressure stockings

11. Deep vein thrombosis

If the DVT is in calf:

- Vigorous ankle-toe movements and legs elevated
- Avoid pressure on the back of the calf while carrying out any activities

If the DVT is in iliofemoral region:

- Bed rest may be advised till the swelling subsides
- Legs in elevation
- Foot exercises, quadriceps and gluteal muscle contractions, hip and knee flexion and extension can aid in circulation.

# BLADDER AND BOWEL PROBLEMS

## 12. Stress incontinence

- Kegels exercise
- Kegel balls or weights, vaginal cones, electronic kegel exerciser can be used to strengthen the pelvic floor muscles.
- Electrical stimulation and interferential therapy
- Electromyography can be used to train control
- Bladder Retraining

## 13. Bowel incontinence

## 14. Constipation

## PSYCHOLOGICAL PROBLEMS

15. The three common manifestations of Post-natal depressive illness are:

- The ‘maternity’, ‘baby’, ‘third day’ blues
- Puerperal psychosis
- Postnatal depression

16. Breast engorgement, mastitis, tender and cracked nipples

# Summary

# References


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10. George D. Harris, Russell D. White. Diabetes management and exercise in pregnant patients with diabetes. CLINICAL DIABETES.2005;23( 4):165-168

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THANK YOU

# Bharath institute of Higher Education ands Research

## Sri Lakshmi Narayana Institute of Medical Sciences

Participant list of Value added course: **Physiotherapy**

**NOVEMBER 2015 - JANUARY 2016**

| SL.NO | REG. NO | STUDENTS NAME | SIGNATURE |
|---|---|---|---|
| 1 | U12MB221 | BHARATHI K. | |
| 2 | U12MB222 | CHENNUPATI LAKSHMI SHRAYA | |
| 3 | U12MB223 | CINDRELLA ESTHER.J | |
| 4 | U12MB224 | DEVIKA S. | |
| 5 | U12MB225 | DHIVAKER.N | |
| 6 | U12MB226 | DIVYA V.B. | |
| 7 | U12MB227 | GAYATHRI G. | |
| 8 | U12MB228 | GOKULRAJ.M | |
| 9 | U12MB229 | GOKULNATH.E | |
| 10 | U12MB230 | GOSULA PRIYANKA | |
| 11 | U12MB231 | GYNANA SURIYA PRAKASH .K | |
| 12 | U12MB232 | HARI PRASANTH.M | |
| 13 | U12MB233 | ISWARYA R. | |
| 14 | U12MB234 | JANANI .S | |
| 15 | U12MB235 | JENNATHUL THURIYA .S | |
| 16 | U12MB236 | JOSELINE PRINCY A. | |
| 17 | U12MB237 | KALAIARASAN.J | |
| 18 | U12MB238 | KANNIKA .T | |
| 19 | U12MB239 | KARTHIKEYAN .N | |
| 20 | U12MB240 | KAVI NILAVU.K | |

# Assessment of course on Physiotherapy in OBG

**1.Who started a nutritional system of antenatal clinic with a uiform pattern of visit and procedure**

a) Janet Campbell b) Aurgust karl

c) Hendry Edmund d) William Thomas

**2.Kegel's excerise is done for**

A)pelvic floor dysfunction

B)coccydynia

C) symphysis pubis dysfunction

D) nerve compression syndrome

**3.Excerise is contraindicated in all except**

a) placenta previa b) preterm rupture of membrane

c)PIH d) musculocutaneous problem

**4.post nature depressive illness in cell except**

a) maternity blue b) rupture

c)Postnatal depression d) manic episodes

**5.left side lying position is useful in**

a) GDM b) PIH c) anemia d) CPD

**6. Relaxin is produced by……**

a) ovaries b) uterus c) pitutary d) adrenals

**7. pelvic girdle pain is caused due to……**

a) sacroiliac joint dysfunction b) lumbar sacral

c)PS dysfunction d) femoro pelvic dysfunction

**8 ……. % of women will experience urinary incontinence during pregnancy ?**

a) 30-50 b) 50-60 c) 40-70 d)80-100

**9……. % of pregnant women suffer from pelvic girdle pain and low back pain**

a) 4 b)5 c)7 d)13

**10…… weeks postpartum onwards we can see a women physiotherapist for abdominal and pelvic floor assessment**

a) 4 b) 9 c) 6 d) 2

## Assessment of course on Physiotherapy in OBG

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 **BHARANI CHANDAR.G** has actively participated in the Value Added Course on **PHYSIOTHERAPHY IN OBSTETRICS** held during Nov 2015 – Jan 2016 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**

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, 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 **JANANI.S** has actively participated in the Value Added Course on **PHYSIOTHERAPHY IN OBSTETRICS** held during Nov 2015 – Jan 2016 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**

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-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:** PHYSIOTHERAPY IN ANTENATAL AND POSTNATAL CARE
**Date:** 27/08/2018
**Name:** PHARATH I K
**Reg NO.** U12MB221
**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

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**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:** PHYSIOTHERAPY IN ANTENATAL AND POSTNATAL CARE
**Date:** 19/01/2019
**Name:** DIVYA V.B
**Reg NO.** U12MB226
**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

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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: 24.02.2016**

**From**
Dr. Nivedhana arthi
Assistant Professor,
Obstetrics and Gynaecology,
Sri Lakshmi Narayana institute of Medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

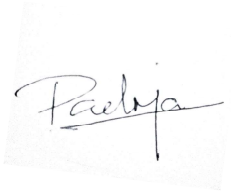
**To**
The Dean,
Sri Lakshmi Narayana institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

**Sub: Completion of value-added course: Physiotherapy**

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **Physiotherapy** on April 18 – Jan 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. Padma

PROFESSOR & HEAD
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

**VALUE ADDED COURSES**

**OBGY 2 PHYSIOTHERAPY IN OBSTETRICS**



SLIMS,PONDICHERRY

Date 05/05/15

**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 ANATOMY TEACHING-OSTEOLOGY**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **INTEGRATED ANATOMY TEACHING OSTEOLOGY** on 05/05/15. We solicit your kind permission for the same.

Kind Regards

R. Chidhambaram

**Dr..R.CHIDHAMBARAM**

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Rajasekaran

The HOD: Dr. R. Chidhambaram

The Expert: Dr. S. Shanmugasundaram

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

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

07.05.2015

**Sub: Organizing Value-added Course: INTEGRATED ANATOMY TEACHING-OSTEOLOGY 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 ANATOMY TEACHING-OSTEOLOGY.** 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 2015. 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

## Course Proposal

**Course Title:** INTEGRATED ANATOMY TEACHING

**Course Objective:** TO DEMONSTRATE SKELETAL SYSTEM AS SEEN IN SKELETON AND X-RAYS

**Course Outcome:** BETTER UNDERSTANDING OF BONE MORPHOLOGY

**Course Audience:** ANY MEDICAL STUDENT

**Course Coordinator:** PROF.DR.R.CHIDHAMBARAM,M.B.B.S,MDRD.,

**Course Faculties with Qualification and Designation:**

1. DR.R.CHIDHAMBARAM,MBBS,MDRD.PROF. AND HOD
2. DR.SHRINUVASAN,MBBS,DNB,ASST PROFESSOR
3. DR.JYOTI BASU,MBBS,DNB,SENIOR RESIDENT

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 01-11-2015 | INTRO | 2:00 PM | 2 hours |
| 2 | 02-11-2015 | UPPER LIMB BONES | 2:00 PM | 2 hours |
| 3 | 03-11-2015 | LOWER LIMB BONES | 2:00 PM | 2 hours |
| 4 | 04-11-2015 | SHOULDER GIRDLE- BONES | 2:00 PM | 2 hours |
| 5 | 05-11-2015 | PELVIC GIRDLE BONES | 2:00 PM | 2 hours |
| 6 | 06-11-2015 | CERVICAL SPINE- BONES | 2:00 PM | 2 hours |
| 7 | 07-11-2015 | THORACIC SPINE- BONES | 2:00 PM | 2 hours |
| 8 | 08-11-2015 | LUMBOSACRAL SPINE- BONES | 2:00 PM | 2 hours |
| 9 | 09-11-2015 | CHEST WALL-BONES | 2:00 PM | 2 hours |
| 10 | 10-11-2015 | SKULL -BONE | 2:00 PM | 2 hours |
| 11 | 11-11-2015 | PNS, MASTOIDS | 2:00 PM | 2 hours |
| 12 | 12-11-2015 | TEMPORAL BONE | 2:00 PM | 2 hours |
| 13 | 13-11-2015 | ORBITS,FACIAL BONE | 2:00 PM | 2 hours |
| 14 | 14-11-2015 | MANDIBLE | 2:00 PM | 2 hours |
| 15 | 15-11-2015 | RECAP | 2:00 PM | 2 hours |
| | | | Total Hours | 30 |

**REFERENCE BOOKS: (Minimum 2)**
**1.GRAY'S ANATOMY**
**2.ANATOMY IN DIAGNOSTIC IMAGING**

# VALUE ADDED COURSE

**1. Name of the programme & Code :**

**Integrated anatomy teaching-osteology & RAD 01**

**2. Duration & Period**

30 hrs & September 2015– January 2016 & February15 – August 2016

**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 2015– January 2016 & February15 – August 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- September 2015 - August 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | **RAD 01-1** | **Integrated anatomy teaching-osteology** | Dr. Jothibasu | 1st MBBS | 20 (Sep 15 – Jan 16) |
| 2 | **RAD 01-2** | **Integrated anatomy teaching-osteology** | Dr. Shrinuvasan | 1st MBBS | 20 (Feb15-Aug-116) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

**COORDINATOR**

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

BIHER

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

SLIMS

Course Name: INTEGRATED ANATOMY TEACHING-OSTEOLOGY

Subject Code: VAC1

Name of Student: ARshyaR Roll No.: U16MD257

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 presentation

*Date:*

Signature

Course Name: INTEGRATED ANATOMY TEACHING-OSTEOLOGY

Subject Code: VAC 1

Name of Student: Ajay.N Roll No.: 21GMA256

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 presentation

Date:

Ajay
Signature

Abitha Raj Lir U16MR253

# OSTEOLOGY

**1. The following are true:**
(a) The supraspinatus tendon passes above the acromion process.
(b) The clavicle has a medullary cavity.
(c) The rhomboid fossa marks the site of origin of the costo-clavicular ligament.
(d) The clavicle is the last bone to ossify.
(e) A distance of less than 5 mm between the humerus and the acromion indicates likely supraspinatus tendon impingement.

**2. Regarding the shoulder joint:**
(a) The capsule of the shoulder joint is lax inferiorly.
(b) The long head of the biceps runs under the transverse humeral ligament.
(c) The subscapularis bursa is a herniation of the shoulder joint synovial membrane deep to the subscapularis muscle, through a defect in the glenohumeral ligament.
(d) Teres major forms part of the rotator cuff.
(e) During shoulder arthrography contrast passes normally into the subacromial bursa.

**3. Regarding the shoulder joint:**
(a) CT arthrography is of value in the assessment of the glenoidlabrum.
(b) T2-W images and STIR (short tau inversion recovery) sequences with fat suppression can identify tears in the supraspinatus tendon.
(c) On ultrasound, the supraspinatus tendon is echobright.
(d) In anterior dislocation of the shoulder, cortical defects may occur in the anterior aspect of the head of the humerus
(e) All the rotator cuff muscles are attached to the greater tubercle of the humerus.

**4. Regarding the upper limb:**
(a) The radial groove is situated in the radius.
(b) The capitulum articulates with the ulna.
(c) The ligament of Struthers may compress the median nerve.
(d) The capitulum is the first secondary ossification centre to appear in the elbow.
(e) A prominent posterior fat pad in a lateral radiograph of the elbow is seen in cases of joint effusion.

**5. In the upper limb:**
(a) The annular ligament of the elbow blends with the ulnar collateral ligament.
(b) The bicipitalaponeurosis separates the superficial median cubital vein from the deeper brachial artery.
(c) The ulna articulates with the carpal bones.
(d) The distal radio-ulnar joint has no communication with the carpal joints.
(e) The ulna articulates with the triquetral only during ulnar deviation of the wrist.

**6. Concerning the wrist and carpus:**
(a) The mid-carpal joint does not communicate with the radiocarpal joint.
(b) On a lateral wrist radiograph the distal radius has a slight volar tilt.

(c) The lunate articulates proximally with the radius and distally with the capitate.
(d) The flexor retinaculum is attached to the pisiform, hook of hamate, scaphoid tubercle and ridge of the trapezium.
(e) Flexor carpi-radialis attaches to the pisiform.

**7. In the hand and wrist:**
(a) In most cases two views are enough to exclude scaphoid fractures.
(b) In 15% of cases blood supply is from the distal to the proximal portion of the scaphoid.
(c) The scaphoid ossifies in the sixth year.
(d) All the metacarpals articulate with each other and with the corresponding carpal bones.
(e) The commonest supernumerary bone of the wrist joint is the os radiale.

**8. In skeletal imaging:**
(a) Phased array surface detection coils greatly improve the signal to noise ratio in MRI of bone joint and soft tissue.
(b) Abnormalities of cortical bone and calcification are usually not detected by MRI.
(c) Meniscal abnormalities of the knee are best demonstrated on T1-weighted scans.
(d) A fat fluid level within the suprapatellar bursa of the knee joint indicates a fracture within the joint.
(e) Bone scans using 99mTc MDP are very specific for pathology.

**9. In the bony pelvis:**
(a) thetriradiate cartilage is seen as a Y-shaped lucency at the acetabulum in an immature skeleton in a plain radiograph.
(b) the iliac crest has a separate ossification centre.
(c) the rectus femoris originates at the anterior superior iliac spine.
(d) theobturator foramen is bounded inferiorly by the sacro-spinous ligaments.
(e) thesacrotuberous ligament defines the posterior limit of the lesser sciatic foramen.

**10. In the pelvis:**
(a) The iliopsoas muscle passes anterior to the inguinal ligament.
(b) The aponeurosis of the external oblique has a thickening, which runs from the pubic tubercle to the anterior superior iliac spine as the inguinal ligament.
(c) The sacroiliac joint does not have a synovial component.
(d) The intersosseous sacroiliac ligament is a strong ligament.
(e) Each half of the vertebral arch of the sacrum appears at 16–20 weeks of fetal life.

## Student Feedback Form

Course Name: **INTEGRATED ANATOMY TEACHING OSTEOLOGY**

Subject Code: VAC1

Name of Student: ARShyaR Roll No.: U16MD257

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 presentation

Date:

Signature

## Student Feedback Form

Course Name: **INTEGRATED ANATOMY TEACHING OSTEOLOGY**

Subject Code: VAC1

Name of Student: Ajay N Roll No.: U16MD256

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

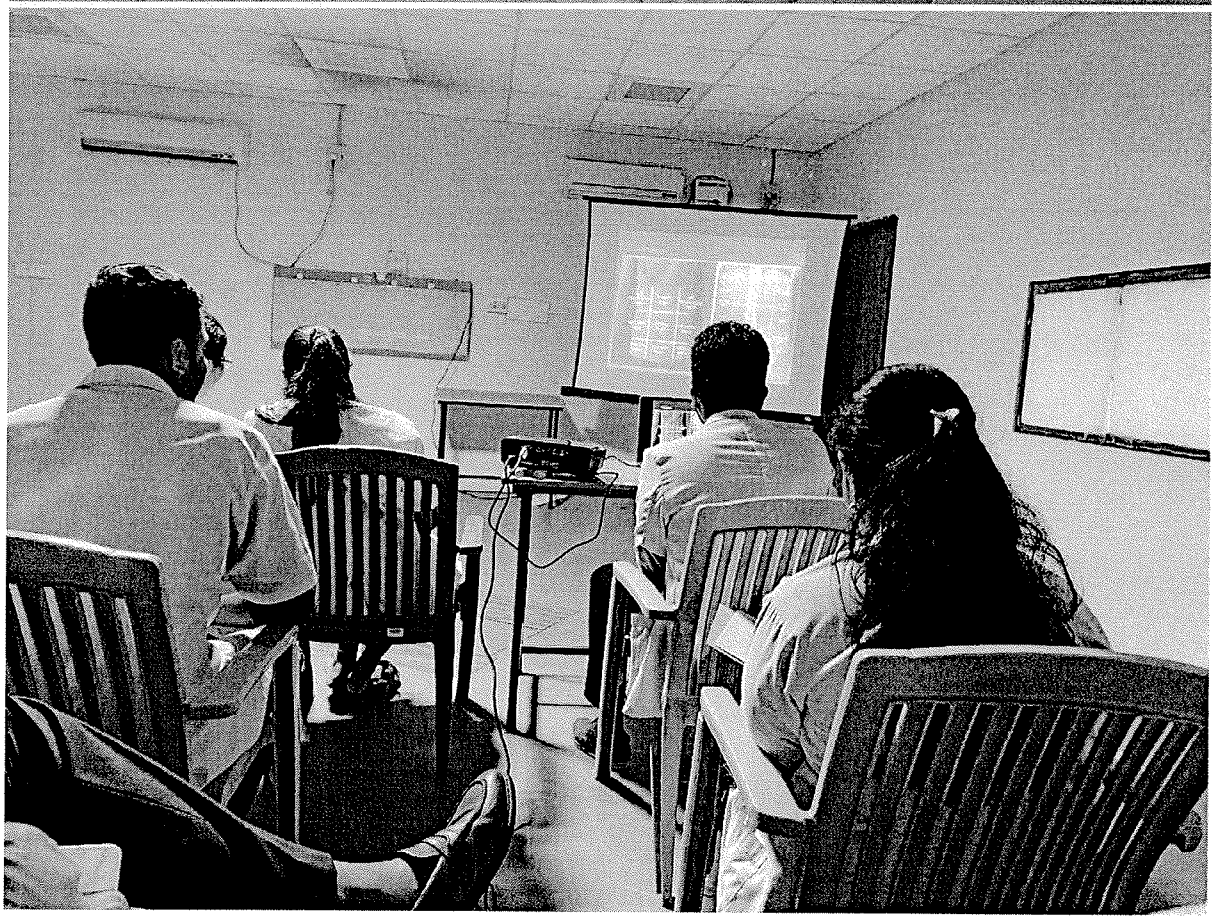
Suggestions if any:

Good presentation

Date

Signature





## Course Proposal

**Course Title:** INTEGRATED ANATOMY TEACHING

**Course Objective:** TO DEMONSTRATE SKELETAL SYSTEM AS SEEN IN SKELETON AND X-RAYS

**Course Outcome:** BETTER UNDERSTANDING OF BONE MORPHOLOGY

**Course Audience:** ANY MEDICAL STUDENT

**Course Coordinator:** PROF.DR.R.CHIDHAMBARAM,M.B.B.S,MDRD.,

**Course Faculties with Qualification and Designation:**

1. DR.R.CHIDHAMBARAM,MBBS,MDRD.PROF. AND HOD
2. DR.SHRINUVASAN,MBBS,DNB,ASST PROFESSOR
3. DR.JYOTI BASU,MBBS,DNB,SENIOR RESIDENT

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 01-11-2015 | INTRO | 2:00 PM | 2 hours |
| 2 | 02-11-2015 | UPPER LIMB BONES | 2:00 PM | 2 hours |
| 3 | 03-11-2015 | LOWER LIMB BONES | 2:00 PM | 2 hours |
| 4 | 04-11-2015 | SHOULDER GIRDLE- BONES | 2:00 PM | 2 hours |
| 5 | 05-11-2015 | PELVIC GIRDLE BONES | 2:00 PM | 2 hours |
| 6 | 06-11-2015 | CERVICAL SPINE- BONES | 2:00 PM | 2 hours |
| 7 | 07-11-2015 | THORACIC SPINE- BONES | 2:00 PM | 2 hours |
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| 10 | 10-11-2015 | SKULL -BONE | 2:00 PM | 2 hours |
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| 14 | 14-11-2015 | MANDIBLE | 2:00 PM | 2 hours |
| 15 | 15-11-2015 | RECAP | 2:00 PM | 2 hours |
| | | | Total Hours | 30 |

**REFERENCE BOOKS: (Minimum 2)**
**1.GRAY'S ANATOMY**
**2.ANATOMY IN DIAGNOSTIC IMAGING**

Date: 06.06.2015

From

Dr.R.Chidhambaram
Professor and Head,
Department of Radiology and imaging sciences,
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 ANATOMY TEACHING-OSTEOLOGY**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: : **: INTEGRATED ANATOMY TEACHING-OSTEOLOGY** 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***

***SLIMS PONDY***

***INTEGRATED***

***ANATOMY TEACHING***

***OSTEOLOGY***

***VENUE:***

*Lecture hall IV*

*TIME: SATURDAY 2.00 PM TO 4 PM.*

***COURSE CONTENTS***

***1.BASIC VIEWS IN MUSCULOSKELETAL SYSTEM***

***2.BASIC IDENTIFICATION OF NORMAL BONES***

***3.BASIC IDENTIFIACTION OF NORMAL JOINTS***

# Classification of bones

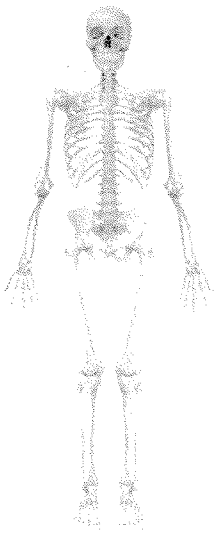
According to their position:

1.) Axial Skeleton

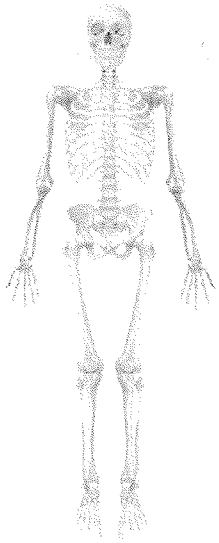
2.) Appendicular skeleton

BIHER SLIMS

Axial skeleton



Appendicular skeleton



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According to their shape:

1.) Long bones (Eg, Femur, humerus, tibia etc).

2.)Short bones (E.g. Carpal and Tarsal bones)

3.) Flat bones (E.g. Occipital, Parietal, frontal etc).

4.) Irregular bones (e.g. Sacrum,coccyx, Ethmoid maxilla etc).

5.)Sesamoid bones (Eg: Patella)

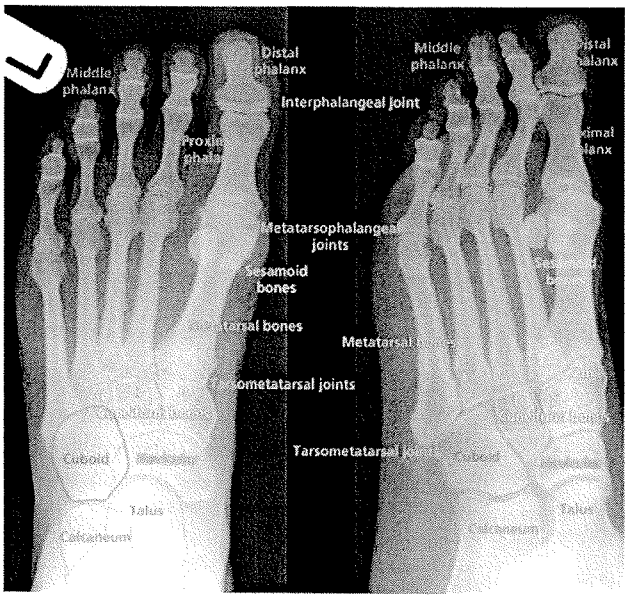



**Figure 20b. Normal foot,** AP and oblique views

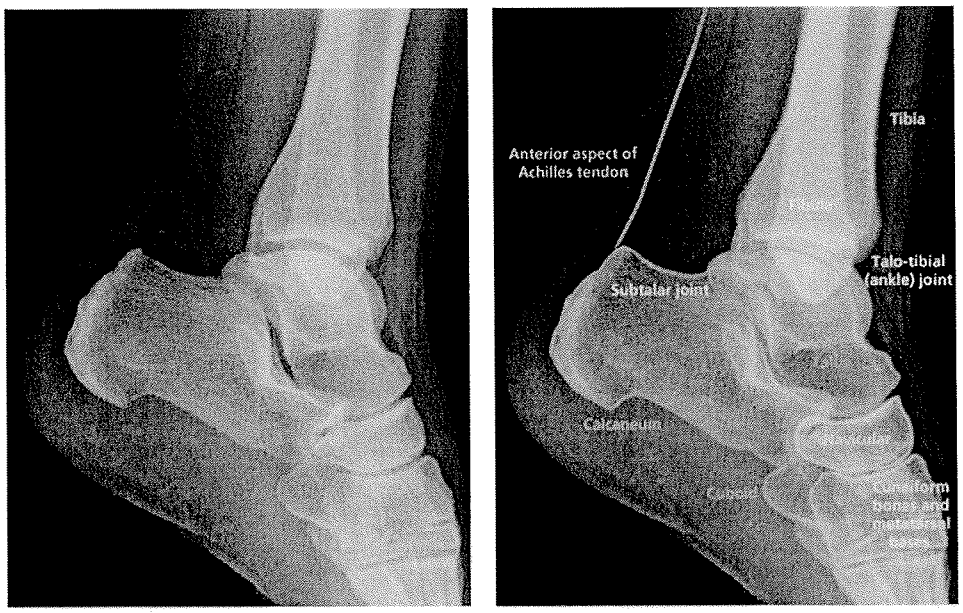



**Figure 19. Normal ankle**, lateral view.

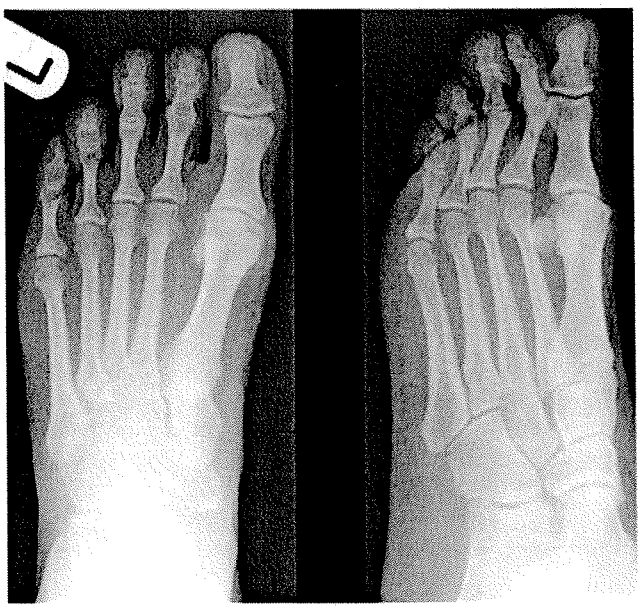


**Figure 20a. Normal foot,** AP and oblique views

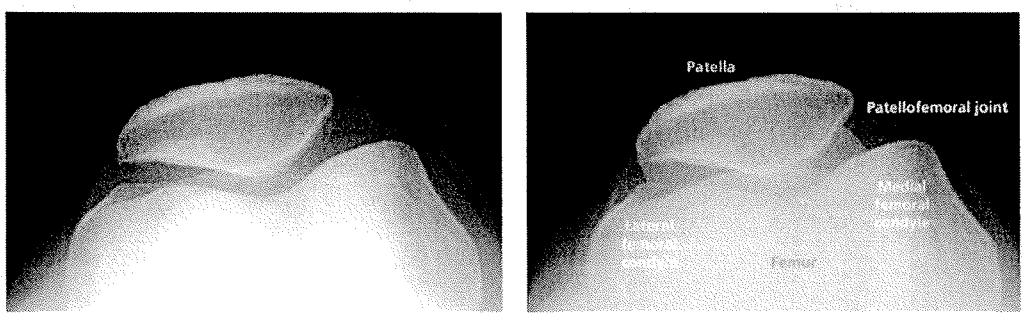



**Figure 17. Normal knee,** sky-line patella view.

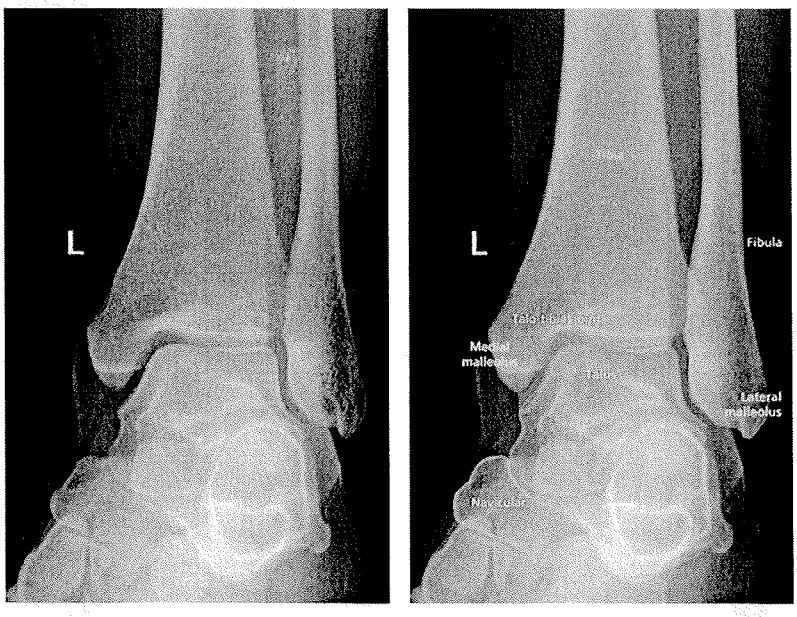



**Figure 18. Normal ankle,** AP view.

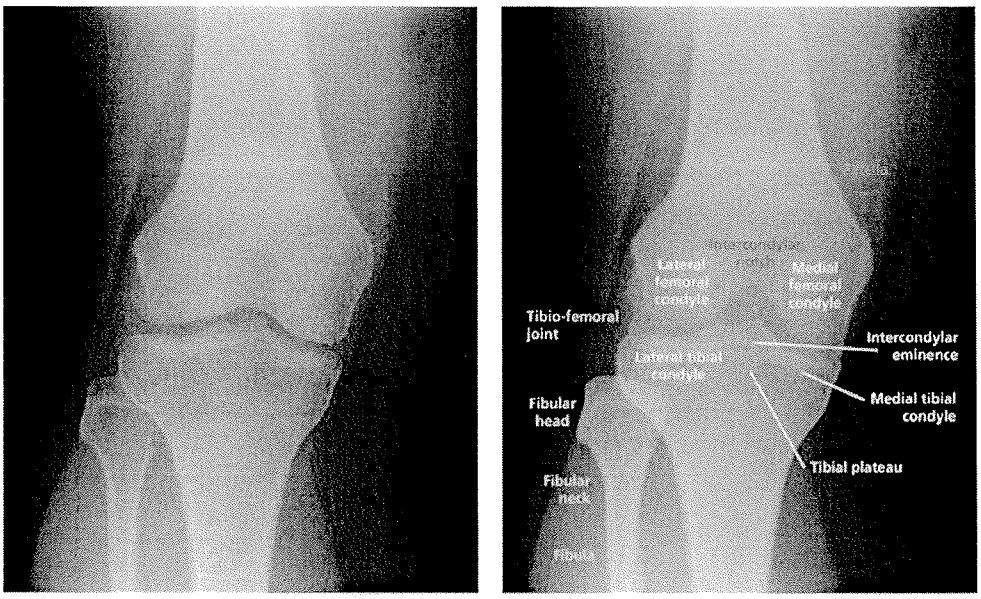



**Figure 15. Normal knee,** AP view

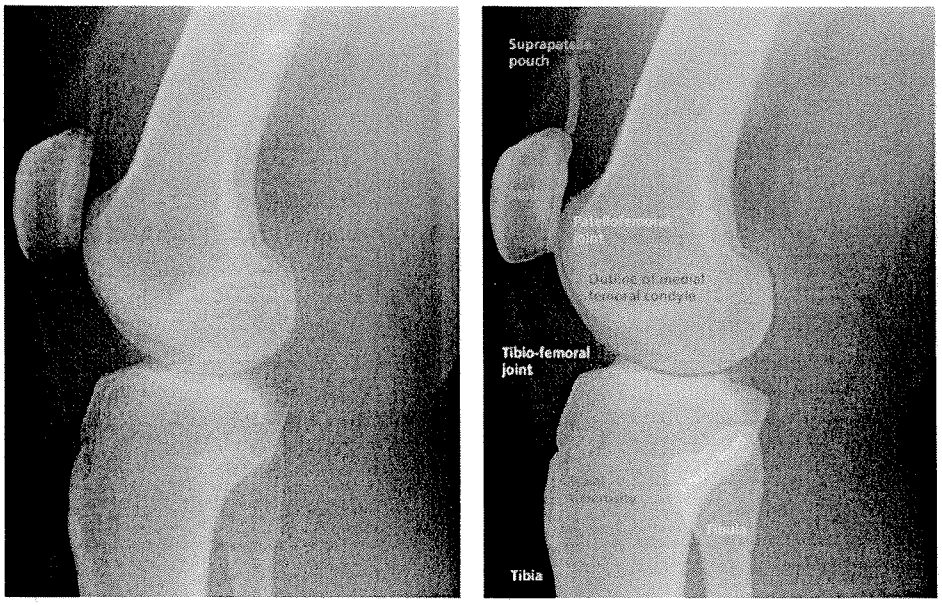



**Figure 16. Normal knee,** lateral view.

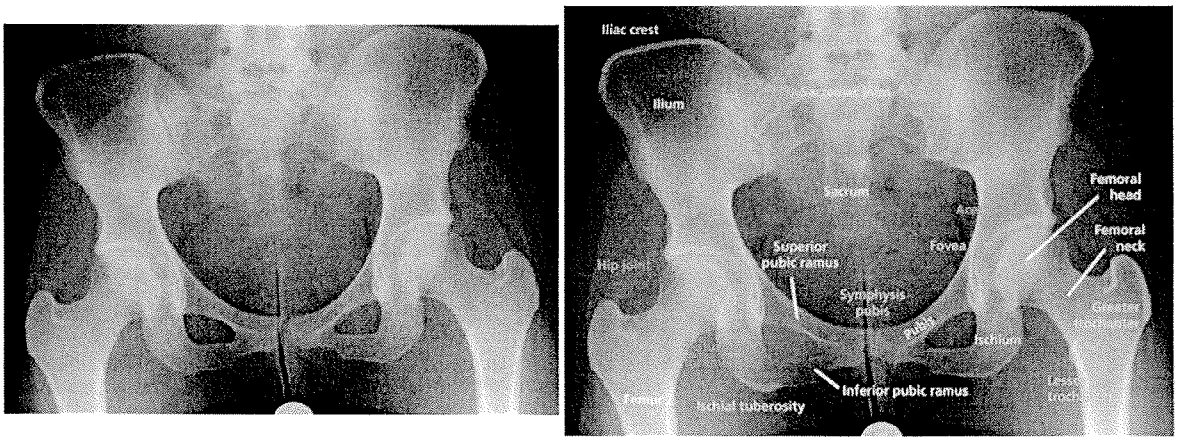



**Figure 13 Normal pelvis,** AP view.

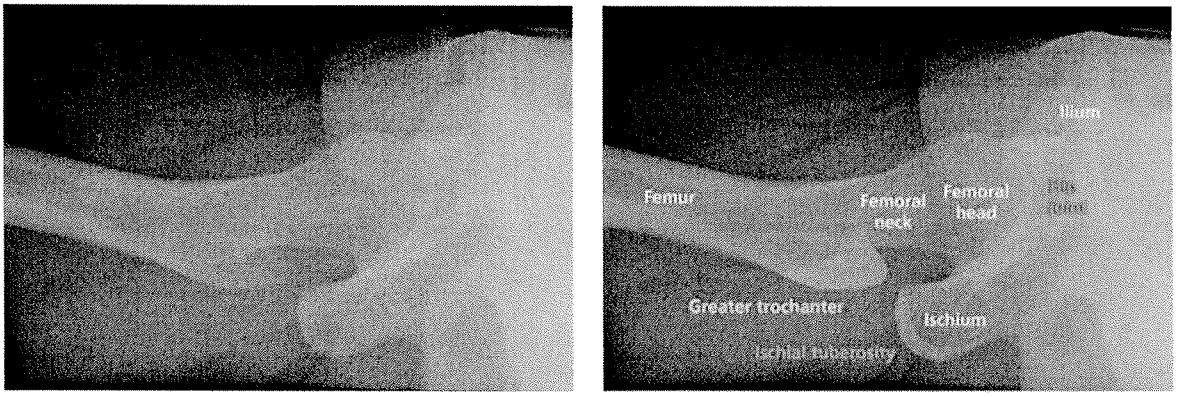



**Figure 14. Normal hip,** lateral view.

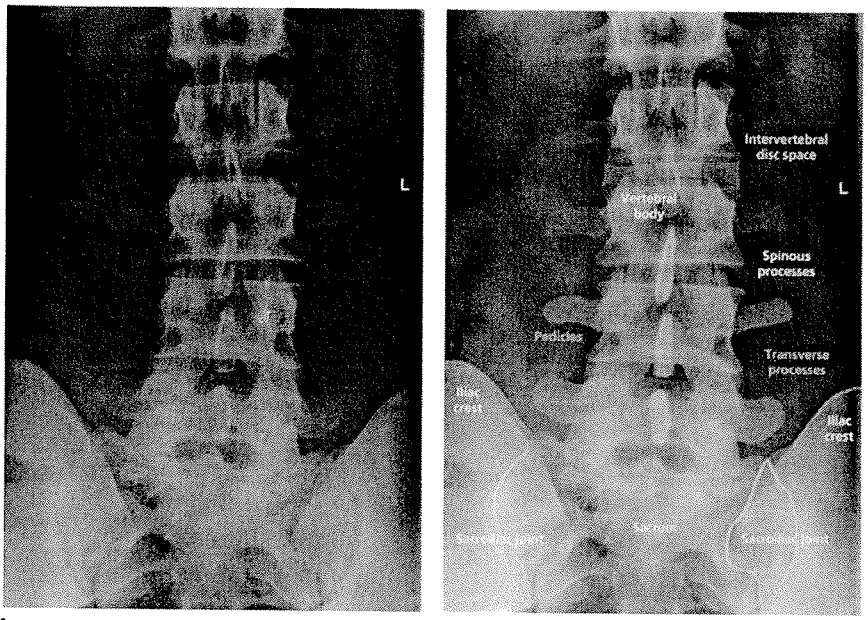



Figure 11. Normal lumbar spine and sacroiliac joints, AP view.

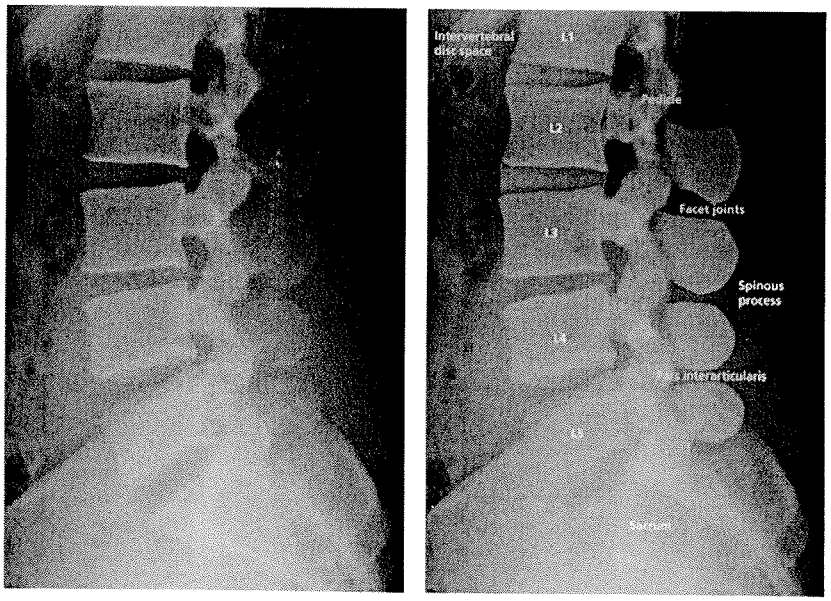



Figure 12 Normal lumbar spine, lateral view.

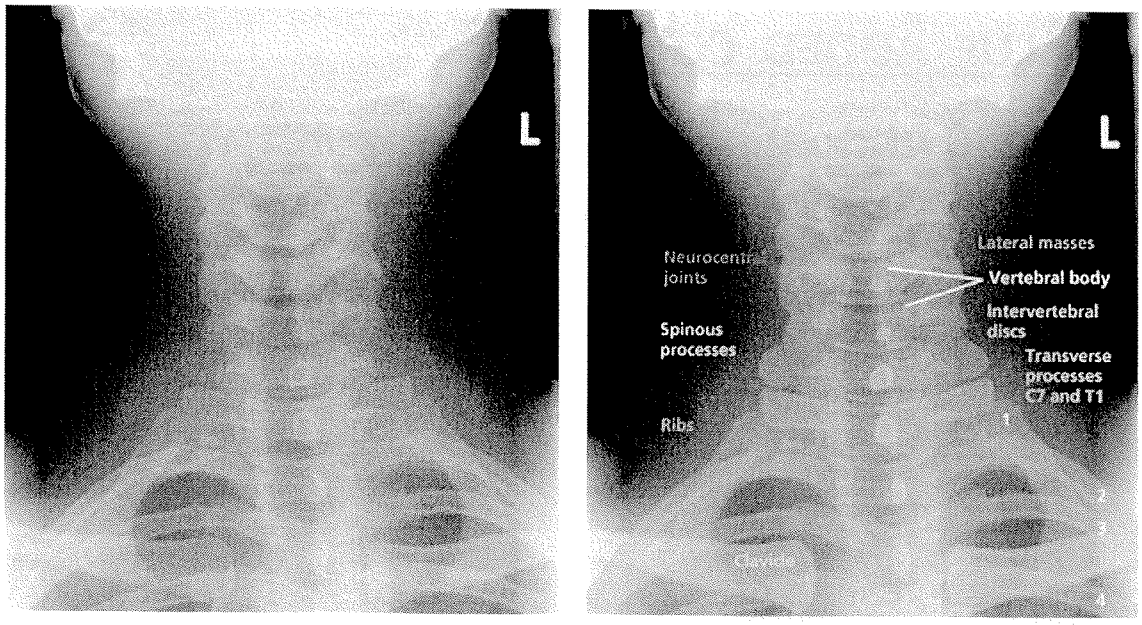



**Figure 9. Normal cervical spine,** AP view.

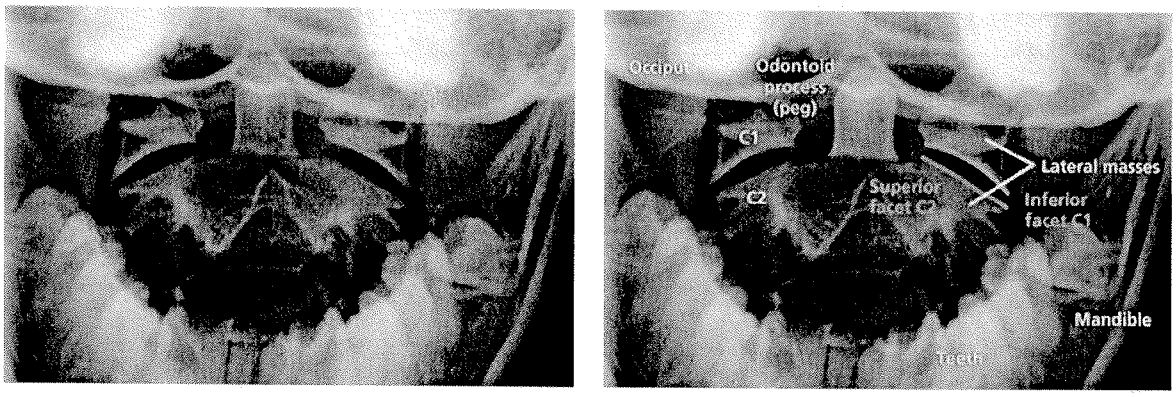



**Figure 10. Normal cervical spine,** through-mouth view

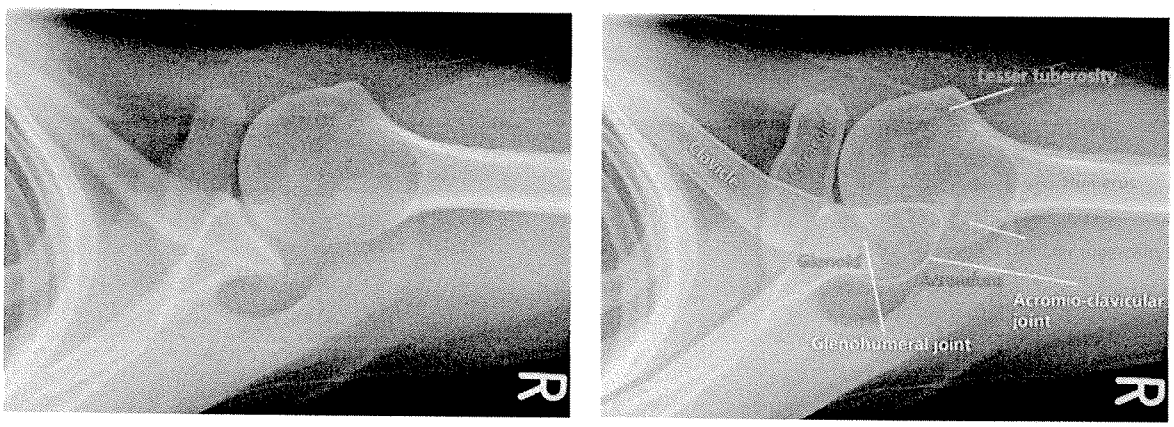



**Figure 7 Normal shoulder,** axial view.

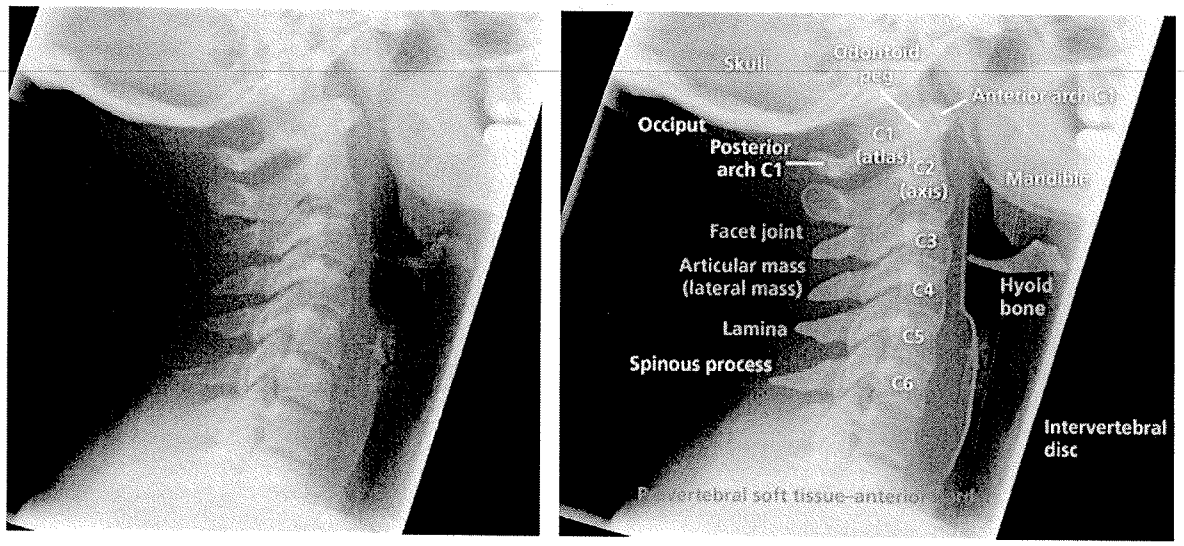



**Figure 8 Normal cervical spine,** lateral view.

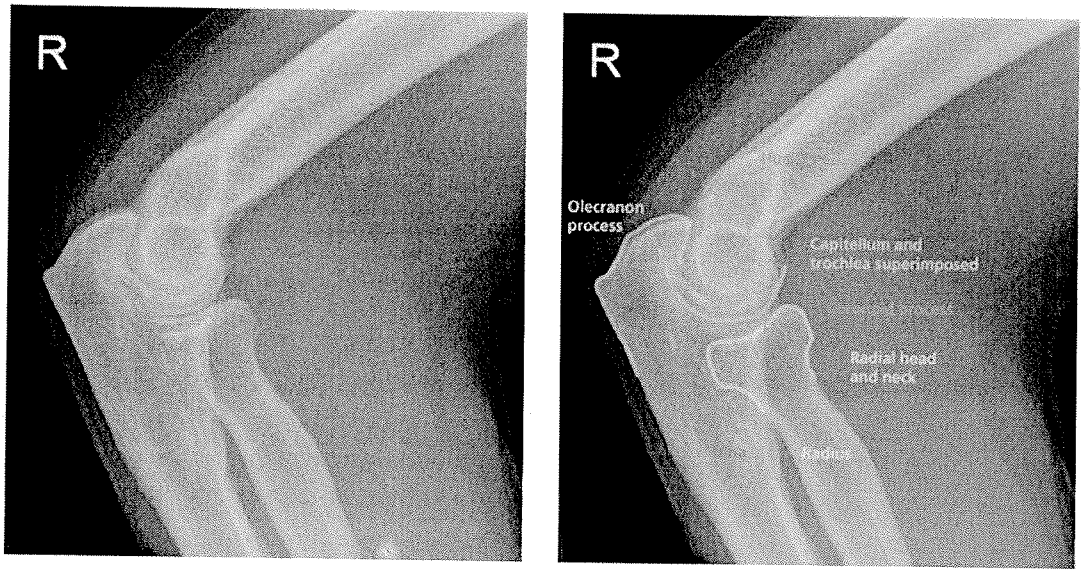



**Figure 5 Normal elbow,** lateral view.

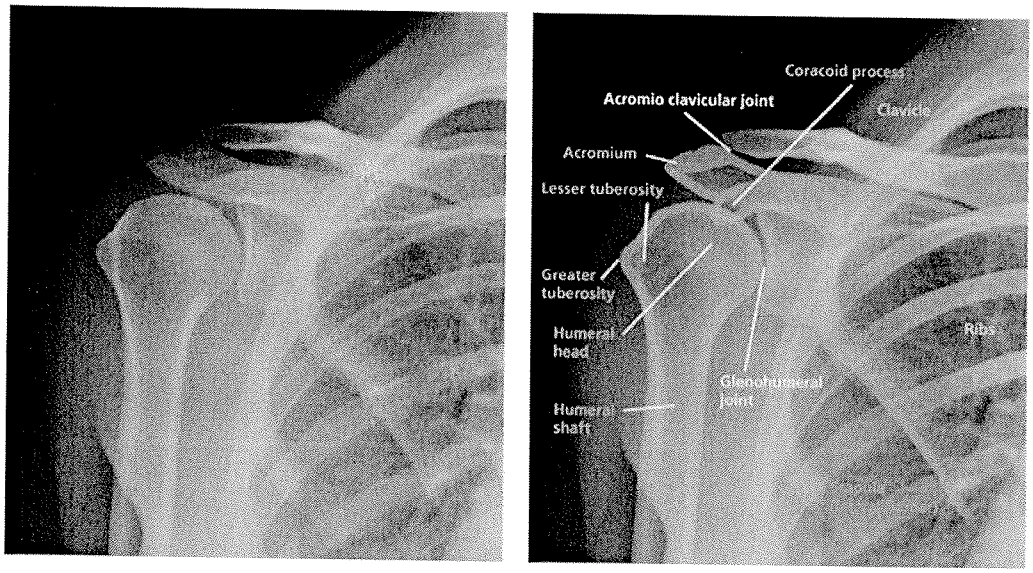



**Figure 6. Normal shoulder,** AP view.

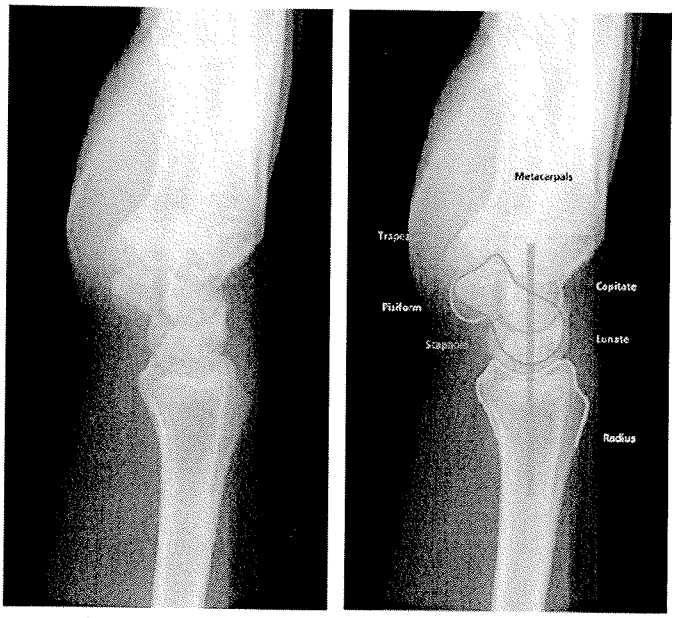



**Figure 3. Normal wrist,** lateral view

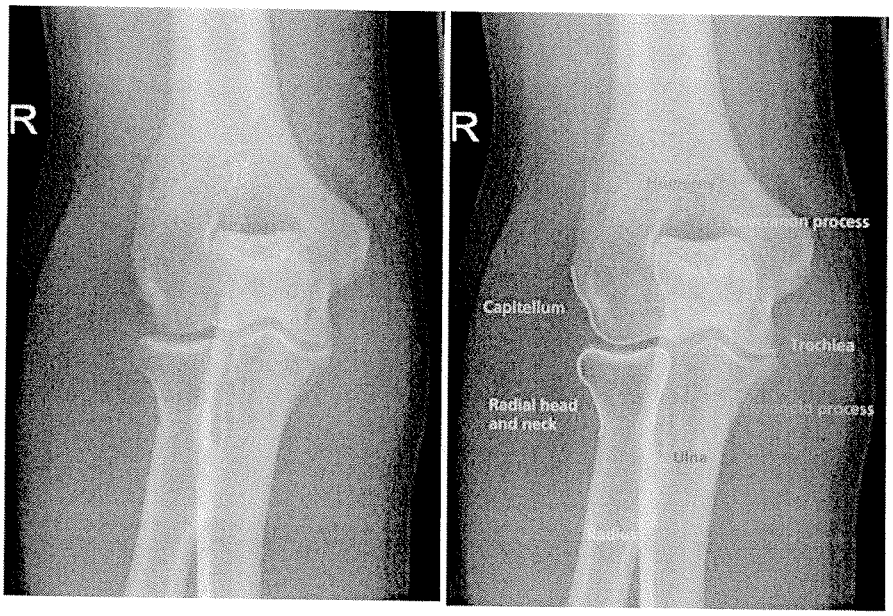



**Fig 4.Normal Elbow,** AP view

# Normal anatomy on musculoskeletal X-rays

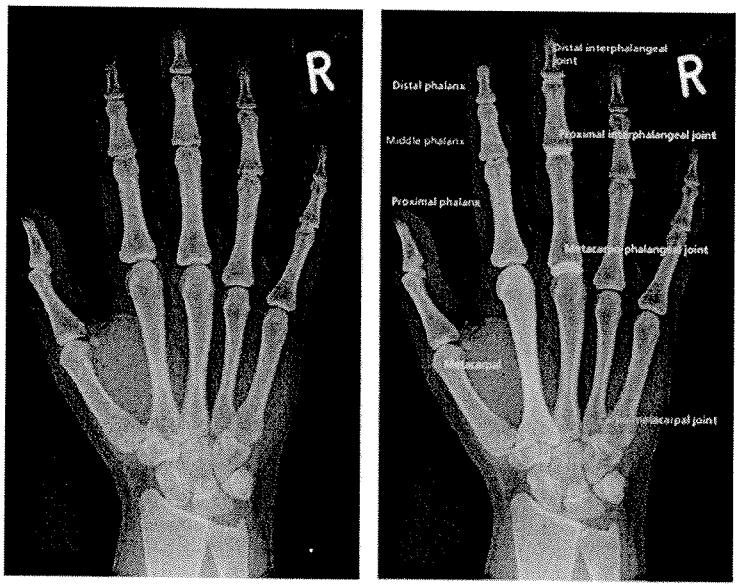



**Fig 1. Normal Hand**

Remember trapezi*um* is adjacent to the th*umb*.

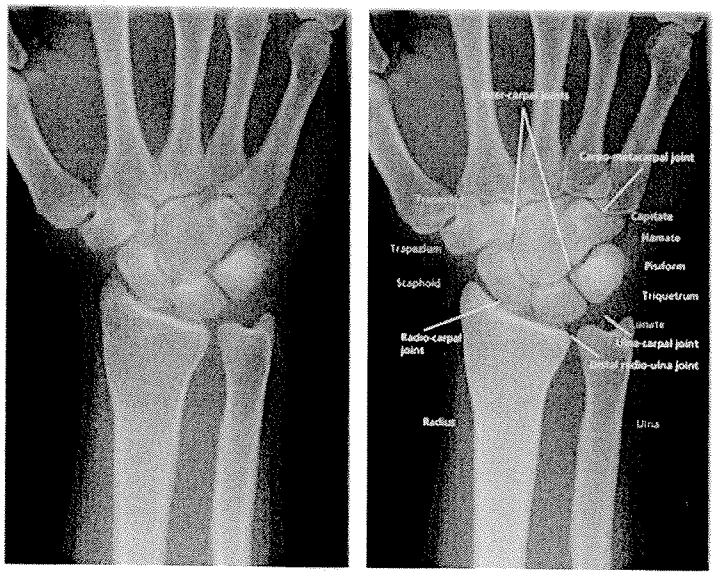



**Fig 2. Normal Wrist,** PA view

***SRI LAKSHMI NARAYANA***

***INSTITUTE OF MEDICAL SCIENCES***

***DEPARTMENT OF RADIOLOGY AND IMAGING SCIENCES***

# *INTEGRATED*

# *ANATOMY TEACHING*

## *CARDIAC ANATOMY*

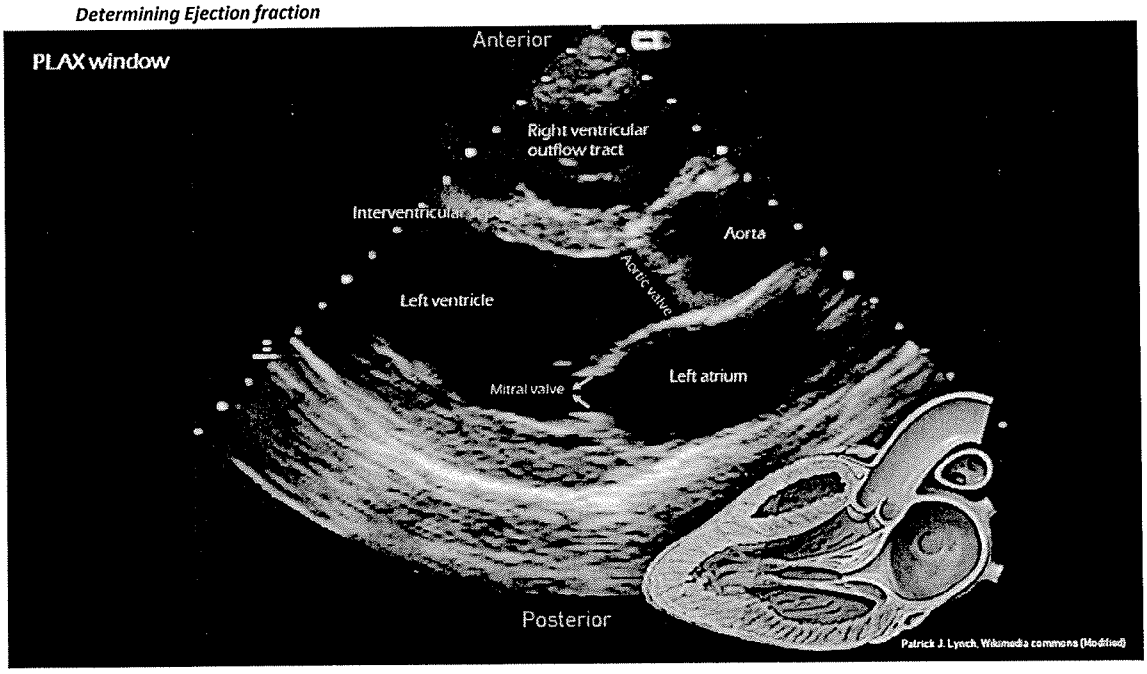
## *COURSE CONTENTS*

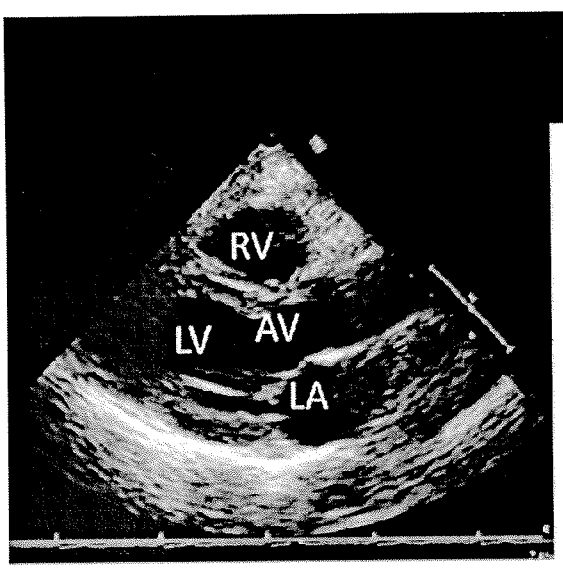
***Basic views***

***Identifying Atria and Ventricles***

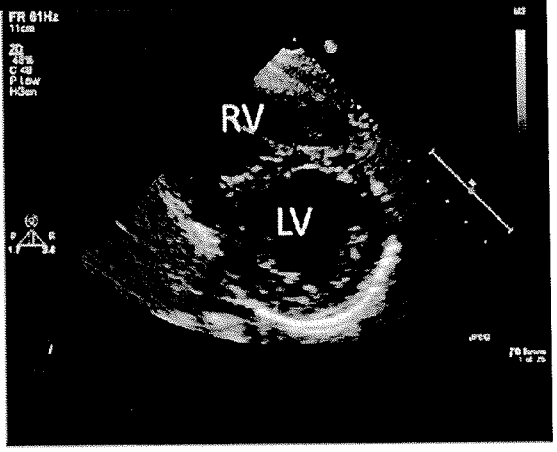
***Identifying AV valves***

***Determining Ejection fraction***



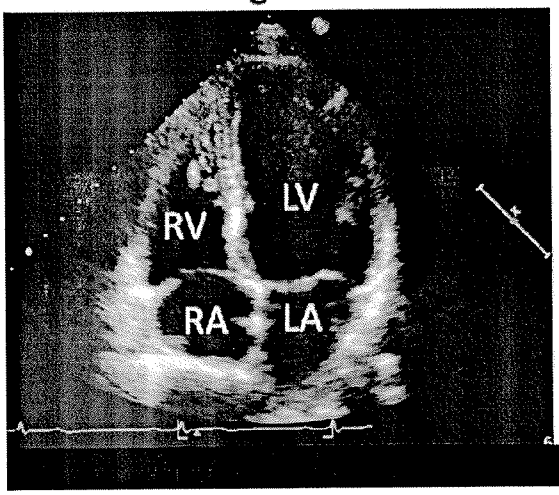



Parasternal Long Axis

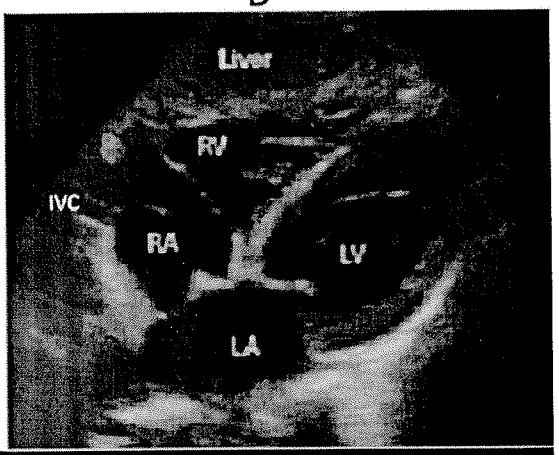


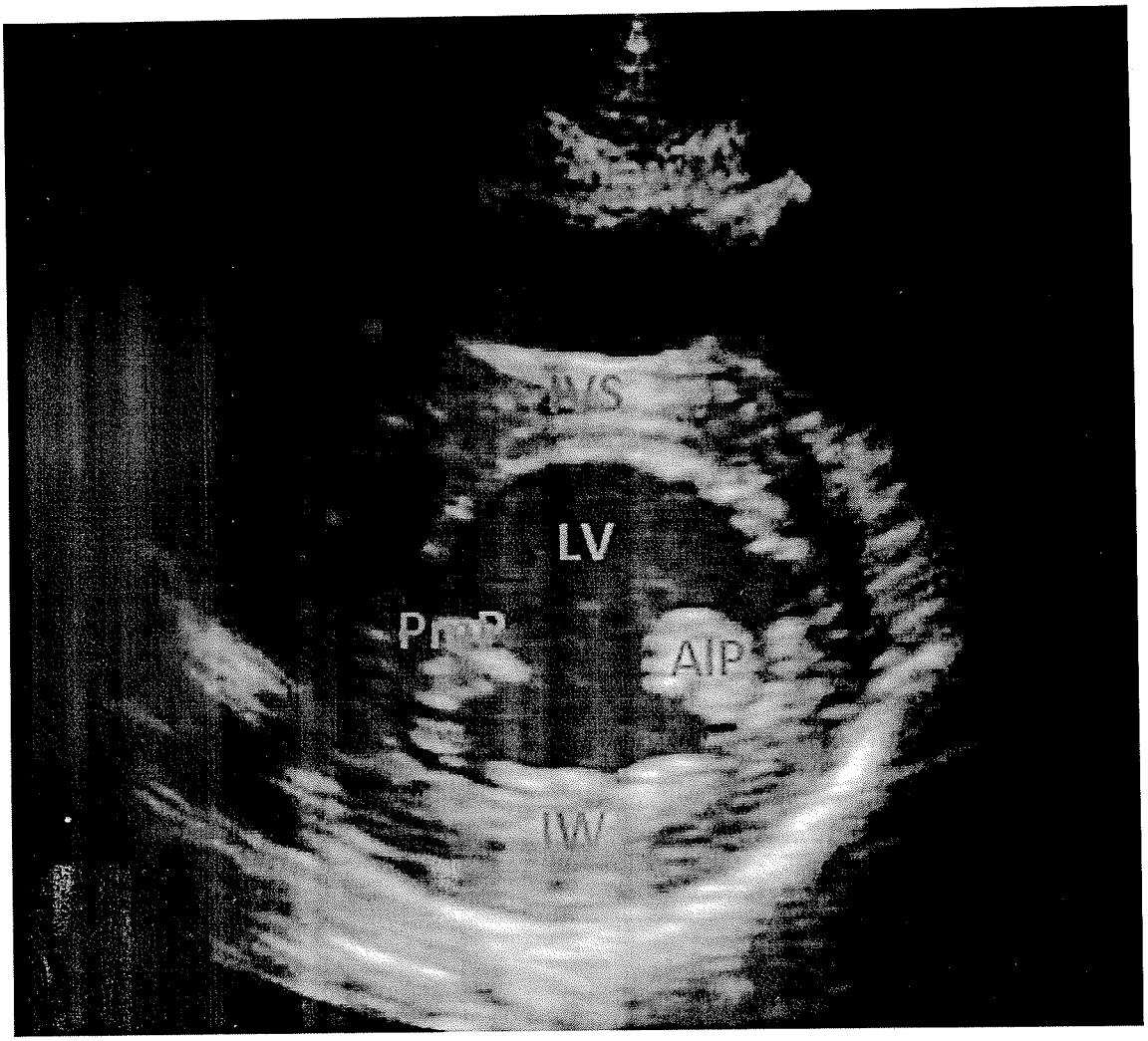

Parasternal Short Axis

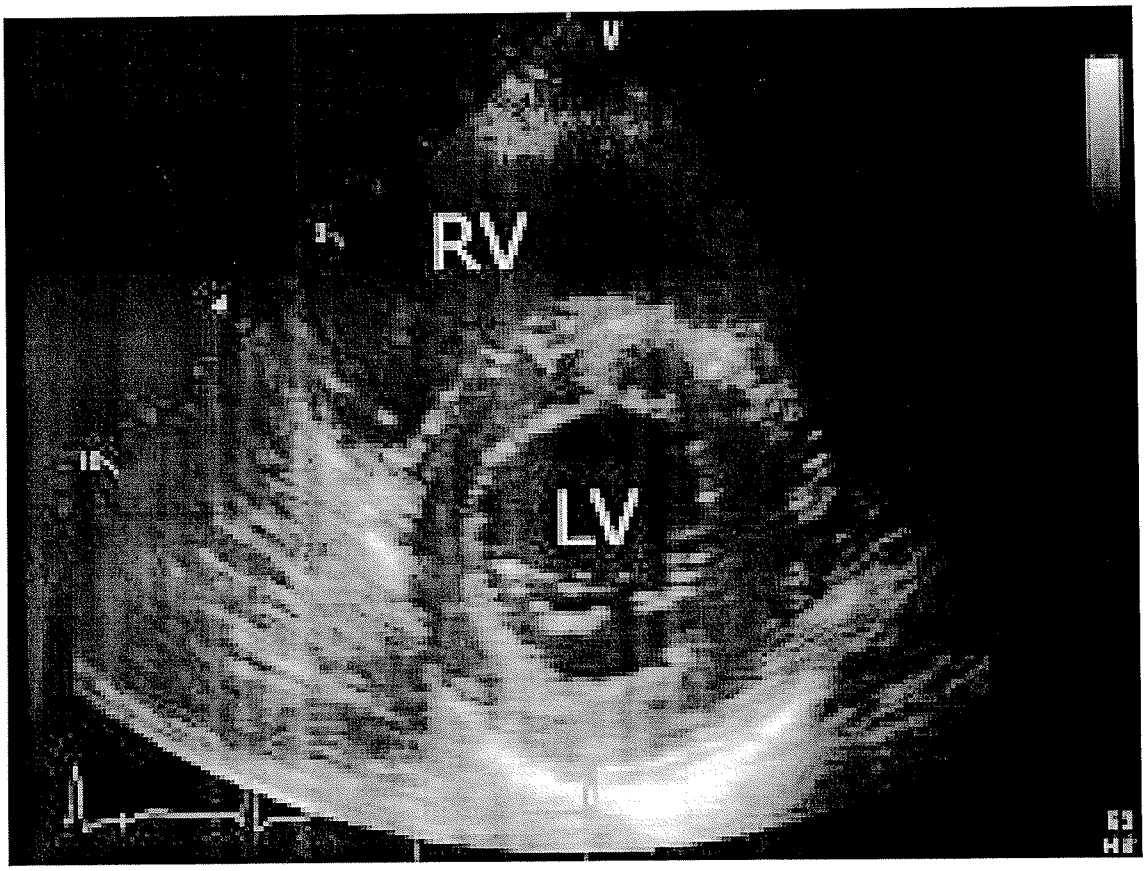
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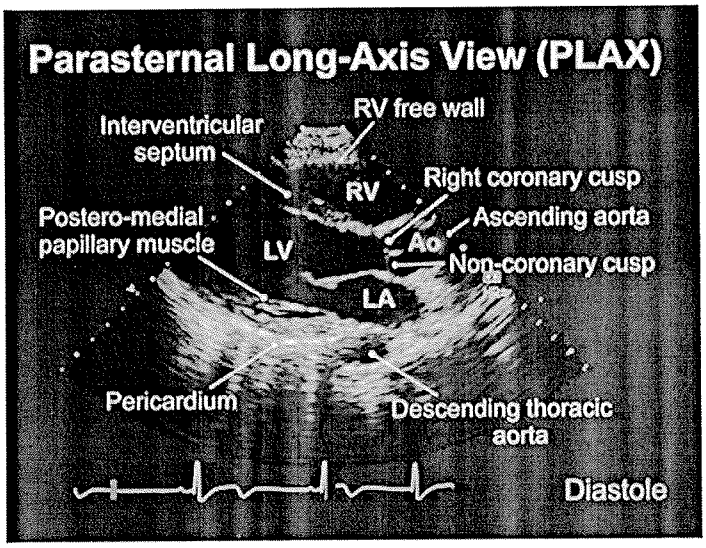



D




IVS
LV
AIP
IW




*VENUE:*

*LECTURE HALL:II*

*TIME : SAT 2 TO 4 PM.*

SLIMS,PONDICHERRY

**Date**:04/05/2015

**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 TEACHING –CARDIAC CYCLE**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled:**INTEGRATED PHYSIOLOGY TEACHING –CARDIAC CYCLE** on 04/05/2015. 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. Jayakumar

The HOD: Dr. R. Chidhambaram,

The Expert: Dr. S. Shanmuganan.

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
BIHER

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.
SLIMS

## Course Proposal

**Course Title:** INTEGRATED PHYSIOLOGY TEACHING –CARDIAC CYCLE

**Course Objective:** TO DEMONSTRATE CARDIAC CYCLE.

**Course Outcome:** BETTER UNDERSTANDING OF CARDIAC CYCLE.

**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.SRHRNIVASAN,MBBS,DNB,ASST PROFESSOR
3. DR.JYOTI BASU,MBBS,DNB,SENIOR RESIDENT

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 21-11-2015 | INTRO | 2 pm | 2 HOUR |
| 2 | 22-11-2015 | CARDIAC CYCLE | 2 pm | 2 HOUR |
| 3 | 23-11-2015 | VENTRICLES | 2 pm | 2 HOUR |
| 4 | 24-11-2015 | ATRIA | 2 pm | 2 HOUR |
| 5 | 25-11-2015 | CARDAIC VALVES | 2 pm | 2 HOUR |
| 6 | 26-11-2015 | ELECTRICAL CONDUCTION | 2 pm | 2 HOUR |
| 7 | 27-11-2015 | CARDIAC CYCLE | 2 pm | 2 HOUR |
| 8 | 28-11-2015 | SYSTOLE | 2 pm | 2 HOUR |
| 9 | 29-11-2015 | DIASTOLE | 2 pm | 2 HOUR |
| 10 | 30-11-2015 | MYOCARDIAL FUNCTION | 2 pm | 2 HOUR |
| 11 | 01-12-2015 | VALVULAR FUNCTION | 2 pm | 2 HOUR |
| 12 | 02-12-2015 | HEART SOUNDS | 2 pm | 2 HOUR |
| 13 | 03-12-2015 | CARDIAC FUNCTION | 2 pm | 2 HOUR |
| 14 | 04-12-2015 | APPLIED PHYSIOLOGY | 2 pm | 2 HOUR |
| 15 | 05-12-2015 | RECAP | 2 pm | 2 HOUR |
| | | | Total Hours | 30 |

**REFERENCE BOOKS: (Minimum 2)**

**1.GANONG**

**2.GUYTON**

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

07.05.2015

**Sub: Organising Value-added Course: INTEGRATED PHYSIOLOGY TEACHING – CARDIAC CYCLE. 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 TEACHING –CARDIAC CYCLE"**. 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 2015. 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- cardiac cycle by echocardiography**
   **RAD 02**
2. **Duration & Period**
   30 hrs & September 2015– January 2016 & February – August 2016
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 2015– January 2016 & February – August 2016
8. **Year of discontinuation: 2016**

9. **Summary report of each program year-wise**

| Value Added Course- September 2015 - August 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | **RAD 02-1** | **Integrated physiology teaching- cardiac cycle by echocardiography** | Dr. Jothibasu | II nd MBBS | 20 (Sep15 – Jan16 ) |
| 2 | **RAD 02-2** | **Integrated physiology teaching- cardiac cycle by echocardiography** | Dr. Srinivasan | II ND MBBS | 20 (Feb16- Aug16) |

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.

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**VALUE ADDED COURSE**

**TOPIC:-** Integrated Physiology teaching – Cardiac cycle by Echo.

**List of Students Enrolled:**

| IST YEAR MBBS STUDENTS | | | |
|---|---|---|---|
| Sl.NO. | NAME OF THE STUDENT | UNIVERSITY REG. NO. | signature |
| 1 | KAVITHA .M | U16MB311 | |
| 2 | KAVIYA .K | U16MB312 | |
| 3 | KEERTHANA .K | U16MB313 | |
| 4 | KEERTHI K DAS | U16MB314 | |
| 5 | KUNCHAL BALA VENKATA RAMANA RED | U16MB315 | |
| 6 | LAKSHMIPURAM VEDA SREEVIDYA | U16MB316 | |
| 7 | LOGESH BABU J.S | U16MB317 | |
| 8 | LOKESHWARAN .M | U16MB318 | |
| 9 | MADHUMITHA .R | U16MB319 | |
| 10 | MADHUMITHA .S | U16MB320 | |
| 11 | MANIMAARANE .R | U16MB321 | |
| 12 | MATHIVAANANE .R | U16MB322 | |
| 13 | MATHIVANAN .J | U16MB323 | |
| 14 | MD ALTAF KHAN | U16MB324 | |
| 15 | MEKALA CHARAN CHOWDARY | U16MB325 | |
| 16 | MERLIN.S | U16MB326 | |
| 17 | MERLINE SHEEBA .B | U16MB327 | |
| 18 | MOHAN .B | U16MB328 | |
| 19 | MOHIT BHARDWAJ | U16MB329 | |
| 20 | MONISH PALEI PATRA | U16MB330 | |
| 21 | MONISHA . S | U16MB331 | |
| 22 | MONISHA .M | U16MB332 | |
| 23 | MONISHDEVI .N | U16MB333 | |
| 24 | MOUNIKA .A | U16MB334 | |
| 25 | MOUNIKA.B | U16MB335 | |
| 26 | MUHAMMAD SHEBIN | U16MB336 | |
| 27 | MUSKAAN SHAMIM | U16MB337 | |
| 28 | MUSULURI SHYAM SINDHU | U16MB338 | |
| 29 | NAMITA YADAV | U16MB339 | |
| 30 | NAMRATA GHORAI | U16MB340 | |

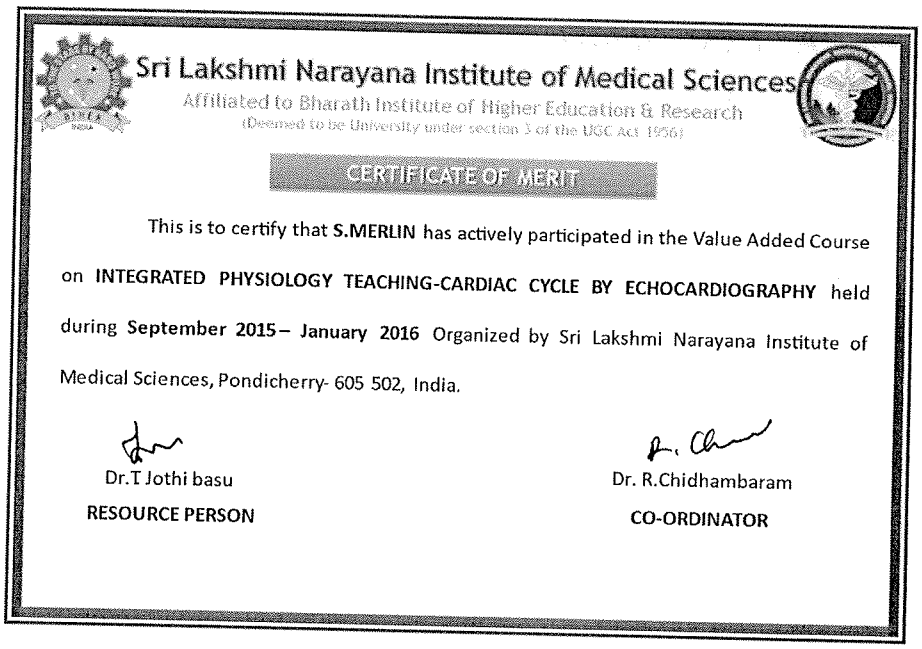
**RESOURCE PERSON**

**COORDINATOR**

**Annexure- II**

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Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

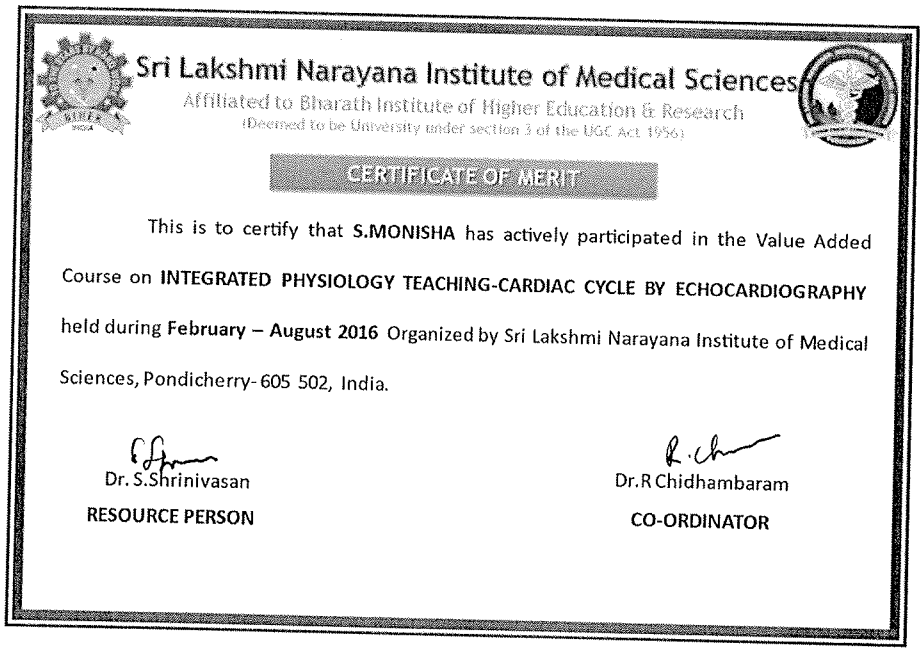
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that **S.MERLIN** has actively participated in the Value Added Course on **INTEGRATED PHYSIOLOGY TEACHING-CARDIAC CYCLE BY ECHOCARDIOGRAPHY** held during **September 2015– January 2016** Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.T Jothi basu
**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 **S.MONISHA** has actively participated in the Value Added Course on **INTEGRATED PHYSIOLOGY TEACHING-CARDIAC CYCLE BY ECHOCARDIOGRAPHY** held during **February – August 2016** Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. S.Shrinivasan
**RESOURCE PERSON**

Dr.R Chidhambaram
**CO-ORDINATOR**

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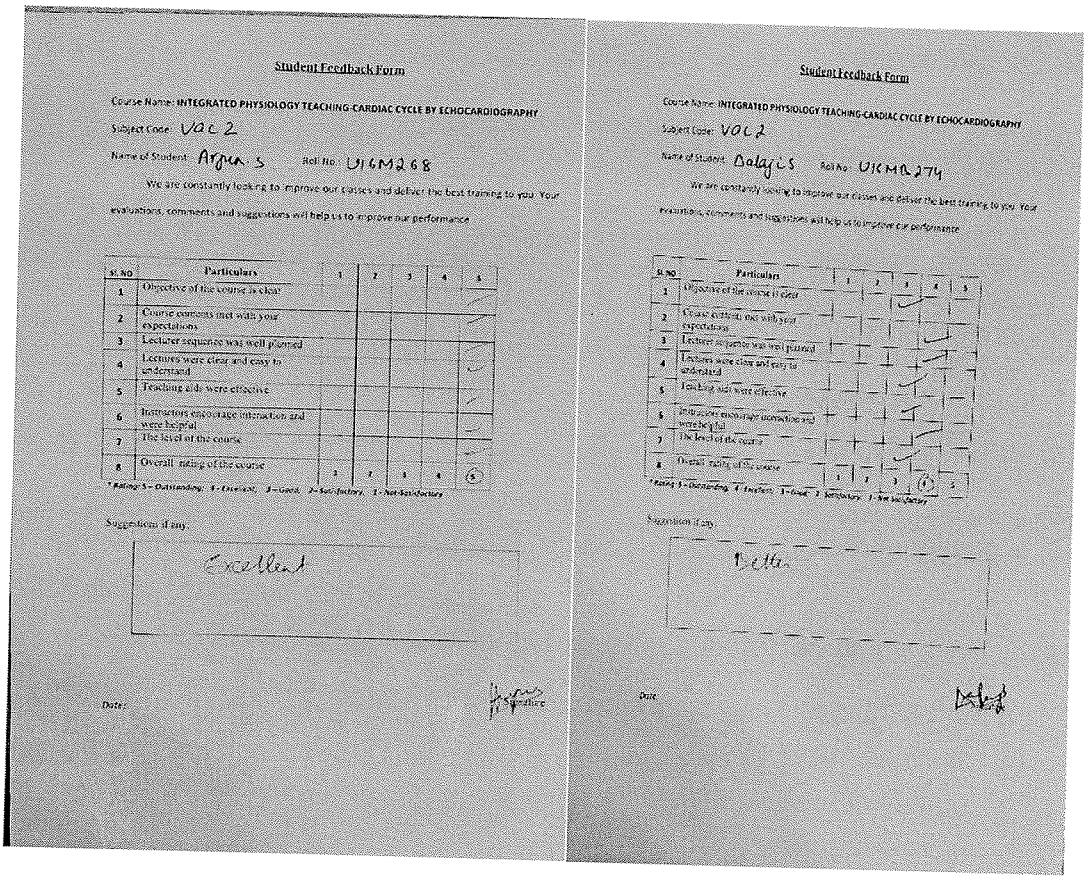
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SLIMS



Student Feedback Form

Course Name: INTEGRATED PHYSIOLOGY TEACHING-CARDIAC CYCLE BY ECHOCARDIOGRAPHY

Subject Code: VOL 2

Name of Student: Arjun S Roll No: U16M268

We are constantly looking to improve our courses 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 | | | | | ✓ |

*Rating: 5 – Outstanding, 4 – Excellent, 3 – Good, 2 – Satisfactory, 1 – Not Satisfactory

Suggestions if any:

Excellent

Date:

Student Feedback Form

Course Name: INTEGRATED PHYSIOLOGY TEACHING-CARDIAC CYCLE BY ECHOCARDIOGRAPHY

Subject Code: VOL 2

Name of Student: Balaji S Roll No: U16M274

We are constantly looking to improve our courses 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 | | | | | ✓ |

*Rating: 5 – Outstanding, 4 – Excellent, 3 – Good, 2 – Satisfactory, 1 – Not Satisfactory

Suggestions if any:

Date:

BIHER

SLIMS

COURSE NAME ECHOCARDIOGRAPHY

STUDENT NAME Sonia Sultan

ROLL NUMBER U16F4286

MCQS

1. Echocardiography is essentially _____
   a) Ultrasound of the heart
   b) sighing sound of the heart
   c) another name for a treadmill test
   d) recording of heart sounds

2. The probe used for imaging the heart is _____
   a) Linear Probe
   b) Curvilinear Probe
   c) Phase Array Probe
   d) Endo-cavitary Probe

3. Which mode is used for cardiac imaging?
   a) A – Mode
   b) B – Mode
   c) M – Mode
   d) 3D – Mode

4. Continuous Wave (CW), Pulsed Wave (PW) and Color Flow (CF) are terms used for which kind of ultrasound?
   a) 3D ultrasound
   b) Dynamic Ultrasound
   c) Doppler Ultrasound
   d) Advanced Ultrasound

5. Echocardiography can be used for even _____
   a) Remove stenosis of the heart
   b) correctly locate the blockages in the arteries and veins
   c) assess the baby's heart anatomy and function
   d) measure heartbeat

6. Which kind of echocardiography may be recommended to diagnose coronary heart disease?
   a) Thoracic Echocardiography
   b) Stress Echocardiography
   c) Trans-esophageal Echocardiography
   d) 3D Echocardiography

7. Which of the following ultrasound techniques gives the best ultrasound image of the heart?
a) 2D phased array
b) Linear phased array
c) Trans-esophageal
d) Curvilinear array

8. Which of the following is not included in the essential views of echocardiogram?
a) Left parasternal window
b) Apical window
c) Subcostal window
d) Suprasternal notch window
e) right parasternal window

9. Suprasternal window is?
a) Arch of aorta view
b) 4 chamber view
c) 2 chamber view
d) substernal view

10. Long axis parasternal views are these except?
a. left ventricle
b. zoomed mitral valve
c. right ventricular outflow
d. 4 chamber view

Date: 06.06.2016

From

Dr.R.Chidhambaram
Professor and Head,
Department of Radiology and imaging sciences,
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 TEACHING – CARDIAC CYCLE**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: : **INTEGRATED PHYSIOLOGY TEACHING –CARDIAC CYCLE** : for 20 medical students ( 2 batches) .

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.

**Encl: Certificates**

**Photographs**

DEPARTMENT OF RADIOLOGY
SRI LAKSHMINARAYANA
INSTITUTE OF MEDICAL SCIENCE
PUDUCHERRY - 605 002.

**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

**Osudu, Agaram Village, Villianur commune, Kuduppakkam Post, Pudhucherry-605 502**

Date:04.05.2015

From

Dr.K.C.Mallika Arjuna
Professor and Head,
Department of Anatomy,
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: Home Health Aide**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Home Health Aide** for first year M.B.B.S to 10 December 2015. We solicit your kind permission for the same.

Kind Regards

Dr.K.C.Malika Arjuna

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: **Dr. Rajasekar**

The HOD: **Dr.K.C.Malika Arjuna**

The Expert: **Mr.N.Anandramajayan**

The committee has discussed about the course and is approved.

Dean Subject Expert HOD

(Sign & Seal)

(Sign & Seal)

(Sign & Seal)

PROFESSOR & HOD
DEPARTMENT OF ANATOMY
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

07.06.2020

**Sub: Organising Value-added Course: Home Health Aide . 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 **"Home Health Aide"**. 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 July to Augest 2015. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

Encl: Copy of Course content

# Course Proposal

**Course Title:**

Home Health Aide

**Course Objective:**

1. Introduce the students to health care
2. To learn complex of Home Health Aide

**Course Outcome:**

Gain knowledge on Home Health Aide better understanding and easy learning

**Course Audience:** 1st year MBBS

**Course Coordinator:** Dr.Mallika Arjuna

**Course Faculties with Qualification and Designation:**

1. Dr. B Rajesh, M.Sc., Ph.D, Professor/Anatomy
2. Mr.N.Ananramajayan, M.Sc, Assistant Professor/Anatomy

**Course Curriculum/subtopics with schedule (30 hours)**

| Sl.No | Date | Topic | Time | Hours | Faculty Name |
|---|---|---|---|---|---|
| SlNo | Date | Topic | Time | Hours | |
| 1. | 15.12.15 | Basic human anatomy & physiology | 1-5p.m | 4 | Dr. B Rajesh |
| 2. | 16.12.15 | Understanding a patient's needs | 4-5p.m | 1 | Mr.N.Anandaramajayan |
| 3. | 17.12.15 | Caring for the visually impaired | 4-5p.m | 1 | Dr. B Rajesh |
| 4. | 19.12.15 | Daily care of a patient | 4-5p.m | 1 | Dr. B Rajesh |
| 5. | 20.12.15 | Feeding a patient | 4-5p.m | 2 | Mr.N.Anandaramajayan |
| 6. | 21.12.15 | Basic nursing skills | 4-5p.m | 1 | Dr. B Rajesh |
| 7. | 22.12.15 | Understanding body mechanics | 4-5p.m | 1 | Dr. B Rajesh |
| 8. | 27.12.15 | Fall prevention care and restraints | 4-6p.m | 2 | Mr.N.Anandaramajayan |
| 9. | 28.12.15 | Communication with patients and their careers | 4-6p.m | 2 | Dr. B Rajesh |
| 10. | 29.12.15 | General health & hygiene | 4-6p.m | 2 | Mr.N.Anandaramajayan |
| 11. | 30.12.15 | Special skin care for pressure sores | 4-6p.m | 2 | Dr. B Rajesh |
| 12. | 2.01.16 | Role of a patient care assistant | 4-6p.m | 2 | Mr.N.Anandaramajayan |
| 13. | 3.01.16 | Bathing a patient | 4-5p.m | 1 | Dr. B Rajesh |
| 14. | 4.01.16 | Administering drugs as per prescriptions | 4-5p.m | 1 | Mr.N.Anandaramajayan |
| 15. | 5.01.16 | Disposal of medical waste | 4-5p.m | 1 | Mr.N.Anandaramajayan |

| | | | | | |
|---|---|---|---|---|---|
| 16. | 6.01.16 | Patient handling, lifting, and moving patients | 4-6p.m | 2 | Dr. B Rajesh |
| 17. | 7.01.16 | Emergency first aid | 4-6p.m | 2 | Mr.N.Anandaramajayaan |
| | | | Total Hours | 30 | |

**REFERENCE BOOKS/ARTICLES:**


1. Home Health Aide Training Manual and Handbook- Emmanuel C. Anene

2. Handbook of Home Health Care Administration- Marilyn D. Harris

# VALUE ADDED COURSE

**1. Name of the programme & Code**

**Home Health Aide and AN HA01**

**2. Duration & Period**

(30 hrs) from December 2015– Ist week to January 2016

**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's - *Enclosed as Annexure- III*

**6. Certificate model**

*Enclosed as Annexure- IV*

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

Once – December 2015 – 1st week to January 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- December 2015 – January 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | AN HA 01 | **Home Health Aide and AN HA01** | **Dr.RAJESH.B**<br>**Mr.N.Anandaramajayan** | 1st MBBS | 20 (December 2015 1 week - January 2016) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

**COORDINATOR**

# HOME CARE AIDE

BIHER

SLIMS

# Home care aide

## Introduction:

Home care includes any professional support services that allow a person to live safely in their home. In-home care services can help someone who is aging and needs assistance to live independently; is managing chronic health issues; is recovering from a medical setback; or has special needs or a disability. Professional caregivers such as nurses, aides, and therapists provide short-term or long-term care in the home, depending on a person's needs.

## The care you need in the place you love

Home care can be the key to achieving the highest quality of life possible. It can enable safety, security, and increased independence; it can ease management of an ongoing medical condition; it can help avoid unnecessary hospitalization; it can aid with recovery after an illness, injury, or hospital stay—all through care given in the comfort and familiarity of home. Home care can include:

Help with daily activities such as dressing and bathing

Assistance with safely managing tasks around the house

Companionship

## Therapy and rehabilitative services

Short- or long-term nursing care for an illness, disease, or disability—including tracheostomy and ventilator care

## Types of home care

Not all home care providers offer all the different types of home care services. This short guide will provide an overview of the different types of home care. Care is customized to your individual needs and may include services from one or more of the types described. Contacting a provider to discuss your needs can help determine what care is best for you.

While the multiple types of home care may serve different needs, they share a common goal: to enable happier, more independent living for the people receiving care, and to provide support and peace of mind for their families.

Types of home care

### PERSONAL CARE AND COMPANIONSHIP

BIHER

SLIMS

→ Help with everyday activities like bathing and dressing, meal preparation, and household tasks to enable independence and safety

Also known as Non-medical care, home health aide services, senior care, homemaker care, assistive care, or companion care

**PRIVATE DUTY**

**NURSING CARE**

→ Long-term, hourly nursing care at home for adults with a chronic illness, injury, or disability

Also known as Home-based skilled nursing, long-term nursing care, catastrophic care, tracheostomy care, ventilator care, nursing care, shift nursing, hourly nursing, or adult nursing

**HOME**

**HEALTH CARE**

→ Short-term, physician-directed care designed to help a patient prevent or recover from an illness, injury, or hospital stay

Also known as Medicare-certified home health care, intermittent skilled care, or visiting nurse services

**EXAMPLES OF CARE SERVICES**

**Personal Care and Companionship services may include:**

- Assistance with self-care, such as grooming, bathing, dressing, and using the toilet
- Enabling safety at home by assisting with ambulation, transfer (eg, from bed to wheelchair, wheelchair to toilet), and fall prevention
- Assistance with meal planning and preparation, light housekeeping, laundry, errands, medication reminders, and escorting to appointments
- Companionship and engaging in hobbies and activities
- Supervision for someone with dementia or Alzheimer's disease

**Private Duty Nursing Care services may include:**

- Care for diseases and conditions such as Traumatic brain injury (TBI), Spinal cord injury (SCI), ALS, MS
- Ventilator care

- Tracheostomy care
- Monitoring vital signs
- Administering medications
- Ostomy/gastrostomy care

Feeding tube care

Catheter care

Home Health Care services may include:

Short-term nursing services

Physical therapy

Occupational therapy

Speech language pathology

Medical social work

Home health aide services

## HOW IS IT PAID?

Personal care and companionship services are usually paid directly by the person receiving care (private pay), or through long-term care insurance or Medicaid. Other funding sources may be:

## Private pay

Long-term care insurance

Health insurance

Veterans benefits

Workers' compensation

Private duty nursing care can be paid through a variety of sources, including:

Private pay

Health insurance

Veterans benefits

Workers' compensation

Medicaid (with qualifications)

Direct payment by person receiving care (private pay)

When specific qualifications are met (generally, when services are ordered by a physician and a clinical assessment deems them necessary), Home Health services are typically paid for

## LIST OF PARTICIPANTS

| Sl. No. | Registration Number | Name of the Student |
|---|---|---|
| 1 | U15MB251 | AARTHI .H |
| 2 | U15MB252 | ABARNA. M |
| 3 | U15MB253 | ABINAYA.J |
| 4 | U15MB254 | ADARSH .S |
| 5 | U15MB255 | AGILAN .A |
| 6 | U15MB256 | AKSHAYA .S |
| 7 | U15MB257 | AKSSHAYA .M.R |
| 8 | U15MB258 | AMARNATH. S |
| 9 | U15MB259 | AMUDHESAR .K.M |
| 10 | U15MB260 | ANANDH.S |
| 11 | U15MB261 | ARCHITH VIGNESH .B |
| 12 | U15MB262 | ARJUNBALAJI .A |
| 13 | U15MB263 | ARUL NIVETHINI V.A |
| 14 | U15MB264 | ARUL PRINCE. E |
| 15 | U15MB265 | ARUNKUMAR .S |
| 16 | U15MB266 | ARUN PRASAD. K |
| 17 | U15MB267 | ARUNA .S |
| 18 | U15MB268 | ASAN THASTHAGIR. M |
| 19 | U15MB269 | ASWIN. B |
| 20 | U15MB270 | BALAMANI KANDAN. S |

Annexure II

# VALUE ADDED COURSE

## Home Health Aide and AN HA01

List of students Enrolled – December 2015 to January 2016

| Sl. No. | Registration Number | Name of the Student | Signature |
|---|---|---|---|
| 1 | U15MB251 | AARTHI .H | |
| 2 | U15MB252 | ABARNA. M | |
| 3 | U15MB253 | ABINAYA.J | |
| 4 | U15MB254 | ADARSH .S | |
| 5 | U15MB255 | AGILAN .A | |
| 6 | U15MB256 | AKSHAYA .S | |
| 7 | U15MB257 | AKSSHAYA .M.R | |
| 8 | U15MB258 | AMARNATH. S | |
| 9 | U15MB259 | AMUDHESAR .K.M | |
| 10 | U15MB260 | ANANDH.S | |
| 11 | U15MB261 | ARCHITH VIGNESH .B | |
| 12 | U15MB262 | ARJUNBALAJI .A | |
| 13 | U15MB263 | ARUL NIVETHINI V.A | |
| 14 | U15MB264 | ARUL PRINCE. E | |
| 15 | U15MB265 | ARUNKUMAR .S | |
| 16 | U15MB266 | ARUN PRASAD. K | |
| 17 | U15MB267 | ARUNA .S | |
| 18 | U15MB268 | ASAN THASTHAGIR. M | |
| 19 | U15MB269 | ASWIN. B | |
| 20 | U15MB270 | BALAMANI KANDAN. S | |

**RESOURCE PERSONS** **COORDINATOR**

1.

2.

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - IV**

Home Health Aide and AN HA01

**SHORT ANSWER QUESTIONS**

**Course Code: AN HA01**

**I. ANSWER ALL THE QUESTIONS :** (10X2=20 marks)

1. What does in home health care do?
2. Who can qualify for home health care?
3. How do I arrange my home health care?
4. How Much Does Medicare pay for home health care per hour?
5. What do home care workers get paid?
6. What is the difference between a caregiver and a home health aide?
7. What are the four major services in healthcare?
8. What kind of home care does Medicare pay for?
9. What is considered a skilled need for home health?
10. What does home care entail?

# Home Health Aide

ANANDH.S
U15MB260

1. Wide Range of Servce need for long. dn. nursing home care. it also includ occupational physical therapy

2 2. Under care of doctor plan of care created

2 Revin Regular by doctor

2 3. By docta or caregiver

2 4 Rs 5000 - 10000

2 5. Rs 450 /day

6. Care give a Typically family member

| Hom health aid u some one for outside

2 7 Medica doe not pay to home health care

15/20

# Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Sri Lakshmi Narayana Institute of Higher Education & Research

## CERTIFICATE OF MERIT

This is to certify that ARCHITH VIGNESH .B has actively participated in the Value Added Course on **Home Health Aid** held during December 2015 to January 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

COORDINATOR

# Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
Deemed to be University u/s 3 of the UGC Act 1956

## CERTIFICATE OF MERIT

This is to certify that AGILAN.A has actively participated in the Value Added Course on **Home Health Aid** held during December 2015 to January 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

COORDINATOR

**Annexure 5**

## Student Feedback Form

**Course Name: Home Health Aide**

**Subject Code: AN HA01**

**Name of Student:** ARJUN BALAJI **Roll No.:** VISMB262

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

Signature of Student

Date: 7/1/16

**Annexure 5**

## Student Feedback Form

**Course Name: Home Health Aide**

**Subject Code: AN HA01**

**Name of Student:** BALAMANI KANDPAL **Roll No.:** V15MB270

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

Bala

Signature of Student

Date: 7/1/16

Date: 31-01-2016

From

Dr.K.C.Mallika Arjuna
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.

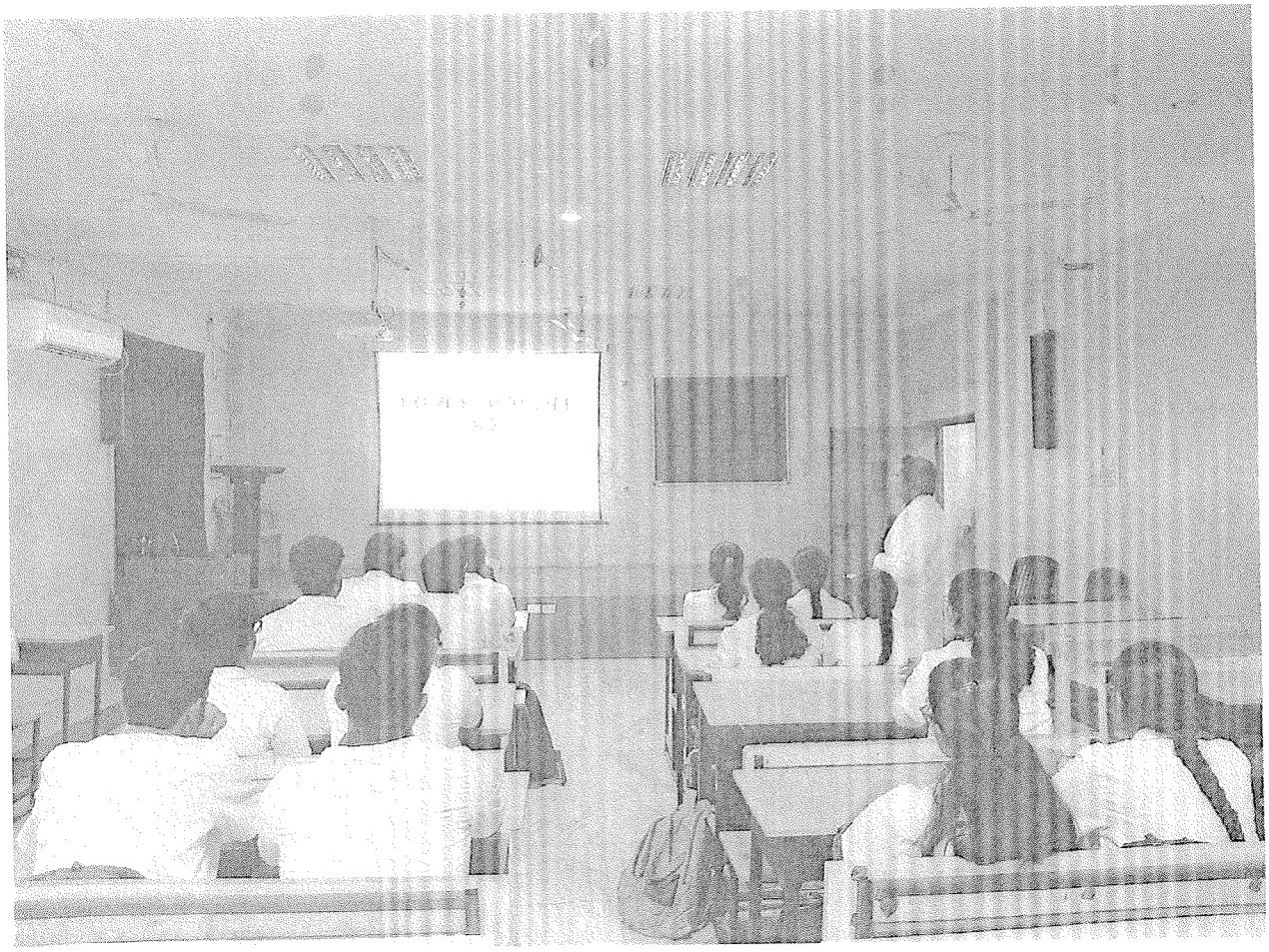
**Sub: Completion of value-added course: Home Health Aide and AN HA01– Reg.**

Dear Sir,

With reference to the subject mentioned above, the Department of Anatomy has conducted the value-added course on **Home Health Aide and AN HA01** during December 2015 to January 2016 for 1st year MBBS Students (2015-2016 Batch). We solicit your kind action to send certificates for the participants whose list is attached with this letter.

Kind Regards,

**Encl:** Participants List



# Sri Lakshmi Narayana Institute of Medical Sciences

Date: 04.05.2015

From
Dr Raji Sharma
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: Clinical nutrition**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Clinical nutrition** for undergraduates from Jan -Jun 2016. We solicit your kind permission for the same.

Kind Regards

Dr. RAJI SHARMA

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr RAJASEKAR

The HOD: Dr. RAJI SHARMA

The Expert: Dr K SELVARAJU

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

05.06.2015

**Sub: Organising Value-added Courses: Clinical Nutrition - 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 **"_CLINICAL NUTRITION"** course in Jan –June 2016. 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 15/06/2015. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

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

Encl: Copy of Course content

# COURSE PROPOSAL

**Course Title**: **Clinical Nutrition**

**Course Objective:**

1.To enable the students to learn about nutritional needs and various disorders arising out of unmet nutritional needs and to know how to identify and treat them clinically.

2. To learn about nutritional requirements pertaining to special clinical situations

**Course Outcome:**

On successful completion of the course the students will have skill in assessing nutritional requirements of patients and managing malnutrition.

**Course Audience: II year MBBS students**

**Course Coordinator:** Dr **RAJI SHARMA**

**Course Faculties with Qualification and Designation:**

1. Dr SELVARAJU –ASSOCIATE
2. Dr.JALAKANDAN-ASSOCIATE

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

| S.No | Date | TOPIC | Time | Hours | Faculty |
|---|---|---|---|---|---|
| 1 | 02.01.2016 | principles of healthy nutrition | 2-4PM | 2 | Dr Selvaraju |
| 2 | 09.01.2016 | Nutritional assessment | 2-4PM | 2 | Dr. Jalakandan |
| 3 | 23.01.2016 | malnutrition | 2-4PM | 2 | Dr Selvaraju |
| 4 | 30.01.2016 | Weight management and eating disorders | 2-4PM | 2 | Dr. Jalakandan |
| 5 | 06.02.2016 | Nutrition and anaemia | 2-4PM | 2 | Dr Selvaraju |
| 6 | 13.02.2016 | Enteral nutrition | 2-4PM | 2 | Dr. Jalakandan |
| 7 | 20.02.2016 | Parenteral nutrition | 2-4PM | 2 | Dr Selvaraju |
| 8 | 27.02.2016 | Group discussion | 2-4PM | 2 | Dr. Jalakandan |
| 9 | 05.03.2016 | Workshop on nutrition practices | 2-4PM | 2 | Dr Selvaraju |
| 10 | 12.03.2016 | Metabolic stress | 2-4PM | 2 | Dr. Jalakandan |
| 11 | 19.03.2016 | Life expectancy | 2-4PM | 2 | Dr Selvaraju |
| 12 | 26.03.2016 | Nutrition in various disorders | 2-4PM | 2 | Dr. Jalakandan |
| 13 | 02.04.2016 | HIV/ AIDS | 2-4PM | 2 | Dr Selvaraju |
| 14 | 09.04.2016 | Nutrition in mental disorders | 2-4PM | 2 | Dr. Jalakandan |
| 15 | 16.04.2016 | Final assessment | 2-4PM | 2 | Dr Selvaraju |

**REFERENCES:**

1) Understanding Normal and Clinical Nutrition, 8thEdition

2) Nutrition and Diagnosis –Related Care (Nutrition and Diagnosis –Related Care(Escott-Stump))

3) Manual of Clinical Nutrition Management

# VALUE ADDED COURSE

**1. Name of the program & Code**

CLINICAL NUTRITION, ANAES 02

**2. Duration & Period**

30 hrs: January 2016- June 2016

**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 2016-JUNE 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- January 2016- June 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | ANAES 02 | CLINICAL NUTRITION | DR. SELVARAJU K | II MBBS | 20 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

**Dr K SELVARAJU**

**COORDINATOR**

**Dr RAJI SHARMA**

Professor & Head, Dept. of Physiology,
Sri Lakshmi Narayana Institute of Medical Sciences
Oulgaret, Kudapakkam, Puducherry - 605 502.

**Annexure I**

# CLINICAL NUTRITION

## TOPICS

1. Principles of Healthy Nutrition
2. Nutritional Assessment
3. Malnutrition
4. Weight Management and Eating Disorders
5. Nutrition and Anemia's
6. Enteral Nutrition
7. Parenteral Nutrition
8. Metabolic stress
9. life expectancy
10. HIV/AIDS
11. Nutrition in mental disorder

## Principles of Healthy Nutrition

Energy balance is the difference between energy intake, which can be metabolized, and total energy expenditure. It could be said that the human body's energy state is balanced when its energy expenditure is equal to its energy intake.
Thehumanbodyrequiresenergytoperformitsmanyfunctions, tofacilitate muscle activity and developmental demands and to correct problems that may have been caused by disease or injury. Energy needs are met by the energy obtained from the body's diet, which derives from foods either of plant or of animal origin. Food energy is released in the body through the oxidation of carbohydrates, fats, proteins (which are called macronutrients) and alcohol. If energy intake and expenditure are not equal, the result will be either a positive energy balance, in which body energy stores (and mainly fat) are increased, or a negative energy balance, in which the body falls back on using its energy stores (fat, protein and glycogen). Consequently, the body's energy balance (along with other factors) determines to a large extent its weight and general health status.

According to the definition given by the World Health Organization (WHO), energy requirement is 'the level of energy intake that will balance energy expenditure when we have a body size and composition, and a level of physical activity consistent with long-term good Resting metabolic rate (RMR), energy expenditure under resting conditions, tends to be somewhat higher (10–20%) than under basal conditions owing to increases in energy expenditure caused by recent food intake (i.e. by the thermic effect of food) or by the delayed effect of recently completed physical activity. Thus, it is important to distinguish between BMR and RMR and between BEE and resting energy expenditure (REE) (RMR extrapolated to 24 hours). BMR is measured under a specific set of circumstances: the subject must be awake, lying comfortably in a supine position, in a state forest, inawarmroom,atleast12hoursafterlastfoodingestion. Sincethese strictconditionsarehardtoachieveinhospitalsettings,energy requirements are usually expressed as RMR. Basal, resting and sleeping energy expenditures are related to body size, being most closely correlated with the size of the fat-free mass (FFM), which is the weight of the body less the weight of its fat mass. The size of the FFM generally explains about 70–80% of the variance in RMR. However, RMR is also affected by age, gender, nutritional state, inherited variations and by differences in the endocrine state, notably (but rarely) by hypo- or hyperthyroidism.

Theothertwocomponentsofenergyexpenditureare

(1)theenergy spenton dailyactivitiesandphysicalexercise and

(2) the energy spent in response to a variety of thermogenic stimuli (thermogenesis), which include the food we consume, certain drugs, low temperatures, muscle tension, stress and similar psychological states.

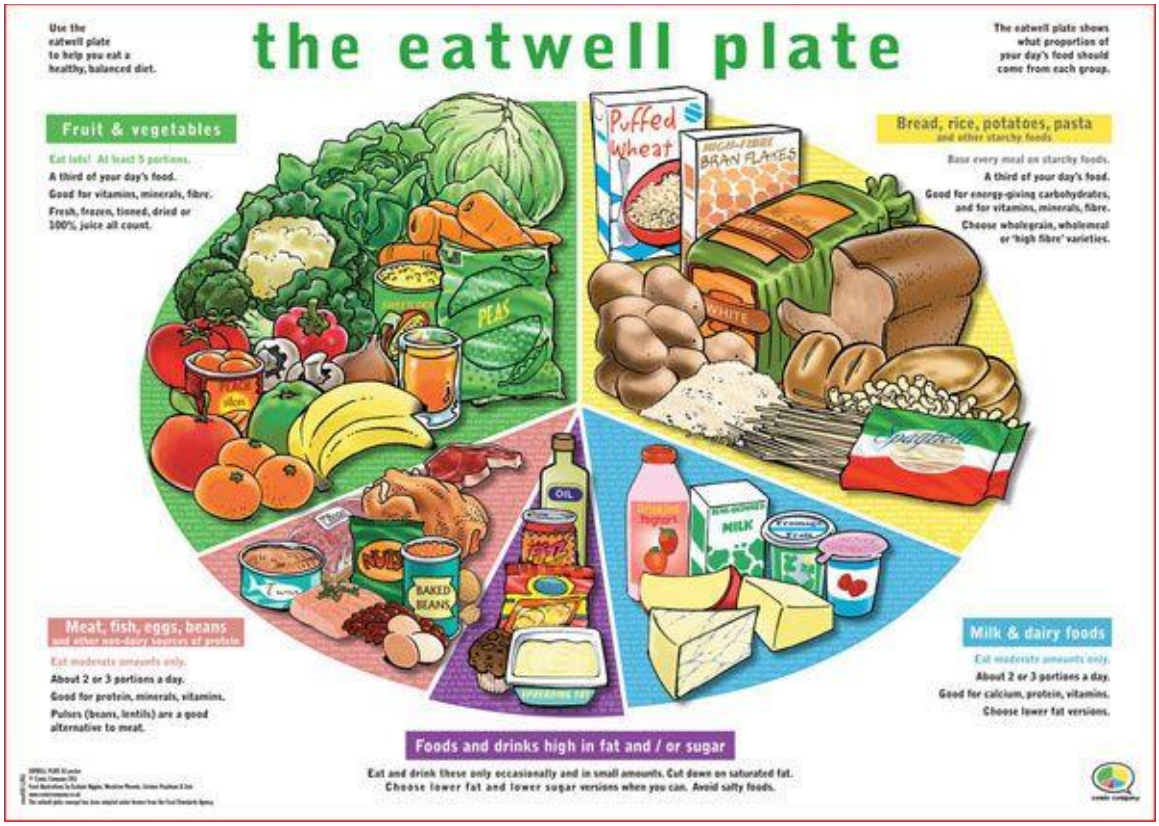
It has long been known that food consumption elicits an increase in energy expenditure, a phenomenon known as the 'thermic effect of food' (TEF). The intensity and duration of meal-induced TEF is determined primarily bythe amount and composition of the food consumed, mainly owing to the metaboliccostsincurredinhandlingandstoringingestednutrients.Activation of the sympathetic nervous system, elicited by dietary carbohydrate and by sensory stimulation, causes an additional, but modest, increase in energy expenditure. The increments in energy expenditure during digestion above baseline rates, divided by the energy content of the food consumed, vary from 5 to 10% for carbohydrate, 0 to 5% for fat, and 20 to 30% for protein. The high TEF for protein reflects the relatively high metabolic cost involved in processing the amino acids yielded by the absorption of dietary protein, for protein synthesis or for the synthesis of urea and glucose. In general, consumption of the usual mixture of nutrients is generally considered to elicit increases in energy expenditure equivalent to 10% of the food's energy content.

Thefirstunitofenergyemployedinnutrition was the calorie [the amount of energy needed to raise the temperature of 1 gram (g) of water from 14.5 to 15.5◦C]. Carbohydrates, the most prevalent organic molecules, are a valuable source of energy in the human diet. It is estimated that in Western countries more than 40% of the energy intake in an average diet comes from carbohydrates. As their name denotes, they are synthesised from carbon dioxide and water during plant photosynthesis. Dietary carbohydrates may be classified by molecular size into

(1) sugars, which can be further subdivided into monosaccharides and disaccharides,

(2) oligosaccharides, which can be further subdivided into maltooligosaccharides and other oligosaccharides, and

(3) polysaccharides, which can be further subdivided into starch and non-starch polysaccharides. The commonest monosaccharaides are glucose and fructose, which occur in fruit and vegetables. The best-known disaccharides (consisting of two sugarunits) are lactose (which is found in milk), sucrose (common sugar) and maltose. Oligosaccharides, containing 3–10 sugar units, are often breakdown productsofpolysaccharides,whichcontainmorethan10sugar units.Polysaccharides differ from sugars in that they are non-sweet and less soluble in water. Examples of polysaccharides include starch and glycogen, which are the storage forms of carbohydrates in plants and animals, respectively. Finally, sugar alcohols, such as sorbitol and mannitol, are alcohol forms of glucose and fructose, respectively.




According to an older broad categorisation, carbohydrates may also be classedas

(1)simplecarbohydrates(knownassimplesugars),whicharechemically made up of one or two sugar units and are digested quickly, and

(2) complex carbohydrates (or starches), which are made of three or more linked sugar units and take longer to absorb. The latter lead to a slower and more stable release of glucose in the blood and are considered healthier.

In the 1920s, according to another categorisation, carbohydrates were divided into

(1) available ones (digested and absorbed in the small intestine and providing carbohydrates for metabolism) and

(2) unavailable ones (carbohydrates passing to the large intestine and offering substrate for intestinal microflora).Thelatterwerelaterlargelyreplacedwiththeterm‘dietaryfibre’, although the two terms are not entirely synonymous.

Moreover, they help in vitamin and mineral absorption. Another well-known function of carbohydrates is to impart sweetness to our food. In addition to that, starch, structural polysaccharides and many oligosaccharides have various other roles. For instance, polydextrose adds texture to certain food items. Thanks to their versatility, carbohydrates are widely used in the food industry, for example as thickeners, stabilisers, emulsifiers, crystallisation inhibitors, gelling agents, etc.

The minimum intake of dietary carbohydrate which is compatible with life can be extremely low, provided that there is an adequate intake of protein and fat amounts, in order to promote de novo synthesis of glucose through the hydrolysis of endogenous or dietary protein or glycerol derived from fat. Generally, it is accepted that the minimum carbohydrate amount we need ona daily basis is 100g [380kcal (1590kJ)]. If this minimum requirement is not covered, the result will be the extensive breakdown of body protein, as well as significant salt and water loss. A diet low in carbohydrates may also lead to bone mineral loss, hypercholesterolaemia, and mainly in ketogenesis and ketone-body production in themitochondriaoflivercells.Ketogenesisisthenaturalresponseofthebody to a low-carbohydrate diet, owing to the exhaustion of cellular carbohydrate stores, such as glycogen and energy production through fatty acids. For this reason, professional associations such as the British and the American Dietetic Association do not recommend low-carbohydrate diets, which usually are especially high in fat and protein. Low-carbohydrate diets restrict caloric intake by reducing the consumption of carbohydrates to 20–60g per day (typically less than 20% of the recommended daily caloric intake). The maximum daily amount of glucose tolerated by an average person is about 400g. Excessive glucose intake may result in hyperglycaemia. The glycaemic index (GI) is a classification proposed to quantify the relative bloodglucoseresponsetofoodscontainingcarbohydrate.Itisdefinedasthe area under the curve for the increase in blood glucose after the ingestion of a set amount of carbohydrate in an individual food (e.g. 50g) in the two-hour post-ingestion period as compared with ingestion of the same amount of carbohydrate from a reference food (white bread or glucose) tested in the same individual, under the same conditions, using the initial blood glucose concentration as a baseline. The consumption of foods that have a low GI is beneficial for health as it contributes to good glycaemic control and to the reduction of chronic disease risk factors. Carbohydrates with a high GI cause higher insulin secretion; this is why the GI of dietary carbohydrates, along with the insulinaemic response to them, is of utmost importance for diabetes control.

The concept of dietary fibre has changed considerably in recent years. It is now recognised that dietary fibre encompasses a much broader range of substances than was acknowledged previously and that it has greater physiological significance than previously thought. There is no generally accepted definition of dietary fibre worldwide. However, there is a consensus that a physiologically based definition is necessary.. They provided a useful simple categorisation of dietary fibre with different physiological properties, as understood at the time. Historically, soluble fibres principally affected glucose and fat absorption, because many of them were

viscous and formed gels in the small intestine (e.g. pectins and ß-glucans). In contrast, types of dietary fibre with a greater influence on bowel function were referred to as ‘insoluble’ (including cellulose and lignin). It is now apparent that this simple physiological distinction is inappropriate because some insoluble fibres are rapidly fermented and some soluble fibres do not affect glucose and fat absorption. As the terms ‘soluble’ and ‘insoluble’ may be misleading, in 1998 the WHO and the Food and Agricultural Organization recommended that they should no longer be used. In general, dietary fibres consist primarily of carbohydrate polymers (nonstarch polysaccharides) that are components of plant cell walls, including cellulose, hemicellulose and pectins, as well as other polysaccharides of plant or algal origin, such as gums and mucilages and oligosaccharides such as inulin. Analogous non-digestible carbohydrates that pass through the small intestine unchanged but are fermented in the large intestine should also be included, for example resistant starch, fructo-oligosaccharides, galactooligosaccharides, modified celluloses and synthesised carbohydrate polymers, such as polydextrose.

Although more studies are certainly needed, it has been suggested that an insufficient consumption of dietary fibre contributes to a plethora of chronic disorderssuchasconstipation,diverticulitis,haemorrhoids,appendicitis,varicose veins, diabetes, obesity, cardiovascular disease, cancer of the large bowel and various other cancers.

Recommendations for adult dietary fibre intake generally fall in the range of 20–35g/day. Others have recommended dietary fibre intakes based on energy intake, 10–13g of dietary fibre per 1000kcal.

In addition, dietary fibre is neither digested nor absorbed in the small intestine. It has at least one of the following properties: stimulates colonic fermentation reduces pre-prandial cholesterol levels reduces postprandial blood sugar and/or insulin levels.

Codex Alimentarius Commission (CAC, 2006) Dietary fibre means carbohydrate polymers with a degree of polymerisation not lower than 3, which are neither digested nor absorbed in the small intestine. A degree of polymerisation not lower than 3 is intended to exclude mono- and disaccharides.

It is not intended to reflect the average degree of polymerisation of a mixture. Dietary fibre consists of one or more of:

edible carbohydrate polymers naturally occurring in the food as consumed

carbohydrate polymers, which have been obtained from food raw material by physical, enzymatic, or chemical means

synthetic carbohydrate polymers.

Dietary fibre generally has properties that:

decrease intestinal transit time and increase stool bulk are fermentable by colonic microflora

reduce blood total and/or low-density lipoprotein cholesterol levels

reduce postprandial blood glucose and/or insulin levels.

Health Council of the Netherlands (2006) Dietary fibre is the collective term for substances that are not digested or absorbed in the human small intestine, and which have the chemical structure of carbohydrates, compounds analogous to carbohydrates, and lignin and related substances.

Lipids form a broad category comprising fats, oils, waxes and various other compounds like lipoproteins, phospholipids and cholesterol. They are all water-insoluble and very useful for living organisms. Fats are food components insoluble in water that represent a condensed source of energy. From a chemical aspect, they are fatty acids, and from a nutritional aspect, theyinclude fatty acids and other lipids, such as phospholipids, sterols, such as cholesterol, and synthetic lipids. One gram of fat provides around 9kcal (37.7kJ) of energy.

Linoleicacid,anomega-6polyunsaturatedfattyacid,andalpha-linolenicacid, an omega-3 polyunsaturated fatty acid, are called 'essential fatty acids' because they are indispensable for our health and they cannot be synthesised by our body, so they have to be obtained through the diet. Linoleic acid is the precursor to arachidonic acid, which is the substrate for eicosanoid production in tissues, is a component of membrane structural lipids and is important in cell signalling pathways. Lack of linoleic acid may lead to various problems, such as skin rash, dermatitis and hair loss. Moreover, lack of alpha-linolenic acid results in adverse clinical symptoms, including neurological abnormalities and poor growth.

Dietary fatty acids can be classified into two large categories: saturated (with nodoublebonds)andunsaturated.

Sources of omega-6 PUFA are liquid vegetable oils, including soybean oil, corn oil and sunflower oil. Omega-3 PUFA tend to be highly unsaturated with one of the double bonds located at three carbon atoms from the methyl end.

Plant sources of omega-3 PUFA (alpha-linolenic acid) include soybean oil, canola oil, walnuts and flaxseed. Alpha-linolenic acid is the precursor for synthesisofEPAandDHA,whichareformedinvaryingamountsinanimaltissues, especially fatty fish (e.g. trout, mackerel, herrings, salmon), but not in plant cells.EPAistheprecursorofomega-3eicosanoids,whichhavebeenshownto have beneficial effects in preventing coronary heart disease, arrhythmia and thrombosis, as well as to growth and neural development. Omega-3 fatty acids are considered good both for physical and mental health and to function preventively against heart disease and certain cancers. They also seem to have a beneficial effect on rheumatoid arthritis and atopic dermatitis.

According to epidemiological and clinical studies, trans fatty acids and to a lesser extent saturated fatty acids (mainly from animal products such as meat anddairy)ofthedietarepositivelyassociatedwithcoronaryheartdisease,hypertension and insulin resistance. Dairy fats and meat naturally contain trans fatty acids; however, the majority of dietary trans fatty acids are derived from partially hydrogenated oils. Hydrogenation (a process used to manufacture margarine, for instance) converts PUFA to more saturated fat, thus counteracting the effectiveness of linolenic acid. Bakery foods, shortenings and fried foods, such as potato chips, French fries, etc., are rich in trans fatty acids and their consumption should be avoided.

Lipoproteins are specialised compounds whose function is to transport through blood circulation lipids to tissues where they are needed. They consist of triacylglycerols and cholesterol esters, phospholipids and free cholesterol, as well as specific proteins, called 'apoproteins', which are important for lipoprotein structure, solubility and metabolism. Lipoprotein density depends on their lipid/protein ratio.

**According to the density then, lipoproteins can be divided into four classes:**

(1) chylomicrons,

(2)verylow-densitylipoproteins(VLDL)

,(3)low-densitylipoproteins(LDL)and high-density lipoproteins (HDL).

Chylomicrons, which are low-density particles formed in the gut, transport dietary lipids to the liver and elsewhere in the body. In the liver, chylomicrons are converted into VLDL, which are the least dense lipoproteins. VLDL and LDL, which are derived from VLDL metabolism, transport fat to the cells. LDL and HDL are responsible for cholesterol transport. LDL transport cholesterol to the cells, while HDL remove excess cholesterol from the cells and carry it back to the liver for breakdown and elimination (reverse cholesterol transport). A chief dietary goal for arteriosclerotic cardiovascular disease prevention is the reduction of LDL and the increase of HDL. It has been found that a high proportion of individuals who have a myocardial infarction have low HDL.

Although it is often classified as a lipid, cholesterol belongs in effect to the class of sterols and consists of carbon, hydrogen and oxygen bound in ring structures. It has a vital role as a precursor for the synthesis of bile acids, vitamin D and the steroid hormones, including cortisol, aldosterone and sex hormones. It also has a central role in cell membrane synthesis. Cholesterol is very susceptible to oxidation. Oxidised cholesterol is involved in the lesions that are responsible for atherosclerosis; therefore, it is implicated in the pathogenesis of heart disease. The main dietary sources of cholesterol are foods of animal origin like eggs, meat and dairy products, as well as certain sea foods, such as lobster, shrimps, etc.

Fat provides more calories per gram than any other nutrient [i.e. 9kcal/g (37.7kJ/g)] and its addition to food or diet increases their energy density. According to the dietary reference value (DRV) for fat intake, saturated fatty acid (SFA) should provide an average of 10% of total daily energy intake, MUFA (predominately oleic acid) should contribute 12% of total daily energy intake for the population, while the intake for PUFA should not exceed 10%of total daily energy intake. In particular, the intake of linoleic acid (omega-6 PUFA) should provide 1% of total energy intake and the intake of linolenic acid (omega-3 PUFA) should provide at least 0.2% of total energy intake. Therefore, according to the Guidelines , total fat intake should be kept between 20 and 35% of total energy intake, mainly from MUFA and PUFA. SFA should not exceed 10% of total energy intake, dietary cholesterol should be limited to 300mg/day and

Proteinsfromanimals,suchasmilk,eggs,meatandfish,areconsidered tobeofhigherqualitythanproteinsderivedfromplantsources(e.g.legumes, grains and vegetables), because the latter lack various essential amino acids. Vegetarian diets are based on the principle of protein complementation,namely the consumption of plant protein sources complementing one another, for instance vegetables and legumes or bread and peanut butter.

The currently recommended daily protein intake is 0.8g/kg (0.37g/lb) body weight for adult men and women. Protein requirements are influenced by many factors, including growth, the need to replace losses and the need to respond to environmental stimuli. Another condition caused by the insufficient intake of proteins, calories and nutrients is marasmus, the main symptoms of which are muscle-wasting, depletion of fat, reduced growth, abnormal liver enlargement and skin problems. If protein deficiency is serious and lasts too long, it makes patients vulnerable to diseases and may even result in death.

Amino acids function as substrates for protein and nucleic acid synthesis, and are involved in protein turnover and enzyme activity regulation, nitrogen transport, oxidation-reduction reaction, etc.

Amino acids can be classified into essential, non-essential and conditionally essential amino acids. According to another nutritional classification amino acids are categorised into two groups: indispensable (essential) and dispensable (non-essential). The nine indispensable amino acids are those that have carbon skeletons that cannot be synthesised to meet the body's needs from simpler molecules in animals, and therefore must be provided in the diet. Dispensable amino acids can be further divided into two classes: truly dispensable and conditionally indispensable. Five of the amino acids are termed dispensable as they can be synthesised in the body from either other amino acids or other complex nitrogenous metabolites. In addition, six other amino acids, including cysteine and tyrosine, are conditionally indispensable as they are synthesised from other amino acids or their synthesis is limited under special pathophysiological conditions.

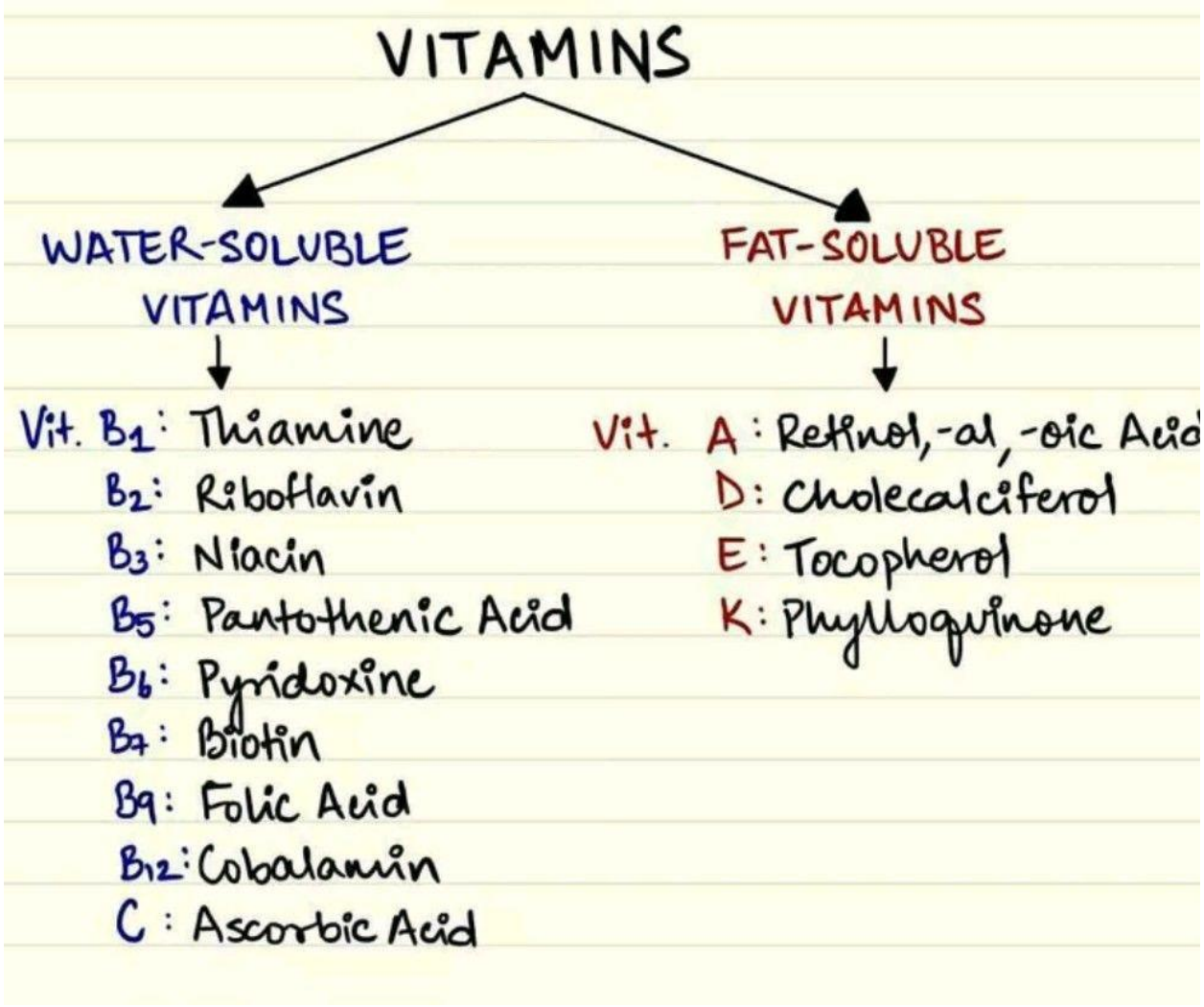
Precursors of conditionally indispensable Histidine Alanine Arginine Glutamine/glutamate, Isoleucine Aspartic acid Cysteine aspartate Leucine Asparagine Glutamine Methionine, serine Lysine Glutamic acid Glycine Glutamic acid/ammonia Methionine Serine Proline Serine, choline Phenylalanine Tyrosine Glutamate Threonine Phenylalanine Tryptophan Valine

a Conditionallyindispensableisdefinedasrequiringadietarysourcewhenendogenoussynthesis cannot meet metabolic need.

b Although histidine is considered indispensable, unlike the other eight indispensable amino acids,itdoesnotfulfilthecriteriausedinthisreportofreducingproteindepositionandinducing negative nitrogen balance promptly upon removal from the diet. glutamate, serine and probably asparagine are truly dispensable.

Aminoacidscanalsobeclassifiedaccordingtotheirstructureintoaromatic amino acids, which are precursors of neurotransmitters such as dopamine, epinephrine and serotonin, and branched-chain amino acids, which are selectively taken up by muscle cells rather than the liver. The former include phenylalanine, tryptophan and occasionally histidine, while the latter include isoleucine, leucine and valine.

Vitamins are micronutrients necessary for the maintenance of normal metabolic functions and blood cell formation. They are not synthesised in adequate amounts in the human body, so they have to be obtained through the diet, as vitamin deficiencies may lead to various dysfunctions. Water-soluble vitamins are rapidly depleted and must be regularly replenished, while fat-soluble (lipid-soluble) vitamins are better stored in the body. Vitamins can also be divided into natural and synthetic ones. Their action and kinetics are similar.




Many vitamins can have serious side effects or even prove to be toxic if taken in excess; this is why megadoses must be avoided. This applies especially to the fat-soluble vitamins, as they can accumulate in the body, reaching potentially dangerous levels. Vitamin A and D toxicity syndromes are well documented, while vitamin K may also be toxic in water-soluble form. Some examples of well-known side effects due to vitamin excess are:

headaches (vitamin A)

vomiting (vitamins A and D)

nausea (vitamins D, C, nicotinamide, vitamin B6)

spontaneous abortions and birth defects (vitamin A)

diarrhoea (vitamin C, pantothenic acid, choline, carnitine)

Hemolytic anaemia and kernicterus (vitamin K)

hepatomegaly (vitamin A, niacin).

Although it is preferable to follow a balanced diet that covers all the vitamin needs of the body, vitamin supplements are sometimes indicated for groups of people that may be at risk of developing certain deficiencies. Eligible candidates for vitamin supplementation may be:

the very young, and especially premature infants pregnant women the very old some categories of people suffering from chronic diseases, and especially chronically undernourished patients and chronic alcoholics, who commonly develop thiamin deficiency injured people, given the fact that vitamins (and especially ascorbic acid) play a role in wound healing strict vegetarians (vegans), who may be at increased risk of developing specific vitamin.

It must be stressed,however, thatsince the antioxidant action of the above mentioned vitamins has not been fully elucidated yet and more studies are evidently needed, vitamin supplements ideally should be taken on prescription and only after careful evaluation of each individual's nutritional status. In addition, patients should be warned of the dangers of the excessive intake of vitamins, and especially vitamins A, D, E and K.

Mostwater-solublevitaminsaregenerallyfoundinthesamegroupsoffoods, namely whole grains, leafy vegetables, legumes, meat and dairy products. Food sources of vitamin C (ascorbic acid) are fresh fruit (and especially citrus fruit) and vegetables. Vitamin B12 is synthesised by micro-organisms and then becomes incorporated in animal tissues. This is why vegans, who avoid animal products altogether, are at risk of developing B12 deficiency. As for the food sources of fat-soluble vitamins, they generally include leafy vegetables, seed oils, meat and full-fat dairy products. More specifically, as far as vitamin A is concerned, it should be noted that the term includes both retinol and provitamin A carotenoids. Liver, fortified margarine and full-fat milk products are good dietary sources of retinol and bright orange fruits and vegetables (e.g. carrots, pumpkins, sweet potatoes, apricots) and dark-green vegetables (e.g. peppers, spinach, broccoli) are the best sources of carotenes.

The dietary sources of vitamin D, which are not as important as its endogenous synthesis on the skin by the sunlight, however, are oily fish, eggs, liver, full-fat dairy products and fortified milk. Oily fish and green leafy vegetables are also rich in vitamin E. Other good sources of vitamin E are seeds, vegetable oils and beans. The main food sources of vitamin K are nuts and seeds, as well as nut oils and seed oils.

Minerals and trace elements are required in only small or even trace quantities, but are nonetheless essential for normal bodily function. They exhibit a variety of roles and are often necessary for tissue structure, enzyme system function, fluid balance, cellular function and neurotransmissionCalcium is the most abundant inorganic chemical in the human body – it accounts for 1.5–2% of our body weight – and is the main mineral of bones and teeth (approximately 90% of the calcium present in the human body can be found in bones and teeth).

Essential Potentially essential Chromium (Cr) Aluminium (Al) Cobalt (Co) Arsenic (As) Copper (Cu) Boron (B) Fluoride (F) Cadmium (Cd) Iodine (I) Nickel (Ni) Iron (Fe) Silicon (Si) Manganese (Mn) Vanadium (V) Molybdenum (Mo) Selenium (Se) Zinc (Zn)and muscular functions, the good hormonal functioning of the body, normal blood coagulation, effective digestion, etc. TheRNIforcalciumis400–1200mg.Women'sneedsarehigherthanmen's are, especially during lactation. Calcium supplements may be needed for the prevention of osteoporosis, a condition especially prevalent among older women. Foods rich in calcium are milk and dairy products, cruciferous vegetables (e.g. broccoli, cauliflower, Brussels sprouts), mineral waters, almonds and legumes.

Phosphorus is the second most abundant inorganic compound in the body after calcium. Most of the total phosphorus present in our body can be found in the bones, along with calcium. Phosphorus also plays an important role in carbohydrate, lipid and protein metabolism. Sodium,alongwithpotassiumandchloride,isinvolvedinbodyfluidosmolarity and plays the most decisive role in determining extracellular osmolarity.

Iron has multiple biochemical roles in the human body. It is necessary for the production of red blood cells and haemoglobin. As the major component of haemoglobin, it is necessary for the transport of oxygen to cells throughout the body. Iron also reinforces the defensive mechanisms of the body against illnesses.

Zinc is necessary for a broad range of biochemical processes that are important for growth and development and zinc deficiency results in poor healing and growth retardation. The RNI for zinc is 9.5mg for men and 7.0mg for women daily. Its best dietary sources are whole grains, nuts, meat, fish and poultry.

Its best dietary source is fish and seafood. The RNI for iodine is 140μg daily, with no increment during lactation and pregnancy.

Itseems that as an insulin cofactor it contributes to insulin binding to the cell membrane,whileitisalsoinvolvedinmaintainingnormalbloodglucoselevelsand in triglyceride level regulation. The estimated safe and adequate daily intake of chromium is 120μg or 0.5μmol/day for adults and 0.1 and 1.0μg/kg/day (2 and 19nmol/kg/day) for children and adolescents respectively. Doses larger than 200μg are toxic and may cause concentration problems and fainting. The best chromium food sources are yeast, liver, potatoes, bran, seafood, meat and poultry.

Fluoride is valuable for healthy bones and teeth and it has been shown to prevent dental caries. There is little evidence that there is any physiological requirement for fluoride and therefore no RNIs have been set; however, it has been suggested that the continuous fluoridation of water supplies to achieve levels of 1ppm (parts per million) is generally recommended. Water, therefore, is the best source of fluoride, although its content may vary fromone area to another. Fluoride is also found in several foods, which provide about 25% of total intake. Fluoride is considered as semi-essential since, although no physiological requirement can be shown to exist, it has known beneficial effects.

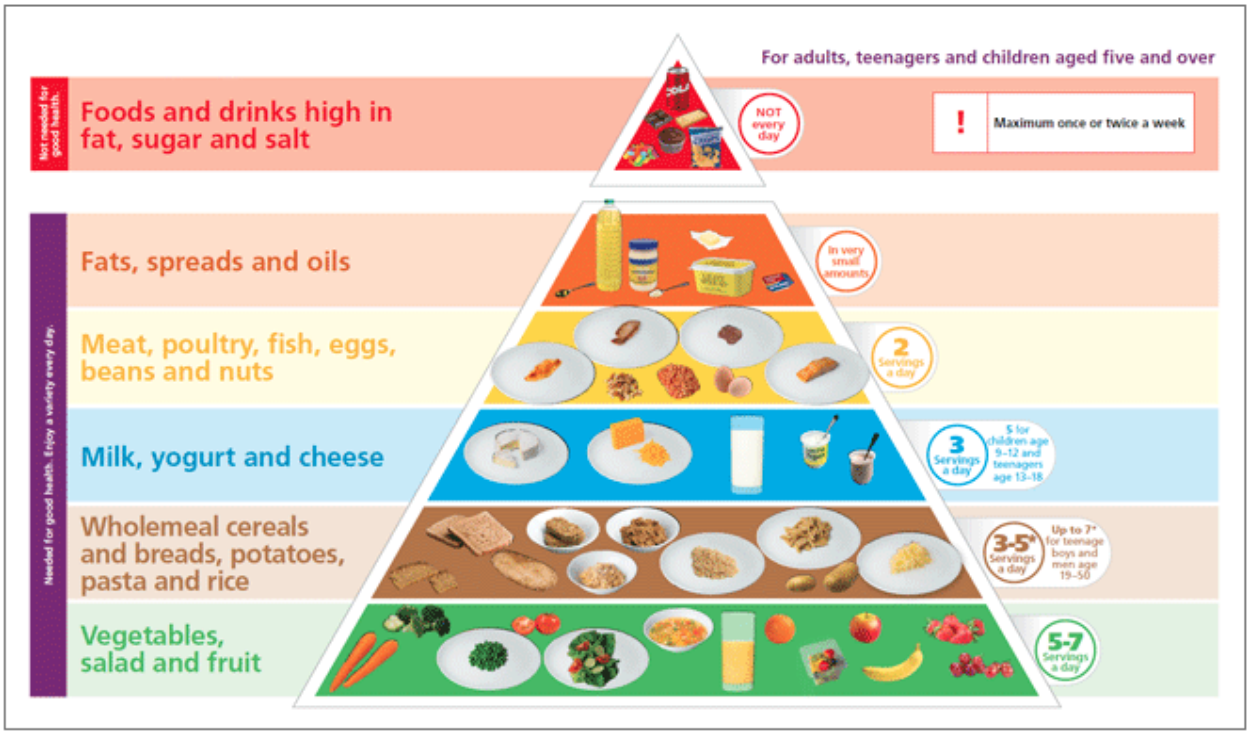
Food guide models are mainly teaching instruments that can be used in order to educate the general population on healthy eating and to visualise the frequency of consumption of the different food groups. They are most frequently in the form of a pyramid or a plate and are divided into sections, accordingtotheenumberoffoodgroups(e.g.fruits,cereals,fats,vegetables). The size of every section represents the frequency of food or food group consumption; although in some of the food models there are certain numeric suggestionsforfoodconsumptionandforportions.Insomeofthesemodels, there are suggestions for exercise, fluid consumption and alcohol.

The Food Guide Pyramid is a practical graphic developed by the US Department of Agriculture (USDA) in 1992.Concerns have been raised about the base of the pyramid, which recommends too many carbohydrates without any reference to the differences between good (complex) carbohydrates versus refined ones and sugars. In view ofnew scientificdata,many experts alsocriticisethe pyramid's message to avoid fat.

The Balance of Good Health plate was the food model suggested and most widely used in UK, which showed the types and proportions of foods needed

Food Pyramid, the vegetarian pyramid and many ethnic ones. A pyramid that does not limit guidance only to food choices and quantities is Willett's Healthy Eating Pyramid, a pyramid that gives emphasisto daily physical exercise and weight control, along with abundant consumption of whole grains, vegetables and plant oils. Most of these healthy diet models advise consuming plenty of fruit and vegetables and cutting down on sugar products and refined carbohydrates.

People should generally be encouraged to eat a balanced diet consisting of reasonable choices of all macronutrients, including fats and healthycarbohydrates, to maintain a normal body weight and to make physical activity an integral part of their everyday life.




**Nutritional Assessment**

Nutritional assessment is an extremely useful tool for the application of nutritional therapy. It is related to the individual's

(1) food and nutrient intake (diet history),

(2) lifestyle,

(3) medication intake

(4) social and medical history and

(5)anthropometric,bodycompositionandbiochemicalmeasurements.It includesboththescreeningandassessmentoftheperson'snutritionalstatus, the collection of data through the use of interviews, questionnaires and specially designed forms and the scientific analysis of the information obtained.

Thesedataareusedinordertoidentifythenutritionalstatusoftheindividual, to design the appropriate nutritional therapy and to investigate the need for greater nutritional support.

Taking a dietary history is a common method of evaluating food intake, and wasdevisedbyBurkein1947.Itcanbemadebytaking,throughaninterview, an informative dietary history of an individual or a group of people. Some of the most frequent and necessary information collected is: the usual dietary and meal plan, the number of meals, the usual meal size and the common amount of food, the usual location of eating, the consumption of ready-made meals, snacks and fast food, fluid intake, including the consumption of beverages and alcohol, possible food allergies, food preferences and the frequency of consumption.

A dietary history can give the dietitian an accurate picture not only of a person's normal food intake but also of the quality of that diet. However, the interview is a time-consuming process requiring well-educated interviewers being able to collaborate successfully with interviewees in order both to generate accurate data about a person's usual dietary intake and to be able to differentiate between the number and content of daily meals (daily meal plan).

The 24-hour recall is a simple method of direct nutritional assessment, which was first used by Wiehl in 1942. Using this method, it is easy to obtain the necessary information concerning the individual's total food and fluid intake, for the previous day or previous 24 hours. It is a quantitative method and is based on the assumption that the intake described is typical of the daily food and drink intake of the individual. The advantages of this method are that it is easy, quick, to a large extent representative and does not need special equipment (e.g. scales).

## Themain disadvantages of this method are:

(1) it is dependent on the memory of the individual and thus it is not advisable for individuals with decreased memory skills (older people and young children);

(2) it is does not provide accurate information when there is a day-to-day variation of the food intake; and

(3) thereisusuallythetendencyfromtheintervieweesaskedtodeclareincorrect food intake (either lower or higher than actual food intake), which may lead to statistical mistakes and unreal results (overestimation appears to be more frequent than underestimation for portion sizes). The role of a well-skilled dietitian or any other health professional involved in this method is essential in order to obtain the data accurately.

The selection of the appropriate method depends on the type of information to be collected. As there is no ideal method that could be used in all the cases and evaluations, each method addresses a different target group (e.g. different age, gender, social, educational group) or a different food or nutrient intake assessment. For the estimation of the actual nutrient intake of individuals or small groups of people for a certain period, food diaries or 24-hour recall are used. For the estimation of the mean dietary and nutrient intakeinalargepopulation,repeated24-hourrecallsorfooddiariesareused, while in the case of the estimation of the mean intake of a certain food item (e.g. specific type of fat, sweetener, fibre), by a small or larger population, a

## Classification -BMI

Underweight <18.5

Normal weight 18.5–24.9

Overweight 25–29.9

Obesity Class 1 30–34.9

Obesity Class 2 35–39.9

Extreme Obesity Class 3 >40

Classification of overweight and obesity by BMI and waist circumference

Increased risk for obesity-related health problems, e.g. type 2 diabetes, hypertension and cardiovascular disease Waist circumference Women <88cm Men <102cm Waist circumference Women >88cm Men >102cm

Underweight (BMI <18.5)

Normal (BMI 18.5–24.9)

Eventually high (thin obese)

Overweight (BMI 25–29.9)

Increased High Obese Class I (BMI 30–34.9)

High Very high Obese Class II (BMI 35–39.9)

Very high Very high Extreme Obesity Class 3 (BMI >40)

It can be also calculated in US/Customary units: BMI = lb × 703 / in.2, where 'lb' is the subject's weight in pounds and 'in.' is the subject's height in inches. Values of BMI lower than 25 are considered of normal weight. Individuals with BMI of 25–30 are considered overweight, while values over 30 present obesity. Persons with a BMI <18.5 have an increased mortality rate. It should be mentioned, though, that BMI is not directly correlated with the accumulation of body fat, and for this reason there are exceptions (e.g. athletes, who have a very limited level of body fat and cannot be classified as overweight or obese like other adults).

The term 'anthropometric' refers to comparative measurements of the body, which are used in nutritional assessments in order to understand human physical variation.

**The most useful measurements for infants, children and adolescents, which are used to assess growth and development, usually include:**

length

height

head circumference (length is used in infants and toddlers, rather than height, because they areunable to stand).

The anthropometric measurements which are used for adults usually include:

Height

weight

BMI

waist/hip ratio

percentage of body fat.

weight

weight-for-length

The measurement of circumferences of the human body, for example the area of waist and hip, can be used in order to estimate the distribution of body fat and the danger of the development of certain diseases related to the central distribution of fat. The waist/hip ratio (WHR) is the ratio of the circumference of the waist to that of the hips and is calculated by measuring thewaistcircumference,justabovetheupperhipboneanddividingbythehip circumference at its widest part. In several, but not all observational studies, indexes of abdominal adiposity, such as the WHR and waist circumference (WC), predict coronary heart disease and strokes better than BMI, while an increased WHR is related with increased risk of stroke in women.

Wrist circumference is one of the measurements that have been proposed for the estimation of the size of the frame, which include the width of wrist and knee and are considered valuable. However, the quotient of the height tothewristcircumferenceandthemeasurementofwidthofelbowaretwoof the more often used measurements of the frame's size.

**The size of the frame (r) is measured through the following**

quotient:r=height(cm) wristcircumference(cm)

Many different biochemical markers can reveal nutritional depletion and play an essential role in nutritional evaluation. As far as concerns the evaluation of vitamins and minerals levels in the body, this can be realised by the measurement of these or their products of metabolism, in the blood, the urine and other biological materials. Serum proteins seem to be useful markers of nutritional status.

**Serum albumin**

The serum albumin level is an indicative marker, for the nutritional evaluation of a patient, although it has a relatively long half-life of 21 days. Patients with low serum albumin levels are in poor nutritional condition and at high risk of death.

**Prealbumin**

Malnourished patients, according to Subjective Global Assessment – a method of assessing nutritional status – have significantly lower levels of prealbumin. Thus, determining the levels of prealbumin can be a sensitive and cost-effective method of assessing the severity of illness, which can resultfrommalnutritioninpatientswhoarecriticallyillorhaveachronicdisease and may allow for earlier recognition and intervention for malnutrition.

**Serum creatinine**

This protein is used as a nutritional marker, because of its relation to muscle mass.Measuringserumcreatinineisasimpletestanditisthemostcommonly used indicator of renal function.

**Serum transferrin**

This is an iron-transport protein, which serves as a sensitive marker of total nutrition status and more specifically as a marker of iron deficiency. Serum transferrin receptor (sTfR) level is a new specific and sensitive indicator of tissue iron status and iron deficiency.

Nutritional requirements are determined by a wide variety of factors. In order to identify special nutritional requirements and determine the extent to which the individual's nutritional needs are covered, specific parameters and methodsareused,whichcanprovideallofthenecessarydata.

## The nutritional requirements assessment includes:

clinical assessment

physical assessment

biochemical/haematological assessment

anthropometric and body composition assessment

current dietary assessment.

SGAclassificationisacomprehensiveassessmenttechnique and a valid screening tool for the prevention and treatment of, especially, malnutrition or undernutrition, in various patient populations.

Proteinisoneofthemainmacronutrientsthatareessentialforlifeandgrowth andvitalforthestructureandthemetabolismofthehumanbody.Itiscontinuously broken down and synthesised (the homeostatic mechanism generally known as protein turnover), but it cannot be stored and thus there is a daily minimum requirement intake to maintain the body's structure and function throughout life. In adults and on a daily basis, approximately 200–300g of protein or 3–4g protein/kg body weight is turned over. Protein contains nitrogen and the daily protein requirements are related to the total amount needed to maintain nitrogen equilibrium and cover losses. A general estimation of the protein requirements is based on the current RNIs and RDAs for protein, which are, for the average adult, 0.75–0.8g/kg of body weight per day, while a more accurate estimation can be made by measuring the nitrogen excretion and total losses (via urine, faeces, fistulae or other losses).

Carbohydrate is the main fuel for the human body and the most important dietary energy source, providing approximately 3.8kcal/g. The total carbohydraterequirements areusuallyexpressed asapercentage (e.g.45–60% for adults) of the total energy intake, according to the dietary reference values (DRVs) for the main nutrients, from which 39% should derive from starches, milksugarsandintrinsicsugarsandnotmorethan11%fromnon-milkextrinsic sugars. At the same time, there are general recommendations for carbohydrate intake, in grams. Thus, the minimum daily recommendation for carbohydrate is 100g, in order to provide enough energy and avoid protein breakdown, and the maximum intake is approximately 400g for the average adult.

Fluid requirements vary considerably between individuals and are influenced by various factors, related to the individual's age, gender, level of physical activity, type of diet, the environmental temperature and the climate, the individual's total fluid intake (from foods, water and beverages) and fluid output (kidney losses, respiratory, skin and gastrointestinal losses) and the general state of the individual's health. Individuals should take no less than the amount of fluids that cover the total losses and no more than the amount that can be excreted by the kidney function.

It is recommended that the fluid intake should be at least 500–750ml greater than urinary losses, but it should be even greater in cases of high temperatures or the presence of burn or pyrexia or in the case of any other reason of higher-than-normal losses.

Generally and under normal circumstances, the fluid requirements can be estimated:

children: 1.5ml/kg

adults: 1ml/kg or 30–35ml/kg body weight.

Dehydration is a fluid imbalance caused by inadequate intake or excessive losses. There are different biochemical markers that can identify and reveal the presence of dehydration.

**These markers are:**

urea/creatinine ration, which should be≥0.15

elevated levels of plasma sodium urine colour or specific urine gravity

serum osmolarity.

infants and young children, owing to poor intake or increased gastrointestinal losses

olderpeopleorpatients,owingtolowfluidintake,bluntedthirstresponse or poor food intake (anorexia, depression)

people with eating and/or swallowing difficulties

people with undiagnosed (or uncontrolled) diabetes mellitus and burns patients

patients receiving diuretic drugs and laxatives or people with the symptoms of diarrhoea and/or vomiting

patients suffering from pyrexia(mostly older) people with a physical immobility.

## Malnutrition

'Malnutrition' is a general term for a medical condition caused by an improper or insufficient diet. The term usually refers to generally bad or faulty nutrition and is most often related to undernutrition. According to the World Health Organization (WHO), malnutrition is the 'cellular imbalance between supply of nutrients and energy and the body's demand for them to ensure growth, maintenance and specific functions', and is the greatest risk factor for illness and death worldwide.

It can be associated with both undernutrition and overnutrition. Malnutrition and the state of deficiency or excess of energy, protein and other nutrients lead to measurable adverse effectsontissue,bodyfunctionandappearanceandclinicaloutcomes.There are different ways to classify malnutrition.

Anorexia, inadequate food intake or lack of food supplies and loss of appetite are probably the most common causes of malnutrition worldwide, especially in developing, but also in developed, countries. Anorexia can result from pathophysiological, psychological and general social problems. Different types of chronic and inflammatory diseases such as cystic fibrosis, chronic renal failure, stroke, Parkinson's disease, respiratory and orthopaedic problems, childhood malignancies, chronic inflammatory bowel diseases, fatigue, muscle weakness and difficulties with tasting, chewing and swallowing can lead to reduced food intake and malnutrition. Also, nausea and vomiting, which may result from certain diseases, and the use of certain drugs or specific treatments (chemotherapy, radiotherapy) may have a negative effect on appetite. Also, psychological factors such as anxiety and depression or the presence of dementia can cause malnutrition. Finally, malnutrition can have social causes, such as the institutionalisation of individuals (e.g. in hospitals, nursing homes), poverty and famine, poor food hygiene, inappropriate food supplies and the early cessation of breastfeeding.

**The most common physical signs of protein and energy malnutrition (PEM) are:**

weight loss and cachexia

decreased subcutaneous tissue and reduction in muscle and body tissue mass, which can be most often observed in the legs, arms, buttocks and face

oedemas

neurological problems and abnormalities

oral changes (red and usually swollen mouth, lips and gums)

muscle cramp and pain

skin changes (dry and peeling, frail, swollen, pale, loss of elasticity and poor healing)

hair changes (dry and discoloured).

'Malnutrition' is a general term that, although it encompasses overnutrition resulting from overeating or the excessive intake of nutrients (e.g. fat, simple sugars and carbohydrates),most often refers to undernutrition resulting from inadequate consumption, poor absorption or the excessive loss of nutrients and calories, regardless of whether any other specific nutrient is a limiting factor. On the other hand, malnutrition arises from deficiencies of specific nutrients or from diets based on inappropriate combinations or proportions of foods.

Cachexia is a wasting syndrome, regulated by cytokines, and a condition of general ill health, malnutrition, undesired weight loss and physical weakness. Cachexia is associated with various chronic and end-stage diseases and medical conditions (e.g. metabolic acidosis, infectious diseases, autoimmune disordersandmalignantconditions,suchasvariouscancers,infections,AIDS, congestiveheartfailure,cysticfibrosisandCrohn'sdisease).

**Apart from infants and adolescents, who are very susceptible to malnutrition for various reasons, other categories of people at risk are:**

older people, in nursing homes or hospitals, and especially those who are suffering from long-term illnesses or chronic metabolic disorders

poor people who are underfed or poorly fed

people living in less-developed or developing countries of the world

patients with neurological diseases such as dementia

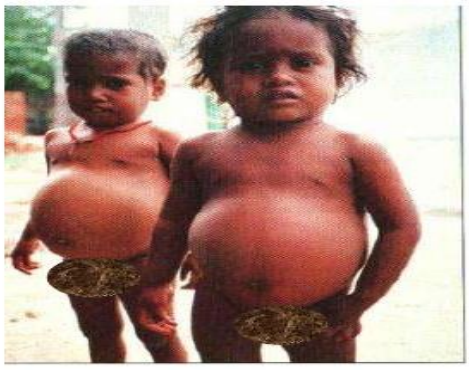
pregnant women

peoplelivingindeprivedsocioeconomiccircumstances,withoutadequate sanitation, education or means of preparing food

individuals at risk of systemic infections.

Kwashiorkorand marasmusarethe twodifferentformsofproteinand energy malnutrition.. Kwashiorkor (from the West African word for 'displaced child') is a severe form of undernutrition, which develops in individuals on diets with a low protein/energy ratio. The main symptoms of Kwashiorkor are oedema, wasting, liver enlargement, hypoalbuminaemia, steatosis and the possible depigmentation of skin and hair.

| Marasmus (PEM) | Kwashiorkor |
|---|---|
| Severe deficiency of all nutrients and inadequate caloric intake | Severe protein deficiency but normal caloric intake |
| Peripheral edema is absent | Peripheral edema is present |
| Hair changes absent | Hair changes common (sparse and easily pulled out) |
| Skin is dry and wrinkled but no dermatosis | Dermatosis, flaky paint appearance of skin |
| Voracious appetite | Poor appetite |
| Absent subcutaneous fat | Reduced subcutaneous fat |
| Fatty liver uncommon | Fatty liver common |
| Better prognosis | Worse prognosis |

| Marasmus | Kwashiorkor |
|---|---|
|  |  |

Marasmus (from the Greek word for ‘to waste away’) is the other form of malnutrition, which is caused by the inadequate intake of both protein and energy.. The main symptoms of marasmus are severe wasting, with little or no oedema, minimal subcutaneous fat, severe muscle wasting and non-normal serum albumin levels.

Disease-related malnutrition is a common problem, which can be detected in nearly all health care settings. The prevalence of disease-related malnutrition is reported from various studies to range from 25–40% in hospital inpatients to 15–25% in home care units and 20–25% in nursing homes. Screening is essential, must be easy and fast and should be done as soon as patients are admitted, in order to define and validate whether they are at risk of malnutrition and what action should be taken. The introduction of a malnutrition screening tool for hospital outpatients can play a crucial role in improving the detection of disease-related malnutrition. Vitamins/Minerals

Clinical signs Calcium Numbness, muscle aches (in extreme cases), rickets, fractures, muscle spasms Magnesium Irregular heart rhythms (arrhythmias), seizures, dizziness, weakness Selenium Impaired thyroid function, impaired cardiac function, enlarged heart Zinc Loss of taste Vitamin D Rickets, risk of fractures, low bone density and weak bones Folic acid Increased risk of specific birth defect (neural tube defect), elevated homocysteine levels, anemia, fatigue Vitamin C Scurvy, poor appetite, digestion problems , bruising, slower healing of cuts Beta-carotene (Vitamin A) Eye damage (e.g. lack of night vision), dry skin Vitamin B-6 Low red blood cell count (anemia), low white blood cell count (neutropenia), poor appetite, trouble concentrating, reduced strength, hair loss, elevated homocysteine levels Vitamin B-12 Pernicious anemia, muscle weakness, confusion in older people, tingling in the hands/feet, elevated homocysteine levels Vitamin E Lack of coordination of malnutrition, improve patient outcomes (e.g. weight status) and compliance and, finally, promote early nutritional therapy. According to the latest European Society of Parenteral and Enteral Nutrition (ESPEN) guidelines for nutritionalscreening,MUST isthemostwidelyusedscreening toolforadults, mainly in the community, but also in hospitals settings, where NRS-2002 is the most appropriate tool for under nutrition detection, with an additional grading of severity of diseases. Both these tools have excellent reliability and a high level of validity. Apart from the above-mentioned tools, there is another one that concerns and is mainly used for older people. This tool is MNA, which includes physical and mental parameters and adietaryquestionnaire, for the detection of under nutrition among older people, even in the early stages. The ESPEN guidelines state that there is, as yet, no universally accepted screening tool for children. All these screening tools include the assessment of risk factors such as: difficulty in chewing and swallowing, presence of dysphasia, loss of appetite for more than three days, unintentional weight loss, levels of prealbumin and albumin, energy intake and the presence of pressure ulcers, multiple food allergies or intolerances, skin breakdown or intravenous nutrition (total parenteral nutrition or peripheral parenteral nutrition).

## The main causes of hospital malnutrition are usually related to the lack of:

global interest in nutrition and/or poor recording of food intake in patient notes and inadequate referral to dietitians

nutritional support

practice guidelines and nationally agreed standards

clearly defined responsibilities in planning and managing nutritional care

sufficient educational level with regard to nutrition among all staff groups (medical and nursing)

patients' influence and knowledge

cooperation between different staff groups

involvement by the hospital management.

When the gastrointestinal tract does not function properly, the fortification of food intake with protein, fat or carbohydrate oral supplements, mainly in powder or liquid form, the use of oral sip supplements, enteral nutrition through nasogastric tube or gastrostomy and, finally, central or peripheral parenteral nutrition can provide all of the macro- and micronutrients the patient needs to retain their lost weight and to meet their nutritional needs.

## Weight Management and Eating Disorders

Although,forthemajorityofpeople,theterms'overweight'and'obese'seem to be synonymous, there is a significant difference between them. Health professionals can determine whether a person is overweight or obese by combining their age and gender with the anthropometric parameters of their body weight, body mass index (BMI) and body fat mass. An adult who has a BMI of 25–29.9kg/m2 is said to be overweight, while an adult with a BMI in excessof30kg/m2 issaidtobeobese.Inthecaseofchildrenandadolescents, the various BMI and weight ranges are different from those of adults, and the fact that normal levels of fat in the body vary depending on gender and age must be taken into account. In the case of children or teenagers, the various BMI and weight ranges are different from those for adults and take into consideration the normal differences in body fat, according to gender (boys or girls) and age group.

Weight status category Percentile range Underweight Less than the 5th percentile Healthy weight 5th percentile to less than the 85th percentile At risk of overweight 85th to less than the 95th percentile Overweight Equal to or greater than the 95th percentile

BMI is a useful screening tool and the most widely used index for the identification of possible weight problems among children, although it is not usually considered a reliable indicator of body fatness in the individual as it fails to distinguish between lean body mass and fat.Certainly, from a public health and statistical perspective, BMI measurements of a population are still a very good indicator. Thus, the relationship between BMI and body fatness varies according to bodycompositionandproportions.TheCentersforDiseaseControlandPrevention (CDC) and the American Academy of Pediatrics (AAP) recommend the use of BMI for the screening of overweight or obese children above the age of 2 years old. BMI for children and teens is combined with age growth charts (for either girls or boys). The growth charts show the weight status categories (underweight, healthy weight, at risk of overweight, overweight) for children and teens. BMI for age weight status categories and the corresponding percentiles are shown in

The pathogenetic mechanism of obesity is still a big mystery, as there is still the question of the interaction between relevant environmental factors and genetic correlates in the development of the disease. In recent years, research into genetics has greatly increased our understanding of the mechanisms involved in the imbalance of the body weight and the body mass, and the features of genetic conditions such as Prader-Willi syndrome and Bardet-Biedl syndrome.. Scientific findings on genetic predisposition to the development of obesity come from various studies on animals, and humans. A large number of studies between twins, adopted children and their families have shown that genetic factors play a significant role in the pathogenesis of obesity, whilecertaingenesinvolvedinpathwayswhichregulatefoodintakeandenergyexpendituremayplayaroleinpredispositiontoobesity.

**Obesityismoststronglyrelated with:**

variations in the sequence of genes, e.g. in uncoupling proteins (UCPs), the adrenergic receptors, the peroxisome proliferator-activated receptor (PPRAs) and the leptin receptor (OBR) polymorphisms and mutations in various genes, which are responsible for the control of appetite by the hypothalamus; the metabolism; or the adipokine release predispose to obesity [e.g. the FTO gene, the TNF-or the gene related to the synthesis of the melanocortin receptor or the proopiomelanocortin (POMC) gene that impairs the synthesis or structure of POMC-derived peptides]. In conclusion, it could be said that the development of obesity is partially determined by genes and genetic factors, but the environment (diet, activity, way of life, stress, etc.) influences its phenotypic expression.

The increase in fat intake of the modern diet and reduced physical activity are the two main causes of the development of obesity in industrialised countries. Fat is the most energy-dense nutrient in our diet, producing nine calories per gram, which is more than twice the calories derived from other macronutrientssuchascarbohydratesandproteins.Atthesametime,dietary fat is more efficiently metabolised and stored in body fat than carbohydrates are. Finally, although very fatty foods provide a high amount of calories, in parallel with an intense feeling of enjoyment and pleasure, they do not produce a strong feeling of satiety.

For this reason they are usually overconsumed, which encourages the passive over-consumption of calories and the development of obesity by affecting the body's total energy balance. Over-consumption and the extra amount of dietary fat intake can lead to its storage in fat tissue (in percentage terms sometimes as high as 96%). Thus, an initial recommendation to lower dietary fat intake to initiate significant weight loss is reasonable and supported by scientific literature, experiments on animals and clinical studies in humans. An increase in dietary fat intake leads to obesity in animals and has been associated with a higher prevalence of overweight and obesity in many human population studies. One of the main mechanisms through which dietary fat can contribute to the development of obesity is the regulation of leptin levels. Experiments have shown that an increased dietary fat intake results in central leptin resistance, whereas the restriction of dietary fat can lead to a partial improvement in leptin signalling, resulting in a spontaneous reduction in appetite and body weight. Of course, there is always the paradox of the modern diet, where the average fat content of the American diet is dropping (from 36% to 34%, according to the most recent National Health and Nutrition Examination Survey), but the weight of the average American continues to increase, mainly because the number of total calories continues to increase.

Carbohydrates represent the most essential energy fuel for the organism and play a very important role in our diet. They produce greater satiety, especially when they are in the form of complex high-fibre types, a better control of pre- and postprandial blood glucose levels and a higher dietary-induced thermogenesis, with a lower energy density (3.75kcal/g (15.7kJ/g), than fats (9kcal/g, 37.68kJ/g).

The association between the intake of carbohydrates and obesity is still debateable. This relationship depends on the total amount consumed and energy requirements, as well as the type of carbohydrate and how refined or complex it is.

These simple sugars, especially sucrose in refreshments and fructose in juices, have a direct effect on decreasing insulin resistance,increasinglipidlevelsandincreasingbodyweightwhenconsumed in large amounts. On the other hand, a diet that is high in complex carbohydrates from fruits, vegetables, legumes and whole wheat and grain products provides a large amount of dietary fibre, which may play an important role in producing greater satiety and weight loss, while the parallel lowering of total-fat intake in the diet can also result in a spontaneous reduction in total energy (caloric) intake and weight loss in overweight and obese persons. During the last few decades, the low-carbohydrate and high-protein diets have become very popular, suggesting severe carbohydrate restriction as the absolute solution totheobesityproblem.Itisknownthatthisrestrictionofcarbohydrateintake initially mobilises glycogen stores in the liver and induces the production of ketone bodies (ketogenesis) through the use of free fatty acids instead of glucose, as energy fuel, and increased diuresis.

There are different causes for the development of obesity, which are related to genetics, human biology, hormones and environmental factors. An imbalance between energy intake and energy expenditure is consider the most important. When we consume more calories than we expend for our daily needs (basal metabolic rate, thermogenic processes and activity), this extra energy is stored in the body, mainly as fat stored in fat tissue, in order to be used later as an energy fuel. Therefore, apart from the quality of the diet and the proportion of fat, protein and carbohydrates, the total quantity of energy intake and energy consumed is most important for the energy balance of the body.

An ideal dietary weight-reducing programme must contain all the food groups, without excluding any of them (e.g. low-carbohydrate diets). It is a programme that includes daily servings of fruits and vegetables (raw or cooked), fat-free or low-fat milk and milk products and servings from starchy foods (e.g. bread, rice, pasta, cereals) and potatoes, legumes, adequate protein sources such as lean meat, poultry, fish, beans, eggs and nuts, with a certain amount of fat, mainly in the form of monounsaturated olive oil. For this reason, alcohol in a hypocaloric diet would provide unneeded calories, displacing more nutritious foods. At the same time, an ideal dietary programme should be characterised by variety, proportionality, flexibility and personalisation and should cover the nutritional and energy needs of the dieter, according to their age, gender, resting metabolic rate, health status, level of physical activity and their lifestyle. The total reduction in calories should not exceed 500–1000kcal/day (2093–4189kJ/day), in order to achieve a weight loss of 0.5–1kg/week (1.1–2.2lb/week). Finally, during weight loss, attention should be given to maintaining an adequate intake of vitamins and minerals (e.g. iron and calcium).

These diets are advised for a short period (no more than three months) and only under medical supervision. They can be dangerous, as they are not nutritionally balanced diets and they may produce certain nutritional and electrolyte deficiencies, lean body mass loss or development of medical problems(e.g.gallstones).Forthisreason,theseprogrammesarenotsuitable foralloverweightorobesepeople,butonlytoobesepatientsthatcannotlose weightthroughconventionalmethodsanddietsofmodestcaloricrestriction, and to patients with certain medical problems, in whom a rapid weight loss is indicated. They are often prescribed to the morbidly obese patient, under medical supervision, prior to their undergoing bariatric surgery, and during and post-surgery, in order to reduce complications.

High-protein diets are the most popular type of exclusion diets used in the weight-control industry. The higher intake of protein and the severe restriction of carbohydrates in the diet, through the exclusion of fruits, starchy foods and legumes, had been considered the best solution for obesity. It is true that protein provides specific benefits in the diet that are useful during a weight-reducing diet programme.

Moreover, meals containing protein (meat products, poultry, cheese, egg whites, etc.) induce satiety, prolong the feeling of fullness and depress hunger. Protein metabolism produces higher diuresis, which contributes to a larger initial weight loss.

In the cases of stricter programmes, when the caloric level is lower than 1200kcal (5024kJ), or in the presence of specific groups of people (e.g. adolescents, lactating women), a supplement is usually necessary since the food intake may be insufficient. The most commonly used supplements are those of iron, sodium, potassium, magnesium, phosphorus and calcium. Apart from the known supplements, a wide variety of other nutritional supplements are usually proposed during the diet. Fish oils (good sources of omega 3, which improve glucose-insulin metabolism and cholesterol levels), conjugated linoleic acid (CLA), chitosan, L-carnitine, but also herbs, such as the dangerous ephedra (also known as ma huang, which has been withdrawn recently because it has been linked with fatal complications such as liver failure), psyllium (a soluble fibre), green tea ( Camellia sinensis ), capsaicin ( Capsicum frutescens ) and others are some of the 'natural' supplements that are suggested as promoting weight reduction. All of these should only be administrated with medical approval and should be a part of a balanced weight-reducing dietary programme.

Exercise is considered a cornerstone of weight loss and weight maintenance. It represents the second component of energy balance, which is the output or the energy expenditure that is necessary to achieve a positive energy balance and weight loss. Body weight is determined by the balance betweenenergy intake and energy expenditure, and weight loss can only be achieved by decreasing energy intake and/or increasing physical activity. Exercise contributes to the suppression of the appetite, improves the psychological status of the dieter and is extremely important for the maintenance of any weight loss. The American Heart Association recommends at least 30–45 minutes of moderate/intense physical activity (e.g. walking) as many days as possible in the week, while other foundations, such as the Institute of Medicine, recommend an even greater frequency of moderate/intense exercise, which should last approximately 60 minutes per day (which can be as intermittent activity throughout the day, rather than a single period of exercise). The type of exercise, its the frequency and intensity are strongly related to the severity and morbidity of obesity, the mobility of the obese patient and their motivation and so its type and level of intensity should be specific to the individual patient's needs and physical ability.

It is widely accepted that in order to achieve the best weight reduction, a reduction in calorie intake of 500–1000kcal (2093–4187kJ) per day will help to achieve a healthy and gradual, weekly weight loss.

Although many popular diets suggest a very drastic decrease in energy intake, according to theliterature,theenergyallowanceshouldbelowerthan1000–1200kcal/day (4187–5024J/day) for women and 1200–1600kcal/day (5024–6699J/day) for men.

**According to their function, these supplements have been organized by the Food & Drug Administration into the following categories:**

increased energy consumption: supplements such as ephedra, bitter orange, guarana, caffeine, country mallow, yarbe mate

increased satiety: guar gum, psyllium, glucomannan

increasedlipidoxidation:L-carnitine,hydroxycitricacid,greentea,vitamin B5, liquorice, pyruvate, CLA (conjugated linoleic acid – naturally occurring fatty acid, which is found in meat, cheese and dairy products)

decreased lipid absorption: chitosan

various ways of function: laminaria, spirulina, apple cider vinegar, etc.

Ring insertion (also known as gastric band insertion) is one of the most populartypesoftreatmentformorbidobesity.Thefirstphaseofthepostoperative diet is the clear liquids phase (apple juice, orange juice, water, flat diet soft drinks, sugar-free jelly, low-fat soup, etc.). When these liquids are well tolerated, the patients pass to the second phase, which includes semi-liquid foods and drinks and lasts for one to two weeks. The patient receives all the foods in a similar consistency to that of thinned mashed potatoes. During this phase, the patient is fed with skimmed or semi-skimmed milk, blended soups (made with skimmed milk instead of water, to increase the protein content), blended fruit, shakes made with skimmed milk and light/non-fat yogurt and blendedmeat,creamysoups,mashedpotatoesmadewithskimmedmilkand sugar-free yogurt. This phase lasts for approximately two weeks, accordingto the degree of tolerance. Immediately afterwards comes the third phase, of the semi-solid diet. This diet consists of low-fat cottage cheese, cooked, peeled vegetables, boiled or canned fruits in natural juice, boiled eggs, chopped lean meat, skimmed or semi-skimmed milk, unsweetened instant breakfast (e.g. porridge oats), sugar-free, low-fat yogurt and boiled chicken. The last phase is the low-fat solids diet. This is low in fat and sugar, avoids carbonated and caffeinated drinks but includes plenty of other, non-alcoholic, fluids [as much as 1500–1800ml (52.5–63floz) according to the patient's tolerance]. The patient must add one new food at a time, must chew all food very well and sip only limited amounts of liquids with their meal, and if necessary must take a vitamin/mineral supplement to cover any nutritional needs.

The Roux-en-Y gastric bypass is a process which involves the creation of a small stomach pouch and the bypass of the distal stomach and the proximal small bowel, and is a very drastic way for weight reduction for morbidly obese patients. This operation can often lead to long-term iron, calcium, vitamin B12 and vitamin D deficiencies. The postoperative diet is liquidbased for the first week.

On day one post-surgery the patient must drink in small sips and wait in-between sips for some minutes and avoid taking more that 100ml (3.5floz) at once, while the total fluid intake should be at least 2000ml (70floz) per day. For days 2–6 they must be on a liquid diet, with sugar-free fruit juice, skimmed milk, clear soups and vegetable juices, and if necessary on protein drinks and supplements. For the second week (days 7–13), they should be on a pur´eed diet, which has a thicker consistency. This diet includes yoghurt, porridge, skimmed or semi-skimmed milk, soups, scrambled egg, pureed meat and blended vegetables, fruits and vegetable juices. The most frequent nutritional problems that appear after bariatric surgery are dehydration, protein malnutrition and vitamin/mineral deficiency.

**Fluids**

Dehydration is often present after almost all types of surgery, mostly owing to limited fluid intake. Especially in cases of gastric bypass, patients have difficulty in getting the appropriate amount of fluid because of the limited content of the stomach. The symptoms of sweating, diarrhoea and vomiting, in parallel with greater faecal production, enhance fluid loss. There are no specific recommendations for fluid intake, but patients are advised to drink plentyoffluid,usingthesenseofthirstandthequantityandcolourofurineas markers of sufficient hydration. Nutritional fluids (e.g. juices, low-fat milk) are preferable,sincetheyprovideenergyandproteinapartfromhydration,while non-nutritionalfluidsarebestavoidedoratleastrestrictedtobetweenmeals.

**Protein**

Accordingtorecentresearch,themostimportantmacronutrienttotakeafter bariatric surgery (e.g. gastric bypass surgery) is protein. Protein, in contrast to fat or carbohydrate, does not change gastric transit time significantly, while at the same time it is essential for tissue repair and growth after a major surgicalprocedure.Inthesecases,ahigh-proteindietcontributestothefaster healing of the trauma, the maintenance of an increased basal metabolic rate and the stimulation of the protein synthesis. A protein intake of 60–90g/day is recommended for the postoperative period through the consumption of high-protein foods or the use of sugar-free fluid protein supplements, which provideallttheadequateessentialaminoacids,butalsovitaminsandminerals, which were malabsorbed in the postoperative period. Protein is important even after recovery, as it continues to provide adequate thermogenic action, in order to lose weight or to sustain previous weight loss.

When we say ‘fad diets’ we are usually referring to a wide variety of popular diets that mainly promote energy- or nutrient-restricted eating plans that exclude certain nutrients (e.g. low-carbohydrate diets). Therefore, fad diets are usuallybothunhealthyandinsufficient,especiallyforchildren,andforthemajority of adults. Diets such as the Cabbage Soup Diet, the South Beach Diet,the Hollywood Diet or the Grapefruit Diet are well promoted and commercialised, through books, magazines and TV series.

Almost all of them are not based on scientific evidence and studies but on pseudo-scientific claims and are considered non-clinical dietary programmes that can even be harmful. They promote rapid weight loss by increasing diuresis and use of fat stores as energy fuel, through ketosis, and finally they overemphasise one food or type of food, banning a specific food or food group or suggesting that a specific food or product can increase the body's chemistry. They usually lack sufficientenergy,proteinandcertainfat-solublevitaminsandminerals,which are essential for the maintenance of the total health status of the obese or overweight patient.

Nutritionalintervention,by a scientificgroup ofspecialists,is essentialfor the total health management of an anorexic patient. The restoration of normal nutrition, the prevention of muscle and bone loss, the increased energy intake level, the gradual weight gain and the normalised hormonal function are the main nutritional interventions needed, in the case of anorexia nervosa, in parallel with psychotherapeutic treatment. For all the above, it is necessary to provide nutritional support to these people, who are considered patients. In cases of patients who weigh less than 45kg (99lb) and are severely malnourished, an initial calorie intake of 1400–1500kcal/day (5862–6280kJ/day) is considered a starting level of refeeding, in order to reduce the chances of stomach pain, bloating, fluid retention or heart failure and to reduce the patient's anxiety of becoming 'overweight', which is the main cause of the disorder. In certain cases, when either extreme weight loss, a critical medical condition of the anorexic patient or refusal of feeding is present, tube or enteral feeding, preferably through a nasogastric tube, may be required. In these cases, in order to avoid fluid or electrolyte disturbances, tube feeding should have a slow flow (i.e. the rate of fluid going through the tube should be a low one), while the total fluid chart, electrolyte levels and blood glucose concentration must be carefully monitored. In the case of life-threatening situations, a patient can be fed intravenously for a short period, until oral or nasogastric feeding become possible.

Anorexics, owing to their decreased food intake and extreme weight loss, are at increased risk of vitamin and mineral deficiency.

**Nutrient deficiencies**

(e.g. vitamin abnormalities) may contribute to muscle mass catabolism, tissue damage (hair loss, bone density) and various cognitive difficulties (such as poor judgement, memory loss, other psychiatric conditions) and should be corrected through dietary intervention and supplementation. Planning the diet of a person with anorexia nervosa should consider the following macroand micronutrients and ensure an adequate intake of:

protein, to prevent and treat muscle mass loss

carbohydrates, to avoid erratic weight changes

fat and essential fatty acids

nutrients necessary to support bone mineral density (calcium, vitamin D, magnesium)

other minerals such as iron and zinc (zinc deficiency may cause altered taste as well as a variety of neuropsychiatric symptoms)

fat-soluble vitamins (A, E, D, K).

A very important phase in the treatment of an anorexic is the refeeding period, especially for patients with a very low BMI, when a number of serious complications may occur, and dietary and medical monitoring is highly recommended. During this phase, a wide range of electrolyte disturbances (e.g. hypokalaemia, hypocalcaemia and hypomagnesaemia), referred to as 'refeeding syndrome', and renal or hepatic impairment, may occur.

The consequencesofthisprocedurecanbeminimisedbyavoidinganinitialexcessive protein intake, by giving the patient relatively small amounts of food and by increasing the quantities of all the nutrients progressively.

Bulimia nervosa is a serious, even life-threatening, and difficult-to-overcome eating disorder, in which patients are preoccupied with their weight, body fat and body shape. Bulimics usually judge themselves severely and produce episodes of bingeing and purging. Physical complications and dangers of bulimia nervosa often include imbalance in electrolytes (sodium, chloride and potassium abnormalities), gastrointestinal problems and oesophagus inflammation, constipation, bloating or nausea, anaemia, heart problems, tooth decay and gum problems, absence of a period and finally, in the most severe cases, death.

The dietitian is one of the professionals who can contribute, as part of a scientific team, to the treatment of people with eating disorders. Eating disorders, such as anorexia and bulimia nervosa, have physiological, but mostly psychological, causes and require professional management and knowledge of the nutritional and health aspects of the illness.

Anorexia nervosa involves extreme dietary behaviour, weight loss, electrolyte imbalance and increasednutritional requirements.

The role of a clinical dietitian in the treatment of anorexia nervosa is crucial, for it is they who: collect the nutritional and behavioural information

assess the level of undernutrition and of nutrient deficiencies, providing these data to the other members of the team

try to establish a normal food intake

incorporate a wider variety of food items in the daily dietary intake of the patient

discuss and educate the anorexic on the adoption of a healthy and wellbalanced meal plan.

## Nutrition and Anaemias

Iron-deficiency anaemia is a condition characterised by inadequate iron deposits in the body. Iron deficiency is the commonest nutritional deficiency and it occurs when body iron stores are insufficient to support the necessary rate of red blood cell production and haem synthesis in the bone marrow, to maintain a normal circulating red cell mass and haemoglobin concentration. It can be caused by an inadequate dietary daily intake, increased demands due to pregnancy or growth and/or by increased blood losses (menstrual losses, haemorrhage or trauma). The main symptoms of iron deficiency include fatigue, shortness of breath and vertigo. Periods of life with increased vulnerability of iron-deficiency anaemia include adolescence (particularly among girls after the onset of menstruation), women during pregnancy or of childbearing age, infants and older people.

Haemoglobin and serum ferritin are the most common ways to detect anaemia. The World Health Organization (WHO) criteria for the detection ofanaemia,establishedin1975, arethe mostwidely accepted.Haemoglobin concentrationsbelow13g/dlforadultmales,12g/dlformenstruatingwomen and11g/dlinpregnancyareconsideredindicativeofanaemia

Aim of the test Laboratory test Confirm the presence of anaemia Haemoglobin Haematocrit Evaluate iron status Iron stores Bone marrow iron Serum ferritin Iron supply Serum transferrin receptor concentration Transferrin saturation Free erythrocyte protoporphyrin Red blood cells indices Serum iron

There are two types of iron in the diet:

Haem iron derived from haemoglobin and myoglobin, which represents a small fraction of total iron in the diet and is highly absorbed. Haem iron is provided by animal-origin foods (i.e. red meat and meat products, liver, kidneys, egg yolk, fish, chicken, etc.).

Non-haem iron, which is inorganic iron, very abundant in vegetable foods and in fortified foods (i.e. dried fruits and vegetables, wholegrain cereals, legumes and fortified bread and cereals).

The bioavailability of non-haem iron is much lower than haem iron and it dependsonseveraldietaryandphysiologicalfactors.Theabsorptionofhaem iron can range from 8 to 40%, while non-haem iron is absorbed by 0.5–6%. The average iron content of a typical Western diet is about 10–15mg, of which only 10–15% is absorbed.

Haem iron, principally provided by meat, fish and blood-derived foods, as mentioned before, is better absorbed than non-haem iron is. Haem iron absorption can be altered only by meat

presence and to a smaller degree by the presence of calcium. Haem iron absorption is higher in the presence of meat, by a mechanism still under investigation. Moreover, as meat is the best dietary source of iron, it enhances its absorption and significantly increases the dietary content of iron. It should also be stressed that heat treatment and storage can transform haem iron into non-haem iron, resulting in the lower absorption of iron from certain foods.

With respect to calcium, some studies have shown that calcium chloride inhibits haem iron absorption in the same extension as non-haem iron. Calcium seems to have a direct effect on haem iron absorption, counteracting the enhancing effect of meat. It has also been demonstrated that this inhibitory effect is dose-related, as a dose below 40mg does not have an inhibitory effect, while maximum inhibition is reached with intakes around 300mg, where the inhibition of iron absorption is almost complete. The availability of non-haem iron further depends on dietetic factors and is generally considered lower. Its absorption is inhibited by the presence of phytic acid and polyphenols.

According to recent scientific data, phenolic compounds found in spices and herbs (i.e. chilli, garlic, pepper, shallot and turmeric) are potent inhibitors of iron availability, reducing iron availability from 20 to 90% in a dose-dependent manner. The aim of dietary advice in patients with iron-deficiency anaemia is to enhance the iron absorptionof their food and to restoreironstores in the body.

**Patients should be advised to:**

include food items with high iron content in their daily diet

consume sources of vitamin C in every meal, to enhance iron absorption

consume food items with haem iron in every meal if possible

avoidtheconsumptionoflargeamountsoftea and coffee,especiallywith meals, as they could inhibit iron absorption

consume up to three cups of milk or yogurt per day, as generally advised, but not with items rich in iron.

Haemochromatosis is an inherited or secondary condition that alters iron metabolism.Itisthemostcommonformofironoverloadduetoexcessiveiron absorption from the intestine. Physiologically, the only available mechanism in humans to prevent iron overload is the regulation of iron absorption in the intestine.

Hereditaryhaemochromatosisiscausedbyadefectinagenecalled HFE, which interferes with the regulation of dietary iron absorption from the small intestine. Haemochromatosis can also be due to repeated blood transfusions Even though haemochromatosis may be asymptomatic, it can be

accompanied by symptoms such as chronic fatigue, abdominal pain, irregular heart rhythm, hair loss and changes in skin colour – not attributed to sun exposure. Haemochromatosis can cause serious health problems, mainly owing to iron accumulation in the organs, i.e. hepatic disorders (cirrhosis, hematoma – with or without alcohol use), arthritis, gallstones, diabetes and heart disorders (heart failure, heart attack). It can be diagnosed by the measurement of elevated transferrin saturation (>50% for women and >60% for men), elevated ferritin levels and genetic tests to certify HFE gene mutations. The main therapy for haemochromatosis is iron removal, either by blood donation (phlebotomy) or by pharmacological removal by chelation therapy. Dietary advice consists of ways to impair iron absorption from foods. Increasing fibre intake, avoiding the intake of vitamin C at mealtimes and the increased intake of dietary items with either low iron content or of low iron bioavailabilityisoftenrecommended.VitaminCandironsupplementsshould be avoided in these patients. Moreover, alcohol intake should be restricted as it can worsen the hepatic damage.

Megaloblastic anaemia is characterised by the formation of abnormally large erythrocytes in the bone marrow and by abnormally large (macrocytic) erythrocytes and hyper-segmented neutrophils in the blood. Megaloblastic anaemia is caused by a reduction in the rate of DNA biosynthesis, resulting in abnormal nuclear maturation and ineffective erythropoiesis. The most commonaetiologyformegaloblasticanaemiaisfolateandB12 deficiencies.Other lesscommonfactorsaretheuseofdrugsthatinterruptDNAbiosynthesisand inherited conditions presenting defective enzymes of DNA biosynthesis.

In Western countries, B12 deficiency is mainly caused by pernicious anaemia. Pernicious anaemia is characterised by the insufficient production of the

The dietary management of B12 deficiency includes a high-protein diet (1.5g/kg body weight), a higher consumption of green leafy vegetables and inclusion of food items rich in B12, i.e. meat, eggs and dairy products.

Pregnancy is characterisedbyanincreasedneedoffolicacid,whilemedicationforepilepsy and barbiturates can cause folate deficiency. Moreover, alcohol consumption can alter folate metabolism and absorption. Foods with a high folate content include green leafy vegetables, fruits, breakfastcerealsanddairyproducts.Folateissensitivetohightemperatures, and cooking can destroy 50–95% of folate in the foods. Therefore, patients should be advised to consume fresh fruit and vegetables in order to increase their dietary intake of this vitamin.

## Enteral Nutrition:

Thetwomaincategoriesofenteralnutritionareenteraltubefeedingandoral nutritional supplements. Before deciding to provide nutritional support to a patient enterally, it is important to take into account:

the predicted duration of the provision of the nutritional support

the danger of aspiration or tube misplacement

the presence or absence of digestion and absorption, i.e. the level of gastrointestinal (GI) functionality

whether a surgical operation is programmed

the texture and the volume of the feed that should be provided in order to meet the patient's needs.

Enteral tube feeding (ETF) is the provision of nutrients by a tube through the GI tract in patients who cannot attain sufficient oral intake from food and/or oral nutritional supplements or who cannot nourish themselves safely for periods of more than five days (e.g. dysphagic patients). It aims to maintain a patient's nutritional status and to improve their nutritional intake.

Oral supplements are usually pre-packed drinks, pills or powder-like substances, with a significant nutrient content, prescribed to improve the nutritional status of patients who fail to meet their nutritional requirements through food intake alone.

Oral nutritional supplements can be categorised as follows:

Complete oral supplements, which contain macro- and micronutrients. Usually they are prescribed as a supplement to the daily intake of foods, but the majority of them can be provided as exclusive nutrition. The content of these feeds in macronutrients varies and there are supplements for general use or for specific clinical conditions.

Oral supplements with modified nutrient content, i.e. hydrolysed or partially hydrolysed, elemental or semi-elemental feeds, fat-free, etc.

Supplements of one or more macronutrients, i.e. carbohydrate, fat or protein. Multivitamin supplements.

Oral nutritional support should be considered for malnourished patients or those in danger of insufficient nutrient intake through food, presupposing that they can swallow safely and they have an adequately functioning GI.

Most enteral feeds are ready-to-use fluids, in microbial-free containers that provide macronutrients, micronutrients, fluids and, in some cases, soluble or insoluble fibre. They are

usually nutritionally complete within a specific volume, providing the necessary nutrients to support the dietary needs of the patient.

Elemental and semi-elemental feeds facilitate digestion and absorption in patients with a problematic GI function. They are indicated for patients with inflammatory bowel disease, pancreatic insufficiency, malabsorption, short bowel syndrome, radiation enteritis, early enteral feeding or intolerance to polymeric feeds.

**Renal feeds**

They usually contain limited amounts of sodium, potassium and phosphorus. Their protein content varies: there are low-protein feeds for the early stages of chronic kidney disease (CKD) and higher-protein feeds for end-stage CKD patients (i.e. patients undergoing hemodialysis or peritoneal dialysis). The feeds for end-stage CKD patients are usually energy-dense, facilitating the fluid restriction that is needed for them.

**Pulmonary feeds**

They usually contain a higher percentage of their total energy in the form of fat to reduce the carbon dioxide that is produced by the feed metabolism.

**Hepatic feeds**

These are commonly low in aromatic amino acids (AAA) and methionine and high in branched-chain amino acids (BCAA). They usually have a high calorie/nitrogen ratio, are hypercaloric, low in sodium and contain dietary fibre to promote gut motility. They are usually low in copper, iron and manganese and are supplemented with fat-soluble vitamins, folic acid and B-complex vitamins.

**Diabetic feeds**

They usually have a lower carbohydrate content and a type of carbohydrate that is different from the standard formulas. They usually contain oligosaccharides, fructose and cornstarch, and in combination with their higher fibre content they aim at better glycaemic control as a result of delayed gastric emptying and a reduced intestinal transit.

Enteral feeds with dietary fibre contain both soluble and insoluble fibre. Soluble fibres, such as guar, pectin and FOS, are used as prebiotics. These substances are fermented by the colonic bacteria and short-chain fatty acids (SFAs) are produced. SFAs provide energy to colonocytes, improve mucosal growth and improve water and sodium absorption. Insoluble fibre increasesfaecalvolume, enteral peristalsisand thereby decreases faecaltransit time.

Enteral feeds with dietary fibre are recommended for patients with longterm enteral nutrition as they promote mucosal growth and gut peristalsis.

The use of enteral nutrition presupposes a sufficient functionality of the GI tract. Therefore, its use is contraindicated in specific clinical conditions that are characterised by compromised GI functionality, i.e. complete intestinal obstruction, intractable vomiting, paralytic ileus, circulatory shock, GI haemorrhage, short bowel, severe diarrhoea, GI ischemia and high output (>500ml/day) enterocutaneous fistula.

Following the initiation of enteral nutritional support, frequent monitoring of thepatientisessential,inordertoensuretheearlydetectionandtreatmentof possible complications, to check the tolerability of the feed and to make sure that the goals of the nutritional support are fulfilled.

Parameter Frequency Weight At least three times/week Signs of oedema Daily Signs of dehydration Daily Fluid balance Daily Adequacy of provided nutritional support At least twice/week Nitrogen balance Weekly Gastric residues Every four hours Electrolytes; blood, urine, nitrogen (BUN); creatinine 2–3 times/week Blood glucose, Ca, Mg, P Weekly Frequency and consistency of defecation Daily

It should be stressed that refeeding syndrome has no specific clinical features and therefore may easily go unrecognised. Its predominant biochemical sign is hypophoshataemia, while other features can be observed, such as rapid decreases of potassium, magnesium or sodium levels and water retention. These fluid and electrolyte abnormalities can lead to dehydration, cardiac or respiratory failure, rhabdomyolysis, seizures, coma, hypotension and sudden death. In order to prevent refeeding syndrome in patients receiving artificial nutritional support, it is vital to closely monitor their fluid balance and electrolyte status.Patientsathighriskofdevelopingrefeedingsyndromewhoneedartificialnutritionalsupportshoul dbeidentified. Inthesepatients,theinitiationof feedingshouldbeverygradual,withareducedcalorierateoftheirestimated dietary requirements (approximately 20kcal/kg/day) to prevent the development of refeeding syndrome. Moreover, measurements of electrolytes and biochemical parameters (creatinine, urea, potassium, magnesium, phosphorus) should be performed daily for at least four days after the initiation of the provision of enteral feeding.

**Enteral feeding and TPN**




**Parenteral Nutrition**

Parenteral nutrition (PN) is the intravenous provision of nutrients, without using the gastrointestinal (GI) system. It should be considered for patients with: malnutrition or inadequate or unsafe oral and/or enteral nutritional intake GI functionality insufficient to support an adequate degree of digestion and absorption of nutrients, due to ileus, dysmotility, fistulae, surgical resection, etc. prolonged GI system failure (>5 days) or intestinal failure which is predicted to last for >5 days. PN may also be chosen in patients who cannot tolerate enteral feeding (EF) or when EF is unsafe or impractical.

PN can be provided via catheter in: A peripheral vein dedicated solely to PN. As peripheral veins cannot support the infusion of hypertonic parenteral solutions, peripheral parenteral nutrition (PPN) should be chosen for short-term nutritional support (<14 days), as it can only partially cover the patient's nutritional needs. A central vein with high blood flow, either by a dedicated centrally placed central venous catheter or by a free dedicated lumen in a multilumen centrally placed catheter. Central parenteral nutrition or total parenteral nutrition (TPN) should be provided through tunnelling subclavian lines for long-term use (>30 days), while other central veins can also be used (cephalic vein or internal jugular vein). For TPN of shorter duration, nontunnelling lines can be used.

Theparenteralsolutionshouldnotexceed800–900mOsm/kgtopreventthrombophlebitis,the main complication of PPN. As peripheral veins cannot tolerate concentrated solutions, nutritional

needs can be met with larger volumes of solutions, or can be covered only partially, especially if there is a fluid restriction for the patient (e.g. patients with renal, cardiopulmonary or hepatic failure). Therefore, PPN should be used for short-term parenteral nutritional support (<14 days), while it is also suggested that PPN should be used as a supplementary nutritional support or during the transitional phase from parenteral to enteral or oral feeding. TPN is the provision of nutrients through a central vein. In TPN hypertonic solutions can be safely used, resulting in the provision of solutions with a higher calorie content but with lower volumes.

What should the monitoring of critically ill patients receiving PN include and how often should these values be obtained?

TheprovisionofPNpresupposes–justliketheprovisionofenteralnutritional support – regular monitoring, in order to ensure the safety of the patient and the achievement of the goals of their nutritional support.

The assessment of a patient's nutritional needs is essential in order to ensure the sufficient provision of nutrients through nutritional support.

**Energy**

Usually, the energy needs of the patient can be estimated by the calculation of their basal metabolic rate, ideally by indirect calorimetry. Owing to the high cost of the equipment for indirect calorimetry, in the clinical setting the use of appropriate equations taking account of the age, sex, body weight and additional increments depending on the metabolic stress of the patients are a more common means of assessment. For the majority of patients, the provisionof 20–30kcal/kg seems to be adequate, while for severely malnourished patients or those at risk of refeeding syndrome lower levels of energy intake should be chosen.

**Protein**

Protein needs are estimated according to the body weight of the patient, with relevant variations due to metabolic stress or illness. Typically, the provision of 1.0g/kg of protein (corresponding in 0.15g nitrogen from amino acids) is sufficient for most patients. In situations of severe metabolic stress requirements could be higher (i.e. 1.0–1.5g/kg), while in patients with renal or hepatic failure lower protein intakes are advised.

**Fluids**

Fluids should be about 30–35ml/kg per day, adding possible fluid losses owing to drains fistulae, etc. All sources of fluids should be calculated to avoid the excessive provision of fluid.

Micronutrients and electrolytes

As the parenteral provision of micronutrients does not go through digestion and absorption, the recommended daily allowances are lower than those for oral nutrition. The majority of pre-prepared PN feeds contain variable amounts of electrolytes, while there are others which are electrolyte-free for patients with renal or hepatic failure. Regarding micronutrients, most feeds contain insignificant amounts of vitamins and minerals and therefore should beaddedtothefeed.

These complications can be reduced if the personnel applying the PN are trained and use full aseptic techniques. The possibility of catheter occlusion can be minimised if PN solutions are given from dedicated intravenous catheters and the danger of infection or sepsis can be reduced if changes in catheters and PN bags are performed with strict aseptic techniques. Apart from the complications associated with intravenous access, PN is associated with metabolic and fluid-related complications. Acute and serious biochemical alterations may be caused by the provision of a large osmolar load to the circulation, resulting in refeeding syndrome. Hyperglycaemia due to diabetes or stress-induced insulin resistance is rather common and should be treated with insulin. PN can also cause fluid imbalances and hepatic disturbances, but the latter are mainly caused by the presence of sepsis or side effects from other drugs rather than by PN itself.

In the past, in order to reverse catabolism and to maintain the nutritional status of patients, deliberate overfeeding, or hyperalimentation, was initiated. Laterresearchonhyperalimentation,though,cametotheconclusionthatthe provision of PN that exceeds the patient's needs increases the risk of several complications. It can cause uraemia, hyperglycaemia, hyperlipidaemia, fatty liver (hepatic steatosis), hypercapnia (especially with the provision of excessive amounts of carbohydrates) and fluid overload. Overfeeding can be prevented by not exceeding the patients' nutritional needs and by measuring their basal metabolic rate by indirect calorimetry. Hyperglycaemia is a rather common complication in critically ill patients. It can be caused by hyperalimentation or by insulin resistance to the stress response. A proportion of all hospitalised patients either has diabetes orimpaired glucose tolerance (pre-diabetic state). Hyperglycaemia may lead to glycosuria (an excessive excretion of water by the kidney), resulting in hyperosmolar dehydration, which may be fatal for the patient if it remains untreated. Apart from micronutrient and vitamin additions to the parenteral solutions, some medications can be added. The medications most commonly added to the feed are insulin, in order to avoid hyperglycaemia, and antacids, to avoid gastroduodenal stress ulceration. In order to avoid incompatibilities with the components of the feed, caution must be exercised when adding other medications. More specifically, diuretics, vasopressors, antibiotics and narcotics can be added to the feed, provided that they are compatible with the solution's contents.

Pre-operatively, PN may improve the surgical outcome in several malnourished patients. In well-nourished or moderately malnourished patients, it has not been shown to have beneficial effects, as the risk of complication outweighs any potential benefit. Postoperatively, PN should be initiated in malnourished patients when enteral nutrition cannot be initiated for a period of 5–7 days. In well-nourished patients, PN should be considered only if the oral or enteral nutrition will not be possible for an extended period.

In patients with mild acute pancreatitis, nutritional support has a minimal benefit as most of them are usually well nourished and can tolerate the necessary period of 5–7 days for pancreatic rest without oral or enteral feeding.

Moreover, even in severe cases of pancreatitis, enteral feeding through a nasoenteric or jejunal tube has been shown to be effective and safe.

Moreover, TPN may be needed in necrotic pancreatitis, pancreatic abscesses and pancreatic pseudocysts.

Ready-to-use bags for PN, containing protein, glucose and lipid in a bag with separate sterile champers, which are perforated and mixed before hanging, are called ‘three-in-one solutions’. These bags of PN are usually more easy to use for the nursing staff, lower in cost and are preferred to making up individual parenteral solutions. However, these solutions are not flexible and cannot cover the needs of individual patients.



## Metabolic Stress

Head injury is a trauma of the head, with or without injury to the brain. Head injury is a condition that increases the metabolic responses and the nutritional needs of the whole body. The initial systemic response after injury is the condition of hyper metabolism and hyper catabolism. In the acute phase, headinjurydecreasestheimmunologicalandgastrointestinalfunctions,leads to hyperglycaemia and increases ventricular fluid and the levels of serum cytokines. The provision of an adequate supply of nutrients is associated with an improved patient outcome. Early and adequate nutrition, whether enteral or parenteral, is believed to be essential for the patient's health and for improving the outcome of their injury. The best route of nutritional administration (parenteral or enterally) and the best timing of administration (e.g. early versus late) should be established. Most of the related studies propose early feeding in order to achieve better outcomes related to the patient's survival and disability. A significant benefit of glutamine supplementation on thesafetyandefficacyofthetreatment,decreasedmortality,durationofstay and infectious morbidity in critical illness has been demonstrated by recent data of head-injured patients.

As mentioned above, head injury increases the body's metabolic responses anditsnutritionaldemandsandthereforetheprovisionofanadequatesupply of nutrients is associated with improved treatment outcomes. The two different routes for the administration of nutrition are total parenteral nutrition (TPN) or enteral nutrition (EN). TPN is used in severely head-injured patients, when there is no gastric function or after an extended period, when a patient is nil by mouth. There are studies that propose this mode of feeding in order to achieve a better treatment outcome following head injury.
ENispreferredwhenthereisgastricfunction,becauseofthelowerriskof hyperglycaemia, infection and total cost. The route of administration can be through a percutaneous gastrostomy or jejunostomy tube or through percutaneous gastrojejunostomy. Recent studies suggest that an enteral formula containing glutamine and probiotics may decrease the infection rateand shorten the patient's staying the intensive careunit. The presence of increased intracranial pressure and the position and the severity of the brain injury may determine the beginning of EN. Most of the current studies have proved that when either parenteral or enteral feeding covers energy expenditure and nitrogen excretion, through equivalent quantities of feeding, almost the same outcome in the patient's treatment is achieved.

When the skin is exposed to excessive heat (from fire), electricity or corrosive chemicals, the resulting tissue damage is known as a 'burn'. The estimation of the severity of burn is based on its depth and the percentage body surface that is burnt. Burns are generally categorised according to the severity of tissue damage, as follows:

First-degreeburns:Theyaffectonlytheouterlayeroftheskin(epidermis) (e.g. mild sunburn). They are characterised by pain and redness and will heal within 5–10 days.

Second-degreeburns:Theyaffectboththeepidermisandthelayerbelow it (the dermis). They are characterised by pain, redness and blisters and will heal in 10–14 days (for milder burns) or 25–35 days (when the depth of burn is greater). They require hospitalisation. Third-degree burns: They destroy the epidermis and dermis, and can involve all layers of the skin and subcutaneous fat, and even underlying bones, muscles and tendons. They are characterised by a white burn site, lack of sensation due to the destruction of the nerve endings, disturbed temperature control and a higher danger of infections. They require immediate hospitalisation.

Severe burn patients present an extreme state of physiological stress and an overwhelming systemic metabolic response. They require specialised nutritionalsupport,whichisanintegralpartofmultidisciplinarymanagement.The main nutritional goals in the treatment of the burn patient are: Monitor nutritional status and provide specialised immune-enhancing nutrition. Estimate energy requirements and provide adequate calories to prevent weight loss of greater than 10% usual body weight. Provide adequate protein for positive nitrogen balance and maintenance or repletion of circulating proteins. The goal of nutritional therapy is to prevent rather than treat already established malnutrition, but protein degradation in burn patients proceeds despite adequate protein supplementation. Provide vitamin and mineral supplementation as indicated. Take into account the hormonal and metabolic changes resulting from a burn injury.

Protein requirements are also increased in burn patients because of the increased catabolism of skeletal muscle, leading to average losses of 260mg protein/kg/hr. Protein intake should vary between 1.5–2.0g/kg of ideal body weight on a daily basis. Nitrogen balance should be assessed on a daily or weekly basis, using the Waxman equation. The rate of protein breakdown into amino acids and the reincorporation of these amino acids are important for collagen synthesis in wound healing as well as for the maintenance of visceral proteins for optimal organ function, especially the immune system. Maintenance of diaphragm and intercostal muscle mass is also important for survival to avoid the reduction of vital capacity and respiratory efficiency. In addition to the urinary losses from the degradation of muscle mass, nitrogen is lost from wound exudate, excision of burns and blood loss during surgery, leading to an extraordinarily negative nitrogen balance.

Burninjuryincreasesthebody'smetabolicdemands,andthereforenutritional requirements. Provision of an adequate supply of nutrients is believed to lower the incidence of metabolic abnormalities, thus reducing septic morbidity, and improving survival rates. The purpose of the nutritional assessment is tocharacterisethepatient'snutritionalstatusandrecognisepre-existingmalnutrition. This is essential for developing an appropriate nutritional regimen to treat specific nutritional disorders (e.g. thiamin replacement for alcoholic patients).

Toprovide optimalrepletionduringthemetabolicinsultoftheburn and multiple surgeries, to reduce morbidity and mortality, and to minimise any loss of muscle strength. Nutritional status is assessed in most patients by a variety of methods, such as anthropometric measurement, biochemical data,clinicalsignsanddiethistory(Thetraditionalparameters of anthropometric, biochemical and clinical data will not be accurate in burn patients because the results are distorted by fluid resuscitation, surgeries and systemic inflammatory responses. For example, body weight, mid-arm circumference, blood count and visceral protein status are affected by fluid resuscitation and transfusion, and nitrogen balance is affected by burn exudate and immobility.

Therefore, diet history becomes more important to nutritional assessments than usual.

Critically ill burn patients present an increased free radical production, which isproportionaltotheseverityoftheburn,whilemicronutrientdeficienciesare frequent after major burns. Burn patients have a high risk of negative trace element balances, which contribute to the imbalance in endogenous antioxidant capacity and the extension of primary lesions. As far as concerns the routeofadministration,theintravenousroutehasbeenproposedasmoreefficient than the enteral. The clinical evidence shows that several factors may determine the efficacy of antioxidant supplementation in burn patients. In severe burns, high doses of vitamin C contribute to a reduction of resuscitationfluid requirements byendothelialantioxidantmechanismsand shouldbe administered to the burn patient in quantities equal to 5–10% of the recommended daily allowance (RDA). B-complex vitamins should be administered in quantities equal to 2–3 times of the RDA, vitamins A and D in quantities equal to twice the RDA and vitamins B12 and K once a week.

It is of primary importance in the care and treatment of burn patients to monitor the electrolyte–fluid balance and to contribute to an accurate fluid resuscitation. Lactated Ringer's solution without dextrose is the fluid of choice, except in children under two, who should receive 5% dextrose in lactated Ringer's solution. The initial rate can be estimated by multiplying the estimated total body surface area (TBSA) burnt, using the appropriate graphs, by the weight in kilograms, which is divided by 4.. The restoration of sodium losses in burn patients is essential, as mild or severehyponatraemia(<135mEq/l)canbepresent,mainlyowingtoextracellular sodium depletion, which follows all the changes that occur in cellular permeability. Hyperkalaemia is another characteristic of massive tissue necrosis.

Pressure sores are primarily developed by unrelieved pressure. There are numerous risk factors responsible for the development of pressure sores, which can be categorised as extrinsic or intrinsic. Sustained pressure, shearing forces, friction and moisture, mechanical loads on the skin and the soft tissues and body weight, age, sex, limitation in activity, dehydration and bowel and bladder incontinence, anaemia, poor nutritional status, medication and infection are some the most important risk factors involved in the aetiology and development of pressure sores.

Pressure ulcers are areas of damage to the skin and underlying tissue that usually occur over bony protrusions such as elbows, heels and hips. Pressure ulcers are caused most frequently by pressure, shear and friction. While unrelieved pressure, shearing forces and friction account for the mechanical aetiology of pressure ulcers, many other conditions can also predispose an individual to pressure ulcers. Pressure sores and malnutrition usually coexist, and the role of diet is vital. Eating a nutritionally rich diet with adequate calories and protein and a full range of vitamins and minerals – especially vitamin C and zinc – has been shown to improve wound healing. Being well nourished also protects the integrity of your skin and guards against breakdown. If you're at risk of or recovering from a pressure sore, your doctor may prescribe vitamin C and zinc supplements, which you can find at health food stores and most pharmacies. Patients with pressure ulcers may require higher protein diets and more energy than other bedridden patients do. Zinc supplementation is often promoted as aiding in wound healing, yet evidence for its efficacy is far from conclusive.

Systemic inflammatory response syndrome (SIRS) is an inflammatory state of the body, without a proven source of infection, which occurs when inflammatory mediators are released into the systemic circulation. Sepsis, SIRSand multiple organ dysfunction syndrome (MODS) represent the progressive stages of the same illnesses. The causes of SIRS are categorised as being either infectious or non-infectious. Although infection can be a common cause of SIRS, it is not the only one. There are also different non-infectious causes, such as severe trauma and complications of surgery, acute pancreatitis, burns, haematoma and venous thrombosis, pulmonary and myocardial infarction, acute adrenal insufficiency, increased cytokine release, neuroleptic malignant syndrome, lymphoma, hypernephroma, tumour lysis syndrome, drug overdose and immunodeficiency (e.g. AIDS).

The role of diet and especially of immunonutrition in critically ill patients is vital, though still controversial. Enteral feedings with arginine, glutamine and omega-3 fatty acids and supplementation with nucleotides have been shown to be beneficial for these patients. Thus, a diet enriched with eicosapentaenoic acid (EPA), gamma-linolenic acid (GLA) and elevated antioxidants may contribute to better hospital outcomes and is associated with lower mortality rates. The appropriate provision of these nutrients has been shown to decrease infectious complications, the duration of hospitalisation and of mechanicalventilation.Thetypeoffeedingformulaandtherouteofnutrition vary, according mainly to the aetiology of SIRS.

MODS, also known as multiple organ failure (MOF), is a condition characterisedbyseveresystemicinflammationandcausedbyalteredorganfunction in acutely ill patients. The major causes of MODS are trauma, burns, haemorrhage, autoimmune disease and over-dosage of drugs and toxic chemicals. Nosocomial infections – related to decreased immune function and gut-barrier malfunction, increased catabolism, morbidity and high rates of mortality–arethemostcommonproblemsincriticallyillpatientswithMODS. MOF is the leading cause of mortality (50–80% of all deaths) in surgical ICUs.

Enteral feeding in MODS patients is the preferred route of nutrition, while the addition of nutritional substrates, such as glutamine, seems to preserve intestinal mucosal integrity and lymphoid tissue in the gastrointestinal tract, decreasing intestinal permeability and bacterial translocation.

## Life Expectancy

In 1935, it was first reported that calorie restriction extended lifespan in rats. Subsequent data have shown that calorie intake reduction without malnutrition slows ageing and prolongs maximum lifespan in other species as well. Maximum lifespan in rodents is also prolonged by intermittent fasting.

**The five main possible mechanisms are:**

reduced production of reactive oxygen species

decreased circulating T3 levels and sympathetic nervous system activity

decreased plasma inflammatory cytokine concentrations

protection against ageing-associated immune function deterioration

increased expression of protein chaperones and neurotrophic factors.

Although there are no validated biomarkers of ageing and it is impracticable toconductrandomised,diet-controlled,long-termsurvivalstudiesinhumans, epidemiologic data show that energy restriction may positively affect factors involved in the pathogenesis of ageing and life expectancy in humans. Coronary heart disease mortality rates, which had declined during World War II food shortages in Europe, rose again after the end of the war. In addition, Okinawa inhabitants, who ate fewer calories than Japanese, had lower cardiovascular disease and cancer rates. The causal association between energy restriction and longevity, however, has not been definitely proven.

**There are several changes:**

low percentage of body fat

low systolic and diastolic blood pressures

markedly improved lipid profile

increased insulin sensitivity

low plasma concentrations of inflammatory markers

low levels of circulating growth factors

low serum concentrations of T3.

Moreover, left ventricular diastolic function in calorie-restricted persons was similar to that of persons 16 years younger.

Calorie restriction leading to weight loss improves numerous obesityassociatedriskfactors.Recentstudieshavealsoshownthatlong-termweight loss caused by bariatric-surgery-induced calorie restriction reduces mortality in extremely obese individuals.

The optimal calorie intake for life prolongation is not known. However, the available data suggest that calorie restriction with adequate nutrient intake in humans is as beneficial as in animal models. It can increase life expectancy and enhance late-life quality by lessening chronic disease burden.Some people are genetically predisposed to live longer. Studies show that familial longevity is inherited, the mortality of centenarian siblings is almost half throughout life and their relative risk to reach 100 is higher than in the general population. Certainly, there are clear indications of thatInaccordancewiththeaboveresultsarethedataofanItalianstudyshowing that in older subjects the 'olive oil and salad' dietary pattern (which included the high intake of olive oil, raw vegetables, soups and poultry) was inversely associated with overall mortality, whereas the 'pasta and meat' pattern (including pasta, tomato sauce, red meat, processed meat, animal fat, white bread and wine) was associated with increased overall mortality. It is also worth noting that the Greek study mentioned above showed that adherence to a Mediterranean diet was essentially unrelated to body mass index (BMI), with small variations depending on model choice and with no practical consequences. A recent report from Finland clearly showed that the long-term change in population diets (mainly a reduction of saturated fat and an increase of unsaturated fat intake) resulted in a major increase in life expectancy and in an 80% reduction in annual cardiovascular disease mortality rates.

The association between the degree of adherence to the Mediterranean diet and survival of patients with diagnosed coronary heart disease (CHD) at enrolment was examined in a population-based prospective study of 1302 Greek men and women. The results showed that a greater adherence to the Mediterranean diet was associated with a significantly lower mortality rate among patients with prevalent CHD at enrolment. In addition, similar results were shown in a French study, the so-called Lyon Diet Heart Study, a randomised secondary prevention trial designed to test whether a Mediterranean diet may lower recurrence rates after a firstmyocardial infarction. The conclusion was that the cardioprotective effect of the Mediterranean diet pattern was maintained up to four years after the initial infarction. There are indirect indications that:

calorie restriction in adults may prolong lifespan

a greater adherence to the Mediterranean type of diet is associated with increased survival.

## HIV/AIDS

Acquired immunodeficiency syndrome (AIDS) is a disorder resulting from the infection with the human immunodeficiency virus (HIV), which leads to a profound immunosuppression and high susceptibility to life-threatening opportunistic infections and malignancies. It was first reported in 1981. HIV infection can be transmitted by:

unprotected vaginal and anal sexual intercourse

receiptofinfectedbloodandbloodproducts(sharinginjectingequipment between drug users, occupational accidents with needle stick injuries, infusion of contaminated blood products)

from the infected mother to the child during pregnancy, birth or breastfeeding (vertical transmission).

Since malnutrition is one of the most common problems in patients with HIV/AIDS, nutritional care aims predominately at the efficient provision of nutrients and the maintenance of body weight and lean body mass within normal levels. Moreover, the delay of wasting syndrome and the early detection and treatment of the metabolic disturbances due to the disease orSymptoms

CD4 lymphocytes count

A. Asymptomatic disease, acute retroviral syndrome, generalised lymphadenopathy

B .Symptoms of AIDS-related complex

C .AIDS-defining conditions >500/μL A1 B1 C1 200–499/μL A2 B2 C2 <200/μL A3 B3 C3

All patients in categories C1, B2, C2, A3, B3 and C3 are characterised as patients with AIDS.the antiretroviral therapy are of main concern. Finally, patients with HIV/AIDS should be provided with nutritional advice tailored to their specific needs, the possible side effects of their medications and their lifestyles.

The most common nutritional problem in symptomatic HIV disease is weight loss or wasting. Although its severity and frequency appear to be reduced by the use of antiretroviral therapy, it remains a problem. Since malnutrition can reduce the quality of life and increase morbidity and mortality in these patients, the early detection and treatment of the underlying cause of insufficient nutrient intake is of vital importance.

**Malnutrition in HIV patients can often be attributed to:**

reducedfoodintake,duetopsychologicalanneurologicalproblems,sore mouth or side effects of their medication (i.e. anorexia, vomiting, nausea)

altered metabolic needs due to the progression of the disease

malabsorption, especially in patients with chronic diarrhoea caused by gastrointestinal pathogens, by medication or by the HIV disease itself.

The main goal for asymptomatic or weight stable HIV-positive patients is to optimise food intake and to ensure the adequate intake of nutrients. Unintentional weight loss should be avoided by the sufficient provision of energy and protein. Although the micronutrient requirements of HIV-positive patients are unknown, a multivitamin and mineral supplement, providing no more than 100% of dietary reference intake (DRI) or reference nutrient intake (RNI)couldbeprescribedinordertoavoiddeficiencies,especiallywhenfood intake is compromised.

The main goals of the nutritional management of symptomatic patients with HIV infection are:

the preservation or increase of lean body mass

adequate provision of macro- and micronutrients

achievement and/or maintenance of a body weight within the normal values for body mass index (BMI)

provision of symptomatic relief, according to the patient's needs.

The energy needs of these patients vary greatly, according to the state of the disease, the presence of problems that could compromise absorption and the utilisation of nutrients. Ideally, energy needs should be calculated by indirect calorimetry. However, in the clinical setting, energy needs could be calculated, with limited accuracy though, by the use of equations such as the Harris-Benedict or Schofield equations, taking into account the relative stress factors according to the overall health status of the patient. Energy requirements are likely to increase by 10% to maintain body weight and physical activity in asymptomatic HIV-infected adults. During symptomatic HIV, and subsequently during AIDS, energy requirements increase by approximately 20–30% to maintain adult body weight. Protein needs in HIV-positive patients are considered relatively high. A dietaryproteinintakeof1.5–2g/kgisconsideredadequateforthemajorityof patients.Likewise, providing 20% of a patient's dailyenergy intake as protein seems to cover the needs of HIV-infected patients, given the fact that their energy needs are high. These recommendations may differentiate in patients with kidney or hepatic disease. In these cases, the relevant recommendations for non-HIV patients should be followed.

Accordingtotheavailabledata,HIV-positivepatientsseemtohavelower levels of vitamin A, B6, C and E in the bloodstream. These data possiblysuggest that HIV-positive patients may need these vitamins more than the healthy population does.

'Highly active antiretroviral therapy' (HAART) is a term used to describe the use of a combination of antiretroviral drugs for the treatment of HIV infection. The main antiretroviral drugs that are used for HIV-positive subjects are categorised according to the phase of the retrovirus life cycle that the drugs inhibit, as follows:

nucleosideandnon-nucleosidereversetranscriptaseinhibitors(NRTIsand nNRTIs respectively) inhibit reverse transcription of the virus.

protease inhibitors (PIs) inhibit the activity of protease (an enzyme used by HIV to cleave nascent proteins for the final assembly of new virons).

integrase inhibitors inhibit integrase, the enzyme that is responsible for the integration of viral DNA into the DNA of the host cell.

fusion inhibitors interfere with the binding, fusion and entry of the HIV virus to the host cell. maturation inhibitors inhibit the last step of virus production, by blocking the formation of the capsid protein of the virus.

The use of HAART has transformed HIV infection from an acute illness to a manageablechroniccondition.However,thesignificantdecreaseinmortality of HIV patients and the increase in their life expectancy have been accompanied by several clinical and metabolic complications. Nutrition-related side effects have been shown to correlate negatively with quality-of-life measures in people infected with HIV. The most common gastrointestinal adverse effects include nausea, vomiting, dyspepsia, anorexia, abdominal pain, chewing/swallowing difficulties and taste alterations. Usually, these effects lose their intensity after the first month of treatment. If they persist, they may compromise dietary intake, and a change in the drug regimen should be considered. Providing specific strategies to support patients through these challenges is an important part of nutritional therapy.

The main metabolic complication is described as 'HAART-induced lipodystrophy syndrome', which includes:

lipoatrophy (face, extremities and buttocks)

fataccumulation(abdomen,dorsocervicalorsupraclavicularfatpad–buffalo hump)

dyslipidaemia [hypertriglyceridaemia, hypercholesterolaemia and low high-density lipoprotein (HDL) cholesterol]

insulin resistance and glucose intolerance and lactic acidosis.

In the absence of results from randomised, controlled clinical trials evaluating specific dietary interventions in HIV-infected patients with lipid disorders, the current recommendations for the management of dyslipidaemia in HIVinfected patients receiving HAART do not differ from the recommendations forthenon-HIV-infectedpopulation.ItissuggestedthatHIV-infectedpatients withdyslipidaemiashouldfollowtheNationalCholesterolEducationProgram Adult Treatment Panel III (NCEP ATP III) recommendations, which include dietary restriction of total fat to 25–35% of total energy intake, saturated fat to less than 7% of total calories, dietary cholesterol to less than 200mg per day, use of plant sterols (2g/d) and attainment of a prudent diet increased with a high intake of dietary fibre (10–25g/d 'Wasting syndrome' is a term used to describe unintentional weight loss (>10% of the usual body weight) in combination with diarrhoea, fatigue and/or fever for a period of more than 30 days. The weight loss concerns mainly the loss of lean body mass and, secondarily, fat mass. Wasting can contribute to the deterioration of a patient's immune system and is connected with high rates of mortality and usually signals that the HIV-infection is progressing to AIDS. Detailed dietary assessment should be performed regularly in HIV-infected patients to ensure the early detection of wasting syndrome. When and if it is identified, certain actions should take place in order to maximise dietary intake of the patient and halt their weight loss. Dietary advice should focus on energy- and nutrient-dense foods, while meal planning should be the first priority for these patients. Food enrichment and food fortification could also improve the nutrient intake. If the patient's dietary intake remains compromised, oral supplements could be used. If the patient fails to attain a sufficient dietary intake, the use of artificial nutritionshouldbeconsidered.Enteralandparenteralnutritioncouldbeused in order to preserve the patient's nutritional status.

Omega-3 fatty acids – namely eicosapentaenoic and docosahexaenoic acid – have been shown to be effective for lowering triglycerides in patients with

HIV-associated dyslipidaemia. A 16-week randomised study in patients with HAART-associated hypertriglyceridaemia showed that fish oil supplementation reduced plasma triglyceride by 20%. Other studies have demonstrated thebenefitsofomega-3fattyacidsaswell.Omega-3fattyacidsmayalsohave secondary benefits in decreasing bone resorption and decreasing markers of systemic inflammation.

HIV-infected patients, owing to their compromised immune system, are usually more vulnerable to food-borne illness than the non-infected population. Special care should be taken for the education of HIV-infected patients in the safe handling of food in order to minimise the danger of a food-borne illness. Strict hygiene measures should be taken during food preparation, and foods easily spoilt or of a high microbial load should be avoided (raw or semi-raw meat and fish, raw eggs, non-pasteurised milk and milk products, soft cheese and cheese with moulds, i.e. Roquefort or blue cheese).

Moreover, attention shouldbepaidtotheexpirydatesoffoodproductsandtothecarefulstoring of food. In the developed world, tap water is usually safe. If water comes from wells or rivers, it should be boiled before it is consumed. Ice cubes and cold drinksshouldalsobeprepared fromsafewaterinordertoavoidwater-borne illnesses.

## Neurological and Mental Disorders

Dysphagia, or difficulty in swallowing, is a common problem in patients with neurological diseases, often resulting in aspiration pneumonia, compromised nutrient intake, dehydration and malnutrition. The main signs and symptoms of dysphagia include:

excessive saliva excretion, choking and coughing during or after meals poor control of tongue, excessive tongue movement and spitting food out of the mouth inability to drink liquids through a straw pocketing of food in cheek or under tongue wet 'gurly' voice after eating or frequent throat clearing delayed or absent laryngeal elevation prolonged chewing or eating time chronic or recurrent upper respiratory problems.

The main goals for the nutritional management of a dysphagic patient are:

the determination of the safest route for the provision of food, to prevent aspiration and choking.

the evaluation of the problem and the assessment of the texture of the foods that the patient can tolerate.

the provision of sufficient energy and nutrient intake, to ensure the best possible nutritional status of the patient.

the intake of sufficient liquid to prevent dehydration.

Consistency Description Foods Pur´eed Pudding-like consistency, thick, homogenous textures Ground or minced Easily mashed foods, no coarse textures, raw fruits or vegetables (except for raw banana) Soft or easy to chew Soft foods prepared without use of blender; meats minced or cut in small pieces, no tough skins, nuts or raw crispy or stingy foods Modified, general Soft textures prepared without grinding or chopping; no nuts or crispy foods Fluids Thin Regular fluids Nectar-like Fluids thin enough to be sipped through a straw or a cup, but thick enough to fall off a tipped spoon slowly (e.g. buttermilk, milkshake) Honey-like Thick fluids eaten with a spoon, too thick for a straw and unable to hold their shape (e.g. thick yogurt, honey) Spoon-thick Pudding-like fluids that must be eaten with a spoon, that can hold their shape on a spoon (e.g. milk pudding, jelly)

Dysphagia diets must be highly individualised, depending on the patient's chewing and swallowing ability. Foods' texture and viscosity may be altered in order to be tolerated. Fluids and liquids are categorised in four groups, progressing form the easiest to most difficult to swallow. The description of food and fluid consistencies is included in Table 16.1.

Food items used in pur´eed preparations should be thoroughly cooked. This causes the loss of a significant amount of their vitamin and mineral content andoftentheprescriptionofamultivitaminisnecessaryinordertoensurethat the patient receives sufficient micronutrient intake. Moreover, constipation is very common among these patients, since texture manipulation through stirring and diluting the food items results in feeds relatively low in dietary fibre. Another problem that can also compromise the nutritional intake of dysphagic patients is the alteration in food appearance and smell following texture manipulation. The use of special equipment that can give special forms to the food and taste enhancers can be used in order to ensure food palatability and better patient compliance.

Perniciousanaemiawasfirstdescribedin1948.Itisamacrocytic,megaloblastic anaemia, caused by B12 deficiency or by secondary vitamin deficiency due to a lack in the intrinsic factor, which is excreted in the stomach and is necessary for the absorption of B12. The overt symptoms of pernicious anaemia includeparaesthesia,numbnessandtinglingoffeetandhands,poormuscular coordination, poor memory and diminution of the sensation of vibration and position. Its treatment consists of intramuscular or subcutaneous injections of B12. For the nutritional management of pernicious anaemia, food items such as meat, eggs and dairy foods are considered rich sources of vitamin B12 and should be included in the diet plan of the patient to ensure the sufficient dietary intake of this vitamin.

Nutritional neuropathies mainly affect the peripheral nervous system, and their symptoms include lean body mass depletion and progressive wasting. Early signs are anorexia, irritability, weight loss and abdominal discomfort, while in the long term paralysis, numbness and the disturbance of a patient's sense of hot and cold may be observed. The most common forms of nutritionalneuropathies–beriberiandalcoholicneuropathy–canbeattributedto thiamindeficiency,butotherdeficienciesinB-complexvitaminscannotbeexcluded. The nutritional management of these neuropathies is a balanced diet with supplementation of B-complex vitamins. Specifically in alcoholic neuropathy, thiamin supplements should be added, and abstinence from alcohol is essential for the recovery of the patient.

When a patient with a recent stroke is being evaluated, it must be taken into account that:

A brain injury due to a stroke results in a hypercatabolic state for patients, raising their energy and protein needs significantly. Moreover, as insulin resistanceandelectrolyteimbalancesarerathercommoninthesepatients, they should also be co-estimated.

A stroke can severely modify the ability of the patient to receive food without help.

Neurological deficit Influence on nutritional parameters Perception Disturbed perception of time. Unable to identify meal times Visual perception/ hemianopsia Cannot define or recognise food items. In some cases only half of the plate is seen and therefore only half of the food is eaten Spatial deficits Unable to analyse position of the plate Behaviour Food thrown around and not eaten Apraxia Unable to use cutlery and self-feed Aphasia Forget to eat Memory Forget that he/she has already eaten Hemiplegia Able to use only one hand to self-feed Ataxia Unable to self-feed Psychological influences/ depression Limited appetite

Malnutrition is common in patients with stroke, caused either by their increased nutritional needs or by their compromised nutritional intake, and can prolong the recovery or increase comorbidities, such as pressure ulcers and infections.

Cognitive decline and dementia deeply affect the quality of life of older peopleandtheircaregivers.TherapeuticoptionsforthetreatmentofAlzheimer's diseaseanddementiahavebeenshowntobeoflimitedefficacy,andprevention strategies are mandatory. There is cumulative evidence of the possible protective role of lifestyle and diet-related factors for the prevention of cognitive decline. At present, in older subjects, balanced diets, the prevention of nutritional deficiencies of antioxidants by nutritional supplements and moderate physical activity could be considered the first line of defence against the onset or progression of dementia. Moderate alcohol consumption seems to be a protective factor against mild cognitive impairment, dementia and Alzheimer's disease. Apart from alcohol, dietary models based on complex carbohydrates, fruits and vegetables and low in animal fat appear to protect against cognitive decline that is degenerative or vascular in origin, owing mainlytothehighprovisionofantioxidants.FishconsumptionhasbeenassociatedwiththelowerriskofAlzheimer'sdiseaseinlongitudinalcohortstudies.
Conversely,vitamindeficienciescouldhaveanegativeimpactoncognition in older people, while the aluminium content of foods and water may also affect the risk of developing Alzheimer's disease.

maintain a state of ketosis and their beneficial effect may be attributed to the role of ketone bodies as inhibitory neurotransmitters, providing an anticonvulsant effect to the patient. There are two forms of ketogenic diets: the traditional one and the ketogenic diet based on medium-chain triglycerides (MCT). Both forms of these diets are calculated to provide 75% of the recommended dietary allowance (RDA) of energy for the child's ideal weight and height and a 4:1 ratio of kcal from fat to kcal from protein and carbohydrates respectively. But it must be borne in mind that the child receives sufficient protein provision to ensure growth (approximately 1g/kg body weight/day). Fluids are controlled (approximately 65ml/kg/day) and should not exceed 2l/day. The MCT approach provides 50–70% of kcals in the form of MCT oil. In the MCT approach, a greater amount of non-ketogenic food is allowed as ketosis can be more easily achieved with MCT oil, and fluid restriction is not necessary. It should be stressed that the ketogenic diet is a difficult diet to follow, and can be nutritionally incomplete. Therefore, a

multivitamin supplement is often needed to ensure the sufficient nutritional intake and growth of the child. Ketogenic diets are often discontinued after 2–3 years.

One of the main problems associated with multiple sclerosis is malnutrition due to the loss of interest in, or inadequate consumption of, food.

The aetiology of malnutrition in these patients is:

psychological factors, e.g. anorexia or depression, as a result of the diagnosis side effects of the medical treatment fatigue and disability in preparing meals.

Apartfromundernourishment,overweightandobesityduetolimitedphysical exercise and increased appetite mainly due to corticosteroid therapy can also be observed in this population. Moreover, binge eating and bulimic episodes can be seen as a result of depression in these patients.

It is also noteworthy that constipation is a common symptom, resulting from reduced mobility and physical exercise, restricted fluid intake due to problems in micturition or continence and reduced bowel movement due to the disease.

Parkinson's disease frequently affects patients' nutritional intake. The symptomsofthediseasecanvarybetweenpatientsandmayworsenasthedisease progresses. They can include:

tremor and rigidity, causing difficulties in preparing food and self-feeding slow movement, resulting in extended meal duration depression, limited appetite, apathy drug side effects (nausea, vomiting, anorexia) swallowing difficulties (dysphagia).

Patients with Parkinson's disease may also have increased energy requirements due to tremor and rigidity thus worsening the effects of an already inadequate intake.

Nutritional intervention should aim to promote an adequate dietary intake, taking intoaccountany difficultiesin feeding due to symptomsofParkinson's disease. Such interventions may include nutritional support (e.g. supplementation, tube feeding during the end stages of the disease and texture modification due to dysphagia). Table 16.3 proposes specific solutions for the problems that are usually seen in patients with Parkinson's disease.

Levodopa (or L-DOPA) is used in the treatment of Parkinson's and has been foundtobeaffectedbydietaryintake,particularlythatofneutralaminoacids, which compete with the levodopa and reduce its action. Recent interest has focused on the use of protein redistribution diets to optimise the action of Levodopa.Thismayinvolvelimitingproteinorredistributingitwithinthediet toreducetheproteinloadatbreakfastandlunchandmovingittotheevening meal. Interest has also arisen around the effects of antioxidant nutrients in the prevention of Parkinson's; however, there is no evidence to suggest that they have any effect on the progression of the disease.

The main types of mood disorders are depression, anxiety and mania. Its nutritional implications depend on the severity of the disorder, and some of the most common ones are summarised in Table 16.4. Severe depression can alter a patient's interest in food, either by increasing the amount of food consumed or by causing anorexia or food refusal. Moreover, mainly owing to neurotransmitterimbalance,depressioncancausecarbohydratecravings, resulting in weight gain. Depression can also diminish thirst sensation, resulting in a high risk of dehydration for these patients.

Mood disorder Influence on food intake Nutritional implication Depression Reduced interest in food, apathy, anorexia, food refusal Weight loss, malnutrition Loss of thirst sensation Dehydration, constipation Carbohydrate cravings Weight gain, dietary imbalances Anxiety Diarrhoea, abdominal pain or discomfort Selective avoidance of food groups, excessive nutrient losses Mania Xerostomia and altered taste due to drugs' side effects Difficulties in chewing and swallowing Increased appetite Weight gain, obesity Strange food habits Nutrient imbalances, weight gain

Anxiety can also have an effect on the nutritional status of the patient. It is often accompanied by diarrhoea and abdominal pain or discomfort, causing the selective avoidance of food groups and excessive nutrient losses. Finally, mania can be accompanied by unusual eating habits and increased appetite,causingweightgainandnutritionalimbalance.Moreover,drugside effects include taste alterations and xerostomia, resulting in difficulties in swallowing and chewing.

Lithium salts are used for the treatment of mania and have a very narrow range between therapeutic effectiveness and toxicity. Therefore, they should be used only for the period they are necessary, as their long-term use is connected with undesired effects on renal function. Moreover, there is an inverse relationship between sodium intake and serum lithium levels, and toxicity from lithium can be a result of sodium restriction. Patients receiving therapy with lithium should be encouraged to maintain sufficient fluid intake and avoid dietary modifications that could alter their sodium intake.

**VALUE ADDED COURSE**
**CLINICAL NUTRITRION**
**Annexure II**

STUDENT ENROLLMENT LIST (JAN-JUNE 2016)

| S.No. | University no | Name of the student | Year / | |
|---|---|---|---|---|
| 1. | U14MB301 | RENJITH. J | II nd | Renjith |
| 2. | U14MB302 | RESHMA. R.L. | II nd | Reshma |
| 3. | U14MB303 | RICHARD ROZARIO. C | II nd | Richard Rozario |
| 4. | U14MB304 | RUBINA.S | II nd | Rubina |
| 5. | U14MB305 | SABARI KRISHNAN.N | II nd | Sabari Krishn |
| 6. | U14MB306 | SANDHYA.S | II nd | Sandhya |
| 7. | U14MB307 | SANTHOSH KUMAR. L | II nd | Santhosh Kumar |
| 8. | U14MB308 | SARAN. S | II nd | Saran |
| 9. | U14MB309 | SASIDHARAN. V | II nd | Sasidharan |
| 10. | U14MB310 | SENTAMIL SELVAN .P | II nd | Sentamil Selvan |
| 11. | U14MB311 | SHALINI. T. C. | II nd | Shalini |
| 12. | U14MB312 | SHANMUGA RAJA. A | II nd | Shanmuga Raja |
| 13. | U14MB313 | SHANMUHA PRIYA. S | II nd | Shanmuga Priya |
| 14. | U14MB314 | SHAREEFA AKHTAR.S | II nd | Shareefa Akhtar |
| 15. | U14MB315 | SHEMBIYAN. R.M. | II nd | Shembiyan |
| 16. | U14MB316 | SIKKANDAR. A | II nd | Sikkandar |
| 17. | U14MB317 | SINDHU. M | II nd | Sindhu |
| 18. | U14MB318 | SIVARAJ. S | II nd | Sivaraj |
| 19. | U14MB319 | SOUNDARYA. S | II nd | Soundarya |
| 20. | U14MB320 | SOWMYA DEVI. N | II nd | Sowmya devi |

**RESOURCE PERSON**

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**Dr K.SELVARAJU**

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Osudu, Kudapakkam, Puducherry - 605 502.

**Annexure III**

# MCQs: CLINICAL NUTRITION

1. When the food is directly given in the veins ,it is called ___ nutrition

    a. Parenteral

    b. Enteral

    c. Intravenous

    d. Saline

2. When food is given in the stomach /intestines directly then it is ___nutrition

    a. Intravenous

    b. Saline

    c. Enteral

    d. Parenteral

3. A person who has, had a renal transplant should regulate the intake of

    a. Carbohydrates

    b. Proteins

    c. Fat

    d. Vitamins

4. To overcome diabetes, a person can increase the intake of___and reduce the intake of ___

    a. Carbohydrates , proteins

    b. Proteins , fats

    c. Fats, carbohydrates

    d. Carbohydrates, fats

5. For a person suffering from problems like slow neural transmission eg: dementia ,they should be given

a. Increased sodium

b. Increased potassium

c. Increased calcium

d. Increased  magnesium

6. A person who is suffering from high blood pressure should cut down on____

a. Sodium

b. Potassium

c. Calcium

d. Magnesium

7. Long period of parenteral nutrition is not recommended because of

a. It increase the toxicity of blood

b. It puts pressure on the kidney

c. It will put pressure on the heart

d. It causes the cell pack to degenerate

8. In case of muscle fatigue, which of the vitamin should be taken

a. A

b. D

c. E

d. K

9. Which vitamin in large amount harms the bone

a. A

b. B

c. C

d. D

10. In case of renal insufficiency what should be taken in place of protein

a. Glucose

b. Vit. K

c. Triglycerides

d. Essential amino acids

Renjith. J

**Annexure III**

# MCQs: CLINICAL NUTRITION

8/10

1. When the food is directly given in the veins ,it is called ___ nutrition

   a. Parenteral

   b. Enteral

   c. Intravenous

   d. Saline

2. When food is given in the stomach /intestines directly then it is ___nutrition

   a. Intravenous

   b. Saline

   c. Enteral

   d. Parenteral

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   b. Proteins

   c. Fat

   d. Vitamins

4. To overcome diabetes, a person can increase the intake of___and reduce the intake of ___

   a. Carbohydrates , proteins

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   d. Carbohydrates, fats

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b. Vit. K

c. Triglycerides

d. Essential amino acids

Gindho. H

**Annexure III**

# MCQs: CLINICAL NUTRITION

7/10

1. When the food is directly given in the veins ,it is called ___ nutrition

   a. Parenteral

   b. Enteral

   c. Intravenous

   d. Saline

2. When food is given in the stomach /intestines directly then it is ___nutrition

   a. Intravenous

   b. Saline

   c. Enteral

   d. Parenteral

3. A person who has, had a renal transplant should regulate the intake of

   a. Carbohydrates

   b. Proteins

   c. Fat

   d. Vitamins

4. To overcome diabetes, a person can increase the intake of___and reduce the intake of ___

   a. Carbohydrates , proteins

   b. Proteins , fats

   c. Fats, carbohydrates

   d. Carbohydrates, fats

5. For a person suffering from problems like slow neural transmission eg: dementia ,they should be given

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b. B

c. C

d. D

10. In case of renal insufficiency what should be taken in place of protein

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b. Vit. K

c. Triglycerides

d. Essential amino acids

**Annexure V**

**Student Feedback Form**

Course Name: **CLINICAL NUTRITION**

Subject Code: **ANAES 02**

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: **CLINICAL NUTRITION**

Subject Code: **ANAES 02**

Name of Student: RUBINA.B Roll No.: 014MB304

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:

Need More couse content

**Annexure V**

**Student Feedback Form**

Course Name: **CLINICAL NUTRITION**

Subject Code: **ANAES 02**

Name of Student: SARAN.S Roll No.: U14MB308

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: 15.05.2016

From
Dr. Nithianandam
Professor and Head,
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: Clinical nutrition**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Clinical Nutrition in January-June 2016 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. S Nithianandam

Head of Dept. Anaesthesiology,
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 _SHALINI T C____ has actively participated in the Value Added Course on Clinical Nutrition held during January - June 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

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

Dr.SELVARAJU.K

RESOURCE PERSON

Dr. NITHIANANDAM S

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

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 __SANTOSH KUMAR L_____ has actively participated in the Value Added Course on Clinical Nutrition held during January - June 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.SELVARAJU K

RESOURCE PERSON

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

Dr. NITHIANANDAM S

COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry - 605 502


REDMI K20 PRO
AI TRIPLE CAMERA

Name list

**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

**OSUDU, AGARAM VILLAGE,KUDAPAKKAM POST,PUDUCHERRY-605502.**

Date: 29.12.2015

From
DR.BALAJI SUBRAMANIYAN. R
ASSOCIATE PROFESSOR
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: *Oral manifestations of Diabetes Mellitus on 12.1.16***

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: ***Oral manifestation of Diabetes Mellitus*** on 12.1.2016. 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.JAYAKUMAR

The HOD: DR. BALAJI SUBRAMANIYAN. R

The Expert: DR.BALAJI SUBRAMANIYAN. R

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. R. BALAJI SUBRAMANIYAN
Associate Professor
Department of Dentistry
Sri Lakshmi Narayana
Institute of Medical Sciences
Osudu, Agaram, Puducherry.

HOD

Dr. R. BALAJI SUBRAMANIYAN
Associate Professor
Department of Dentistry
Sri Lakshmi Narayana
Institute of Medical Sciences
Osudu, Agaram, 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

8.1.2016

**Sub: Organising Value-added Course: *Oral manifestations of 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, **Bharath Institute of Higher Education and Research**, is organising **"*Oral manifestations of 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 10.1.2016. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. P. JAYAKUMAR, M.S., M.Ch.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Puducherry-605502.

Dean

Encl: Copy of Course content and Registration form.

# COURSE PROPOSAL

**Course Title:** ***Oral manifestations of Diabetes Mellitus***

**CourseObjective: To create awareness among medical students about Oral manifestations of diabetes mellitus**

**CourseOutcome:In depth knowledge in oral examination**

**Course Audience:MBBS STUDENTS**

**Course Coordinator: Dr. Jayakumar**

**Course Faculties with Qualification and Designation:**

1. **Dr. Balaji Subramaniyan. R M.D.S & associate professor**

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1. | 12.1.16 | Sigificance of oral hygience in dm patients | 4PM-7PM | 3 hrs |
| 2. | 22.1.16 | Oral manifestations in Diabetes melitus | 4pm-7 pm | 3hrs |
| 3. | 7.2.16 | Gingival abscess | 5pm-8pm | 3 hrs |
| 4. | 16.2.16 | Periodontal abscess | 4pm-7pm | 3hrs |
| 5. | 27.2.16 | Dento alveolar abscess | 5pm-8pm | 3 hrs |
| 6. | 6.3.16 | Patients care in type I diabetes | 5pm-8pm | 3 hrs |
| 7. | 12.3.16 | Patients awareness about oral hygiene in Dm pts | 4pm-7pm | 3 hrs |
| 8. | 21.3.16 | Halitosis | 5pm-8pm | 3 hrs |
| 9. | 26.3.16 | Oral examination of DM pts | 5pm-8pm | 3 hrs |
| 10. | 12.4.16 | Recurrent gingival inflammation | 4pm-7pm | 3 hrs |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | Total Hours | 30 |

**REFERENCE BOOKS: (Minimum 2)**

**1.BURKET'S ORAL MEDICINE**

**2. GHOM'S ORAL MEDICINE**

# Oral Manifestations and Complications of Diabetes Mellitus


## Abstract

DIABETES MELLITUS IS A GROWING PUBLIC health concern and a common chronic metabolic disease worldwide. Diabetes mellitus represents a group of metabolic diseases that are characterised by hyperglycaemia due to a total or relative lack of insulin secretion and insulin resistance or both. The metabolic abnormalities involve carbohydrate, protein and fat metabolism. Diabetes mellitus affects all age groups, but is more common in adults. The World Health Organization (WHO) has recently declared it to be a pandemic. Its prevalence has increased dramatically over the past few decades and it is expected to triple in the next decade. Diabetes mellitus is considered a leading cause of death due to its microvascular and macrovascular complications. The most common types of diabetes are type 1 (also known as insulin dependent) and type 2 (also known as non-insulin-dependent). Type 2 is the more prevalent type. Countries with the highest rates of diabetes in the Eastern Mediterranean region and the Middle East are the United Arab Emirates, Saudi Arabia, Bahrain, Kuwait and Oman.[9] Oman is one of the countries that has a high prevalence of diabetes mellitus, especially type 2 diabetes, and its prevalence is expected to increase in the next twenty years.

Various inflammatory diseases and soft tissue pathologies in oral cavities are associated with diabetes mellitus; however, awareness of these complications is lacking worldwide. Periodontal diseases have been proposed as the sixth most prevalent complication of diabetes mellitus following the other diabetic complications. It has been reported as a more frequent oral complication of diabetes compared to other oral manifestations such as dry mouth and caries. Periodontitis is more frequent and severe in patients with diabetes with poor glycaemic control. Early identification and/or management of these oral manifestations may help in the early diagnosis of diabetes and in attaining better glycaemic control. Therefore, diabetic oral complications need to be identified and included in the ultimate care of diabetes in order to fight this chronic metabolic disease effectively.


## Oral Complications and Manifestations of Diabetes Mellitus

Several soft tissue abnormalities have been reported to be associated with diabetes mellitus in the oral cavity. These complications include periodontal diseases (periodontitis and gingivitis); salivary dysfunction leading to a reduction in salivary flow and changes in saliva composition, and taste dysfunction. Oral fungal and bacterial infections have also been reported in patients with diabetes. There are also reports of oral mucosa lesions in the form of stomatitis, geographic tongue, benign

migratory glossitis, fissured tongue, traumatic ulcer, lichen planus, lichenoid reaction and angular chelitis. In addition, delayed mucosal wound healing, mucosal neuro-sensory disorders, dental carries and tooth loss has been reported in patients with diabetes. The prevalence and the chance of developing oral mucosal lesions were found to be higher in patients with diabetes compared to healthy controls.

## Periodontal Diseases

### Pathophysiologylogy of Periodontitis

Periodontitis is one of the most widespread diseases in the world affecting the oral cavity, and is highly prevalent in both developed and developing countries.28 Periodontitis is a chronic inflammatory disorder affecting the gingivae and the periodontal tissue initiated by bacteria.29 The micro-flora in the dental plaque that forms daily adjacent to the teeth causes this inflammatory process. Eventually, the toxins that are released by the microorganisms in the dental plaque will start the gingival inflammation as a result of failure to remove the dental plaque on a daily basis. A periodontal pocket is formed as a result of the progression of the gingival inflammation causing the gingivae to detach from the tooth surface. This periodontal pocket is filled with bacteria and its toxins. As the disease worsens, the pocket will get deeper carrying the dental plaque until it reaches the alveolar bone that will eventually be destroyed with the periodontal attachment. This process is very common and causes destruction of periodontal tissues, loss of alveolar bone and, finally, tooth loss . There are many factors contributing to this type of inflammation beside the presence of bacteria in dental plaque; a susceptible host is one of them

### Periodontitis and Diabetes Mellitus

The link between diabetes mellitus and periodontal disease is not well recognised by the medical community. Periodontal disease has been reported with increased prevalence and severity in patients with type 1 and type 2 diabetes.30 The mechanism by which hyperglycaemia can induce periodontal destruction is not yet fully understood. However, there are many theories which propose factors such as advanced glycation end products, changes in collagen statue, and altered immune function that causes impaired polymorphonuclear leukocyte function which may facilitate bacterial persistence in the tissue and the accumulation of advanced glycation end products, which results from prolonged and chronic hyperglycaemia

Diabetes mellitus (DM) is probably one of the oldest diseases known to man. It was first reported in Egyptian manuscript about 3000 years ago. In 1936, the distinction between type 1 and type 2 DM was clearly made.Type 2 DM was first described as a component of metabolic syndrome in 1988. Type 2 DM (formerly known as non-insulin dependent DM) is the most common form of DM characterized by hyperglycemia, insulin resistance, and relative insulin deficiency. Type 2 DM results from interaction between genetic, environmental and behavioral risk factors.

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. As a result of this trend, it is fast becoming an epidemic in some countries of the world with the number of people affected expected to double in the next decade due to increase in ageing population, thereby adding to the already existing burden for healthcare providers, especially in poorly developed countries. This review is based on a search of Medline, the Cochrane Database of Systemic Reviews, and citation lists of relevant publications. Subject heading and key words used include type 2 diabetes mellitus, prevalence, current diagnosis, and current treatment. Only articles in English were included.

Screening and diagnosis is still based on World Health Organization (WHO) and American Diabetes Association (ADA) criteria which include both clinical and laboratory parameters. No cure has yet been found for the disease; however, treatment modalities include lifestyle modifications, treatment of obesity, oral hypoglycemic agents, and insulin sensitizers like metformin, a biguanide that reduces insulin resistance, is still the recommended first line medication especially for obese patients. Other effective medications include non-sulfonylurea secretagogues, thiazolidinediones, alpha glucosidase inhibitors, and insulin. Recent research into the pathophysiology of type 2 DM has led to the introduction of new medications like glucagon-like peptide 1 analogoues: dipeptidyl peptidase-IV inhibitors, inhibitors of the sodium-glucose cotransporter 2 and 11ß-hydroxysteroid dehydrogenase 1, insulin-releasing glucokinase activators and pancreatic-G-protein-coupled fatty-acid-receptor agonists, glucagon-receptor antagonists, metabolic inhibitors of hepatic glucose output and quick-release bromocriptine. Inhaled insulin was licensed for use in 2006 but has been withdrawn from the market because of low patronage

and increased secretion of pro-inflammatory cytokines such as tumour necrosis factor-α and prostaglandin E-2.[31,32] The increase in collagenase activity together with the reduction in collagen synthesis will adversely influence collagen metabolism. This would result in compromised wound healing as well as periodontal tissue destruction. Recent studies indicate that periodontitis has a bidirectional effect on glycaemic control in patients with diabetes.[33] There is a cluster of research studies, which support the hypothesis of periodontitis occurring more frequently in patients with diabetes with poor glycaemic control.[33–38] In addition, there is enough evidence to support the hypothesis that poor periodontal conditions could worsen glycaemic control as well. Many studies report that diabetes is a risk factor for gingivitis and periodontitis and it is more severe with poor glycaemic control [Figure 2].[39] The risk of developing periodontitis in patients with diabetes has been reported to be three times higher than the general population.[40]

Numerous risk factors have been reported that make patients with diabetes more susceptible to periodontal disease, especially those with poor oral hygiene, poor metabolic control, longer duration of diabetes and who are smokers.[41–43] Smoking was identified in many studies as being a major preventable risk factor for periodontal disease and tooth loss in the general population and in patients with diabetes.[44–48] The dentist and the physician should play an important role in advising and supporting patients with diabetes regarding smoking cessation. The dentist should be engaged in counselling these patients and referring them to a specialist organisation which deals with smoking cessation.[49]

Several studies showed that the treatment of periodontal disease has an influence on glycaemic control in both type 1 and type 2. A recent meta-analysis of the efficacy of periodontal treatment on glycaemic control in patients with diabetes suggested that such treatment could lead to a significant reduction in HbA1c.[50] However, they also recommended that the results need to be viewed with caution due to a lack of strength and limitations in the designs of some of the studies included. Periodontitis and diabetes are related to each other therefore further larger studies are required to determine the effect of periodontal treatment on glycaemic control.

## Salivary and Taste Dysfunction

### Salivary Dysfunction

Saliva has a major role in maintaining a healthy oral cavity. Saliva is produced by major salivary glands (parotid, sub-mandibular and sub-lingual) and numerous minor salivary glands distributed in the oral cavity. Salivary dysfunction has been reported in patients with diabetes.[51,52] A cross sectional epidemiological study was conducted in 2001 to look at the prevalence of hyposalivation and xerostomia (dry mouth) and to determine the relationship between salivary dysfunction and diabetes

complications. This study was conducted in type 1 diabetics and control subjects without diabetes. They found that symptoms of reduced salivary flow rate and xerstomia were more frequently reported by patients with diabetes than the controls, especially by those diabetics who had developed neuropathy.[53] Other studies conducted in type 2 diabetics also confirmed that xerostomia and hyposalivation were more prevalent in this group of patients.[54] It has been shown that poorly controlled type 2 diabetics have a lower stimulated parotid gland flow rate compared to well-controlled patients and patients without diabetes.[55] An increase in salivary pathogens was also reported in these patients.[56] Patients with diabetes usually complain of xerostomia and the need to drink very often (polydypsia and polyuria). The constant dryness of the mouth would irritate the oral soft tissues, which in turn will cause inflammation and pain. Patients with diabetes with xerostomia are more predisposed to periodontal infection and tooth decay. The cause of this is not yet fully understood in patients with diabetes, but may be related to polydypsia and polyuria or alternation in the basement membrane of the salivary glands. It is known that diabetes mellitus is associated with chronic complications such as neuropathy, micro-vascular abnormalities and endothelial dysfunction that lead to deterioration of microcirculation and this may play a role in reduction of the salivary flow rate and composition.[57,58] Sialosis is defined as asymptomatic, non-inflammatory, non-neoplastic, bilateral chronic diffuse swelling mainly affecting the parotid glands. Sialosis has been found to be more prevalent in patients with diabetes mellitus.[59]

### Taste Dysfunction

There are many factors that have been implicated in altered taste sensation in the oral cavity. Metabolic and endocrine diseases were proposed as causative factors for this disturbance; nevertheless, salivary dysfunction can contribute to altered taste sensation or elevation of detection thresholds.[60, 61] Taste dysfunction has been reported to occur more frequently in patients with poorly controlled diabetes compared to healthy controls.[62] Diabetic patients who suffer from neuropathy have a higher taste threshold. Taste disturbance has also been reported to lead to poor glycaemic control by inhibiting the ability to maintain a good diet.[63]

## Oral Infection

### Fungal Infections

Oral candidosis is an opportunistic infection frequently caused by *Candida albicans* species. Many predisposing factors can lead to this infection; these include smoking, xerostomia and endocrine and metabolic diseases.[64] Other factors were also implicated such as old age, medications, Cushing's syndrome, malignancies, and the use of dentures.[65] Oral candidosis has been classified into primary and

secondary. Primary oral candidosis is subclassified into acute (pseudomembranous and erythematous), chronic (pseudomembranous, erythematous and hyperplastic) and candida associated lesions.

Pseudomembranace candidosis is also known as oral thrush. It is characterised by the presence of a creamy white patch which, when wiped, reveals underlying erythematous and bleeding oral mucosa. The soft palate is the most commonly affected area followed by the cheek, tongue and gingivae. It could be chronic in immuno-compromised patients.66 Erythematous candidosis can present as acute or chronic infection. It is believed to result from the usage of steroid and broad spectrum antibiotics and mainly affects the tongue.66 Hyperplastic candidosis is known as candidal leukoplakia. It appears as an irregular whitish raised plaque-like lesion commonly seen in the buccal mucous membrane near the commissures.

Candida associated lesions include denture induced stomatitis, angular chelitis and median rhomboid glossitis which have mixed bacterial and fungal etiology. Denture induced stomatitis is mainly seen in full denture wearers in the underlying surface of the upper denture. Angular chelitis is seen in the lip commissures as an erythematous crusting lesion. The lesion has been reported to occur in diabetics with poor glycaemic control. Median rhomboid glossitis is seen on the dorsal surface of the tongue as adepopulated erythematous diamond-shaped patch at the midline.

The incidence of fungal infections in patients with diabetes mellitus has been recognised for many years.67 Candidal infection is reported to be more prevalent in patients with diabetes especially in those patients who smoke, wear dentures, have poor glycaemic control and use steroids and broad spectrum antibiotics.68 In addition, salivary dysfunction in patients with diabetes can also contribute to higher carriage of fungi in this group of patients. It is clear from these studies that both local and systemic predisposing factors might increase candidal carriage rate and hence increase the risk of oral candidal infection in patients with diabetes.

## Bacterial Infections

Patients with diabetes are more susceptible to developing oral bacterial infections. They are well known to have an impaired defense mechanism hence considered to be immuno-compromised. Diabetics with diabetic complications and poor metabolic control are more prone to spreading and recurrent bacterial infection. Several studies have reported that patients with diabetes are more prone to deep neck bacterial infection compared to patient without diabetes.72,73 A four-year prospective study by Rao *et al.* investigated the severity of maxillofacial space infection of odontogenic origin, the type of micro-organism, the sensitivity of the micro-organisms to antibiotics, and the length of hospital stay of patients with diabetes compared with patients without diabetes. They concluded that the spread of the bacterial infection to the submandibular space was more common in patients and controls and that the second commonest area was the buccal

space. *Streptococcus* species was more commonly isolated in both groups. Patients with diabetes were found to stay longer in hospital due to more severe infection and required more time to control their blood glucose levels.[74]

## Poor Oral Wound Healing

Poor soft tissue regeneration and delayed osseous healing in patients with diabetes are known complications during oral surgery. Therefore, the management and treatment of patients with diabetes undergoing oral surgery is more complex. It was reported that delayed vascularisation, reduced blood flow, a decline in innate immunity, decreased growth factor production, and psychological stress may be involved in the protracted wound healing of the oral cavity mucosa in patients with diabetes.[75]

## Non-Candidal Oral Soft Tissue Lesion

Oral lesions that are not caused by candidal infection have been reported to occur in patients with diabetes such as fissured tongue, irritation fibroma and traumatic ulcer. These lesions were more prevalent in diabetes compared to the controls.[27] Altered or delayed wound healing may play a role in traumatic ulcer.

## Oral Mucosal Disease

Both lichen planus and recurrent apthous stomatitis have been reported to occur in patients with diabetes.[76,77] Oral lichen planus (OLP) is a skin disorder that produces lesions in the mouth. OLP is reported to occur more frequently in patients with type1 diabetes compared to type 2 diabetes.[76] The reason for this is that type 1 diabetes is considered an autoimmune disease, and OLP has been reported to have an underlying autoimmune mechanism. Patients with diabetes are subjected to a prolonged state of chronic immune suppression especially in type 1 diabetes. In addition, acute hyperglycaemia causes alteration in the immune responsiveness in diabetes mellitus. Atrophic-erosive oral lesions are more common in patients with diabetes with OLP.[77]

## Neuro-Sensory Oral Disorder

Oral dysesthesia or burning mouth syndrome (BMS) is a painful condition affecting the oral cavity (palate, tongue, throat and gingivae).[78,79] Other abnormal oral sensations may co-exist with the burning mouth sensation such as tingling,

numbness, dryness or sore mouth at the same time. The exact cause of BMS is unknown, but it has been attributed to several conditions such as dry mouth, menopause, candidal infection, diabetes mellitus, cancer therapy, psychological problems and acid reflux. BMS is classified into two types: primary idiopathic, and secondary as a result of a systemic process; secondary BMS has been reported to occur with diabetes mellitus. It could adversely affect the ability to maintain good oral hygiene in patients with diabetes. Diabetic neuropathy could be the underlying cause of BMS in patients with diabetes. The nerve damage in diabetic neuropathy has been reported to show an increase in the Langerhans cells that are associated with immune disturbance.[80, 81] Therefore, it is crucial to screen patients who have symptoms of BMS for diabetes mellitus.

## Dental Caries and Tooth Loss

It is well known that patients with diabetes are susceptible to oral infections that lead to tooth decay and loss.[82] Salivary secretion dysfunction, periodontal and sensory disorders could increase the likelihood of developing new and recurrent dental caries and tooth loss [Figure 3]. The relationship between diabetes and development of dental caries is still unclear. It is well-known that the cleansing and buffering capacity of the saliva is diminished in patients with diabetes mellitus resulting in increased incidence of dental caries, especially in those patients who suffer from xerostomia.

Conclusion:

Diabetes mellitus is a chronic, non-communicable and endemic disease. Type 2 compared to type 1 diabetes mellitus is more prevalent worldwide and increasing, especially in Oman. Oral manifestations and complications in patients with diabetes mellitus have been recognised and reported recently as a major complication of diabetes mellitus. There is increasing evidence that chronic oral complications in patients with diabetes adversely affect blood glucose control. Prevention and management of oral complications, especially periodontal disease, in patients with diabetes is important due to their possible adverse effect on glycaemic control. Promotion of a healthy oral cavity in patients with diabetes is paramount. Epidemiological and research data on this problem in Omani patients with diabetes should be expanded by further studies.

There are several clinical implications from this review. These include: 1) a lack of awareness of oral complications among both diabetics and health providers; 2) an understanding of the way diabetes affects oral health is necessary for both clinicians and patients, therefore research in this field should be encouraged; 3) the need for

regular follow-up of patients with diabetes mellitus by both dentist and physicians; 4) the major role that dentists should play in recognising the signs and symptoms of diabetes and their oral complications; 5) advice and counselling for diabetic smokers regarding smoking cessation, and 6) vigorous treatment of oral infection either bacterial or fungal in these patients, especially if they have poor glycaemic control.

Go to:

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**Annexure 2**

**Bharath Institute of Higher Education and Research**

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Participant list of Value added course: *Oral manifestations of Diabetes Mellitus* **on 12.1.2016**

| Sl.No | Reg.No | Name of the candidate |
|---|---|---|
| 1 | U13MB287 | VELMURUGANE. E |
| 2 | U13MB288 | VENKADESH.V.S |
| 3 | U13MB289 | VENNILA.T |
| 4 | U13MB290 | VIGNESH. V |
| 5 | U13MB291 | VIGNESHWARAN.M |
| 6 | U13MB292 | VIKRAMAN.J |
| 7 | U13MB293 | VINITHA.R |

Bharath Institute of Higher Education and Research

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Participant list of Value added course: *Oral manifestations of Diabetes Mellitus*

| Sl.No | Reg.No | Name of the candidate | Signature |
|---|---|---|---|
| 1 | U13MB287 | VELMURUGANE. E | |
| 2 | U13MB288 | VENKADESH.V.S | |
| 3 | U13MB289 | VENNILA.T | |
| 4 | U13MB290 | VIGNESH. V | |
| 5 | U13MB291 | VIGNESHWARAN.M | |
| 6 | U13MB292 | VIKRAMAN.J | |
| 7 | U13MB293 | VINITHA.R | |

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

## Oral manifestations and complications of Diabetes Mellitus

and DI-2

**QUESTIONS**

**Course Code: DI-2**

**I. ANSWER ALL THE QUESTIONS**

1. Gingival/periodontal abscess?
2. Mucosal changes associated with diabetes?
3. Oral candidiasis?
4. Halitosis?
5. Oral hygiene status of diabetes mellitus?

NAME- VIGNESH.V

ROLL NO:- U1TMB290

262

(1) Explain in details, Significance / manifestations of Diabetic mellitus?

The oral manifestations and complications related to DM (dry mouth - xerostomia) tooth decay (rare) periapical lesions, gingivitis / periodontitis., oral candidiasis burning mouth (glossodynia) altered taste, sialosis type sialadenosis / parotid type.

- metabolic Disorder —
- no specific oral lesions associated to diabetic. However there are a number of problems by presence of hyperglycemia.

— Microangiopathy

- Altered cell mechanics
- Increased $Ca^{++}$
- Impaired collagen breakdown.

Salivary glands

- Xerostomia
- Tenderness
- May cause steady enlargement of parotid glands.

Dental caries

- Increased prevalence of caries & diastema
- Hypoglycemic state show a positive association with dental caries.

Gaborio

- Reasons - microphage metabolism

  delayed healing of wound

  Pulpitis

  Nanpulpitis

  Dry socket

# 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 VELMURUGANE. E has actively participated in the Value Added Course on *Oral manifestations of Diabetes Mellitus and* held during JAN 2016 – APR 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Balaji Subramaniyan. R
RESOURCE PERSON

Dr. Jayakumar
COORDINATOR

# Student Feedback Form

Course Name: ORAL MANIPESTATIONT OF DIABETIC MILLETUS

Subject Code: DI - 2

Name of Student: VENKATESH Roll No.: U13MB288

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

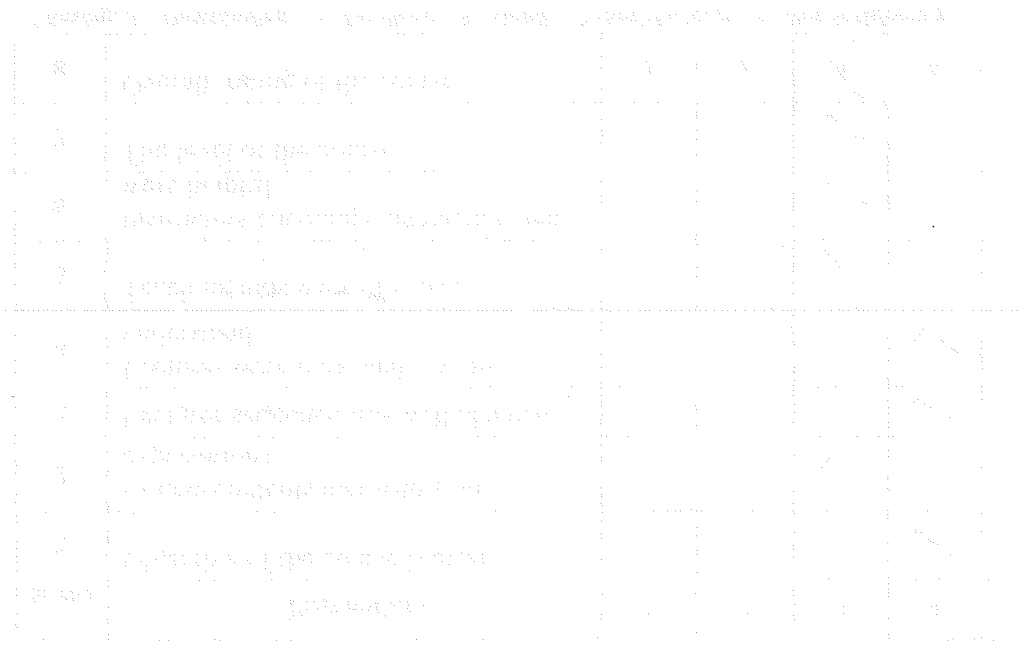
| Sl. NO | Particulars | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | Objective of the course is clear | | | | ✓ | |
| 2 | Course contents met with your expectations | | | ✓ | | |
| 3 | Lecturer sequence was well planned | | | | ✓ | |
| 4 | Lectures were clear and easy to understand | | | | ✓ | |
| 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: 12.1.16

Signature



# COURSE COMPLETION

Date10.4.2016

From
DR.BALAJI,
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: *Oral manifestations of Diabetes Mellitus***

Dear Sir,

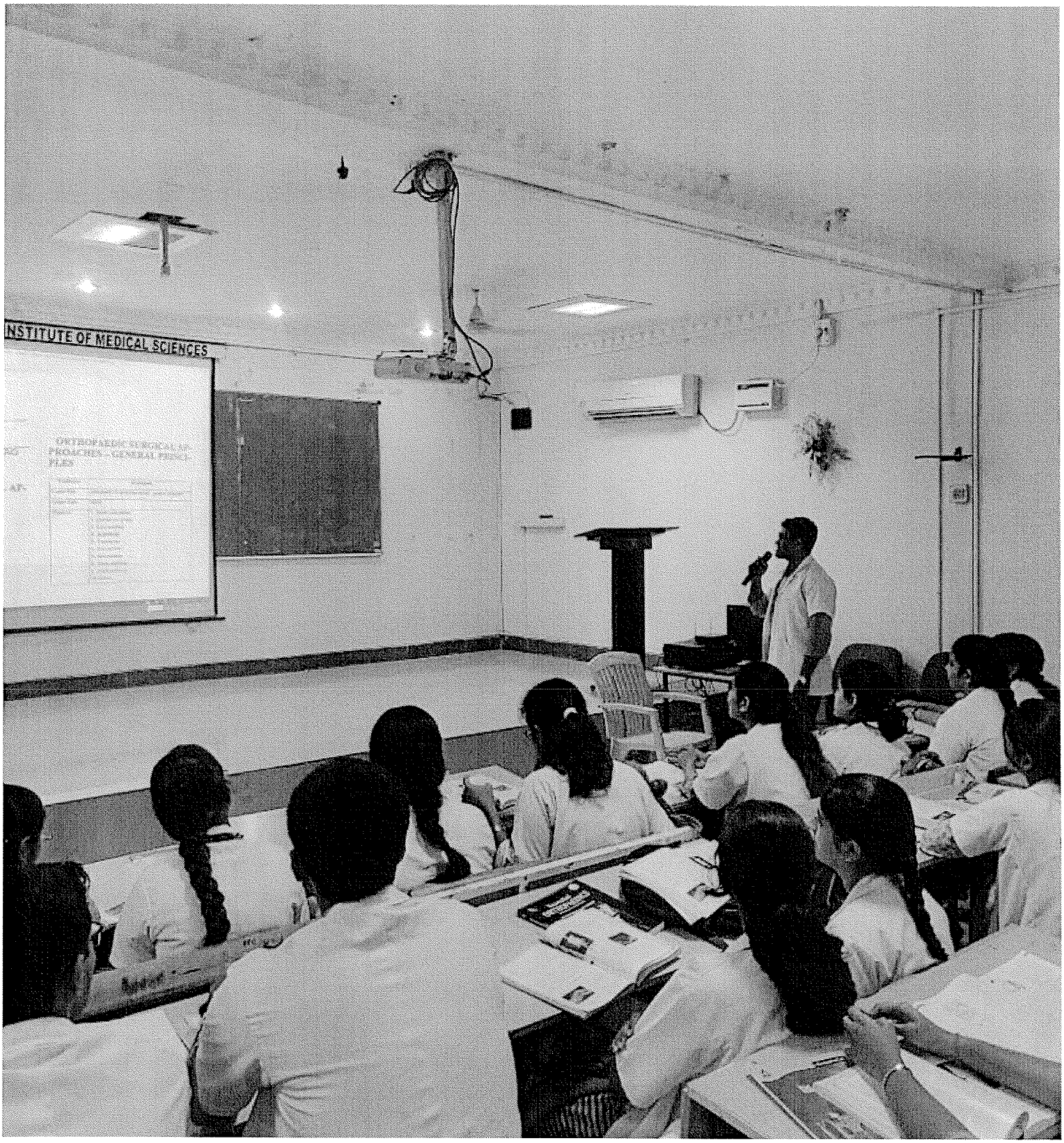
With reference to the subject mentioned above, the department has conducted the value-added course titled: ***Oral manifestations of Diabetes Mellitus*** on 10.4.2016. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. R. BALAJI SUBRAMANIYAN
DR.BALAJI SUBRAMANIYAN.R
Department of Dentistry
Sri Lakshmi Narayana
Institute of Medical Sciences
Osudu, Agaram, Puducherry.

**Encl: Certificates**

**Photographs**


NSTITUTE OF MEDICAL SCIENCES

# Sri Lakshmi Narayana Institute of Medical Sciences

Date 02/01/2016

From
Dr.K.R.Jothikumar,
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:** : Audiological Care For Musicians reg.

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Audiological Rehabilitation on Jan 2016 to June 2016. We solicit your kind permission for the same.
Kind Regards

Dr.K.R. Jothikumar

---

**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:03/01/16**

**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 2015-16 - 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 : Audiological Care For Musicians**

**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:05.01.2016**

**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 2015-2016 – Reg.

**Ref:** Ref. No. SLIMS/Dean Off/VAC /024 Dated: 03.01.2016

*****

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 2015– 2016. 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**

.

07/01/2016

**Sub: Organising Value-added Course:** Audiological Rehabilitation **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 **"Audiological Rehabilitation"**. 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 15/01/2016. 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**

Audiological Care For Musicians– A value added course for the medical students. **&ENT 02**

**2. Duration &Period**

30 hrs & Jan 2016-June 2016

**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 2016- June 2016

**8. Year of discontinuation:**2016

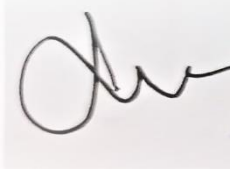
**9. Summary report of each program year-wise**

| **Value Added Course-** Jan 2016- June 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | ENT 02 | Audiological Care For Musicians | 1.Dr.Venkataramanm<br>2. Dr. Sreedhar.B<br>3.Dr. Jayagar.P | 3rd year MBBS students | 10 students & 2016 |

**10. Course FeedBack**

*Enclosed as Annexure- V*





**RESOURCEPERSON**

1. **Dr.K.R.Jothikumar**
2. **Dr.B.Sredhar**

**COORDINATOR**

**Dr.R.Venkataramanan**

**COURSE PROPOSAL**

## 1. NAME OF THE PROGRAMME

Audiological Care For Musicians– A value added course for the medical students.

## 2. AIM

Training the students to perform audiological assessment and to interpret the results

## 3. OBJECTIVES

a) How to provide Audiological Care for Musicians

b) Unique needs of musicians regarding hearing testing, noise exposure, and hearing conservation

c) Hearing protection for musicians

## 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 2016 – June 2016 . This course is conducted every 6 months.

**Course Audience: 3rd year MBBS students**

**Course Coordinator: Dr.K.Venkataramanan**

**Course Faculties with Qualification and Designation:**

**1.Dr.K.R. jothikumar**

**2.Dr. Sreedhar.B**

**3.Dr. Jayagar.P**

## Schedule followed during the course

| | | | | |
|---|---|---|---|---|
| | | | | Date and time |
| 2 | Audiological Care for Musicians | **Audiologists to provide services for musicians** | 4hrs | 4pm-6pm(4/1/16),4pm-6pm(7/1/16) |
| | | **How preventative hearing health care is important for the typical noise-exposed workers** | 5 hrs | 4pm-6pm(15/2/16),4pm-6pm(17/2/16),4pm-5pm(19/2/16) |
| | | **Ways to reduce levels is hearing protection** | 4 hrs | 4pm-6pm(14/3/16),4pm-6pm(16/3/16) |
| | | **Musicians ear plugs** | 5 hrs | 4pm-6pm(4/4/16),4pm-6pm(6/4/16),4pm-5pm(8/4/16) |
| | | **In ear monitors** | 4 hrs | 4pm-6pm(16/5/16),4pm-6pm(18/5/16) |
| | | **REAT or probe-microphone measures** | 4 hrs | 4pm-6pm(23/5/16),4pm-6pm(25/5/16) |
| | | **Hearing conservation for musicians** | 4 hrs | 4pm-6pm(6/6/16),4pm-6pm(8/6/16) |
| | | **TOTAL** | 30HRS | |

REFERENCE BOOKS: 1) SCOTT BROWN 6th edition

2) ANIRBAN BISWAS 1st edition

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST
PUDUCHERRY.

**ANNEXURE 1**

## Learning Outcomes

After reading this article, professionals will be able to:

- List some of the unique needs of musicians regarding hearing testing, noise exposure, and hearing conservation.
- Discuss considerations for selection and fitting of hearing protection for musicians including custom-fit solutions and ready-fit styles.
- Explain how the audiologist's education, training, counseling, and attitude can be tailored to best serve the needs of musicians.

**1. Is it common for audiologists to provide services for musicians?**

There is a small but dedicated group of "music audiologists" who serve the music industry in an occupational fashion – including some audiologists who meet musicians where they're at and provide on-site clinical services. These include mobile hearing tests, ear impressions, and dedicated counseling for musicians. Just as a cochlear implant audiologist sees a specialized patient population, these "music audiologists" subspecialize in the specific needs of musicians. But, to serve the musician population, you don't necessarily have to travel to concert venues. Any clinical audiologist can provide good clinical service to musicians by understanding the needs of musicians and providing high-quality interventions for this group.

**2. Okay, so what are the audiologic needs of musicians?**

As BenjKanters, a professor of audio engineering at Columbia College Chicago likes to say, "Musicians need an audiologist like everyone needs a dentist." There is a wide spectrum of professional, semi-professional, and amateur musicians who need support to protect their hearing for a lifetime. Indeed, the ears are a key "instrument" for most musicians – being able to hear pitch, timbre, and loudness of music is critical for playing well. In clinical encounters with musicians, the audiologist needs to be able to understand the needs of their patients. This is Audiology 101, right? Understand your patients' needs and you can work to solve their problems.

Musicians make up a surprisingly large group of people. While the number of full-time musicians is low compared to the population – the Bureau of Labor Statistics reports about 41,000 working musicians in the US – there are many more people who identify as musicians who may not be working full-time in music. And, their hearing needs and sound exposure varies significantly. As hearing professionals, our first priority should be preventing hearing loss. Secondarily, we can look at remediating hearing loss.

**3. I'm aware of how preventative hearing health care is important for the typical noise-exposed workers – are musicians similar?**

For the most part,yes. In the United States, workers in noise are often enrolled in a hearing

conservation program (HCP). HCPs are defined by the US Occupational Health and Safety Administration and include sound level measurements, reduction of noise levels through engineering controls, use of hearing protective devices, audiometric monitoring, and education, training, and motivation components. Musicians who are seen in your clinic can be formally enrolled in a clinic-based HCP, or you can create an individual, more informal HCP for each person.

A clinic-based HCP can be designed for your musician population. You need the ability to track patients and remind them to come in annually, as well as booking time with these patients for a little extra counseling about safety around loud music. For practices that primarily fit hearing aids, remember that a musician's hearing conservation program can also be an excellent marketing tool, both for musicians who need hearing aids as well as their families. Marketing preventative hearing healthcare can be an effective tool to help you stand out from the competition!

The goal of any HCP is to reduce the risk of hearing loss for the individual. For musicians, this means reducing their overall *exposure.* We can reduce exposure either by reducing sound levels or by reducing the duration of exposure. For musicians with control over their sound levels, a small reduction in sound levels can significantly reduce overall exposure. A reduction of 3 dB can double your permissible exposure time. Alternately, reducing playing time a little can help to reduce exposure.

**4. I recall that the first step in an HCP is measuring sound levels. How do we do this for musicians?**

Musicians have a range of sound exposures. For example, the musicians playing amplified music on stage may be exposed to levels above 105 dBA for several hours in a night. A musician playing classical music in an orchestra may have lower sound exposure levels, but may have a longer duration of exposure – many classical musicians play for 4-8 hours per day including group and individual rehearsals.

I work in a hospital clinic and see a wide variety of patients. In one week, I had two gentlemen in their 50s come into my clinic in separate visits. Both told me that they were guitarists and were concerned about their hearing, wanting options for hearing protection - we'll call them Larry and Barry. They both told me that they played in bands and played some gigs. Both had "day jobs" and music was a side project for them. But, on further questioning, Larry revealed that his band rehearsed about one night a week and played at a bar once every month. Barry, on the other hand, told me that his band rehearsed three days per week and played gigs around town weekly. Barry's overall sound exposure from music is significantly higher than Larry's, and his needs were significantly more pressing as his band is actually working towards making music a profession.

Understanding the musician's actual sound exposure is important to figuring out what sort of interventions they may need for hearing loss prevention. While the best possible way to do this would be through dosimetry – measuring sound exposure while the patient is working is often not feasible in the clinic. It is reasonable to make some estimates of sound exposure based on a detailed case history.

**5. Once I've established the patient's sound exposure, what's next?**

Considering a model of person-centered care, our most important focus ought to be helping to ensure that the musician is preserving their hearing. Musicians tend to come into the clinic for one of two reasons: They have concerns about deteriorating hearing, or much less common, they have received public health messages regarding noise-induced hearing loss, and are interested in obtaining better hearing protection devices. For both of these concerns, it's important to help the patient understand their hearing status. Have they experienced a hearing loss or hair cell damage due to music over-exposure? Are they effectively protecting their hearing now?

Just like industrial hearing conservation programs, pure-tone audiometry can be helpful to monitor for changes in hearing over time. Similarly, otoacoustic emission measurements can help to identify early changes in cochlear function secondary to sound overexposure. You can use audiometric evaluations to help the patient understand the damage that they are (or could be) doing to their auditory system.

**6. I've heard rumblings that musicians sometimes don't like having hearing tests. What's up with that?**

Audiologists are often trained as *communication specialists*, rather than hearing specialists. We mostly focus on speech understanding and remediating problems that involve speech audibility. Knowledgeable musicians and sound engineers often report frustration with audiologists who care only about hearing from 250-8000 Hz, as this range neglects both lower and higher frequencies that are important for music perception. It's almost as if we forget that our hearing thresholds above 8000 Hz matter – harmonics of music range well into the extended high frequencies that are commonly ignored in most hearing clinics. Testing those frequencies above 8000 Hz can help to show changes in hearing related to aging. It can also explain a musician's complaint about a perception of reduced fidelity of music over time.

One barrier that we commonly run into in the clinic is that some musicians come to the clinic looking for hearing protection only, and not wanting a hearing evaluation. Sometimes, this is financially motivated – many musicians have no health insurance to cover a hearing test. Sometimes, this is efficiency motivated – the musician just wants to get their earplugs and go. And sometimes, this is motivated by stigma – the ear is a critical tool for the musician, and it's psychologically challenging to learn that your ear is damaged.

Regardless of the patient's motivation to avoid a hearing test, I believe the testing is a critical piece of a hearing conservation program for a musician. Monitoring hearing is critical to protecting hearing, and it's important for the audiologist to educate the musician about their hearing.

**7. One way to reduce levels is hearing protection, right?**

Certainly, hearing protection can reduce the musician's actual exposure levels. Unfortunately, there are some significant challenges with recommending hearing protection devices (HPDs) for musicians. Musicians spend many hours over many years learning to use their instruments, including their ears. We often refer to learning how to hear and recognize subtle elements of music as "ear training." Musicians develop a strong auditory memory for how their own instrument should sound, as well as how their playing will interact with others' instruments

and timbre. Unfortunately, even the best HPDs on the market distort some of the cues that musicians use to hear and play music effectively, causing difficulty in judging intonation, tone/timbre, and balance of music (Beach & O'Brien, 2017). The first goal of counseling, therefore, should be reducing their overall exposure by reducing either sound levels in the environment or the duration exposed to high levels of sound. Ideally, environmental modifications will help reduce the musician's risk of hearing disorders.

HPDs, of course, are an option for musicians to reduce the overall sound level of the exposure, but they will necessarily alter the quality and timbre of music. If HPDs are to be used in performance, the musician will need to focus on ear-training with the HPD in place, learning how to hear the cues they need with the attenuation of an ear plug. This process is not easy – for a musician with a lifetime of practice, ear training to HPDs is a little like learning to hear and speak a new dialect of a language. It's the same language you're used to, but it sounds different and foreign. Musicians must practice with their HPDs in before performing, and significant effort may be required to feel comfortable using HPDs in daily play and performance.

**8. I've heard that there are HPDs especially designed for musicians. Don't they solve the distortion issues that you are referring to?**

Not entirely. There are a variety of HPDs designed for use in listening to music. Generally, these are ear plug styles, rather than over-the-ear muffs, and can be divided into custom and ready-fit styles. The primary goal of a set of earplugs designed for music is providing a high-fidelity sound. We generally assume that the highest fidelity sound is a linear sound attenuation which is uniform across frequencies. So, we're looking for a "flat" attenuation across the entire range of hearing, with equal attenuation in lower and higher frequencies. To date, there is limited research to understand how uniform the attenuation needs to be for a musician to find the attenuation acceptable.

Several companies make filters that are designed to fit in a custom silicone or vinyl earplug that create a uniform attenuation. Custom uniform attenuation earplugs (UAEs) can provide a flat attenuation when properly made, though there is a fairly wide variability in how much attenuation is actually achieved (Portnuff, 2018). To obtain the best possible fitting of a custom earplug, a deep ear impression is important. As the ear canal is dynamic with jaw motion, the impression should be taken with the swame type of jaw position that the device will be used. For example, I ask all of my musician patients to bring their instruments in to the clinic to play while we are taking impressions. Do this judiciously though – as I learned from experience, bagpipes played in a hospital clinic can be a little disruptive!

There are also a variety of ready-fit, pre-formed earplugs designed for use with music. These vary in their attenuation widely, both in the labeled attenuation values as well as the actual achievable attenuation. Some products provide up to 25 dB of attenuation when properly worn, though others are as low as 0-1 dB of attenuation. There are also a variety of different ways that ready-fit earplugs seat in the ear canal, including with single flanges, multiple flanges, and foam tips, each of which may be more comfortable for one person than for another. Moreover, it's sometimes harder to find these earplugs in local stores, and one must buy them online.

**9. What about traditional earplugs?**

While foam earplugs and other earplugs designed for industrial use are easy to find, they tend

to have a non-uniform frequency response. Most earplugs attenuation high frequencies significantly more than low frequencies (Berger, 1983). Greater high frequency attenuation than low frequency attenuation can result in a distorted sound which is often perceived as "muffled" for listening to music or understanding speech (Niquette, 2006). In my experience, musicians often report a history of bad experiences with industrial-type earplugs when listening to music and prefer a uniform attenuation. Generally, earplugs designed for music are a better choice for listening to music than earplugs designed for overall sound attenuation (Beach & O'Brien, 2017).

**10. Okay, so how do I know that a given set of earplugs are appropriate for a musician? Can I read the packaging to tell?**

Fortunately, many earplugs are labeled with laboratory-derived average attenuation values on their packaging. You can review the labeling to see what the average attenuation is as a way of choosing earplugs. You do have to look into the data a little – a single number rating (like the noise reduction rating [NRR] in the US) is a poor explanation of the attenuation of an earplug across frequencies. A higher single number rating does not necessarily mean that the earplug is effective for music!

**11. Are there electronic options?**

Electronic HPDs also have some potential for hearing protection with higher fidelity sound than passively attenuating earplugs. These nonlinear earplugs attenuate higher intensity sound while providing minimal attenuation for softer sounds. There is currently one device on the market (made by Etymotic Research) and several more are in development stages. Some musicians have found the electronic option to work very well and swear by it, while others have not found success with it. This is likely due to variability in how it fits the ear across the population.

**12. Once I've chosen an earplug, how do I know that it fits?**

This is probably the most important thing to think about with an earplug – how does it actually fit? There is significant individual variability in how much attenuation untrained users will achieve with their earplugs, and we also know that untrained individuals using earplugs achieve very low attenuation (Casali& Epps, 1986). Earplugs are commonly poorly seated in the ear canal, leading to an ineffective acoustic seal for both custom and ready-fit styles.

The best way to assess the fit of an earplug is by measuring the attenuation in the clinic. Just as we verify the output of hearing aids in the real ear, so should we verify the actual attenuation of hearing protectors. You can use either probe-microphone measures or real-ear attenuation at threshold (REAT) measures. A probe-microphone attenuation measurement is conducted by recording the ear canal SPL of a broadband or tone-sweep stimulus and comparing the level for the open ear, vs. when the earplug is seated in place (Chasin, 1996; Trompette et al., 2015). REAT measures are conducted by testing hearing thresholds in a sound-attenuated booth with the HPD on and off to determine attenuation. This can be assessed either in the sound-field or under circumaural earphones (Portnuff& Price, 2019).

**13. What is better, REAT or probe-microphone measures?**

Either measurement can work, though in my experience I tend to prefer REAT measures. Probe

microphone measurements are faster, but run the risk of a slit leak around the probe tube (Portnuff& Price, 2019). Some audiologists find that they are able to accommodate for this by putting a dab of Otofirm or a water-based lubricant next to the microphone tube, but I struggle with this a little. I find the REAT measurements to be more time consuming but more accurate.

**14. How do you do REAT testing?**

REAT measurements are completed in the sound booth by comparing hearing thresholds with the earplug in and with the earplug out. The difference between these is the attenuation. It is best to use a small step size (1 or 2 dB), and to mask the contralateral ear. REAT can be effectively measured under circumaural earphones, where masking can be easily provided to the contralateral ear, or in soundfield with an insert earphone for masking the contralateral ear.

A formal REAT evaluation for an earplug uses a wide bandwidth with 1/3 octave measurements. This, of course, would not be feasible in the clinic. For simplicity, I recommend at least a low frequency and a high frequency. The low frequency helps to show if the earplug is sealing the ear well, and the high frequency helps to show the uniformity of the attenuation. Better, you can measure several frequencies across the audible range. Some limited data suggests that attenuation measurements at 250, 1000, 2000, and 4000 Hz might be good predictors of the "flatness" of the attenuation (Portnuff, 2018).

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**15. What about in-ear monitors?**

In-ear monitors are custom or ready-fit headphones that replace the need for stage monitor speakers. In amplified music environments, performers often use monitor speakers to hear their instrument and other instruments played back to themselves—these typically are facing the performers, not the audience. In-ear monitors can reduce the overall level of sound on a stage and allow the musician to hear their music better. They also reduce vocal stress, as the performer does not have to sing over the loud music on stage.

It is important the in-ear monitors are "fitted" by an audiologist. Most in-ear monitors are custom made, though some ready-fit devices can be used with custom ear sleeves. For these devices, high quality ear impressions are required in order to get a good acoustic seal in the ear canal. Custom monitors can be made of silicone or acrylic.

**16. Can I just order an in-ear monitor, then?**

No. Musicians tend to use in-ear monitors just like they would stage monitors. That is, they turn up the volume to be a similar level to that of the overall stage level that they have become accustomed to (Federman& Ricketts, 2008). In-ear monitors are not hearing protection and can actually be hazardous to hearing. If an audiologist is fitting a custom in-ear monitor, they must counsel the musician about safe usage levels with these devices. Providing an in-ear device without counseling is not providing preventative care and can be harmful to your patients! Unfortunately, the vast majority of in-ear monitors are fit this way – audiologists take

ear impressions and the patient sends it off to a manufacturer to be made, then receives it back in the mail.

**17. Can in-ear monitors be used safely?**

Yes! Federman and Ricketts (2008) found that musicians can use in-ear monitors at a lower level than stage monitors, even if they do not choose this without counseling. Whenever possible, it's best to measure the attenuation of the monitor to ensure that it is sealing the ear well to attenuate stage noise. Similarly, it's good to know the actual output of the in-ear monitor by using either the manufacturer's specifications (if available) or measured output levels using a probe microphone. With this information, you can accurately counsel your musician patient about hearing safety when using their monitors.

With appropriate counseling, musicians can learn to play with lower levels of sound from their in-ear monitors. Just as using earplugs, though, musicians must ear-train to an in-ear monitor. I counsel my patients that this won't be easy – they have to intentionally work to lower the volume!

**18. You mentioned education, training, and motivation as components to the HCP. How do you incorporate these in the clinic?**

The clinical encounter with a musician must include these counseling components. Musicians who seek out the services of an audiologist are looking for both information about their hearing health and information about how to preserve their hearing for a lifetime. You can use the information you gain from your hearing evaluation and your case history to guide musicians toward safer listening. You can encourage musicians to consider their overall noise/sound dose, including music and other loud sounds when they are thinking about their overall exposure and risk of hearing loss. You can also discuss the effects of loud noise on the auditory system, including hearing loss, tinnitus, and diplacusis. Most importantly, though, the audiologist's attitude must be supportive toward the musician.

**19. How does the audiologist's attitude matter?**

The audiologist working with a musician needs to take a proactive, supportive, and realistic view towards music exposure. Audiologists are used to counseling patients to avoid noise and to wear HPDs in all loud environments. For many working musicians, counseling them away from music exposure is not a realistic option and would not be well received. The audiologist needs to strike a balance between safety and reasonable recommendations that can actually be followed. Overly restrictive recommendations may be ignored. The audiologist must work with the musician to help ensure that the musician is able to take preventative actions effectively in their daily life.

**20. What are other resources for learning more about hearing conservation for musicians?**

Dr. Marshall Chasin has a wonderful textbook for audiologists called *Hearing Loss in Musicians: Prevention and Management*, which contains a wealth of information for the clinician. He also has an accessible textbook for musicians called *Hear the Music: Hearing Loss Prevention for Musicians* that I find very useful for my patients. Additionally, Dr. Heather Malyuk has written a video-based curriculum for hearing loss prevention in schools of music

**Annexure 2**

**Bharath Institute of Higher Education and Research**

SLIMS

| | | |
|---|---|---|
| 1 | U13MB151 | ABDUL RAHMAN.A. |
| 2 | U13MB152 | ABIRAMI KAMBAN K.S |
| 3 | U13MB153 | ABIRAMI.A. |
| 4 | U13MB154 | AFRAA.S. |
| 5 | U13MB155 | AHILA. M. |
| 6 | U13MB156 | AKMAR JEBIN.V.P. |
| 7 | U13MB157 | AKSHAYA. S. |
| 8 | U13MB158 | ALLADI SANATH KUMAR |
| 9 | U13MB159 | ANBAZHAGAN. D |
| 10 | U13MB160 | ANGELIN JEEVA PUSHPAM.S |

ANNEXURE 3

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## PUDUCHERRY

TOPIC: Audiological care for musicians **(ENT 02)**
STUDENT NAME:
UNIVERSITY NO:

1. High frequency audiometry is used in:
a. Otosclerosis b. Ototoxicity
c. Meniere's disease d.non organic hearing loss

2. Sound intensity of whispering is
a.30db b.90db.
c.120db d.2db

3. What is the intensity of normal conversation?
a. 30db b.60b
c.90b d.150db

4.Ear is sensitive to:
a.500-3500Hz b.500-5000Hz
c.300-5000Hz d.20-20000Hz

5. 4 kHz dip in audiogram seen in
a.otosclerosis b.noise trauma
c.menieres disease d.prebycusis

6. which level of sound is painful
a.90-100db b.120-130db
c.60-70db d.20-30 db

7. temporary and permanent threshold shift is seen in
a.ototoxicity b.SNHL
c.prebycusis d.NIHL

8. Maximum audible tolerance recommended by WHO is
a.90 db for 6 hrs b.85 db for 8 hrs
c.85 db for 6 hrs d.85 db for 4 hrs

9 most common structure damage in noise induced hearing loss
a.outer hair cells b. basillar membrane
c.reiseners membrane d.inner hair cells

10. noise induced vertigo seen in
a. otosclerosis b.labrynthine fistula
c.vestibular scahwanomma d. CSOM

**PRE TEST**

2

6. which level of sound is painful

a.90-100db b.120-130db

c.60-70db d.20-30 db

7. temporary and permanent threshold shift is seen in

a.ototoxicity b.SNHL

c.prebycusis d.NIHL

8. Maximum audible tolerance recommended by WHO is

a.90 db for 6 hrs b.85 db for 8 hrs

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a.outer hair cells b. basillar membrane

c.reisseners membrane d.inner hair cells

10. noise induced vertigo seen in

a. otosclerosis b.labrynthine fistula

c.vestibular scahwanomma d. CSOM

ANNEXURE 3

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## PUDUCHERRY

TOPIC: Audiological care for musicians **(ENT 02)**

STUDENT NAME: Abdulrahman . A

UNIVERSITY NO: U13MB151

(2)

1. High frequency audiometry is used in:

a. Otosclerosis b. Ototoxicity

X c. Meniere's disease d.non organic hearing loss

2. Sound intensity of whispering is

a.30db b.90db.

X c.120db d.2db

3. What is the intensity of normal conversation?

a. 30db b.60b

c.90b d.150db

4.Ear is sensitive to:

a.500-3500Hz b.500-5000Hz

X c.300-5000Hz d.20-20000Hz

5. 4 kHz dip in audiogram seen in

a.otosclerosis b.noise trauma

X c.menieres disease d.presbycusis

6. which level of sound is painful

a.90-100db b.120-130db

c.60-70db d.20-30 db

7. temporary and permanent threshold shift is seen in

a.ototoxicity b.SNHL

X c.prebycusis d.NIHL

8. Maximum audible tolerance recommended by WHO is

a.90 db for 6 hrs b.85 db for 8 hrs

X c.85 db for 6 hrs d.85 db for 4 hrs

9 most common structure damage in noise induced hearing loss

a.outer hair cells b. basillar membrane

c.reiseners membrane d.inner hair cells

10. noise induced vertigo seen in

a. otosclerosis b.labrynthine fistula

X c.vestibular scahwanomma d. CSOM

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

5

TOPIC: Audiological care for musicians **(ENT 02)**

STUDENT NAME: Afraa · S

UNIVERSITY NO: U/3 MB154

1. High frequency audiometry is used in:

a. Otosclerosis b. Ototoxicity

X c. Meniere's disease d.non organic hearing loss

2. Sound intensity of whispering is

a.30db b.90db.

c.120db d.2db

3. What is the intensity of normal conversation?

a. 30db b.60b

c.90b d.150db

4.Ear is sensitive to:

a.500-3500Hz b.500-5000Hz

c.300-5000Hz d.20-20000Hz

5. 4 kHz dip in audiogram seen in

a.otosclerosis b.noise trauma

X c.menieres disease d.prebycusis

**POST TEST**

2

6. which level of sound is painful

a.90-100db c.120-130db

c.60-70db d.20-30 db

7. temporary and permanent threshold shift is seen in

a.ototoxicity b.SNHL

c.prebycusis d.NIHL

8. Maximum audible tolerance recommended by WHO is

a.90 db for 6 hrs b.85 db for 8 hrs

c.85 db for 6 hrs d.85 db for 4 hrs

9 most common structure damage in noise induced hearing loss

a.outer hair cells b. basilar membrane

c.reiseners membrane d.inner hair cells

10. noise induced vertigo seen in

a. otosclerosis d.labrynthine fistula

c.vestibular scahwanomma d. CSOM

(9)

ANNEXURE 3

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

PUDUCHERRY

TOPIC: Audiological care for musicians **(ENT 02)**

STUDENT NAME: Afnaa .S

UNIVERSITY NO: U13MB154.

1. High frequency audiometry is used in:

a. Otosclerosis b. Ototoxicity

c. Meniere's disease d.non organic hearing loss

2. Sound intensity of whispering is

a.30db b.90db.

c.120db d.2db

3. What is the intensity of normal conversation?

a. 30db b.60b

c.90b d.150db

4.Ear is sensitive to:

a.500-3500Hz b.500-5000Hz

c.300-5000Hz d.20-20000Hz

5. 4 kHz dip in audiogram seen in

a.otosclerosis b.noise trauma

c.menieres disease d.prebycusis

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a.90-100db b.120-130db

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c.reiseners membrane d.inner hair cells

10. noise induced vertigo seen in

a. otosclerosis b.labrynthine fistula

c.vestibular scahwanomma d. CSOM

8

ANNEXURE 3

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## PUDUCHERRY

TOPIC: Audiological care for musicians **(ENT 02)**

STUDENT NAME: A. Abdul Rahman

UNIVERSITY NO: U13MB151.

1. High frequency audiometry is used in:

a. Otosclerosis ~~b.~~ Ototoxicity

c. Meniere's disease d.non organic hearing loss

2. Sound intensity of whispering is

~~a.~~30db b.90db.

c.120db d.2db

3. What is the intensity of normal conversation?

a. 30db ~~b.~~60b

c.90b d.150db

4.Ear is sensitive to:

a.500-3500Hz b.500-5000Hz

c.300-5000Hz ~~d.~~20-20000Hz

5. 4 kHz dip in audiogram seen in

a.otosclerosis b.noise trauma

c.menieres disease d.prebycusis

**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 Audiological Care for Musicians held during Jan 2016 – June 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.K.R. jothikumar
**RESOURCE PERSON**

Dr.K.Venkataramanan
**COORDINATOR**


## Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

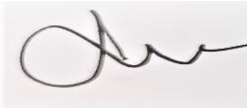
(Deemed to be University under section 3 of the UGC Act 1956)


### CERTIFICATE OF MERIT

This is to certify that Dr. AFRAA.S(U13MB154) has actively participated in the Value Added Course on Audiological Care for Musicians held during Jan 2016 – june 2016 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: Audiological Care for Musicians

Subject Code: **ENT02**

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: Audiological Care for Musicians

Subject Code: **ENT02**

Name of Student: ABDUL RAHMAN. A Roll No.: U13MB152

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:

Pictures can be added

**Annexure 5**

**Course/Training Feedback Form**

**Student Feedback Form**

Course Name: Audiological Care for Musicians

Subject Code: **ENT02**

Name of Student: AFRAA. S Roll No.: U1BMB154

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:

Marvelous

**ANNEXURE 6**

Date : 15/6/2016

From
Dr.K.R. Jothikumar,
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.

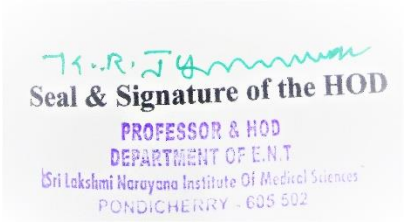
**Sub: Completion of value-added course:** Audiological Care for Musicians reg.

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled:**Audiological Care for Musicians** on Jan 2016 to June 2016. 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

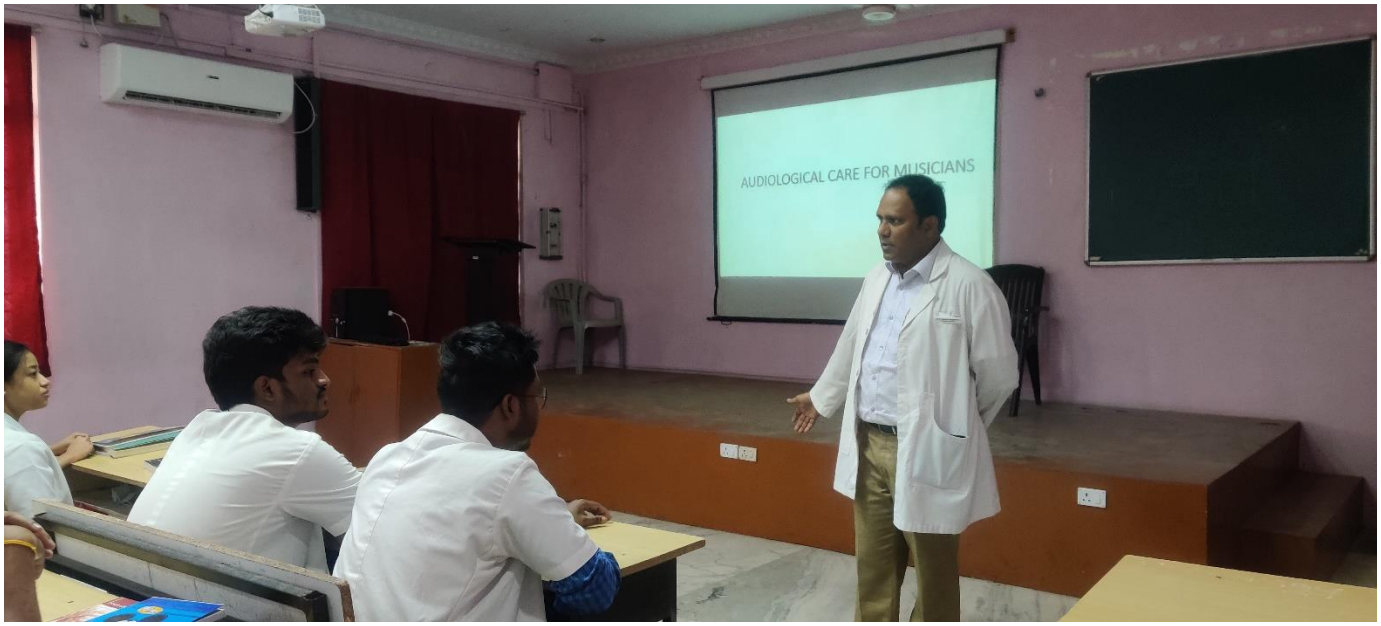
Dr.K.R.Jothikumar
<HOD Sign and Seal>



**ANNEXURE 7**


AUDIOLOGICAL CARE FOR MUSICIANS


AUDIOLOGICAL CARE FOR MUSICIANS


AUDIOLOGICAL CARE FOR MUSICIANS


AUDIOLOGICAL CARE FOR MUSICIANS

**Annexure 1**

Date: 2nd Dec 2015

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: Autopsy in Evolution of Modern Medicine**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Autopsy in Evolution of Modern Medicine** on Jan 2016 - June 2016. 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. JAYAKUMAR

The HOD: DR SN RATHOD

The Expert: DR SN RATHOD

The committee has discussed about the course and is approved.

Dean (Sign & Seal)

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

Subject Expert (Sign & Seal)

Professor & Head
Dept. of Forensic Medicine
Sri Lakshmi Narayana Institute of
Medical Sciences, Puducherry

HOD (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 2015

**Sub: Organising Value-added Course: Autopsy in Evolution of Modern Medicine 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 Dec 15th 2015. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

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

Encl: Copy of Course content and Registration form.

## Annexure 2 – Course Proposal

**Course Title:** Autopsy in Evolution of Modern Medicine

**Course Objective:**

1. Definition of Autopsy and types
2. History of Autopsy in Medicine (From BC to 1000 AD)
3. History of Autopsy in Medicine (From 1000 to 1400 AD)
4. History of Autopsy in Medicine (From 1400 to 1780 AD)
5. History of Autopsy in Medicine (From 1780 to present)
6. Utility of Autopsy (Congenital Heart diseases)
7. Utility of Autopsy (Atherosclerosis)
8. Utility of Autopsy (CAD, MI & sudden death)
9. Utility of Autopsy (Infectious diseases- TB)
10. Utility of Autopsy (Infectious diseases- Viral infections)
11. Utility of Autopsy (Cardiovascular diseases)
12. Autopsy Future
13. Research in autopsy
14. Biochemical, Microbiological & Histopathological Examination

**Course Outcome:** On successful completion of the course the students will have knowledge about the importance of autopsy in advancement of medical knowledge till date and further progression.

**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 | 09-01- 16 | Definition of Autopsy and types | 2 pm to 5 pm | 3 |

| | | | | |
|---|---|---|---|---|
| 2 | 13-02- 16 | History of Autopsy in Medicine (From BC to 1000 AD) | 2 pm to 5 pm | 3 |
| 3 | 27-02- 16 | History of Autopsy in Medicine (From 1000 to 1400 AD) | 2 pm to 5 pm | 3 |
| 4 | 12-03- 16 | History of Autopsy in Medicine (From 1400 to 1780 AD) | 2 pm to 5 pm | 3 |
| 5 | 26-03- 16 | History of Autopsy in Medicine (From 1780 to present) | 2 pm to 5 pm | 3 |
| 6 | 09-04- 16 | Utility of Autopsy (Congenital Heart diseases) | 2 pm to 5 pm | 3 |
| 7 | 23-04- 16 | Utility of Autopsy (Atherosclerosis) | 2 pm to 5 pm | 3 |
| 8 | 14-05-16 | Utility of Autopsy (CAD, MI & sudden death) | 2 pm to 5 pm | 3 |
| 9 | 28-05-16 | Utility of Autopsy (Infectious diseases- TB) | 2 pm to 5 pm | 3 |
| 10 | 11-06-16 | Utility of Autopsy (Infectious diseases- Viral infections) | 2 pm to 5 pm | 3 |
| | | | Total Hours | 30 |

**REFERENCE BOOKS: (Minimum 2)**

1. Diagnoses From the Dead: The Book of Autopsy
2. The Evolution of the Autopsy

## Annexure 3

### Bharath Institute of Higher Education and Research

Participant list of Value added course: **The Evolution of the Autopsy on Jan 2016 - June 2016**

| Sl.No | Reg.No | Name of the candidate |
|---|---|---|
| 1. | U14MB324 | SREEPADMA PURUJITH. S.S. |
| 2. | U14MB325 | SRI JAYALAKSHMI. A |
| 3. | U14MB326 | SRITATA. S |
| 4. | U14MB327 | SRRUTHII. N.M. |
| 5. | U14MB328 | SUBRAMANI. B |
| 6. | U14MB329 | SUDARSHNA. K |
| 7. | U14MB330 | SUKIRTHA. K |
| 8. | U14MB331 | SURYA PRABHA. B |
| 9. | U14MB332 | SURYA NARAYANA. S |
| 10. | U14MB333 | SWATHI .S |
| 11. | U14MB334 | SWATHI. S D/O SHANMUGAM |
| 12. | U14MB335 | SWATHY. M |
| 13. | U14MB336 | THAMARAI SELVI. K |
| 14. | U14MB337 | THAMEENA FATHIMA.A |
| 15. | U14MB338 | THOMAS GIDEON RUSSEL.A |
| 16. | U14MB339 | THULASI. N |
| 17. | U14MB340 | UMMU SALMA. A.B |
| 18. | U14MB341 | VAISHNAVI. R |
| 19. | U14MB342 | VEERA RADHA KUMARI. M |
| 20. | U14MB343 | VENKATESH. M |

**Annexure 4**

**Course/Training Feedback Form**

**Course:** The Evolution of the Autopsy
**Date:** Jan 2016 - June 2016
**Name:**
**Reg NO.**
**Department:** Forensic medicine and toxicology

**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 5**

Date 01-07-2016

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: The Evolution of the Autopsy**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled **The Evolution of the Autopsy** on Jan 2016 - June 2016. 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**

Autopsy in evolution of Modern Medicine & FMT VAC-01

**2. Duration & Period**

30 hrs & July 2015– December 2015 & January 2016 – June 2016

**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**:

(2) July 2015– December 2015 & January – June 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- July 2015 – June 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | FMT VAC01 | Autopsy in evolution of Modern Medicine | Dr. S.N. Rathod | 2nd MBBS | 20 (July 15 – Dec 15) |
| 2 | FMT VAC01 | Autopsy in evolution of Modern Medicine | Dr. S.N. Rathod | 2nd MBBS | 20 (Jan-June16) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

Professor & Head
Dept. of Forensic Medicine
Sri Lakshmi Narayana Institute of
Medical Sciences, Puducherry

DEAN
**COORDINATOR**

**Annexure- II**

# VALUE ADDED COURSE

## Autopsy in Evolution of Modern Medicine and FMT VAC01

## List of Students Enrolled January – August 2016

| 2nd Year MBBS Student | | |
|---|---|---|
| **Sl. No** | **Name of the Student** | **Roll No** |
| 1 | SREEPADMA PURUJITH. S.S. | U14MB324 |
| 2 | SRI JAYALAKSHMI. A | U14MB325 |
| 3 | SRITATA. S | U14MB326 |
| 4 | SRRUTHII. N.M. | U14MB327 |
| 5 | SUBRAMANI. B | U14MB328 |
| 6 | SUDARSHNA. K | U14MB329 |
| 7 | SUKIRTHA. K | U14MB330 |
| 8 | SURYA PRABHA. B | U14MB331 |
| 9 | SURYA NARAYANA. S | U14MB332 |
| 10 | SWATHI .S | U14MB333 |
| 11 | SWATHI. S D/O SHANMUGAM | U14MB334 |
| 12 | SWATHY. M | U14MB335 |
| 13 | THAMARAI SELVI. K | U14MB336 |
| 14 | THAMEENA FATHIMA.A | U14MB337 |
| 15 | THOMAS GIDEON RUSSEL.A | U14MB338 |
| 16 | THULASI. N | U14MB339 |
| 17 | UMMU SALMA. A.B | U14MB340 |
| 18 | VAISHNAVI. R | U14MB341 |
| 19 | VEERA RADHA KUMARI. M | U14MB342 |
| 20 | VENKATESH. M | U14MB343 |

RESOURCE PERSON

Professor & Head
Dept. of Forensic Medicine
Sri Lakshmi Narayana Institute of
Medical Sciences, Puducherry

DEAN
COORDINATOR

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - IV**

**Autopsy in medical knowledge-MCQs**

**Course Code: FMT VAC01**

1. Autopsy in cases of death due to natural cause is helpful

    a. Yes

    b. No

    c. Not sure

2. Which can contribute more to medicine

    a. Medico-legal autopsy

    b. Clinical autopsy

    c. Not sure

3. Autopsy played an important role in the development of medicine

    a. True

    b. False

    c. Not sure

4. Why autopsy?

    a. Maintenance of professional standards

    b. Public reassurance

    c. All of it

5. Is consent of relative required in autopsy for clinical purpose

    a. Yes

    b. No

    c. Not sure

6. An autopsy preliminary report should be distributed within _____.

    A. 24 hours of the patient's death

    **B. 24 hours of the initial prosection**

    C. 7 days of the patient's death

    D. 7 days of the initial prosection

7. The adrenal glands in most individuals may be found within the retroperitoneal fat _____.

A. Above and/or lateral to the superior poles of the kidney

**B. Above and/or medial to the superior poles of the kidney**

C. Lateral to the renal pelvis

D. Medial to the renal pelvis

8. The most common gross abnormality of the kidneys which is manifested by a diffuse, fine granularity of the renal cortical surface is:

A. Wilson's disease

B. Adult polycystic kidney disease

C. Medullary cystic disease

**D. Arterial sclerosis**

9. This is the heart dissection method of choice for the evaluation of ischemic heart disease.

**A. Short-axis method**

B. Long-axis method

C. Inflow-outflow method

D. Four-chamber method

10. The superior aspect of an ocular specimen is characterized by the tendinous insertion of the _____, which underlies the superior rectus muscle.

**A. Superior oblique muscle**

B. Posterior ciliary vessels

C. Inferior oblique muscle

D. Inferior rectus muscle

11. This is the most frequently used specimen for postmortem chemical analysis:

A. Blood

B. Bile

**C. Vitreous**

D. Cerebral spinal fluid

12 The preferred specimen for chromosome analysis when a congenital disorder is suspected and it is possible to collect an appropriate specimen at autopsy is:

A. Vitreous

B. Bile

**C. Blood**

D. Cerebral spinal fluid

13. The component of the US standard certificate of death that contains the necessary demographic information of the deceased such as the name, date of birth and death, social security number, and place of death is called the:

A. Certifier section

B. Disposition section

C. Cause of death section

**D. Decedent section**

14. The disease or injury in which sets in motion the physiologic train of events culminating in cerebral and cardiac electrical silence is the:

A. Manner of death

**B. Cause of death**

C. Mechanism of death

D. Nature of death

15. After cessation of circulation, the blood drains to the most dependent vessels and creates a faint pink erythema of the dependent skin surfaces called:

**A. Livor mortis**

B. Rigor mortis

C. Algo mortis

D. Putrefaction

# 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 "***Autopsy in evolution of modern medicine***" held during Jan 2016 – June 2016 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

10/12/2015

From,
Dr. Muthukumarsamy. B
Professor and HOD,
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: Stress management among medical students**

Respected Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: "Stress management among medical students"on 08/01/2016. We solicit your kind permission for the same.

Kind Regards

Dr. Muthukumarsamy. B

Dr. B. MUTHUKUMARASAMY, MD
Reg. No: 33723
Professor, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

---

**FOR USE OF THE DEAN'S OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayakumar

The HOD: Dr. Muthukumarasamy. B

The Expert: Dr. Panneerselvam

The committee has discussed about the course and is approved.

Subject Expert HOD

DEPARTMENT OF GENERAL MEDICINE
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, PUDUCHERRY-605 502

Dr. B. MUTHUKUMARASAMY, MD.
Reg. No: 33723
Professor, General Medicine
Sri Lakshmi Narayana Institute of 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 ]

[ Affiliated to Bharath University, Chennai - TN ]

## Circular

15/12/2015

**Sub: Organising Value-added Course: Stress management among medical students 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, "**Stress management among medical students**" between January 2016 and April 2016. 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 24/12/2015. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. P. JAYAKUMAR, M.S., M.Ch.,
DIRECTOR / DEAN

Encl: Copy of Course content.

## COURSE PROPOSAL

**Course Title:** Stress management among medical students

# COURSE PROPOSAL

**Course Title:** Stress management among medical students

**Course Objective:** To create an awareness among students of the 2nd year M.B.B.S about stress management

**Course Outcome:** The students acquired knowledge about stress among medical students and how to deal with the same

**Course Audience:** A batch of 25 students belonging to the 2nd year M.B.B.S

**Course Coordinator:** Dr. Muthukumarasamy. B

**Course Faculties:**

1. Dr. Panneerselvam
   Professor
   Department of General Medicine
2. Dr. Chellapandian
   Professor
   Department of Medicine
3. Dr. Arul Murugan
   Associate Professor
   Department of General Medicine

**Course Curriculum/Topics with schedule**

| Sl. No | Date | Topic | Time | Hours | Name of faculty |
|---|---|---|---|---|---|
| 1. | 08/01/2016 | Stress among medical students | 5 pm to 7 pm | 2 hours | Dr. Panneerselvam |
| 2. | 15/01/2016 | Mental stress and its physical manifestations | 4: 30 pm to 6: 30 pm | 2 hours | Dr. Chellapandian |
| 3. | 22/01/2016 | Is stress essential for productivity? | 5 pm to 7 pm | 2 hours | Dr. Panneerselvam |
| 4. | 29/01/2016 | Sleep deprivation | 5 pm to 7 pm | 2 hours | Dr. Panneerselvam |
| 5. | 05/02/2016 | The fear of exams – the age old bane! | 5 pm to 7 pm | 2 hours | Dr. Chellapandian |
| 6. | 12/02/2016 | Interpersonal conflicts – why do they exist and how to tackle them? | 4: 30 pm to 6: 30 pm | 2 hours | Dr. Panneerselvam |
| 7. | 19/02/2016 | Care for self – the seldom taught rule | 5 pm to 7 pm | 2 hours | Dr. Chellapandian |
| 8. | 26/02/2016 | Is stress helpful? | 5 pm to 7 pm | 2 hours | Dr. Chellapandian |
| 9. | 04/03/2016 | Substance abuse among medical students | 4 pm to 6 pm | 2 hours | Dr. Arul Murugan |
| 10. | 11/03/2016 | Eating healthy | 4 pm to 6 pm | 2 hours | Dr. Arul Murugan |

| | | | | | |
|---|---|---|---|---|---|
| 11. | 18/03/2016 | Exercise and stress reduction | 4 pm to 6 pm | 2 hours | Dr. Arul Murugan |
| 12. | 25/03/2016 | Anxiety | 4 pm to 6 pm | 2 hours | Dr. Panneerselvam |
| 13. | 01/04/2016 | Depression | 4 pm to 6 pm | 2 hours | Dr. Muthukumarasamy. B |
| 14. | 08/04/2016 | The role played by the teaching faculty and medical students | 4 pm to 6 pm | 2 hours | Dr. Muthukumarasamy. B |
| 15. | 15/04/2016 | The key stress busters! | 4 pm to 6 pm | 2 hours | Dr. Panneerselvam |
| | | | Total Hours | 30 | |

**REFERENCE BOOKS:**


1. **HARRISON'S PRINCIPLES OF INTERNAL MEDICINE; 18th EDITION**
2. **NEW OXFORD TEXTBOOK OF PSYCHIATRY**

# VALUE ADDED COURSE

1. Name of the programme and code

   Stress management among medical graduates; IM02
2. Duration & period

   30 hrs; between January 2016 – April 2016
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; between January 2016 – April 2016
8. Year of discontinuation

   2016
9. Summary report of each program year wise:

| VALUE ADDED COURSE: January 2016 – April 2016 | | | | | |
|---|---|---|---|---|---|
| Sl. No. | Course code | Course name | Resource persons | Target Students | Strength and year |
| 1 | IM02 | Stress management among medical graduates | Dr. Panneerselvam<br>Dr. Chellapandian<br>Dr. Arul Murugan | 2nd year MBBS | 25 (January 2016 – April 2016) |

10. Course feedback

    Enclosed as Annexure- V

**RESOURCE PERSON- Dr. Panneerselvam**

**COORDINATOR – Dr. Muthukumarasamy. B**

Dr. B. MUTHUKUMARASAMY, MD.,
Reg. No. 33723
Professor, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

**Annexure II**

**Bharath Institute of Higher Education and Research**

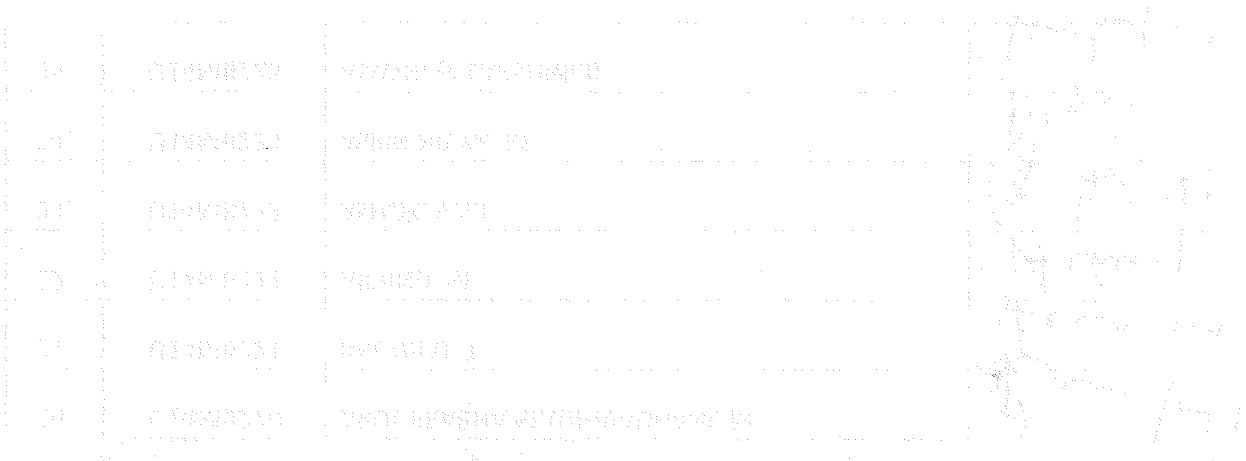
Sri Lakshmi Narayana Institute of Medical Sciences

Participant list with signatures

Value added course: **Stress management among medical students (dated 08/01/2016)**

| Sl.No | Reg.No | Name of the candidate | Signature |
|---|---|---|---|
| 1. | U14MB201 | AASHIK MUKESH. M. S | |
| 2. | U14MB202 | ABEETHA.M | |
| 3. | U14MB203 | ABHINAV. S | |
| 4. | U14MB204 | ABINAYA. M | |
| 5. | U14MB205 | ABISHEK. R | |
| 6. | U14MB206 | ABIRAMI. S | |
| 7. | U14MB207 | AGALYA. S | |
| 8. | U14MB208 | AJAY PANDIAN. V | |
| 9. | U14MB209 | AJEETH. R | |
| 10. | U14MB210 | AJITH KUMAR. M.K. | |
| 11. | U14MB211 | AKSHAI. S | |
| 12. | U14MB212 | ALLEN DANIEL XAVIER.J | |
| 13. | U14MB213 | ALTHAF AHMED | |
| 14. | U14MB214 | AMARA LOKESH | |
| 15. | U14MB215 | AMRESH. K | |
| 16. | U14MB216 | ANANT SURYA. R | |
| 17. | U14MB217 | ANDREW MARIE XAVIER.V | |
| 18. | U14MB218 | APSARA. P | |
| 19. | U14MB219 | ARPUDHA. A | |

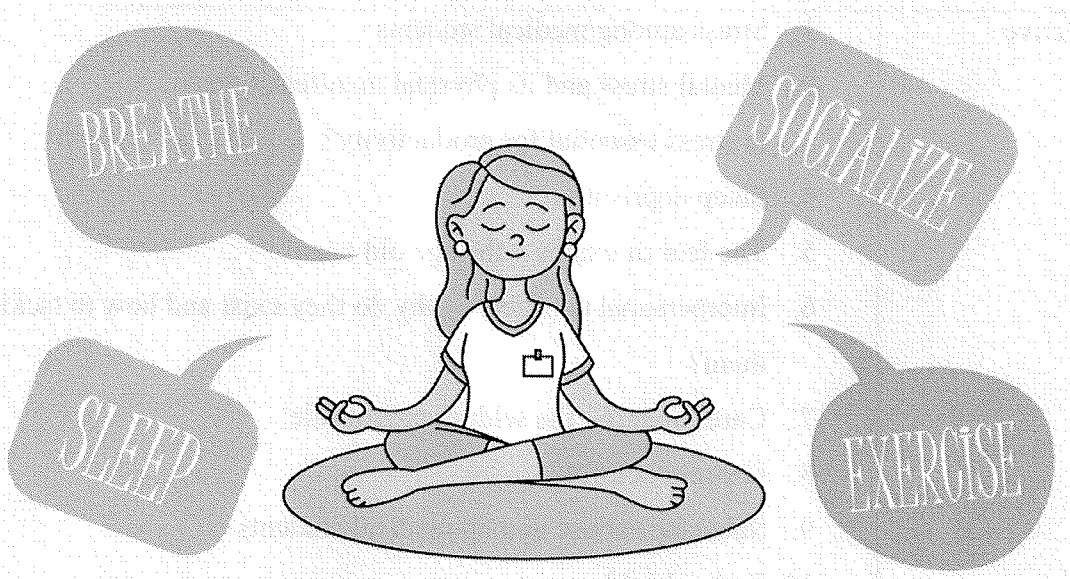
| | | | |
|---|---|---|---|
| 20. | U14MB220 | ARUL PRABHA MADHIVADHANI. M | |
| 21. | U14MB221 | ARUNRAJ. T | |
| 22. | U14MB222 | ARVIND. M | |
| 23. | U14MB223 | ASHOK. V.S.I | |
| 24. | U14MB224 | ASPIN NIVYA. M | |
| 25. | U14MB225 | ASWINI @ LAKSHMI.B | |

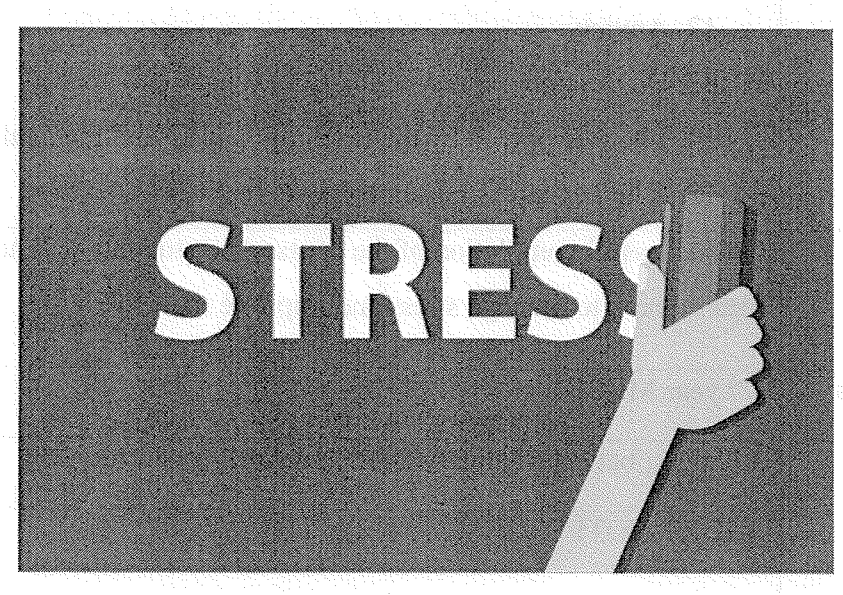


**ANNEXURE – I**

# STRESS MANAGEMENT AMONG MEDICAL STUDENTS

VALUE ADDED COURSE




**PARTICIPANT HAND BOOK**

## COURSE DETAILS

| PARTICULARS | DESCRIPTION |
|---|---|
| Course title | STRESS MANAGEMENT AMONG MEDICAL STUDENTS |
| Course code | IM02 |
| Objective | 1. Stress among medical students<br>2. Mental stress and its physical manifestations<br>3. Is stress essential for productivity?<br>4. Sleep deprivation<br>5. The fear of exams – the age old bane!<br>6. Interpersonal conflicts – why do they exist and how to tackle them?<br>7. Care for self – the seldom taught rule<br>8. Is stress helpful?<br>9. Substance abuse among medical students<br>10. Eating healthy<br>11. Exercise and stress reduction<br>12. Anxiety<br>13. Depression<br>14. The role played by the teaching faculty and medical students<br>15. The key stress busters! |
| Key competencies | On successful completion of the course, the students will have a better idea on how to manage stress and improve their life |
| Target students | 2nd year MBBS |
| Duration | 30 hours; between January 2016 and April 2016 |
| Assessment procedure | SHORT NOTES |

# STRESS AMONG MEDICAL STUDENTS

One would expect medical students to be better off than their peers in other walks of life when it comes to health, and this does hold true to certain extent as far as medical ailments are concerned.When we look at stress and anxiety, however, this particular population seems to be on the receiving end of the spectrum. Multiple studies have found significantly high-stress levels in medical students and the high stress has been reported from multiple countries, spanning different continents.This indicates to certain extent that high stress among medical students is a phenomenon that transcends sociocultural factors, economic status, course patterns, and the alike. Studies done in India are no different and have shown significant morbidity with stress in medical students. Self-rated depression is also found to be significantly higher in Indian medical students.

Medical students experience more stress than the studentsin any other disciplines. They undergo tremendouspressure during their course due to intense syllabus, vastamount of knowledge and requirement of skills withefforts. Such excessive demands of profession getreflected by anxiety, lack of sleep, interpersonal conflictsand depression among students More over expectationsof family members, competition and the uncertaintyinvolved about the future is background of overstress.

Few local factors are like staying in the hostel, hardchallenging studies, new friends, teachers, and the teentender age are challenging issues in their course. Socialissues and financial strains have been also identified as thesources of stress among medical students. The majority ofstressful incidences in traditional curricula are related tomedical training rather than to personal problems.Stress in academic situation can have both positive andnegative consequences. Stress can inhibit and suppresslearning, which is associated with impairment of students'academic performance.

Studying medicine is stressful. Stressors of medical students have been described in many studies. "Stress is a body's non-specific response to demands made upon it, or to disturbing events in the environment". It is a course by which we feel and cope with environmental threats and challenges. Events which cause stress are referred to as stressors. Stress is nothing but the emotional disturbances or changes caused by stressors.

It was also found to decrease attention; hamper decision making and reduce student's abilities to establish good relationships with patients resulting in feeling of inadequacy and dissatisfaction with clinical practice in the future.

Furthermore, it was linked to drug abuse, use of alcohol and suicide among the medical students. These alarming facts confirmed the negative association of stress with mental, emotional and physical morbidity. Chronic exposure to stressful condition exerts negative effects on emotional, mental and physical well-being of the students which also affect the patients' lives and community's health. Numerous studies have revealed that persistent stressful condition associated with mental and physical health problems in medical students at various stages of their training.

Therefore, early detection and intervention may prevent and minimize the ill effects of stress on the students in the future.

Stress is of two types:

1. Favourable Stress - facilitates learning

2. Unfavourable stresses-suppress learning.

Medical students may perceive the same stressors differently based on their inbuilt talents. Excessive amount of stress affect students' self-esteem, achievement and development in their field. Studies in the United States have said that the studying of medicine produce risks to the mental health of qualified medical students high rates of psychological morbidity among them at various stages of their training. In a Singapore based study, 57% of law students and 47.3% of medical students had emotional disorder as measured by GHQ. Another study in Turkey reported that 47.9% of medical students had emotional disorder compared to 29.2% of economic and physical education students as measured by GHQ. These facts suggested a situation of elevated psychological pressure on medical students. Studies have also shown chronic exposure to stress is associated with anxiety and depression interpersonal conflict sleep disturbances and poor academic or clinical performance.

Stress was also found to decrease the quality of attention, concentration, decision-making, and reduces the students' abilities to establish good relationships with patients. As a consequence, students have reported feelings of inadequate and dissatisfactory clinical practice in the future which may affect the lives of patients and the health of a community.

Moreover, stress has also been the cause of misbehaviour of medical student like suicide drug abuse and alcohol use. A study conducted in a Malaysian university reported that 41.9% of medical students had emotional disorders based on the GHQ. Thus, stress which occurs during training of the medical students can create a serious problem if it is uncontrolled. It is important to measure stress among undergraduate medical students.

## MEDICAL STUDENT STRESSOR QUESTIONNAIRE (MSSQ)

The MSSQ was developed to identify the stressors of medical students as well as measure the intensity of stress caused by the stressors. The six domains of stress measured by the MSSQ were developed based on various researches.

It includes: 1. Academic related stressors (ARS) 2. Intrapersonal and interpersonal related stressors (IRS) 3. Teaching and learning-related stressors (TLRS) 4. Social related stressors (SRS) 5. Drive and desire related stressors (DRS) 6. Group activities related stressors (GARS) The MSSQ consists of 40 items representing the six stressor domains. A validation study was conducted and was found that the MSSQ has good psychometric properties; it is a valid and reliable. It has a high internal consistency as Cronbach's alpha coefficient value was 0.95 which is more than the acceptable cut-off point of 0.6.

Usually, successful candidates having excellent academic achievement after the stressful competitive higher secondary examination enter into the medical course. Final year students experience more stress in academic related stressor and teaching and learning related stressor may be due to the fact that they are not allowed to carry their arrears and studying four subjects in a year. Second year students experience slightly high stress due to teaching and learning related stressor. Social related stressor, drive and desired related stressor, group activities related stressor shares nearly equal stress in all students.

Many student experiences less energy and motivation as a major consequence of sleep deprivation. Students have stated that college environment contributes about 16% of stress.

Med School is not easy it is rewarding, yet stressful.

- Stress can be
- Useful and adaptive, or
- Detrimental and maladaptive

## INTERPERSONAL RELATIONSHIPS

Can add to the stress of medical school. This is especially true when we function in one of the 3 roles of the STRESS TRIANGLE.

These roles are Persecutor, Caregiver and Victim

Often these patterns are deeply ingrained and outside ones awareness.

STRESS PRODUCING ROLES

- Persecutors dictatorial, controlling, critical, blaming (undermining others self esteem).
- Caregivers overprotective, too helpful, and seek to please others to detriment of self take care of others feelings, ignoring their own.
- Victims act helpless, pity themselves and are nonassertive.

EFFECTS OF STRESS:

POSITIVE EFFECTS

- Compel you to action (Hmmm, maybe I should start NOW to study for that test in two weeks).

NEGATIVE EFFECTS

- It can result in feelings of distrust, rejection, and anger.
- It can lead to health problems such as anxiety,depression, headaches, upset stomach, rashes, insomnia, ulcers, high blood pressure, heart disease, and stroke.
- Can result in a vicious cycle of feeling overwhelmed then procrastinating etc.

STRESS-BUSTERS

- Believe in yourself.
- You are here today because you CAN do this.
- If you prepare properly you should do fine.
- Don't try to be perfect.
- If you think that less than highest grades is equivalent to failure, then you will be way overstressed. Med school is not that easy.

- Aim to do your best, but realize that you will not get a perfect grade all the time.
- Be aware of your reaction to stress
- Notice your distress, don't ignore it.
- Determine what distresses you and how you react, e.g., the role you take with self/others
- Determine how your body responds to the stress, e.g., where you hold your tension
- Do you become nervous or physically upset? If so, in what specific ways?
- Pay attention to these Distress Signals!

Recognize what you can change:

- Can you avoid the stressor?
- Don't study in noisy places if it disturbs you.
- Can you decrease the stress?
- Give yourself plenty of time to study for tests.
- Can you shorten your exposure to stress?
- Give yourself time to relax, as well. Practice positive self-talk. Visualize yourself as confident/successful.
- Can you change your behaviour?
- Set goals, manage time effectively, reward yourself for jobs well done. Practice positive self-talk. Plan.
- Take care of yourself!

**Stress Management Plan**

Practice time management

Learn relaxation exercises

Rehearse and practice situations

Learn practical coping skills

Decrease negative self talk

Learn to feel good with a workable result – Don't be a perfectionist

Build a network of friends

Ultimately, the only people who can get through to students with any consistency are the students themselves…"

Peer Counseling/ Education Programs

Student Health Advisory Group

Wellness representatives in the dorms

Mental Health Advocacy Group

Involve in screenings and education

STRESS is very common. Use stress in a positive way

Use it to improve your performance.

Learn Coping Skills

Best to way to overcome stress

Academic performance is enhanced by physical and emotional health

We can learn to recognize problems much earlier

Depression, Anxiety and Stress are treatable

Education, Psychotherapy and Medication are all effective

Self -Care--eat, sleep, exercise--is a cornerstone of health (for all of us!)

Being in control of your life and having realistic expectations about your day-to-day challenges are the keys to stress management, which is perhaps the most important ingredient to living a happy, healthy and rewarding life. Be realistic and not be overambitious.

TO SUMMARIZE....

The perceived stress is higher among higher age group and final year medical students. Academic, psychosocial, and environmental stressors are associated with perceived stress. There may be a need to rethink the evaluation and examination system and to provide more time and facilities in the campus for recreation and sports to make it less stressful to the students. Counseling cells can be established for both students and parents. It is important to emphasize that in addition to educating in a professional medical course it is also important to take into account the quality of life of the students during the years of medical training. Teaching stress management and self-care skills to medical students is essential. Individual and organizational interventions are the need of the hour for prevention of stress among medical students.

Students have a high level of academic stress followed by the social and personal stress. Since the stressors cannot be permanently eliminated, we have to necessarily devise efficient methods for managing them so as to not be adversely impacted in the long term. Hence, so as to make a student an efficient stress manager, factors affecting the growth of the person must be taken into concern. Family support can be an effective means for helping medical student coping up with the stressors in their life. A comprehensive program needs to be initiated for the strong mental and emotional built up of medical students with significant involvement of their family.

Annexure - III

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## STRESS MANAGEMENT AMONG MEDICAL STUDENTS

## SHORT NOTES

**Course Code: IM02**

**WRITE SHORT NOTES ON THE FOLLOWING:**

1. Self care – how it is seldom emphasized and why it is essential?
2. Sleep deprivation
3. Depression among medical students
4. Anxiety
5. Stress management techniques

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

**Annexure - III**

## STRESS MANAGEMENT AMONG MEDICAL STUDENTS

## SHORT NOTES

**Course Code: IM02**

**WRITE SHORT NOTES ON THE FOLLOWING:**

1. Self care – how it is seldom emphasized and why it is essential ?
2. Sleep deprivation
3. Depression among medical students
4. Anxiety
5. Stress management techniques

10

10

Multiprandium

(Co-ordination)

1. Medical self care refers to the series of events that an individual takes part in after the onset of physical or mental health symptom. often times, companies & managed Care organisation want to provide resource for their employer to make wise decision about how to go about treating their symptoms.

2. Sleep deprivation is not getting required amount of sleep. This can have causes that aren't due to underlying disease. Examples include stress, school or job requirement or poor sleeping habits.

3. Medical schools are known to be stressful environments for students and hence medical students have been believed to experience greater incidence of depression than others. Here the global prevalence of depression amongst medical students, as well as epidemiological, psychological, educational & social factors in order to identify high risk groups.

4. Anxiety disorders - A mental health disorder characterized by feelings of worry, anxiety or fear that are strong enough to interfere with one's daily activities. Example of anxiety disorder include panic attacks, obsessive – compulsive disorders & post traumatic stress disorder -

5. Stress management techniques :-

- → Exercise
- → Relaxation & Meditation techniques
- → Time Manage
- → organization skills
- → Support systems
- → Diet
- → Sleep

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

**Annexure - I**

## STRESS MANAGEMENT AMONG MEDICAL STUDENTS

## SHORT NOTES

**Course Code: IM02**

**WRITE SHORT NOTES ON THE FOLLOWING:**

1. Self care – how it is seldom emphasized and why it is essential ?
2. Sleep deprivation
3. Depression among medical students
4. Anxiety
5. Stress management techniques

8 1/2

10

(Arthanareeswaran)

1) Making little changes in your life can really add up to a big feeling of relief, learn to relax, take a break and stay positive.

2) Adult population experience insomnia, loss of cognitive functioning, drowsiness, rise of depression, headache, increased rate of gastritis

3) The prevalence of depression is seen especially in the 1st year medical students. So, Importance should be made to alleviate Stress right from the time they enter medical school. Since Academic importance in studies are suggested

4) A feeling of worry, nervousness, or unease about something with an uncertain outcome

5) Stress management techniques such as
   i) relaxation
   ii) Proper rest
   iii) Exercise
   iv) organizational skills
   v) Support systems

ANNEXURE IV

# Sri Lakshmi Narayana Institute of Medical Sciences

## CERTIFICATE OF MERIT

This is to certify that ANANT SURYA. R has actively participated in the Value added course – "Stress Management Among Medical Students" conducted between January 2016- April 2016, organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Panneerselvam
**RESOURCE PERSON**

Dr. Muthukumarasamy. B
Reg. No: 33723
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudaeakkam, Puducherry-605 502
**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 AGALYA. S has actively participated in the Value added course- "Stress Management Among Medical Students" conducted between January 2016-April 2016, organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Panneerselvam
**RESOURCE PERSON**

Dr. Muthukumarasamy. B
**COORDINATOR**

Dr. B. MUTHUKUMARASAMY, MD.,
Reg. No: 33723
Professor, General Medicine

ANNEXURE V

## Student Feedback Form

Course Name: **STRESS MANAGEMENT AMONG MEDICAL STUDENTS**

Subject Code: **IM02**

Name of Student: Ajeeth. R Roll No.: U14MB209

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 ✓ |

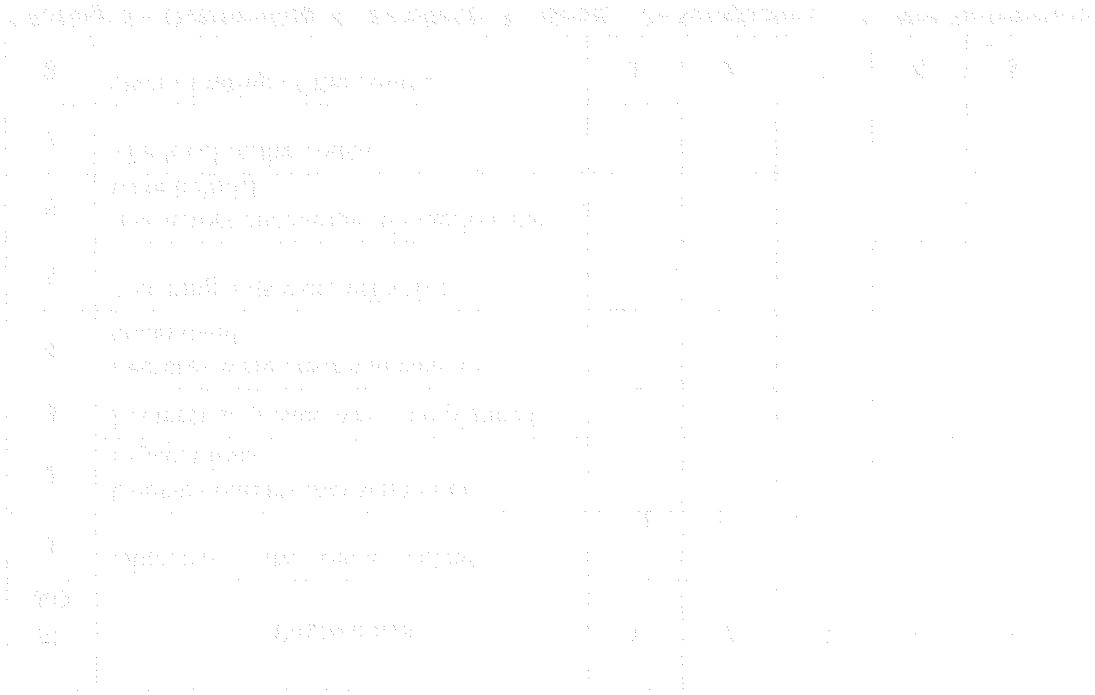
**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

| |
|---|
| – |

Ajeeth R.
Signature

*Date:* 15/04/2016



ANNEXURE V

## Student Feedback Form

Course Name: **STRESS MANAGEMENT AMONG MEDICAL STUDENTS**

Subject Code: **IM02**

Name of Student: AGALYA . S Roll No.: U14MB207

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:

| |
|---|
| – |

AGALYA S
Signature

*Date:* 15/04/2016

# COURSE COMPLETION LETTER

18/04/2016

From

Dr. Muthukumarsamy. B

Professor and HOD,

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: Stress management among medical students**

Respected Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **"Stress management among medical students"** on 15/04/2016. We solicit your kind action to send certificates for the participants. I am attaching the photographs captured during the conduct of the course.

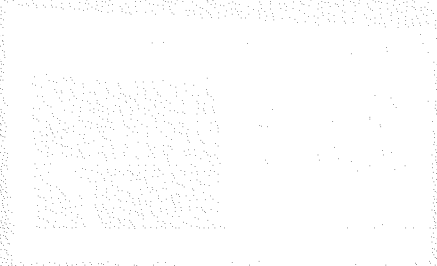
Kind Regards

Dr. Muthukumarsamy. B

Dr. B. MUTHUKUMARASAMY, MD.,
Reg. 33723
Professor General Medicine

**Encl: Photographs**


STRESS



# Sri Lakshmi Narayana Institute of Medical Sciences

From
Dr K Balagurunathan,
Professor and Head,
General Surgery,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Date 3/1/2016

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: BASIC SURGICAL SKILLS**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **BASIC SURGICAL SKILLS , 30 Hours course** on **FEB 2016- JUNE 2016**. 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 JAYAKUMAR

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, Kudapakkam, Puducherry-605 502.

Dean

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

(Sign & Seal)

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 ]
[ Affliated to Bharath University, Chennai - TN ]

## Circular

07.01.2016

**Sub: Organising Value-added Course: BASIC SURGICAL SKILLS**

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 **"BASIC SURGICAL SKILLS "**.

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 FEBRUARY 2016. 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: BASIC SURGICAL SKILLS**

**Course Objective:**

1. Ideal suture mateials
2. Classification of suture materials
3. Absrbable suture materials
4. Non absorbable suture materials
5. Numbering of suture materials
6. Surgical needles
7. Sutring tecniques
8. Types of suturing
9. Types of knots

**Course Outcome:**

**Course Audience: MBBS UNDERGRADUATES**

**Course Coordinator: DR ASAYAS BOSCO CHANDRA KUMAR**

**Course Faculties with Qualification and Designation:**

1. **Dr Balagurunathan , Prof and HOD General Surgery**
2. **Dr Asayas Bosco Chandra Kumar, Prof General Surgery**

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

| SlNo | Date | Topic | Time | Hours | Faculty |
|---|---|---|---|---|---|
| 1. | 4/2/2016 | 1. Ideal suture mateials | 4-6PM | 2 | **Dr Balagurunathan** |
| 2. | 5/2/2016 | 2. Ideal suture mateials | 4-6PM | 2 | **DR ASAYAS BOSCO** |
| 3. | 6/2/2016 | 3. Classification of suture materials | 4-7PM | 2 | **Dr Balagurunathan** |
| 4. | 7/2/2016 | 4. Classification of suture materials | 4-7PM | 2 | **DR ASAYAS BOSCO** |
| 5. | 9/2/2016 | 5. Absrbable suture materials | 4-6PM | 2 | **Dr Balagurunathan** |
| 6. | 11/2/2016 | 6. Absrbable suture materials | 4-6PM | 2 | **DR ASAYAS BOSCO** |
| 7. | 13/2/2016 | 7. Non absorbable suture | 4- | 1 | **Dr** |

| | | | | | |
|---|---|---|---|---|---|
| | | materials | 6PM | | **Balagurunathan** |
| 8. | 15/2/2016 | 8. Non absorbable suture materials | 4-6PM | 1 | **DR ASAYAS BOSCO** |
| 9. | 18/2/2016 | 9. Numbering of suture materials | 4-6PM | 2 | **Dr Balagurunathan** |
| 10. | 22/2/2016 | 10. Numbering of suture materials | 4-6PM | 2 | **DR ASAYAS BOSCO** |
| 11. | 24/2/2016 | 11. Surgical needles | 4-6PM | 2 | **Dr Balagurunathan** |
| 12. | 2/3/2016 | 12. Surgical needles | 4-6PM | 2 | **DR ASAYAS BOSCO** |
| 13. | 4/3/2016 | 13. Sutring tecniques | 4-7PM | 3 | **Dr Balagurunathan** |
| 14. | 6/3/2016 | 14. Sutring tecniques | 4-7PM | 3 | **DR ASAYAS BOSCO** |
| 15 | 8/3/2016 | 15. Types of suturing | 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**

Basic Surgical Skills and GS03

**2. Duration & Period**

30 hrs & FEB 2016 – JUNE 2016

**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 , FEB 2016 – JUNE 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- FEB 2016 – JUNE 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | GS03 | BASIC SURGICAL SKILLS | Dr. ASAYAS BOSCO CHANDRA KUMAR | MBBS | 20 ( FEB 2016 – JUNE 2016) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

**RESOURCE PERSON**

**DR ASAYAS BOSCO CHANDRAKUMAR**

**(PROF GENERAL SURGERY)**

**CO-ORDINATOR**

**DR K BALAGURUNATHAN**

**( HOD GENERAL SURGERY)**

# BASIC SURGICAL SKILLS

# PARTICIPANTS HAND BOOK

BIHER

SLIMS

## COURSE DETAILS

| Particulars | Description |
|---|---|
| Course Title | Basic Surgical skiils |
| Course Code | GS03 |
| Objective | 1. Ideal suture mateials<br>2. Classification of suture materials<br>3. Absorbable suture materials<br>4. Non absorbable suture materials<br>5. Numbering of suture materials<br>6. Surgical needles<br>7. Sutring tecniques<br>8. Types of suturing<br>9. Types of knots |
| Further learning opportunities | Staples in surgery |
| Key Competencies | On successful completion of the course the students will have skill in handling surgical instrments an carry out basic surgical knotting and suturing |
| Target Student | 4th MBBS Students |
| Duration | 30hrs FEB 2016 – JUNE 2016 |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | Multiple choice questions, practical assessment of performanace |
| | |

BIHER SLIMS

**Features of ideal suture material**

Adequate tensile strength

Good knot holding property

Should be least reactive

Easy handling property

Should have less memory

Should be easily available and cost effective

**Absorbable Suture Materials**

**Plain catgut**

derived from submucosa of jejunum of sheep.

yellowish white in colour.

absorbed by infl ammatory reaction and phagocytosis

absorption time is 7 days.

used for subcutaneous tissue, muscle, circumcision in children.

**Chromic catgut**

-catgut with chromic acid salt.

-brown in colour.

-absorption time is 21 days.

-used for suturing muscle, fascia, external oblique aponeurosis, ligating pedicles, etc.

BIHER SLIMS

**Vicryl (Polyglactic acid)**:

-synthetic absorbable suture material.

-gets absorbed in 90 days.

-Absorption is by hydrolysis.

-violet in colour (braided).

-multifi lament and braided.

-very good suture material for bowel anastom osis, suturing muscles, closure of peritoneum

**Dexon (Polyglycolic acid)** --synthetic absorbable suture material like vicryl. It is -creamy yellow in colour (braided).

**Maxon (Polyglyconate)** monofilament.

**PDS (Poly Dioxanone Suture material)**

-absorbable suture material.

-creamy in colour with properties like vicryl.

-costly but better suture material than vicryl

**Monocryl (Polyglecaprone)** monofi lament.

**Biosyn (Glycomer)** monofi lament.

Absorbable suture materials should not be used for suturing tendon, nerves, vessels (vascular anastomosis)

## Uses of absorbable suture materials

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-In bowel anastomosis like gastrojejunostomy, resection and anastomosisVicryl is used

-In cholecystojejunostomy (CCJ), choledocho-jejunos tomy (CDJ), pancreaticojejunostomy. Vicryl is used

-In suturing muscle, fascia, peritoneum, subc utaneous tissue, mucosa

-In ligating pedicles. 1-zero chromic catgut or vicryl are used, e.g. ligation of pedicles during hysterec tomy

-In circumcision, usually 3-zero plain or chromic catgut are used




## Nonabsorbable Suture Materials

**Silk** is natural, multifilament, braided, non-absorbable suture material derived from cocoon of silkworm larva. It is black in colour. It is coated suture material to reduce capillary action.

**Polypropylene (Prolene)** is synthetic, monofi lam ent suture material. It is blue in colour. It has got high memory. (Memory of suture material is recoiling tendency after removal from the packet. Ideally suture material should have low memory.) (Prolene mesh used for hernioplasty is white in colour).

**Polyethylene (Ethylene)** is synthetic monofi lament nonabsorbable suture material. It is black in colour.

**Cotton** is twisted multifi lament natural nonabsor bable suture material. It is white in colour.

**Linen** is derived from bark of cotton tree.

**Steel, polyester, polyamide, nylon** are other non absorbable suture materials.

**Uses of nonabsorbable suture materials**

-In herniorrhaphy for repair

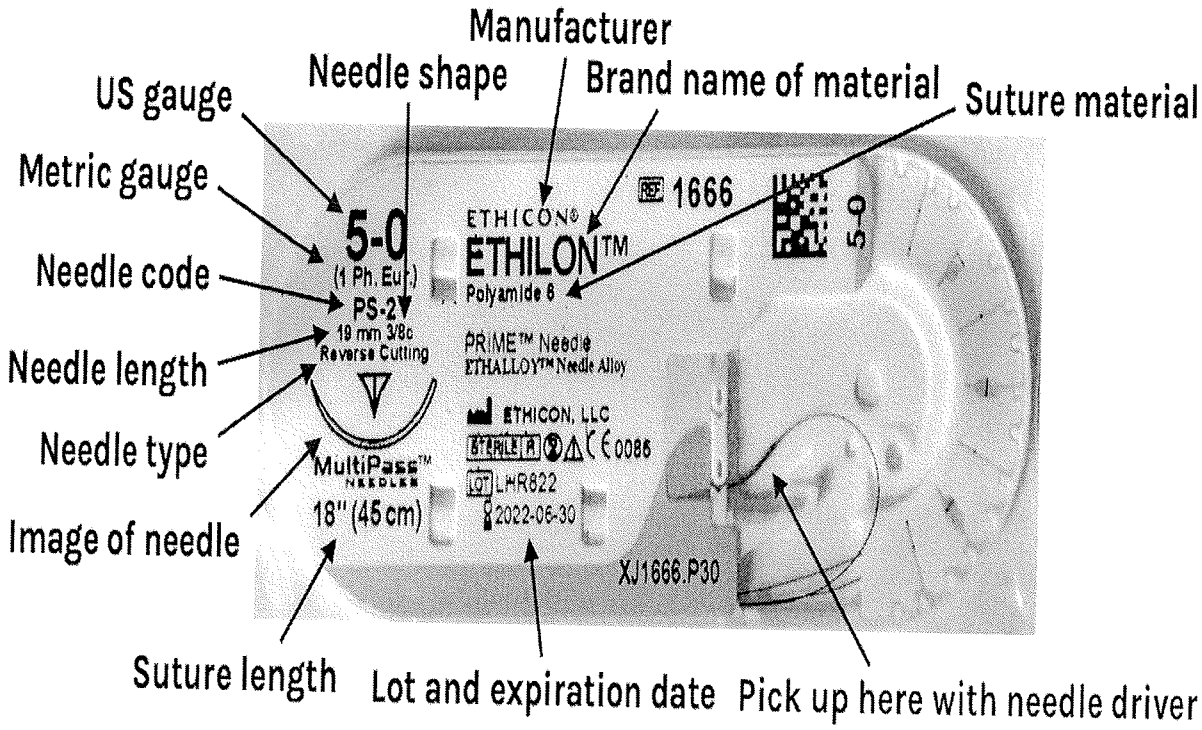
-For closure of abdomen after laparotomy

- For vascular anastomosis (6-zero), nerve suturing, tendon suturing

-For tension suturing in the abdomen

- For suturing the skin

BIHER SLIMS




**Classification 2**

**Natural**

Catgut

Silk.

Cotton

Linen.

**Synthetic**

Vicryl

Dexon

PDS

maxon.

Polypropylene

polyethylene, polyester, poly amide.

**CLASSIFICATION III**

**Braided**: Polyester, polyamide, vicryl, dexon, silk.

**Twisted:** Cotton, linen.

**CLASSIFICATION IV**

**Monofi lament**: Polypropylene, polyethylene, PDS, catgut, steel.

**Multifi lament**: Polyester, polyamide, vicryl, dexon, silk, cotton.

**CLASSIFICATION V : Coated. Uncoated.**

## Numbering of Suture Material

2-Thick. For pedicle ligation.

1-thick

0-zero.

1-zero.

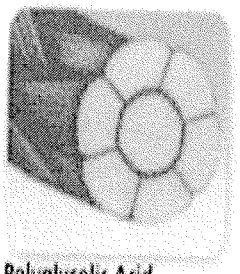
2-zero. For bowel suturing.

3-zero. 4-zero. 5-zero. For vascular anastomosis.

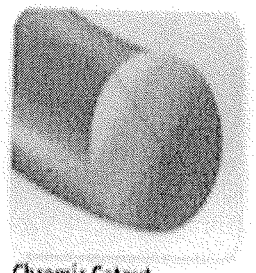
6-zero. 7-zero. 8-zero. 9-zero. For ophthalmic surgery. Requires operating microscope.

BIHER SLIMS

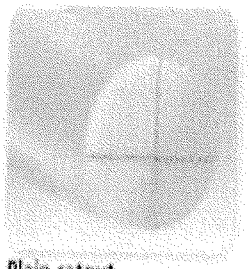
# THREAD



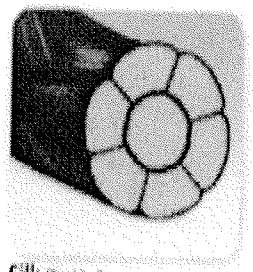
Polyglycolic Acid
Ácido Poliglicólico
Acido Poliglicólico



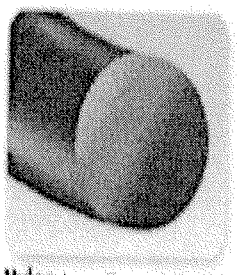
Chromic Catgut
Hilo de Cromo
Fio de Cromo



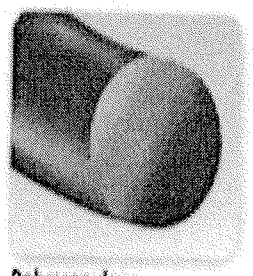
Plain catgut
Hilo Plano
Fio Plano



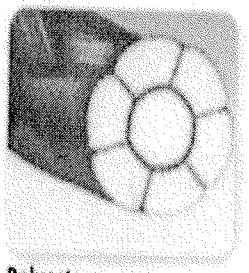
Silk (Braided)
Seda trenzada
Seda trançada



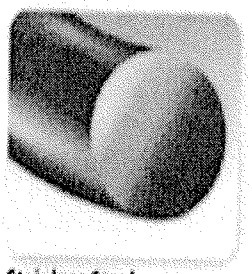
Nylon (monofilament Polyamide)
Nylon (Monofilamento poliamídico)
Nylon (Monofilamento poliamídico)



Polypropylene
Polipropileno
Polipropileno



Polyester (Braided)
Poliester trenzado
Polyester de tresses



Stainless Steel
Acero inoxidable
Aço inoxidável

**Types of suturing**

Continuous suturing

Interrupted simple suturing

Interrupted mattress suturing

Subcuticular suturing

Horizontal tension suturing

Vertical tension suturing

BIHER SLIMS

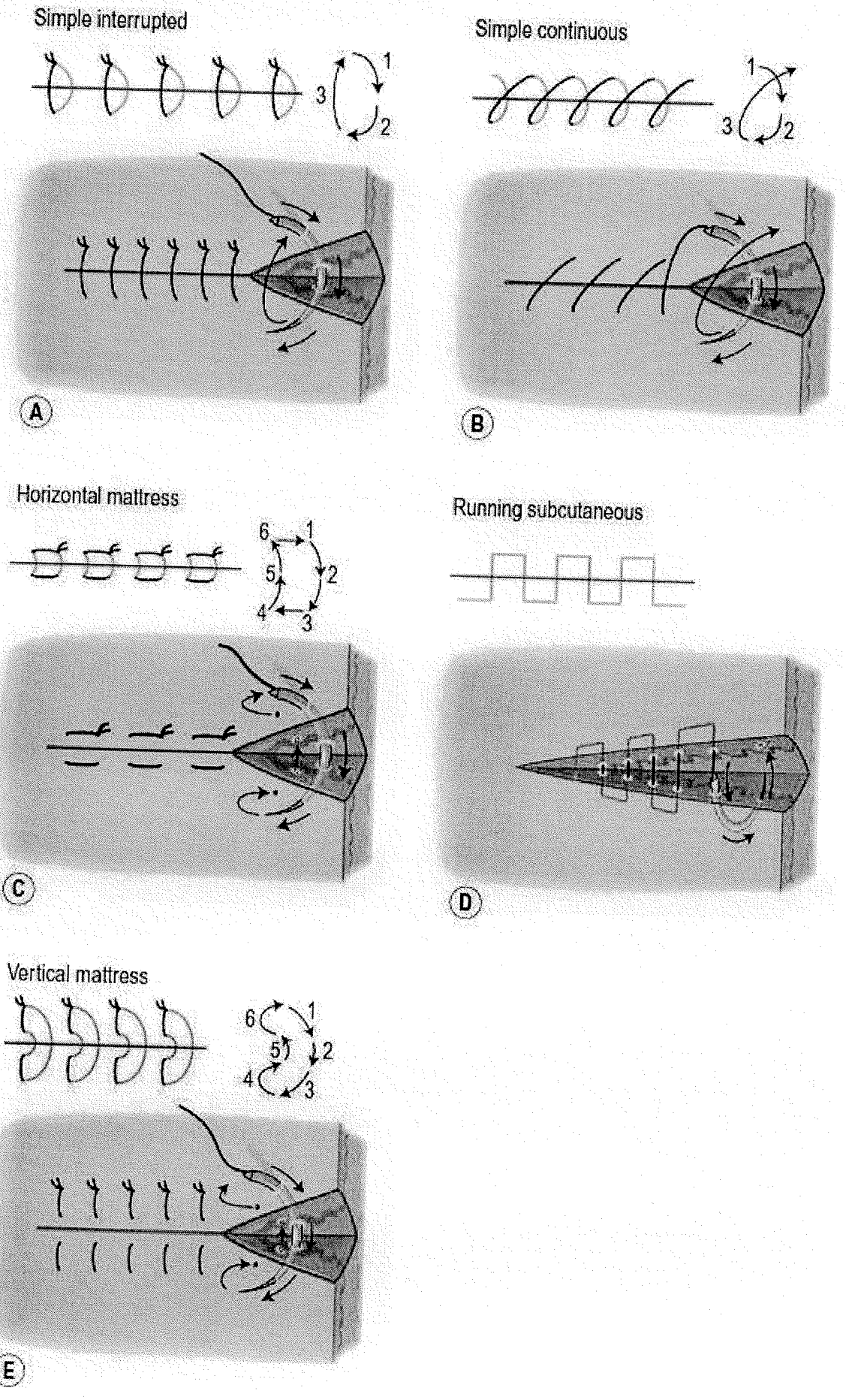
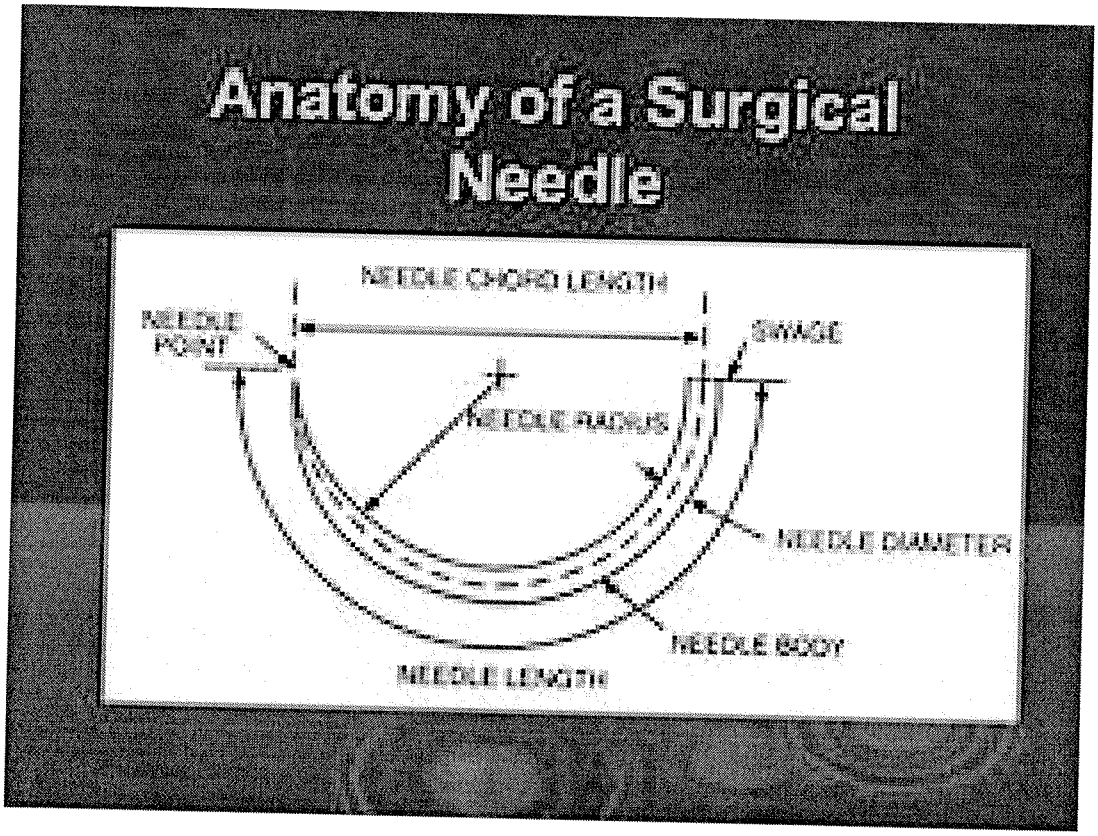
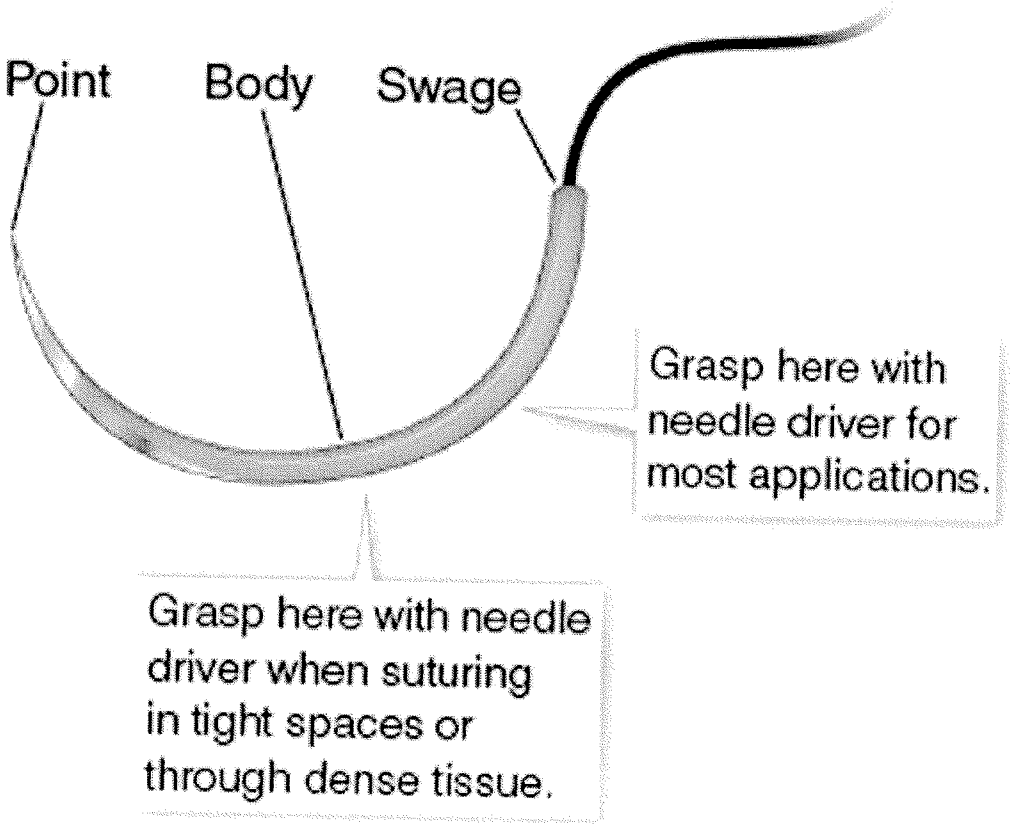



**Fig. 23.8** (A) Simple interrupted sutures (as described). (B) Simple continuous.

# Anatomy of a Surgical Needle





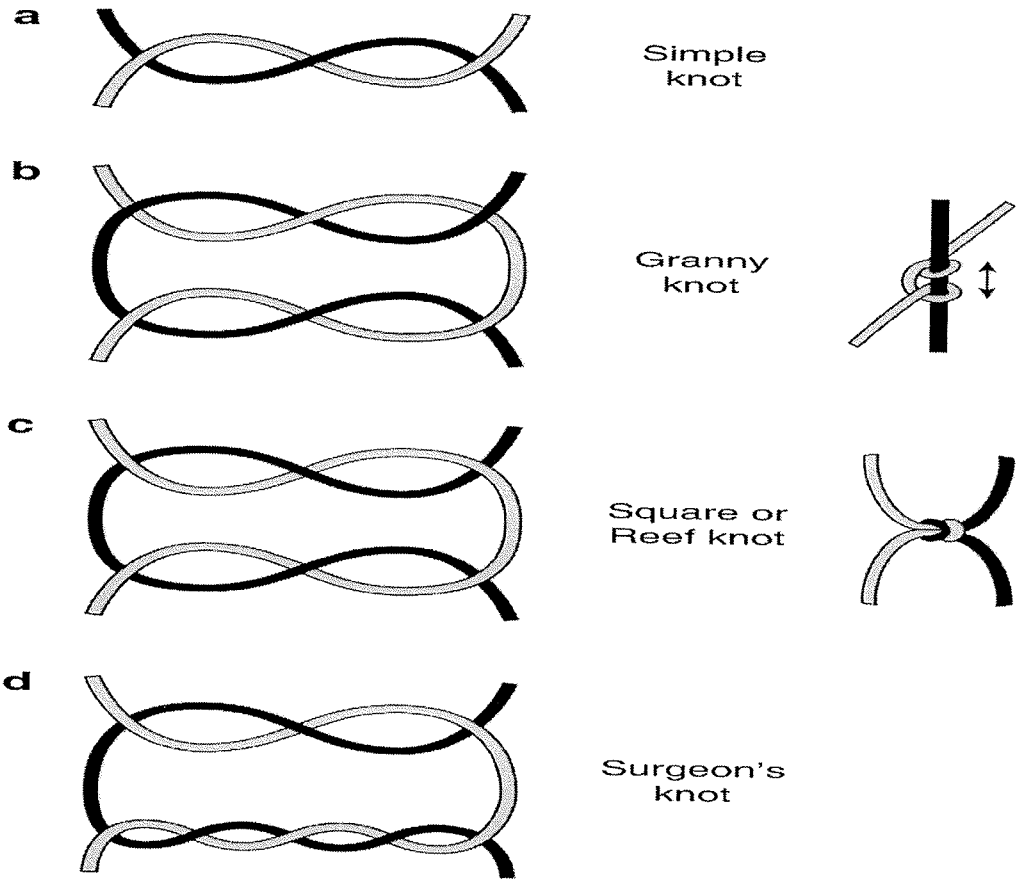

Source: Jonathan Kantor: Atlas of Suturing Techniques: Approaches to Surgical Wound, Laceration, and Cosmetic Repair, AccessEmergencyMedicine
Copyright © McGraw-Hill Education. All rights reserved.

**Types of knots**

Reef knot

Granny knot

Surgeon's knot



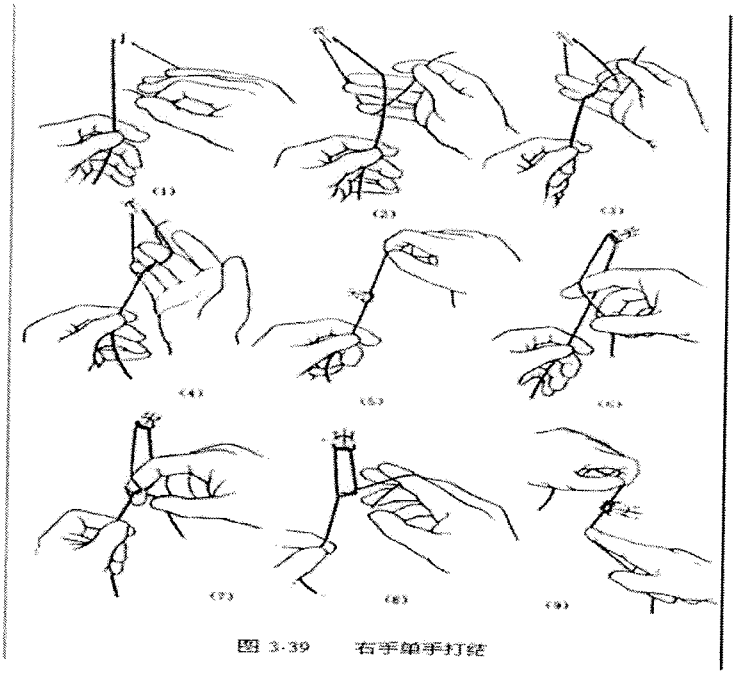



图 3-39　右手单手打结

BIHER
SLIMS

**Annexure- II**

## VALUE ADDED COURSE

### BASIC SURGICAL SKILLS and GS03

### List of Students Enrolled FEB 2016- JUNE 2016

| MBBS Student | | | |
|---|---|---|---|
| Sl. No | Name of the Student | Roll No | Signature |
| 1 | SHANMUGAVEL L N | U13MB261 | |
| 2 | SHEELA PRIYA DARSHINI N | U13MB262 | |
| 3 | SHEIK MOHAMMED YASAR | U13MB263 | |
| 4 | SIVASANKARI B | U13MB264 | |
| 5 | SNEHA T | U13MB265 | |
| 6 | SNEHA T | U13MB266 | |
| 7 | SOBICA D | U13MB267 | |
| 8 | SOWDARAVEL S | U13MB268 | |
| 9 | SRI SAKTHI PRIYA N | U13MB269 | |
| 10 | SRILEKHA D J | U13MB270 | |
| 11 | SRIMUKESH A | U13MB271 | |
| 12 | STEPHEN A | U13MB272 | |
| 13 | SUGANYA P | U13MB273 | |
| 14 | SUGESH CHANDRAN V | U13MB274 | |
| 15 | SURIYA KUMAR G | U13MB275 | |
| 16 | SUSINDHARAN K | U13MB276 | |
| 17 | SWEDHA P | U13MB277 | |
| 18 | THAMIZHARUVI M | U13MB278 | |
| 19 | THAMIZHSELVAN G | U13MB279 | |
| 20 | THARSHINI N | U13MB280 | |

SHANMUGAVEL LN
U13MB261

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - IV**

## BASIC SURGCIAL SKILLS

### MULTIPLE CHOICE QUESTIONS

**Course Code: GS03**

**I. ANSWER ALL THE QUESTIONS**

1. all are absorbable suture materials except

a.catgut

b.vicryl

c.silk

d.exon

2. all are non absorbable suture materials except

a. silk

b. pds

c. prolene

d. polyamide

3. Uses of absorbable suture materials

a. in bowel anastomosis

b. for suturing muscle , facsia, peritoneum

c. Both A & B are Correct

d. None of the above

4. natural suture material among the following is ?

a. dexon

b. vicryl

c. silk

d. none of the above

4. monofilament suture among the following

a. catgut

b. polypropylene

c. steel

d. all of the above

5. Numbering f suture material

a. 9-0 thinner suture

b. 2-0 is thicker

c. Both A & B are Correct

d. None of the above

6. uses of non absorbable suture materials

a. for tension suturing of abdominal muscles

b. in hernioraphy

c. both are correct

d. None of the above

7. What is the suture used for bowel anastomosis

a. absorbable

b. non absorbable

c. prolene

d. none of the above are correct

8. suture maerial used in vascular anastomosis

a. absorbale

b. non absorbable polyfilament

c. non absorbable monofilament

d. None of the above

(x/x)

ASSESSOR NAME : Dr ASAYAS BOSCO CHANDRA KUMAR

SIGNATURE :

DATE : 9/3/2016

SIVA SANKARI B
V13MB264

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

## BASIC SURGCIAL SKILLS

### MULTIPLE CHOICE QUESTIONS

Course Code: GS03

**I. ANSWER ALL THE QUESTIONS**

1. all are absorbable suture materials except

a.catgut

b.vicryl

✓c.silk

d.exon

2. all are non absorbable suture materials except

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✓b. pds

c. prolene

d. polyamide

3. Uses of absorbable suture materials

a. in bowel anastomosis

b. for suturing muscle , facsia, peritoneum

✓c. Both A & B are Correct

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a. dexon

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4. monofilament suture among the following

a. catgut

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a. absorbale

b. non absorbable polyfilament

c. non absorbable monofilament

d. None of the above

7/7

ASSESSOR NAME

SIGNATURE

DATE 9/3/2016

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 SUGANYA P has actively participated in the Value Added Course on BASIC SURGICAL SKILLS held during FEB 2016- JUNE 2016 . 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 SHEELA PRIYA DHARSHINI has actively participated in the Value Added Course on BASIC SURGICAL SKILLS held during FEB 2016- JUNE 2016 . 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: **BASIC SURGICAL SKILLS**

Subject Code: **GS03**

Name of Student: Sobia. Roll No.: V13MB267

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 | | | ✓ | | |

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 8/3/16

Sobia.

Signature

# Student Feedback Form

Course Name: **BASIC SURGICAL SKILLS**

Subject Code: **GS03**

Name of Student: SHANMUGAVEL Roll No.: U13MB361

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 | | | | | ✓ 5 |
| | | 1 | 2 | 3 | 4 | |

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 8/3/16

Shanmugavel
Signature

From
Dr K Balagurunathan,
Professor and Head,
General Surgery,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Date :13/5//2016

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: BASIC SURGICAL SKILLS**

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **BASIC SURGICAL SKILLS** for 20students in FEB 2016- JUNE 2016. 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**


BASIC SUTURING
TECHNIQUES-
SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
DEPARTMENT OF GENERAL
HANDS ON SUTURING TRAINING

# Sri Lakshmi Narayana Institute of Medical Sciences

Date: 07.1.2016

From

Dr.Kamatchi
Professor and Head,
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: Certificate course Communication skills & Quality Assurance in Clinical Microbiology**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Certificate course Communication skills for Feb 2016 to March 2016& Quality Assurance in Clinical Microbiology for July 2016 to August 2016. We solicit your kind permission for the same.

Kind Regards

Dr.Kamatchi

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: **Dr. Jayakumar**

The HOD: **Dr. Kamatchi**

The Expert: **Dr. Abarna.V**

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

DEPT OF MICROBIOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES-PONDICHERRY 605 502

PROFESSOR & HOD
DEPARTMENT OF MICROBIOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

**Sri Lakshmi Narayana Institute of Medical Sciences**

# Circular

14.01.2016

**Sub: Organising Value-added Course:** Communication skills **-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 "Communication skills" from Feb 2016 to March 2016. 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 Jan30th 2016. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Encl: Copy of Course content .

# Course Proposal

**Course Title: Communication skills**

**Course Objective:**

1. Definition for communication
2. Interpersonal communication skills
3. Tips for effective interpersonal communication
4. Principles of communication
5. Barriers to effective communication
6. Social skills
7. Getting and receiving Feedback
8. Improving communication
9. The ladder of inference

**Course Outcome:** On successful completion of the course the students will be able to communicate effectively to others

**Course Audience: Medical undergraduates**

**Course Coordinator: Dr.Kamatchi**

**Course Faculties with Qualification and Designation: Dr.Abarna.V ,Assistant Professor**
**Mr.Naveenkumar,Assistant Professor**

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

| Date | Time | Topic - | Hour | Lecture taken by |
|---|---|---|---|---|
| 3.02.2016 | 4-7pm | what is communication | 3hrs | Dr.Abarna.V |
| 10.02.2016 | 4-7pm | Interpersonal communication skills | 3hrs | Dr.Kamatchi |
| 17.02.2016 | 4-7pm | Tips for effective interpersonal communication | 3hrs | Dr.Abarna.V |
| 24.02.2016 | 4-7pm | Principles of communication | 3hrs | Dr.Kamatchi |
| 2.03. 2016 | 4-7pm | Barriers to effective communication | 3hrs | Dr.Naveenkumar.C |

| | | | | |
|---|---|---|---|---|
| 09.03.2016 | 4-7pm | Social skills | 3hrs | Dr.Abarna.V |
| 16.03.2016 | 4-7pm | Getting and receiving Feedback | 3hrs | Dr.Abarna.V |
| 23.03.2016 | 4-7pm | Improving communication | 3hrs | Dr.Kamatchi |
| 30.03.2016 | 4-7pm | The ladder of inference | 3hrs | Dr.Abarna.V |
| 31.03.2016 | 4-7pm | Group activity | 3hrs | Mr.Naveenkumar.C |
| | | Total hours | 30hrs | |

**References:**


1. Communication skills training practical book – Ian Tuhovsky
2. The science of effective communication- Ian Tuhovsky

# VALUE ADDED COURSE

**1. Name of the programme & Code**

**Certificate course Communication skills** and MIC03

**2. Duration & Period**

30 hrs & Feb 2016– March 2016

**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**:

Feb 2016– March 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| **Value Added Course-** Feb 2016– March 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | MIC03 | Certificate course Communication skills | Dr.Abarna.V<br>Dr.Naveenkumar | 2nd MBBS | Feb 2016– March 2016 |

**10. Certificate model**

*Enclosed as Annexure- V*

**RESOURCE PERSON** **COORDINATOR**

## Annexure I

## COURSE DETAILS

| Particulars | Description |
|---|---|
| Course Title | Communication skills |
| Course Code | MIC03 |
| Objective | 1. what is communication<br>2. Interpersonal communication skills<br>3. Tips for effective interpersonal communication<br>4. Principles of communication<br>5. Barriers to effective communication<br>6. Social skills<br>7. Getting and receiving Feedback<br>8. Improving communication<br>9. The ladder of inference |
| Further learning opportunities | Communication skills |
| Key Competencies | On successful completion of the course the students will be able to communicate effectively to others |
| Target Student | 2nd MBBS Students |
| Duration | 30hrs Every Feb 2016– March 2016 |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | Questionnaire |

| Date | Time | Topic | Resource faculty |
|---|---|---|---|
| 3.02.2016 | 4-7pm | what is communication | Dr.Abarna.V |
| 10.02.2016 | 4-7pm | Interpersonal communication skills | Dr.Kamatchi |
| 17.02.2016 | 4-7pm | Tips for effective interpersonal communication | Dr.Abarna.V |
| 24.02.2016 | 4-7pm | Principles of communication | Dr.Kamatchi |
| 2.03. 2016 | 4-7pm | Barriers to effective communication | Dr.Naveenkumar.C |
| 09.03. 2016 | 4-7pm | Social skills | Dr.Abarna.V |
| 16.03. 2016 | 4-7pm | Getting and receiving Feedback | Dr.Abarna.V |
| 23.03. 2016 | 4-7pm | Improving communication | Dr.Kamatchi |
| 30.03.2016 | 4-7pm | The ladder of inference | Dr.Abarna.V |
| 31.03.2016 | 4-7pm | Group activity and post test | Mr.Naveenkumar.C |

**What is Communication?**

**Communication is simply the act of transferring information from one place, person or group to another.**

Every communication involves (at least) one sender, a message and a recipient. This may sound simple, but communication is actually a very complex subject.

The transmission of the message from sender to recipient can be affected by a huge range of things. These include our emotions, the cultural situation, the medium used to communicate, and even our location. The complexity is why good communication skills are considered so

desirable by employers around the world: accurate, effective and unambiguous communication is actually extremely hard.

**Interpersonal Communication Skills**

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.

**When two or more people are in the same place and are aware of each other's presence, then communication is taking place, no matter how subtle or unintentional.**

**Without speech, an observer may be using cues of posture, facial expression, and dress to form an impression of the other's role, emotional state, personality and/or intentions. Although no communication may be intended, people receive messages through such forms of non-verbal behaviour.**

**Elements of Interpersonal Communication**

**Much research has been done to try to break down interpersonal communication into a number of elements in order that it can be more easily understood. Commonly these elements include:**

**The Communicators**

For any communication to occur there must be at least two people involved. It is easy to think about communication involving a sender and a receiver of a message. However, the problem with this way of seeing a relationship is that it presents communication as a **one-way process** where one person sends the message and the other receives it. While one person is talking and another is listening, for example.

In fact communications are almost always complex, **two-way processes**, with people sending and receiving messages to and from each other simultaneously. In other words,

communication is an interactive process. While one person is talking the other is listening - but while listening they are also sending feedback in the form of smiles, head nods etc.

**The Message**

Message not only means the speech used or information conveyed, but also the non-verbal messages exchanged such as **facial expressions**, **tone of voice**, **gestures** and **body language**. Non-verbal behaviour can convey additional information about the spoken message. In particular, it can reveal more about emotional attitudes which may underlie the content of speech.

**Noise**

Noise has a special meaning in communication theory. It refers to anything that distorts the message, so that what is received is different from what is intended by the speaker. Whilst physical 'noise' (for example, background sounds or a low-flying jet plane) can interfere with communication, other factors are considered to be 'noise'. The use of **complicated jargon**, **inappropriate body language**, **inattention**, **disinterest,** and **cultural differences** can be considered 'noise' in the context of interpersonal communication. In other words, any distortions or inconsistencies that occur during an attempt to communicate can be seen as noise.

**Feedback**

Feedback consists of messages the receiver returns, which allows the sender to know how accurately the message has been received, as well as the receiver's reaction. The receiver may also respond to the unintentional message as well as the intentional message. Types of feedback range from direct verbal statements, for example "Say that again, I don't understand", to subtle facial expressions or changes in posture that might indicate to the sender that the receiver feels uncomfortable with the message. Feedback allows the sender to regulate, adapt or repeat the message in order to improve communication.

**Top Tips for Effective Interpersonal Communication**

Interpersonal communication skills are those which you will need every day in your life – be it in your professional or your personal life.

They are some of the most important skills that you need to focus on as a large percentage of your life involves interacting with people; friends, colleagues, relations or your boss.

**1. Don't Show Negative Body Language**

As the saying goes, 'the first impression is the last impression', hence you should always be careful when it comes to body language.

It is said that a typical communication consists of more than 50% non-verbal communication, which includes body language. So if your body language is sending negative signals to the other person, the communication will probably break down in the process

**2. Do Not Interrupt the Other Person**

It is very rude to interrupt a person while they are speaking. Nobody likes to be interrupted because it hampers the thought process and it is disrespectful.

If you have to make an interruption and it is necessary for you to speak at the exact moment, then you need to make gentle interruptions. Ask the person if you can interrupt him or her and say sorry, and whatever you wanted to say must justify your interruption.

**3. Think Before You Speak**

Another adage that perfectly describes this point is 'look before you leap'. You should think how your words are going to affect the person with whom you are communicating before making any comments.

That means you should try to connect with the feelings of the other person in order to show that you genuinely care about the conversation that is going between the two of you.

**4. Listen Well**

The ability to listen to what a person is saying is itself a skill and you should focus on that while communicating with others.

If you have good listening skills you will be able to understand that person's words more clearly and react in a positive manner. It will also send a signal to the other person that you care about what he/she has to say.

**5. Don't be Defensive or Attacking – Be Neutral**

Some people tend to get defensive or attacking during conversations.

You do not have to get overexcited when someone points out your mistakes and get defensive or attack them. Be neutral and transparent so that you can understand what is actually being discussed. Always maintain the balance in the conversation so that everyone involved in the discussion has a fair part in it.

**6. Don't Deviate**

Always try to stick to the topic of discussion to maintain the relevancy of the communication process.

There is no need to bring something totally unrelated to the discussion and waste the time of the people involved. If you deviate away from the topic, the whole idea of the conversation becomes less meaningful.

**7. Be Confident of Your Ideas**

You should always be confident of what you are speaking and should take ownership of your words. This is will increase the trust that the other people have in you and make the conversation flow more freely.

**8. Be Open to Receiving Feedback**

Sometimes it is good to step back and be receptive to feedback.

Communication is a two-way process and should remain like that. You should be able to open up to feedback from the other person and give honest feedback whenever you feel it is needed.

**9. Use the Right Communication Method**

Communication may not necessarily always be verbal and you should understand that different types of situations ask for different methods.

You should know which type of communication method will be more effective. Location is also an important point to remember; different types of communication need different locations.

**10. Shake Hands Firmly!**

The last but not the least important tip is how you shake hands when you introduce yourself.

Give a firm handshake but do not make it a tight one and also do not squeeze. A weak handshake may indicate lower self-confidence.

Principles of Interpersonal Communication

Common to all interpersonal communications are some basic principles.

These principles govern the effectiveness of our communications; they may be simple to understand but can take a lifetime to master.

This page explains these principles and gives examples of how, why and when interpersonal communication occurs.

**Interpersonal Communication is Not Optional**

We may, at times, try not to communicate; but not communicating is not an option. In fact the harder we try not to communicate, the more we do! By not communicating we are communicating something: perhaps that we are shy, perhaps that we are angry or sulking, perhaps that we are too busy. Ignoring somebody is communicating with them, we may not tell them we are ignoring them but through non-verbal communication we hope to make that apparent.

Once it's Out, it's Out.

The process of Interpersonal Communication is irreversible, you can wish you hadn't said something and you can apologise for something you said and later regret - but you can't take it back.

**The Context of Communication**

**All communication has a context; communication happens for a reason.**

Communication can fail because one or more of the participants overlook the context. To help avoid misunderstandings, and therefore communicate more effectively, it is important that the context of the communication is understood by all. Why is the communication happening? It is important that participants are on the same 'wavelength' so that they understand why the communication is occurring. It may be useful to start a larger conversation by explaining why it is happening.

**Knowing why communication is occurring is an important first step - there are however problems that affect the context of the communication:**

**Misconceptions**

**The context of communication is also governed by our own feelings about it.**

As already discussed, we stereotype people and therefore can develop inaccurate misconceptions and false assumptions. When communicating we may assume that:

- All parties know what we are talking about;
- We know the other person's views and opinions of the situation;
- We should not show any emotion;
- We are right, they are wrong.

There are many other examples of misconceptions highlighting the importance of careful **reflection** and **clarification** in all communication

Barriers to Effective Communication

**Common Barriers to Effective Communication:**

**The use of jargon.** Over-complicated, unfamiliar and/or technical terms.

**Emotional barriers and taboos.** Some people may find it difficult to express their emotions and some topics may be completely 'off-limits' or taboo. Taboo or difficult topics may include, but are not limited to, politics, religion, disabilities (mental and physical), sexuality and sex, racism and any opinion that may be seen as unpopular.

**Lack of attention, interest, distractions, or irrelevance to the receiver.** (See our page **Barriers to Effective Listening** for more information).

**Differences in perception and viewpoint.**

**Physical disabilities such as hearing problems or speech difficulties.**

**Physical barriers to non-verbal communication.** Not being able to see the non-verbal cues, gestures, posture and general body language can make communication less effective. Phone calls, text messages and other communication methods that rely on technology are often less effective than face-to-face communication.

**Language differences and the difficulty in understanding unfamiliar accents.**

**Expectations and prejudices which may lead to false assumptions or stereotyping.** People often hear what they expect to hear rather than what is actually said and jump to incorrect conclusions. Our page **The Ladder of Inference** explains this in more detail.

**Cultural differences.** The norms of social interaction vary greatly in different cultures, as do the way in which emotions are expressed. For example, the concept of personal space varies between cultures and between different social settings. See our page on **Intercultural Awareness** for more information.

**What are Social Skills?**

Social skills are the skills we use to communicate and interact with each other, both verbally and non-verbally, through gestures, body language and our personal appearance.

Human beings are sociable creatures and we have developed many ways to communicate our messages, thoughts and feelings with others.

**Giving and Receiving Feedback**

In life as much as in work, it's important to know how to provide feedback to others, effectively and constructively without causing offence.

There are many opportunities in life for providing others with feedback, from commenting on the way that your colleague has carried out a task, to discussing your children's behaviour with them.

**What is Effective Feedback?**

**For our purposes, we will define effective feedback as that which is clearly heard, understood and accepted.** Those are the areas that are within your power. You have no control over whether the recipient chooses to act upon your feedback, so let's put that to one side.

So how can you make sure that your feedback is effective?

**Develop your feedback skills by using these few rules, and you'll soon find that you're much more effective.**

**1. Feedback should be about behaviour not personality**

The first, and probably the most important rule of feedback is to remember that you are making no comment on what type of person they are, or what they believe or value. You are only commenting on how they behaved. Do not be tempted to discuss aspects of personality, intelligence or anything else. Only behaviour.

**2. Feedback should describe the effect of the person's behaviour on you**

After all, you do not know the effect on anyone or anything else. You only know how it made **you** feel or what **you** thought. Presenting feedback as your opinion makes it much easier for the recipient to hear and accept it, even if you are giving negative feedback. After all, they have no control over how you felt, any more than you have any control over their intention. This approach is a blame-free one, which is therefore much more acceptable.

**Choose your feedback language carefully.**

Useful phrases for giving feedback include:

"When you did [x], I felt [y]."

"I noticed that when you said [x], it made me feel [y]."

How the Ladder Works in Practice

Your beliefs tend to reinforce the data that you select, and how you interpret it, which means that it becomes a positive feedback loop. In this sense, 'positive' is not necessarily 'good'. Instead, it means that the feedback drives the process onwards instead of stopping it, and therefore confirms what you already believe.

"I really liked the way that you did [x] and particularly [y] about it."

"It made me feel really [x] to hear you say [y] in that way."

**3. Feedback should be as specific as possible**

Especially when things are not going well, we all know that it's tempting to start from the point of view of 'everything you do is rubbish', but don't. Think about specific occasions, and specific behaviour, and point to exactly what the person did, and exactly how it made you feel. The more specific the better, as it is much easier to hear about a specific occasion than about 'all the time'!

**4. Feedback should be timely**

It's no good telling someone about something that offended or pleased you six months later. Feedback needs to be timely, which means while everyone can still remember what happened. If you have feedback to give, then just get on and give it. That doesn't mean without thought. You still need to think about what you're going to say and how.

**Receiving Feedback**

It's also important to think about what skills you need to receive feedback, especially when it is something you don't want to hear, and not least because not everyone is skilled at giving feedback.

**Be Open To The Feedback**

In order to hear feedback, you need to listen to it. Don't think about what you're going to say in reply, just listen. And notice the non-verbal communication as well, and listen to what your colleague is not saying, as well as what they are.

Improving Communication:
Developing Effective Communication Skills

Effective communication skills are fundamental to success in many aspects of life. Many jobs require strong communication skills. People with good communication skills also usually enjoy better interpersonal relationships with friends and family.

Effective communication is therefore a key interpersonal skill and learning how to improve your communication has many benefits. However, many people find it difficult to know where to start. This page sets out the most common 'problem areas' and suggests where you might focus your attention.

Identifying Problems

Many people appreciate that they have a problem with communication skills, but struggle to know where to start to improve. There are a number of ways that you can identify particular problem areas, including:

- **Ask your friends, family and colleagues to advise you**. Most people will be happy to help you with your journey towards self-improvement. They may even have been waiting for just this opportunity for some time.

□ Use **a self-assessment tool like our Interpersonal Skills Self-Assessment.** This will help you to identify the most important areas for improvement.

□ You **could instead simply work to improve the most common problem areas** and see what happens.

**Four Key Areas for Improvement**

There are generally four main areas of communication skills that most of us would do well to improve. These are listening skills, non-verbal communication, emotional awareness and questioning.

The Ladder of Inference

Have you ever found yourself perplexed at the way someone else has interpreted something you said or did, and put a meaning on it that you never intended? Or perhaps you have found yourself enraged by someone's comment or action, and concluded that they must be acting against you for some reason?



Date : 01.04.2016

From
Dr.Abarna.V
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:** Communication skills

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled Communication skills 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.Abarna.V

**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 Soundariya .M has actively participated in the Value Added Course on **Certificate course Communication skills** held during Feb 2016- March 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Abarna,V
RESOURCE PERSON

Dr. Kamatchi
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 Soundhari S has actively participated in the Value Added Course on **Certificate course Communication skills** held during Feb 2016- March 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Abarna,V
RESOURCE PERSON

Dr. Kamatchi
COORDINATOR

## AnnexureIV

## Student Feedback Form

Course Name: **Certificate course Communication skills**

Subject Code: **MIC03**

Name of Student: Soundariya .M
RollNo.: U15NB350

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: 31/3/2016

Signature: Soundar

## AnnexureIV

## Student Feedback Form

Course Name: **Certificate course Communication skills**

Subject Code: **MIC03**

Name of Student: Sruthi . S

RollNo.: U15UB354

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: 31.3.2016

Signature:

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - III**

## Certificate course Communication skills

Questionnaire **Course Code: MIC03** Soundariya M

**I. ANSWER ALL THE QUESTIONS**

1. What is communication?

The act of transfered information to person to another

2. Tips for effective interpersonal communication

- favorable face Communication
- gesture
- fascial expression.

3. What are the Barriers to effective communication

Physical disability

4. How to Get and receive Feedback

- feedback should be about the behaviors not the personality should be specific

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Annexure - III**

**Certificate course Communication skills** Sruthi.S

Questionnaire **Course Code: MIC03** VISMB354

**I. ANSWER ALL THE QUESTIONS**

1. What is communication?

Communication is the act of transfearing information to one person to another.

2. Tips for effective interpersonal communication

Face to face communication
Facial expression.
Gesture.

3. What are the Barriers to effective communication

Physical Disability

4. How to Get and receive Feedback

Feedback should be about the behaviour not the personality should be specific.

| | | | |
|---|---|---|---|
| **25** | SRUTHI.S | U15MB354 | |
| **26** | SRUTHI.S | U15MB355 | |
| **27** | SUBALAKSHMI.C | U15MB356 | |
| **28** | SUBASHINI.G | U15MB357 | |
| **29** | SUJI RAKSHANAA.K | U15MB358 | |
| **30** | SURESH KRISHNAN.R | U15MB359 | |
| **31** | SURIYA.R | U15MB360 | |
| **32** | SUSHMITHA.K | U15MB361 | |
| **33** | SUWATHI.R | U15MB362 | |
| **34** | SYLVIA MARY.S | U15MB363 | |
| **35** | THAJES KENCY.F | U15MB364 | |
| **36** | VENKATESH.G | U15MB365 | |
| **37** | VIDYA BARATHI.J | U15MB366 | |
| **38** | VIGNESH.V | U15MB367 | |
| **39** | VIGNESH KUMAR.K | U15MB368 | |
| **40** | VINOTHINI.S | U15MB369 | |

**RESOURCE PERSON**

**COORDINATOR**

**Annexure- II**

**VALUE ADDED COURSE**

**Certificate course Communication skills and MIC03**

**List of Students Enrolled Feb 2016 – March 2016**

| Sl. No | Name of the Student | Roll No | Signature |
|---|---|---|---|
| 1 | RAMRAJ.D | U15MB372 | |
| 2 | REVANTH.C | U15MB374 | |
| 3 | SAKTHIYANATHAN.S | U15MB375 | |
| 4 | SANDIYA.T | U15MB376 | |
| 5 | SARANKUMAR.B | U15MB377 | |
| 6 | SARANYA.R.E | U15MB378 | |
| 7 | SARANYA.E | U15MB379 | |
| 8 | SARATH KUMAR.A | U15MB380 | |
| 9 | SATHESH.B | U15MB381 | |
| 10 | SATHIYA NARAYANAN.S | U15MB383 | |
| 11 | SEDHUPATHY.S | U15MB384 | |
| 12 | SELVA SRINIVASAN.B | U15MB385 | |
| 13 | SENTHILKUMARAN.A | U15MB386 | |
| 14 | SHAHARA ZAD.S | U15MB387 | |
| 15 | SHAKTHI.K | U15MB388 | |
| 16 | SHALINI.A | U15MB393 | |
| 17 | SHANMUGA PRIYANGA.A | U15MB394 | |
| 18 | SHARUMATHI.E | U15MB395 | |
| 19 | SHIYAM.M | U15MB396 | |
| 20 | SHRIRAAM.K | U15MB398 | |
| 21 | SIVANAMBI.S | U15MB348 | |
| 22 | SOUNDARIYA.M | U15MB350 | |
| 23 | SOWMYALAKSHMI.I | U15MB352 | |
| 24 | SREERAM.M | U15MB353 | |

# Sri Lakshmi Narayana Institute of Medical Sciences

Date: 01.12.2015

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: Classification of depression and its treatment methods**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Classification of depression and its treatment methods** on 4/01/2016. 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. Rajasekhar. K**

The HOD: **Dr. Sridhar.V.R**

The Expert: **Dr. Arun.S**

The Expert: **Dr. Arun Seetharaman.**The committee has discussed about the course and is approved.

Dean
( Sign & seal)

Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-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.

HO
(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.

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**

14.12.2015

**Sub: Organising Value-added Course: Awareness, Identification and Classification of depression and its treatment methods**.

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, Identification and Classification of depression and its treatment methods for final year students."** 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 31 December 2015. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

**Dr.Rajasekar**
Prof. S. RAJASEKARAN, M.S., (Gen.)
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605 502.

Encl: Copy of Course content

# Course Proposal

Course Title: **Awareness, Identification and Classification Of depression and its treatment methods**

**Course Objective:**

Awareness on the importance of depression
Awareness On The Contributing Factors To Depression Bio-psychosocial Model Of Approach
Identify diagnostic criteria for depression

**Course Outcome:**

**Course Audience: IInd YEAR STUDENTS of 2014 Batch**
**Course Coordinator: Dr.V.R. Sridhar**
**Course Faculties with Qualification and Designation:**
**1. Dr.V.R.SRIDHAR, Professor & HOD**
**2.Dr.Arun, Assistant Professor**
**Course Curriculum/Topics with schedule (Min of 30 hours)**

| SlNo | Date | Topic | Resource person | Time | Hours |
|---|---|---|---|---|---|
| 1. | 4.01.2016 | The Definition of Depression | Dr.Arun | 4-5p.m | 1 |
| 2. | 6.01.2016 | Symptomatology of Depression | Dr.Arun | 2-3p.m | 1 |
| 3. | 8.01.2016 | Psychotic vs. Nonpsychotic Depression | Dr.Arun | 4-6p.m | 2 |
| 4. | 11.01.2016 | EXPERIMENTAL ASPECTS OF DEPRESSION Biological Studies of Depression | Dr.Arun | 4-6p.m | 2 |
| 5. | 13.01.2016 | Psychological Studies: Tests of Psychoanalysis | Dr.Arun | 4-6p.m | 2 |
| 6. | 18.01.2016 | PART III THEORETICAL ASPECTS OF DEPRESSION Theories of Depression | Dr.Arun | 4-5p.m | 2 |
| 7. | 20.01.2016 | Cognition and Psychopathology | Dr.Arun | 4-5P.M | 1 |
| 8. | 22.01.2016 | Development of Depression | Dr.Arun | 4-5p.m | 1 |
| 9. | 25.01.2016 | Course and Prognosis | Dr. Shridhar | 4-6p.m | 1 |
| 10. | 27.01.2016 | Pharmacological treatment | Dr.Arun | 4-6p.m | 2 |
| 11. | 29.01.2016 | Somatic Therapy | Dr.Arun | 4-6p.m | 1 |
| 12. | 1.02.2016 | Psychotherapy | Dr.Arun | 4-6p.m | 2 |
| 13. | 3.02.2016 | Evaluating Depression | Dr.Arun | 2-5p.m | 3 |

| | | | | | |
|---|---|---|---|---|---|
| | | **Practical** | Dr. Shridhar | | |
| 13. | 5.02.2016 | Cognitive Behavior Therapy | Dr. Shridhar | 2-3 PM | 1 |
| 14. | 8.02.2016 | Graded Relaxation | Dr. Shridhar | 2-3 PM | 1 |
| 15. | 11.02.2016 | Cognitive Hypnotherapy | Dr. Shridhar | 2-4 PM | 2 |
| 16. | 13.02.2016 | Supportive psychotherapy | Dr. Shridhar | 2-4 PM | 2 |
| 17. | 15.02.2016 | Cognitive therapy | Dr. Shridhar | 2-4p.m | 2 |
| | | **Total** | | | 30 hrs |

**REFERENCE BOOKS:**


- **Comprehensive textbook of psychiatry – Kaplan & Saddock**
- **Oxford Textbook Of Psychiatry**
- **Synopsis - Kaplan & Saddock**
- **Stahl's essential psychopharmacology**

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Classification of depression and its treatment methods

**2. Duration & Period**

30 hrs January – June 2016

**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 – June 2016

**8. Year of discontinuation:** 2016

**9. Summary report of each program year-wise**

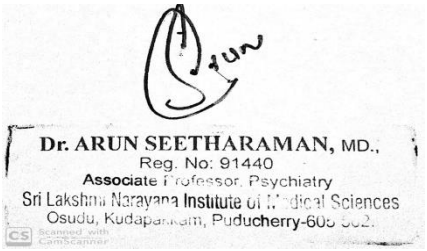
| **Value Added Course-** January – June 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | **PSYC02** | Classification of depression and its treatment methods | **Dr. Sridhar** | IInd YEAR | 15 January – June 2016 |

**10. Course Feed Back**

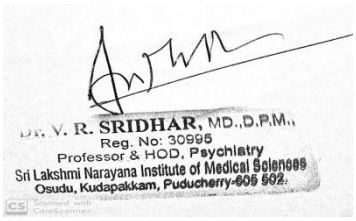
*Enclosed as Annexure- V*

**Resource Person**

1. **Dr. V.R. Sridhar**
2. **Dr. C. Arun Seetharaman**




**COORDINATOR**
**V.R. Sridhar**



# CLASSIFICATION OF DEPRESSION AND ITS TREATMENT METHODS




## PARTICIPANT HAND BOOK

BIHER SLIMS

## COURSE DETAILS

| Particulars | Description |
|---|---|
| Course Title | Depression |
| Course Code | PSYC02 |
| Objective | 1. Epidemiology<br>2. Etiology<br>3. Laboratory, brain imaging & Pschychological tests<br>4. Clinical Assessment<br>5. Differential diagnosis<br>6. Course & prognosis<br>7. Treatment |
| Further learning opportunities | Depression & its management |
| Key Competencies | On successful completion of the course the students will have skill in handling patients with depression and Suicidal ideation |
| Target Student | IInd YEAR MBBS Students |
| Duration | 30hrs Every JANUARY 2016– JUNE 2016 |
| Theory Session | 20hrs |
| Practical Session | 10hrs |
| Assessment Procedure | Multiple choice questions |

## HISTORY

The Old Testament story of King Saul describes a depressive syndrome, as does the story of Ajax's suicide in Homer's Iliad. About 400 BCE, Hippocrates used the terms mania and melancholia to describe mental disturbances. Around 30 AD, the Roman physician Celsus described melancholia (from Greek melan ["black"] and chole ["bile"]) in his work De re medicina as a depression caused by black bile. The first English text entirely related to depression was Robert Burton's Anatomy of Melancholy, published in 1621. In 1854, Jules Falret described a condition called folie circulaire, in which patients experience alternating moods of depression and mania. In 1882, the German psychiatrist Karl Kahlbaum, using the term cyclothymia, described mania and depression as stages of the same illness. In 1899, Emil Kraepelin, building on the knowledge of previous French and German psychiatrists, described manic-depressive psychosis using most of the criteria that psychiatrists now use to establish a diagnosis of bipolar I disorder. According to Kraepelin, the absence of a dementing and deteriorating course in manic-depressive psychosis diPerentiated it from dementia precox (as schizophrenia was then called). Kraepelin also described a depression that came to be known as involutional melancholia, which has since come to be viewed as a severe form of mood disorder that begins in late adulthood.

## Depression

A major depressive disorder occurs without a history of a manic, mixed, or hypomanic episode. A major depressive episode must last at least 2 weeks, and typically a person with a diagnosis of a major depressive episode also experiences at least four symptoms from a list that includes changes in appetite and weight, changes in sleep and activity, lack of energy, feelings of guilt, problems thinking and making decisions, and recurring thoughts of death or suicide.

## I. Epidemiology

**A. Incidence and prevalence**. In the most recent surveys, major depressive disorder has the highest lifetime prevalence (almost 17%) of any psychiatric disorder. The annual incidence (number of new cases) of a major depressive episode is 1.59% (women, 1.89%; men, 1.10%).

**B. Sex**. Major depression is more common in women depressive episodes are more common in men.

**C. Sociocultural.** Depressive disorders are more common among single and divorced persons compared to married persons. No correlation with socioeconomic status. No difference between races or religious groups.

## II. Etiology

### A. Neurotransmitters

**1. Serotonin.** Serotonin has become the biogenic amine neurotransmitter most commonly associated with depression. Serotonin depletion occurs in depression; thus, serotonergic agents are effective treatments. The identification of multiple serotonin receptor subtypes may lead to even more specific treatments for depression. Some patients with suicidal impulses have low cerebrospinal fluid (CSF) concentrations of serotonin metabolites (5-hydroxyindole acetic acid [5-HIAA]) and low concentrations of serotonin uptake sites on platelets.

**2. Norepinephrine.** Abnormal levels (usually low) of norepinephrine metabolites (3-methoxy-4-hydroxyphenylglycol [MHPG]) are found in blood, urine, and CSF of depressed patients. Venlafaxine (Effexor) increases both serotonin and norepinephrine levels and is used in depression for that reason.

**3. Dopamine**. Dopamine activity may be reduced in depression. Drugs that reduce dopamine concentrations (e.g., reserpine [Serpasil]) and diseases that reduce dopamine concentrations (e.g., Parkinson's disease) are associated with depressive symptoms. Drugs that increase dopamine concentrations, such as tyrosine, amphetamine, and bupropion (Wellbutrin), reduce the symptoms of depression. Two recent theories about dopamine and depression are that the mesolimbic dopamine pathway may be dysfunctional in depression and that the dopamine D1 receptor may be hypoactive in depression.

### B. Psychosocial

**1. Psychoanalytic**. Freud described internalized ambivalence toward a love object (person), which can produce a pathologic form of mourning if the object is lost or perceived as lost. This mourning takes the form of severe depression with feelings of guilt, worthlessness, and suicidal ideation. Symbolic or real loss of love object is perceived as rejection.

**2. Psychodynamics**. In depression, introjection of ambivalently viewed lost objects leads to an inner sense of conflict, guilt, rage, pain, and loathing; a pathologic mourning becomes depression as ambivalent feelings meant for the introjected object are directed at the self. In mania, feelings of inadequacy and worthlessness are converted by means of denial, reaction formation, and projection to grandiose delusions.

**3. Cognitive**. Cognitive triad of Aaron Beck: (1) negative self-view ("things are bad because I'm bad"); (2) negative interpretation of experience ("everything has always been bad"); (3) negative view of future (anticipation of failure).

**4. Learned helplessness**. A theory that attributes depression to a person's inability to control events. Theory is derived from observed behavior of animals experimentally given unexpected random shocks from which they cannot escape.

**5. Stressful life events**. Losing a parent before age 11 is the life event most associated with later development of depression.

**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**. No gross brain changes. Enlarged cerebral ventricles on computed tomography (CT) in some patients with psychotic depression; diminished basal ganglia blood flow in some depressive patients. Magnetic resonance imaging (MRI) studies have also indicated that patients with major depressive disorder have smaller caudate nuclei and smaller frontal lobes than do control subjects.

**C. Psychological tests**

**1. Rating scales**. Can be used to assist in diagnosis and assessment of treatment efficacy. The Beck Depression Inventory (BDI) and Zung Self-rating Scale are scored by patients. The Hamilton Rating Scale for Depression (HAM-D), Montgomery Asberg Depression Rating Scale (MADRS).

**2. Rorschach test**. Standardized set of 10 inkblots scored by examiner —few associations, slow response time in depression.

**3. 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,

**V. Bipolar Disorder** 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. Depression (major depressive episode).**

**1. Information obtained from history**

**a. Depressed mood:** subjective sense of sadness, feeling "blue" or "down in the dumps" for a prolonged period of time.

**b. Anhedonia:** inability to experience pleasure.

**c. Social withdrawal.**

**d. Lack of motivation**, little tolerance of frustration.

**e. Vegetative signs**. (1) Loss of libido. (2) Weight loss and anorexia. (3) Weight gain and hyperphagia. (4) Low-energy level; fatigability. (5) Abnormal menses. (6) Early morning awakening (terminal insomnia); approximately 75% of depressed patients have sleep difficulties, either insomnia or hypersomnia. (7) Diurnal variation (symptoms worse in morning).

**f. Constipation.**

**g. Dry mouth.**

**h. Headache.**

**2. Information obtained from mental status examination**

**a. General appearance and behavior**. Psychomotor retardation or agitation, poor eye contact, tearful, downcast, inattentive to personal appearance.

**b. Affect**. Constricted or labile.

**c. Mood**. Depressed, irritable, frustrated, sad.

**d. Speech**. Little or no spontaneity; monosyllabic; long pauses; soft, low monotone.

**e. Thought content**. Suicidal ideation affects 60% of depressed patients, and 15% commit suicide; obsessive rumination; pervasive feelings of hopelessness, worthlessness, and guilt; somatic preoccupation; indecisiveness; poverty of thought content and paucity of speech; mood-congruent hallucinations and delusions.

**f. Cognition.** Distractible, difficulty concentrating, complaints of poor memory, apparent disorientation; abstract thought may be impaired.

**g. Insight and judgment**. Impaired because of cognitive distortions of personal worthlessness.

**3. Associated features**

a. Somatic complaints may mask depression: in particular, cardiac, gastrointestinal, and genitourinary symptoms; low back pain, other orthopedic complaints.

b. Content of delusions and hallucinations, when present, tends to be congruent with depressed mood; most common are delusions of guilt, poverty, and deserved persecution, in addition to somatic and nihilistic (end of the world) delusions. Mood-incongruent delusions are those with content not apparently related to the predominant mood (e.g., delusions of thought insertion, broadcasting, and control, or persecutory delusions unrelated to depressive themes).

**4. Age-specific features**. Depression can present differently at different ages.

**a. Prepubertal**. Somatic complaints, agitation, single-voice auditory hallucinations, anxiety disorders, and phobias.

**b. Adolescence**. Substance abuse, antisocial behavior, restlessness, truancy, school difficulties, promiscuity, increased sensitivity to rejection, poor hygiene.

**c. Elderly**. Cognitive deficits (memory loss, disorientation, confusion); pseudodementia or the dementia syndrome of depression, apathy, and distractibility

**B. Depressive disorders**

**1. Major depressive disorder**. Can occur alone or as part of bipolar disorder. When it occurs alone it is also known as unipolar depression. Symptoms must be present for at least 2 weeks and represent a change from previous functioning. More common in women than in men by 2:1. Precipitating event occurs in at least 25% of patients. Diurnal variation, with symptoms worse early in morning. Psychomotor retardation or agitation is present. Associated with vegetative signs. Mood-congruent delusions and hallucinations may be present. Median age of onset is 40 years, but can occur at any time. Genetic factor is present. Major depressive disorder may occur as a single episode in a person's life or may be recurrent

**2. Other types of major depressive disorder**

In addition to the severity, psychotic, and remission descriptions, additional symptom features (specifiers) can be used to describe patients with various mood disorders. With Psychotic Features. The presence of psychotic features in major depressive disorder reflects severe disease and is a poor prognostic indicator. A review of the literature comparing psychotic with nonpsychotic major depressive disorder indicates that the two conditions may be distinct in their pathogenesis. One difference is that bipolar I disorder is more common in

the families of probands with psychotic depression than in the families of probands with nonpsychotic depression. The psychotic symptoms themselves are often categorized as either mood congruent, that is, in harmony with the mood disorder ("I deserve to be punished because I am so bad"), or mood incongruent, not in harmony with the mood disorder. Patients with mood disorder with mood-congruent psychoses have a psychotic type of mood disorder; however, patients with mood disorder with mood-incongruent psychotic symptoms may have schizoaffective disorder or schizophrenia. The following factors have been associated with a poor prognosis for patients with mood disorders: long duration of episodes, temporal dissociation between the mood disorder and the psychotic symptoms, and a poor premorbid history of social adjustment. The presence of psychotic features also has significant treatment implications. These patients typically require antipsychotic drugs in addition to antidepressants or mood stabilizers and may need ECT to obtain clinical improvement. With Melancholic Features. Melancholia is one of the oldest terms used in psychiatry, dating back to Hippocrates in the 4th century to describe the dark mood of depression. It is still used to refer to a depression characterized by severe anhedonia, early morning awakening, weight loss, and profound feelings of guilt (often over trivial events). It is not uncommon for patients who are melancholic to have suicidal ideation. Melancholia is associated with changes in the autonomic nervous system and in endocrine functions. For that reason, melancholia is sometimes referred to as "endogenous depression" or depression that arises in the absence of external life stressors or precipitants. The DSM-5 melancholic features can be applied to major depressive episodes in major depressive disorder, bipolar I disorder, or bipolar II disorder. With Atypical Features. The introduction of a formally defined depression with atypical features is a response to research and clinical data indicating that patients with atypical features have specific, predictable characteristics: overeating and oversleeping. These symptoms have sometimes been referred to as reversed vegetative symptoms, and the symptom pattern has sometimes been called hysteroid dysphoria. When patients with major depressive disorder with atypical features are compared with patients with typical depression features, the patients with atypical features are found to have a younger age of onset; more severe psychomotor slowing; and more frequent coexisting diagnoses of panic disorder, substance abuse or dependence, and somatization disorder. The high incidence and severity of anxiety symptoms in patients with atypical features have sometimes been correlated with the likelihood of their being misclassified as having an anxiety disorder rather than a mood disorder. Patients with atypical features may also have a long-term course, a diagnosis of bipolar I disorder, or a seasonal pattern to their disorder. The DSM-5 atypical features can be applied to the most recent major depressive episode in major depressive disorder, bipolar I disorder, bipolar II disorder, or dysthymic disorder. Atypical depression may mask manic symptoms as in the

following case. With Catatonic Features. As a symptom, catatonia can be present in several mental disorders, most commonly, schizophrenia and the mood disorders. The presence of catatonic features in patients with mood disorders may have prognostic and treatment significance. The hallmark symptoms of catatonia—stuporousness, blunted aPect, extreme withdrawal, negativism, and marked psychomotor retardation—can be seen in both catatonic and noncatatonic schizophrenia, major depressive disorder (often with psychotic features), and medical and neurological disorders. Clinicians often do not associate catatonic symptoms with bipolar I disorder because of the marked contrast between the symptoms of stuporous catatonia and the classic symptoms of mania. Because catatonic symptoms are a behavioral syndrome appearing in several medical and psychiatric conditions, catatonic symptoms do not imply a single diagnosis. Catatonia is discussed in detail in Section 7.5. Postpartum Onset. DSM-5 allows the specification of a postpartum mood disturbance if the onset of symptoms is within 4 weeks postpartum. Postpartum mental disorders commonly include psychotic symptoms. Postpartum disorders are discussed in Section 26.1, Psychiatry and Reproductive Medicine. Rapid Cycling. Patients with rapid cycling bipolar I disorder are likely to be female and to have had depressive and hypomanic episodes. No data indicate that rapid cycling has a familial pattern of inheritance; thus, an external factor such as stress or drug treatment may be involved in the pathogenesis of rapid cycling. The DSM-5 criteria specify that the patient must have at least four episodes within a 12-month period. Seasonal Pattern. Patients with a seasonal pattern to their mood disorders tend to experience depressive episodes during a particular season, most commonly winter. The pattern has become known as seasonal affective disorder (SAD), although this term is not used in DSM5. Two types of evidence indicate that the seasonal pattern may represent a separate diagnostic entity. First, the patients are likely to respond to treatment with light therapy, although no studies with controls to evaluate light therapy in nonseasonally depressed patients have been conducted. Second, research has shown that patients evince decreased metabolic activity in the orbital frontal cortex and in the left inferior parietal lobe. Further studies are necessary to differentiate depressed persons with seasonal pattern from other depressed persons. This disorder is discussed further in Section 16.2 on Sleep-Wake Disorders. Non–DSM-5 Types. DSM-5 specifiers for depressive disorders are included in

Other systems that identify types of patients with mood disorders usually separate patients with good and poor prognoses or patients who may respond to one treatment or another. They also differentiate endogenous-reactive and primary-secondary schemes. The endogenous-reactive continuum is a controversial division. It implies that endogenous depressions are biological and that reactive depressions are psychological, primarily on the basis of the presence or absence of an identifiable precipitating stress. Other symptoms of

endogenous depression have been described as diurnal variation, delusions, psychomotor retardation, early morning awakening, and feelings of guilt; thus, endogenous depression is similar to the DSM-5 diagnosis of major depressive disorder with psychotic features, melancholic features, or both. Symptoms of reactive depression have included initial insomnia, anxiety, emotional lability, and multiple somatic complaints. Primary depressions are what DSM-5 refers to as mood disorders, except for the diagnoses of mood disorder caused by a general medical condition and substance-induced mood disorder, which are considered secondary depressions. Double depression is the condition in which major depressive disorder is superimposed on dysthymic disorder. A depressive equivalent is a symptom or syndrome that may be a forme fruste of a depressive episode. For example, a triad of truancy, alcohol abuse, and sexual promiscuity in a formerly well-behaved adolescent may constitute a depressive equivalent.

**3. Persistent depressive disorder (Dysthymia).**

The most typical features of dysthymia, also known as persistent depressive disorder, is the presence of a depressed mood that lasts most of the day and is present almost continuously. There are associated feelings of inadequacy, guilt, irritability, and anger; withdrawal from society; loss of interest; and inactivity and lack of productivity. The term dysthymia, which means “ill humored,” was introduced in 1980. Before that time, most patients now classified as having dysthymia were classified as having depressive neurosis (also called neurotic depression). Dysthymia is distinguished from major depressive disorder by the fact that patients complain that they have always been depressed. Thus, most cases are of early onset, beginning in childhood or adolescence and certainly occurring by the time patients reach their 20s. A late onset subtype, much less prevalent and not well characterized clinically, has been identified among middle-aged and geriatric populations, largely through epidemiological studies in the community.

(1) low-grade chronicity for at least 2 years;

(2) insidious onset, with origin often in childhood or adolescence; and

(3) a persistent or intermittent course.

The family history of patients with dysthymia is typically replete with both depressive and bipolar disorders, which is one of the more robust findings supporting its link to primary mood disorder. Epidemiology Dysthymia is common among the general population and aPects 5 to 6 percent of all persons. It is seen among patients in general psychiatric clinics, where it aPects between half and one-third of all patients. No gender diPerences are seen for incidence rates. The disorder is more common in women younger than 64 years of age than in men of any age and is more common among unmarried and young

persons and in those with low incomes. Dysthymia frequently coexists with other mental disorders, particularly major depressive disorder, and in persons with major depressive disorder, there is less likelihood of full remission between episodes. The patients may also have coexisting anxiety disorders (especially panic disorder), substance abuse, and borderline personality disorder. The disorder is more common among those with first-degree relatives with major depressive disorder. Patients with dysthymia are likely to be taking a wide range of psychiatric medications, including antidepressants, antimanic agents such as lithium (Eskalith) and carbamazepine (Tegretol), and sedative-hypnotics. Etiology Biological Factors. The biological basis for the symptoms of dysthymia and major depressive disorder are similar, but the biological bases for the underlying pathophysiology in the two disorders differ.

**SLEEP STUDIES**

Decreased rapid eye movement (REM) latency and increased REM density are two state markers of depression in major depressive disorder that also occur in a significant proportion of patients with dysthymia.

**NEUROENDOCRINE STUDIES**

The two most studied neuroendocrine axes in major depressive disorder and dysthymia are the adrenal axis and the thyroid axis, which have been tested by using the dexamethasone-suppression test (DST) and the thyrotropin-releasing hormone (TRH)- stimulation test, respectively. Although the results of studies are not absolutely consistent, most indicate that patients with dysthymia are less likely to have abnormal results on a DST than are patients with major depressive disorder. Psychosocial Factors. Psychodynamic theories about the development of dysthymia posit that the disorder results from personality and ego development and culminates in difficulty adapting to adolescence and young adulthood. Karl Abraham, for example, thought that the conflicts of depression center on oral- and anal-sadistic traits. Anal traits include excessive orderliness, guilt, and concern for others; they are postulated to be a defense against preoccupation with anal matter and with disorganization, hostility, and self-preoccupation. A major defense mechanism used is reaction formation. Low self-esteem, anhedonia, and introversion are often associated with the depressive character.

**FREUD**

In Mourning and Melancholia, Sigmund Freud asserted that an interpersonal disappointment early in life can cause a vulnerability to depression that leads to ambivalent love relationships as an adult; real or threatened losses in adult life then trigger depression. Persons susceptible to depression are orally dependent and require constant narcissistic gratification. When deprived of love, affection,

and care, they become clinically depressed; when they experience a real loss, they internalize or introject the lost object and turn their anger on it and thus on themselves.

## COGNITIVE THEORY

The cognitive theory of depression also applies to dysthymia. It holds that a disparity between actual and fantasized situations leads to diminished self-esteem and a sense of helplessness. The success of cognitive therapy in the treatment of some patients with dysthymia may provide some support for the theoretical model.

### Diagnosis and Clinical Features

The DSM-5 diagnosis criteria for dysthymia (Table 8.2-1) stipulate the presence of a depressed mood most of the time for at least 2 years (or 1 year for children and adolescents). To meet the diagnostic criteria, a patient should not have symptoms that are better accounted for as major depressive disorder and should never have had a manic or hypomanic episode. DSM-5 allows clinicians to specify whether the onset was early (before age 21 years) or late (age 21 years or older). DSM-5 also allows specification of atypical features in dysthymia. The profile of dysthymia overlaps with that of major depressive disorder but differs from it in that symptoms tend to outnumber signs (more subjective than objective depression). This means that disturbances in appetite and libido are uncharacteristic, and psychomotor agitation or retardation is not observed. This all translates into a depression with attenuated symptomatology. Subtle endogenous features are observed, however, including inertia, lethargy, and anhedonia that are characteristically worse in the morning. Because patients presenting clinically often fluctuate in and out of a major depression, the core DSM-5 criteria for dysthymia tend to emphasize vegetative dysfunction; however, cognitive symptoms are often present. Dysthymia is quite heterogeneous. Anxiety is not a necessary part of its clinical picture, yet dysthymia is often diagnosed in patients with anxiety and phobic disorders. That clinical situation is sometimes diagnosed as mixed anxiety depressive disorder. For greater operational clarity, it is best to restrict dysthymia to a primary disorder, one that cannot be explained by another psychiatric disorder. The essential features of such primary dysthymia include habitual gloom, brooding, lack of joy in life, and preoccupation with inadequacy. Dysthymia then is best characterized as long-standing, fluctuating, low-grade depression, experienced as part of the habitual self and representing an accentuation of traits observed in the depressive temperament. The clinical picture of dysthymia is varied, with some patients proceeding to major depression and others manifesting the pathology largely at the personality level.

### Dysthymic Variants

Dysthymia is common in patients with chronically disabling physical disorders, particularly among elderly adults. Dysthymia-like, clinically significant, sub-threshold depression lasting 6 or more months has also been described in neurological conditions, including stroke. According to a recent World Health Organization (WHO) conference, this condition aggravates the prognosis of the underlying neurological disease and therefore deserves pharmacotherapy. Prospective studies on children have revealed an episodic course of dysthymia with remissions, exacerbations, and eventual complications by major depressive episodes, 15 to 20 percent of which might even progress to hypomanic, manic, or mixed episodes post puberty. Persons with dysthymia presenting clinically as adults tend to pursue a chronic unipolar course that may or may not be complicated by major depression. They rarely develop spontaneous hypomania or mania. When treated with antidepressants, however, some of them may develop brief hypomanic switches that typically disappear when the antidepressant dose is decreased.

**Differential Diagnosis**

The differential diagnosis for dysthymia is essentially identical to that for major depressive disorder. Many substances and medical illnesses can cause chronic depressive symptoms. Two disorders are particularly important to consider in the differential diagnosis of dysthymia— minor depressive disorder and recurrent brief depressive disorder. Minor Depressive Disorder. Minor depressive disorder is characterized by episodes of depressive symptoms that are less severe than those seen in major depressive disorder. The difference between dysthymia and minor depressive disorder is primarily the episodic nature of the symptoms in the latter. Between episodes, patients with minor depressive disorder have a euthymic mood, but patients with dysthymia have virtually no euthymic periods. Recurrent Brief Depressive Disorder. Recurrent brief depressive disorder is characterized by brief periods (less than 2 weeks) during which depressive episodes are present. Patients with the disorder would meet the diagnostic criteria for major depressive disorder if their episodes lasted longer. Patients with recurrent brief depressive disorder differ from patients with dysthymia on two counts: They have an episodic disorder, and their symptoms are more severe.

**Double Depression**

An estimated 40 percent of patients with major depressive disorder also meet the criteria for dysthymia, a combination often referred to as double depression. Available data support the conclusion that patients with double depression have a poorer prognosis than patients with only major depressive disorder. The treatment of patients with double depression should be directed toward both disorders because the resolution of the symptoms of major depressive episode

still leaves these patients with significant psychiatric impairment. Alcohol and Substance Abuse. Patients with dysthymia commonly meet the diagnostic criteria for a substance-related disorder. This comorbidity can be logical; patients with dysthymia tend to develop coping methods for their chronically depressed state that involve substance abuse. Therefore, they are likely to use alcohol, stimulants such as cocaine, or marijuana, the choice perhaps depending primarily on a patient's social context. The presence of a comorbid diagnosis of substance abuse presents a diagnostic dilemma for clinicians; the longterm use of many substances can result in a symptom picture indistinguishable from that of dysthymia.

**Course and Prognosis**

About 50 percent of patients with dysthymia experience an insidious onset of symptoms before age 25 years. Despite the early onset, patients often suffer with the symptoms for a decade before seeking psychiatric help and may consider early-onset dysthymia simply part of life. Patients with an early onset of symptoms are at risk for either major depressive disorder or bipolar I disorder in the course of their disorder. Studies of patients with the diagnosis of dysthymia indicate that about 20 percent progressed to major depressive disorder, 15 percent to bipolar II disorder, and fewer than 5 percent to bipolar I disorder. The prognosis for patients with dysthymia varies. Antidepressive agents and specific types of psychotherapies (e.g., cognitive and behavior therapies) have positive effects on the course and prognosis of dysthymia. The available data about previously available treatments indicate that only 10 to 15 percent of patients are in remission 1 year after the initial diagnosis. About 25 percent of all patients with dysthymia never attain a complete recovery. Overall, however, the prognosis is good with treatment.

**Treatment**

Historically, patients with dysthymia either received no treatment or were seen as candidates for long-term, insight-oriented psychotherapy. Contemporary data offer the most objective support for cognitive therapy, behavior therapy, and pharmacotherapy. The combination of pharmacotherapy and some form of psychotherapy may be the most effective treatment for the disorder. Cognitive Therapy. Cognitive therapy is a technique in which patients are taught new ways of thinking and behaving to replace faulty negative attitudes about themselves, the world, and the future. It is a short-term therapy program oriented toward current problems and their resolution. Behavior Therapy. Behavior therapy for depressive disorders is based on the theory that depression is caused by a loss of positive reinforcement as a result of separation, death, or sudden environmental change. The various treatment methods focus on specific goals to increase activity, to provide pleasant experiences, and to teach patients

how to relax. Altering personal behavior in depressed patients is believed to be the most effective way to change the associated depressed thoughts and feelings. Behavior therapy is often used to treat the learned helplessness of some patients who seem to meet every life challenge with a sense of impotence. Insight-Oriented (Psychoanalytic) Psychotherapy. Individual insight-oriented psychotherapy is the most common treatment method for dysthymia, and many clinicians consider it the treatment of choice. The psychotherapeutic approach attempts to relate the development and maintenance of depressive symptoms and maladaptive personality features to unresolved conflicts from early childhood. Insight into depressive equivalents (e.g., substance abuse) or into childhood disappointments as antecedents to adult depression can be gained through treatment. Ambivalent current relationships with parents, friends, and others in the patient's current life are examined. Patients' understanding of how they try to gratify an excessive need for outside approval to counter low self-esteem and a harsh superego is an important goal of this therapy. Interpersonal Therapy. In interpersonal therapy for depressive disorders, a patient's current interpersonal experiences and ways of coping with stress are examined to reduce depressive symptoms and to improve self-esteem. Interpersonal therapy lasts for about 12 to 16 weekly sessions and can be combined with antidepressant medication. Family and Group Therapies. Family therapy may help both the patient and the patient's family deal with the symptoms of the disorder, especially when a biologically based sub-affective syndrome seems to be present. Group therapy may help withdrawn patients learn new ways to overcome their interpersonal problems in social situations. Pharmacotherapy. Because of long-standing and commonly held theoretical beliefs that dysthymia is primarily a psychologically determined disorder, many clinicians avoid prescribing antidepressants for patients; however, many studies have shown therapeutic success with antidepressants. The data generally indicate that selective serotonin reuptake inhibitors (SSRIs) venlafaxine and bupropion are an effective treatment for patients with dysthymia. Monoamine oxidase inhibitors (MAOIs) are effective in a subgroup of patients with the disorder, a group who may also respond to the judicious use of amphetamines.

**Hospitalization**.

Hospitalization is usually not indicated for patients with dysthymia, but particularly severe symptoms, marked social or professional incapacitation, the need for extensive diagnostic procedures, and suicidal ideation are all indications for hospitalization.

**4. Cyclothymic disorder**. Less severe disorder, with alternating periods of hypomania and moderate depression. The condition is chronic and nonpsychotic. Symptoms must be present for at least 2 years. Equally common in men and women. Onset usually is insidious and occurs in late adolescence or

early adulthood. Substance abuse is common. Major depressive disorder and bipolar disorder are more common among first-degree relatives than among the general population. Recurrent mood swings may lead to social and professional difficulties. May respond to lithium

**5. Disruptive mood dysregulation disorder.** The disorder is a new category included in the DSM-5 to prevent over diagnosis of bipolar disorder in children. The pertinent symptoms include; acute and recurrent angry outbursts that are inconsistent with the developmental age and manifest as irritability, anger, and occur frequently three or more times a week. Of note the diagnosis should not be made before age 6 or after 18 years.

**6. Premenstrual dysphoric disorder**. This disorder has been reclassified in DSM-5 and categorized under depressive disorders. Is a distinct condition that responds to treatment that begins after ovulation and remits early in the menstruation phase. The hallmark symptoms are; begins in the final week of menstrual cycle, with mood lability (ups and downs, sudden tearfulness, and sense of rejection), irritability, depressed mood, hopelessness, anxiety, poor concentration, fatigue, changes in appetite, changes in sleep pattern and physical symptoms (breast tenderness, swelling, and bloating).

CLINICAL FEATURES

Depressive Episodes A depressed mood and a loss of interest or pleasure are the key symptoms of depression. Patients may say that they feel blue, hopeless, in the dumps, or worthless. For a patient, the depressed mood often has a distinct quality that differentiates it from the normal emotion of sadness or grief. Patients often describe the symptom of depression as one of agonizing emotional pain and sometimes complain about being unable to cry, a symptom that resolves as they improve. About two-thirds of all depressed patients contemplate suicide, and 10 to 15 percent commit suicide. Those recently hospitalized with a suicide attempt or suicidal ideation have a higher lifetime risk of successful suicide than those never hospitalized for suicidal ideation. Some depressed patients sometimes seem unaware of their depression and do not complain of a mood disturbance even though they exhibit withdrawal from family, friends, and activities that previously interested them. Almost all depressed patients (97 percent) complain about reduced energy; they have difficulty finishing tasks, are impaired at school and work, and have less motivation to undertake new projects. About 80 percent of patients complain of trouble sleeping, especially early morning awakening (i.e., terminal insomnia) and multiple awakenings at night, during which they ruminate about their problems. Many patients have decreased appetite and weight loss, but others experience increased appetite and weight gain and sleep longer than usual. These patients are classified as having atypical features. Anxiety, a common

symptom of depression, affects as many as 90 percent of all depressed patients. The various changes in food intake and rest can aggravate coexisting medical illnesses such as diabetes, hypertension, chronic obstructive lung disease, and heart disease. Other vegetative symptoms include abnormal menses and decreased interest and performance in sexual activities. Sexual problems can sometimes lead to inappropriate referrals, such as to marital counseling and sex therapy, when clinicians fail to recognize the underlying depressive disorder. Anxiety (including panic attacks), alcohol abuse, and somatic complaints (e.g., constipation and headaches) often complicate the treatment of depression. About 50 percent of all patients describe a diurnal variation in their symptoms, with increased severity in the morning and lessening of symptoms by evening. Cognitive symptoms include subjective reports of an inability to concentrate (84 percent of patients in one study) and impairments in thinking (67 percent of patients in another study). Depression in Children and Adolescents. School phobia and excessive clinging to parents may be symptoms of depression in children. Poor academic performance, substance abuse, antisocial behavior, sexual promiscuity, truancy, and running away may be symptoms of depression in adolescents. Depression in Older People. Depression is more common in older persons than it is in the general population. Various studies have reported prevalence rates ranging from 25 to almost 50 percent, although the percentage of these cases that are caused by major depressive disorder is uncertain. Several studies indicate that depression in older persons may be correlated with low socioeconomic status, the loss of a spouse, a concurrent physical illness, and social isolation. Other studies have indicated that depression in older persons is underdiagnosed and undertreated, perhaps particularly by general practitioners. The under recognition of depression in older persons may occur because the disorder appears more often with somatic complaints in older, than in younger, age groups. Further, ageism may influence and cause clinicians to accept depressive symptoms as normal in older patients

## MENTAL STATUS EXAMINATION

### General Description

Generalized psychomotor retardation is the most common symptom of depression, although psychomotor agitation is also seen, especially in older patients. Hand wringing and hair pulling are the most common symptoms of agitation. Classically, a depressed patient has a stooped posture; no spontaneous movements; and a downcast, averted gaze. On clinical examination, depressed patients exhibiting gross symptoms of psychomotor retardation may appear identical to patients with catatonic schizophrenia.

Mood, Affect, and Feelings Depression is the key symptom, although about 50 percent of patients deny depressive feelings and do not appear to be particularly

depressed. Family members or employers often bring or send these patients for treatment because of social withdrawal and generally decreased activity.

Speech Many depressed patients have decreased rate and volume of speech; they respond to questions with single words and exhibit delayed responses to questions. The examiner may literally have to wait 2 or 3 minutes for a response to a question.

Perceptual Disturbances Depressed patients with delusions or hallucinations are said to have a major depressive episode with psychotic features. Even in the absence of delusions or hallucinations, some clinicians use the term psychotic depression for grossly regressed depressed patients—mute, not bathing, soiling. Such patients are probably better described as having catatonic features. Delusions and hallucinations that are consistent with a depressed mood are said to be mood congruent. Mood-congruent delusions in a depressed person include those of guilt, sinfulness, worthlessness, poverty, failure, persecution, and terminal somatic illnesses (such as cancer and a "rotting" brain). The content of mood-incongruent delusions or hallucinations is not consistent with a depressed mood. For example, a mood-incongruent delusion in a depressed person might involve grandiose themes of exaggerated power, knowledge, and worth. When that occurs, a schizophrenic disorder should be considered. A 42-year-old civil servant said that she was so paralyzed by depression that she felt that she had no personal initiative and volition left; she believed that some malignant force had taken over her actions and that it was commenting on every action that she was undertaking. The patient recovered fully with thymoleptic medication. There is no reason to believe that, in this patient, the feelings of somatic passability and running commentary indicated a schizophrenic process. Thought Depressed patients customarily have negative views of the world and of themselves. Their thought content often includes non-delusional ruminations about loss, guilt, suicide, and death. About 10 percent of all depressed patients have marked symptoms of a thought disorder, usually thought blocking and profound poverty of content. Sensorium and Cognition Orientation. Most depressed patients are oriented to person, place, and time, although some may not have sufficient energy or interest to answer questions about these subjects during an interview. Memory. About 50 to 75 percent of all depressed patients have a cognitive impairment, sometimes referred to as depressive pseudodementia. Such patients commonly complain of impaired concentration and forgetfulness. Impulse Control About 10 to 15 percent of all depressed patients commit suicide, and about two-thirds have suicidal ideation. Depressed patients with psychotic features occasionally consider killing a person as a result of their delusional systems, but the most severely depressed patients often lack the motivation or the energy to act in an impulsive or violent way. Patients with depressive disorders are at increased risk of suicide as they begin to improve and regain the energy needed to plan and carry out a suicide (paradoxical suicide). It is usually

clinically unwise to give a depressed patient a large prescription for a large number of antidepressants, especially tricyclic drugs, at the time of their discharge from the hospital. Similarly, drugs that may be activating, such as fluoxetine, may be prescribed in such a way that the energizing qualities are minimized (e.g., be given a benzodiazepine at the same time). Judgment and Insight Judgment is best assessed by reviewing patients' actions in the recent past and their behavior during the interview. Depressed patients' descriptions of their disorder are often hyperbolic; they overemphasize their symptoms, their disorder, and their life problems. It is difficult to convince such patients that improvement is possible. Reliability In interviews and conversations, depressed patients overemphasize the bad and minimize the good. A common clinical mistake is to unquestioningly believe a depressed patient who states that a previous trial of antidepressant medications did not work. Such statements may be false, and they require confirmation from another source. Psychiatrists should not view patients' misinformation as an intentional fabrication; the admission of any hopeful information may be impossible for a person in a depressed state of mind.

**Objective Rating Scales for Depression**

Objective rating scales for depression can be useful in clinical practice for documenting the depressed patient's clinical state. Zung. The Zung Self-Rating Depression Scale is a 20-item report scale. A normal score is 34 or less; a depressed score is 50 or more. The scale provides a global index of the intensity of a patient's depressive symptoms, including the affective expression of depression. Raskin. The Raskin Depression Scale is a clinician-rated scale that measures the severity of a patient's depression, as reported by the patient and as observed by the physician, on a 5-point scale of three dimensions: verbal report, displayed behavior, and secondary symptoms. The scale has a range of 3 to 13; a normal score is 3, and a depressed score is 7 or more. Hamilton. The Hamilton Rating Scale for Depression (HAM-D) is a widely used depression scale with up to 24 items, each of which is rated 0 to 4 or 0 to 2, with a total score of 0 to 76. The clinician evaluates the patient's answers to questions about feelings of guilt, thoughts of suicide, sleep habits, and other symptoms of depression, and the ratings are derived from the clinical interview.

**DIFFERENTIAL DIAGNOSIS**

Major Depressive Disorder Medical Disorders. The diagnosis of mood disorder due to a general medical condition must be considered. Failure to obtain a good clinical history or to consider the context of a patient's current life situation can lead to diagnostic errors. Clinicians should have depressed adolescents tested for mononucleosis, and patients who are markedly overweight or underweight should be tested for adrenal and thyroid dysfunctions. Homosexuals, bisexual

men, prostitutes, and persons who abuse a substance intravenously should be tested for acquired immune deficiency syndrome (AIDS). Older patients should be evaluated for viral pneumonia and other medical conditions. Many neurological and medical disorders and pharmacological agents can produce symptoms of depression. Patients with depressive disorders often first visit their general practitioners with somatic complaints. Most medical causes of depressive disorders can be detected with a comprehensive medical history, a complete physical and neurological examination, and routine blood and urine tests. The workup should include tests for thyroid and adrenal functions because disorders of both of these endocrine systems can appear as depressive disorders. In substance-induced mood disorder, a reasonable rule of thumb is that any drug a depressed patient is taking should be considered a potential factor in the mood disorder. Cardiac drugs, antihypertensives, sedatives, hypnotics, antipsychotics, antiepileptics, antiparkinsonian drugs, analgesics, antibacterials, and antineoplastics are all commonly associated with depressive symptoms.

**NEUROLOGICAL CONDITIONS.**

The most common neurological problems that manifest depressive symptoms are Parkinson's disease, dementing illnesses (including dementia of the Alzheimer's type), epilepsy, cerebrovascular diseases, and tumors. About 50 to 75 percent of all patients with Parkinson's disease have marked symptoms of depressive disorder that do not correlate with the patient's physical disability, age, or duration of illness but do correlate with the presence of abnormalities found on neuropsychological tests. The symptoms of depressive disorder can be masked by the almost identical motor symptoms of Parkinson's disease. Depressive symptoms often respond to antidepressant drugs or ECT. The interictal changes associated with temporal lobe epilepsy can mimic a depressive disorder, especially if the epileptic focus is on the right side. Depression is a common complicating feature of cerebrovascular diseases, particularly in the 2 years after the episode. Depression is more common in anterior brain lesions than in posterior brain lesions and, in both cases, often responds to antidepressant medications. Tumors of the diencephalic and temporal regions are particularly likely to be associated with depressive disorder symptoms.

**PSEUDODEMENTIA**.

Clinicians can usually differentiate the pseudodementia of major depressive disorder from the dementia of a disease, such as dementia of the Alzheimer's type, on clinical grounds. The cognitive symptoms in major depressive disorder have a sudden onset, and other symptoms of the disorder, such as self-reproach, are also present. A diurnal variation in the cognitive problems, which is not seen in primary dementias, may occur. Whereas depressed patients with cognitive

difficulties often do not try to answer questions ("I don't know"), patients with dementia may confabulate. During an interview, depressed patients can sometimes be coached and encouraged into remembering, an ability that demented patients lack. Mental Disorders. Depression can be a feature of virtually any mental disorder, but the mental disorders listed in Table 8.1-8 deserve particular consideration in the differential diagnosis.

**OTHER MOOD DISORDERS.**

Clinicians must consider a range of diagnostic categories before arriving at a final diagnosis. Mood disorder caused by a general medical condition and substance-induced mood disorder must be ruled out. Clinicians must also determine whether a patient has had episodes of mania-like symptoms, indicating bipolar I disorder (complete manic and depressive syndromes), bipolar II disorder (recurrent major depressive episodes with hypomania), or cyclothymic disorder (incomplete depressive and manic syndromes). If a patient's symptoms are limited to those of depression, clinicians must assess the severity and duration of the symptoms to differentiate among major depressive disorder (complete depressive syndrome for 2 weeks), minor depressive disorder (incomplete but episodic depressive syndrome), recurrent brief depressive disorder (complete depressive syndrome but for less than 2 weeks per episode), and dysthymic disorder (incomplete depressive syndrome without clear episodes).

**OTHER MENTAL DISORDERS.**

Substance-related disorders, psychotic disorders, eating disorders, adjustment disorders, somatoform disorders, and anxiety disorders are all commonly associated with depressive symptoms and should 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. An abnormal result on the dexamethasone-suppression test, the presence of shortened REM latency on a sleep electroencephalogram (EEG), and a negative lactate infusion test result support a diagnosis of major depressive disorder in particularly ambiguous cases.

**UNCOMPLICATED BEREAVEMENT.**

Uncomplicated bereavement is not considered a mental disorder even though about one-third of all bereaved spouses for a time meet the diagnostic criteria for major depressive disorder. Some patients with uncomplicated bereavement do develop major depressive disorder, but the diagnosis is not made unless no resolution of the grief occurs. The differentiation is based on the symptoms' severity and length. In major depressive disorder, common symptoms that

evolve from unresolved bereavement are a morbid preoccupation with worthlessness; suicidal ideation; feelings that the person has committed an act (not just an omission) that caused the spouse's death; mummification (keeping the deceased's belongings exactly as they were); and a particularly severe anniversary reaction, which sometimes includes a suicide attempt. In severe forms of bereavement depression, the patient simply pines away, unable to live without the departed person, usually a spouse. Such persons do have a serious medical condition. Their immune function is often depressed, and their cardiovascular status is precarious. Death can ensue within a few months of that of a spouse, especially among elderly men. Such considerations suggest that it would be clinically unwise to withhold antidepressants from many persons experiencing such an intense mourningSchizophrenia. Much has been published about the clinical difficulty of distinguishing a manic episode from schizophrenia. Although difficult, a differential diagnosis is possible. Merriment, elation, and infectiousness of mood are much more common in manic episodes than in schizophrenia. The combination of a manic mood, rapid or pressured speech, and hyperactivity weighs heavily toward a diagnosis of a manic episode. The onset in a manic episode is often rapid and is perceived as a marked change from a patient's previous behavior. Half of all patients with bipolar I disorder have a family history of mood disorder. Catatonic features may be part of a depressive phase of bipolar I disorder. When evaluating patients with catatonia, clinicians should look carefully for a past history of manic or depressive episodes and for a family history of mood disorders. Manic symptoms in persons from minority groups (particularly blacks and Hispanics) are often misdiagnosed as schizophrenic symptoms. Medical Conditions. In contrast to depressive symptoms, which are present in almost all psychiatric disorders, manic symptoms are more distinctive, although they can be caused by a wide range of medical and neurological conditions and substances. Antidepressant treatment can also be associated with the precipitation of mania in some patients.

## COURSE AND PROGNOSIS

Studies of the course and prognosis of mood disorders have generally concluded that mood disorders tend to have long courses and that patients tend to have relapses. Although mood disorders are often considered benign in contrast to schizophrenia, they exact a profound toll on affected patients.

### Major Depressive Disorder Course

### ONSET.

About 50 percent of patients having their first episode of major depressive disorder exhibited significant depressive symptoms before the first identified episode. Therefore, early identification and treatment of early symptoms may

prevent the development of a full depressive episode. Although symptoms may have been present, patients with major depressive disorder usually have not had a premorbid personality disorder. The first depressive episode occurs before age 40 years in about 50 percent of patients. A later onset is associated with the absence of a family history of mood disorders, antisocial personality disorder, and alcohol abuse.

**DURATION**

An untreated depressive episode lasts 6 to 13 months; most treated episodes last about 3 months. The withdrawal of antidepressants before 3 months has elapsed almost always results in the return of the symptoms. As the course of the disorder progresses, patients tend to have more frequent episodes that last longer. Over a 20-year period, the mean number of episodes is five or six.

**DEVELOPMENT OF MANIC EPISODES.**

About 5 to 10 percent of patients with an initial diagnosis of major depressive disorder have a manic episode 6 to 10 years after the first depressive episode. The mean age for this switch is 32 years, and it often occurs after two to four depressive episodes. Although the data are inconsistent and controversial, some clinicians report that the depression of patients who are later classified as having bipolar I disorder is often characterized by hypersomnia, psychomotor retardation, psychotic symptoms, a history of postpartum episodes, a family history of bipolar I disorder, and a history of antidepressant-induced hypomania. Prognosis. Major depressive disorder is not a benign disorder. It tends to be chronic, and patients tend to relapse. Patients who have been hospitalized for a first episode of major depressive disorder have about a 50 percent chance of recovering in the first year. The percentage of patients recovering after repeated hospitalization decreases with passing time. Many unrecovered patients remain affected with dysthymic disorder. About 25 percent of patients experience a recurrence of major depressive disorder in the first 6 months after release from a hospital, about 30 to 50 percent in the following 2 years, and about 50 to 75 percent in 5 years. The incidence of relapse is lower than these figures in patients who continue prophylactic psychopharmacological treatment and in patients who have had only one or two depressive episodes. Generally, as a patient experiences more and more depressive episodes, the time between the episodes decreases, and the severity of each episode increases.

**PROGNOSTIC INDICATORS.**

Many studies have focused on identifying both good and bad prognostic indicators in the course of major depressive disorder. Mild episodes, the absence of psychotic symptoms, and a short hospital stay are good prognostic indicators. Psychosocial indicators of a good course include a history of solid

friendships during adolescence, stable family functioning, and generally sound social functioning for the 5 years preceding the illness. Additional good prognostic signs are the absence of a comorbid psychiatric disorder and of a personality disorder, no more than one previous hospitalization for major depressive disorder, and an advanced age of onset. The possibility of a poor prognosis is increased by coexisting dysthymic disorder, abuse of alcohol and other substances, anxiety disorder symptoms, and a history of more than one previous depressive episode. Men are more likely than women to experience a chronically impaired course.

## VIII. Treatment

Treatment of patients with mood disorders should be directed toward several goals. First, the patient's safety must be guaranteed. Second, a complete diagnostic evaluation of the patient is necessary. Third, a treatment plan that addresses not only the immediate symptoms but also the patient's prospective well-being should be initiated. Although current treatment emphasizes pharmacotherapy and psychotherapy addressed to the individual patient, stressful life events are also associated with increases in relapse rates. Thus, treatment should address the number and severity of stressors in patients' lives. Overall, the treatment of mood disorders is rewarding for psychiatrists. Specific treatments are now available for both manic and depressive episodes, and data indicate that prophylactic treatment is also effective. Because the prognosis for each episode is good, optimism is always warranted and is welcomed by both the patient and the patient's family. Mood disorders are chronic, however, and the psychiatrist must educate the patient and the family about future treatment strategies. Hospitalization The first and most critical decision a physician must make is whether to hospitalize a patient or attempt outpatient treatment. Clear indications for hospitalization are the risk of suicide or homicide, a patient's grossly reduced ability to get food and shelter, and the need for diagnostic procedures. A history of rapidly progressing symptoms and the rupture of a patient's usual support systems are also indications for hospitalization. A physician may safely treat mild depression or hypomania in the office if he or she evaluates the patient frequently. Clinical signs of impaired judgment, weight loss, or insomnia should be minimal. The patient's support system should be strong, neither overinvolved nor withdrawing from the patient. Any adverse changes in the patient's symptoms or behavior or the attitude of the patient's support system may suffice to warrant hospitalization. Patients with mood disorders are often unwilling to enter a hospital voluntarily and may have to be involuntarily committed. These patients often cannot make decisions because of their slowed thinking, negative Weltanschauung (world view), and hopelessness. Patients who are manic often have such a complete lack of insight into their disorder that hospitalization seems absolutely absurd to them. Psychosocial Therapy Although most studies indicate—and most clinicians and

researchers believe—that a combination of psychotherapy and pharmacotherapy is the most effective treatment for major depressive disorder, some data suggest another view: Either pharmacotherapy or psychotherapy alone is effective, at least in patients with mild major depressive episodes, and the regular use of combined therapy adds to the cost of treatment and exposes patients to unnecessary adverse effects. Three types of short-term psychotherapies—cognitive therapy, interpersonal therapy, and behavior therapy—have been studied to determine their efficacy in the treatment of major depressive disorder. Although its efficacy in treating major depressive disorder is not as well researched as these three therapies, psychoanalytically oriented psychotherapy has long been used for depressive disorders, and many clinicians use the technique as their primary method. What differentiates the three short-term psychotherapy methods from the psychoanalytically oriented approach are the active and directive roles of the therapist, the directly recognizable goals, and the end points for short-term therapy. Accumulating evidence is encouraging about the efficacy of dynamic therapy. In a randomized, controlled trial comparing psychodynamic therapy with cognitive behavior therapy, the outcome of the depressed patients was the same in the two treatments. The National Institute of Mental Health (NIMH) Treatment of Depression Collaborative Research Program found the following predictors of response to various treatments: low social dysfunction suggested a good response to interpersonal therapy, low cognitive dysfunction suggested a good response to cognitive-behavioral therapy and pharmacotherapy, high work dysfunction suggested a good response to pharmacotherapy, and high depression severity suggested a good response to interpersonal therapy and pharmacotherapy.

**Cognitive Therapy.**

Cognitive therapy, originally developed by Aaron Beck, focuses on the cognitive distortions postulated to be present in major depressive disorder. Such distortions include selective attention to the negative aspects of circumstances and unrealistically morbid inferences about consequences. For example, apathy and low energy result from a patient's expectation of failure in all areas. The goal of cognitive therapy is to alleviate depressive episodes and prevent their recurrence by helping patients identify and test negative cognitions; develop alternative, flexible, and positive ways of thinking; and rehearse new cognitive and behavioral responses. Studies have shown that cognitive therapy is ePective in the treatment of major depressive disorder. Most studies found that cognitive therapy is equal in efficacy to pharmacotherapy and is associated with fewer adverse effects and better follow-up than pharmacotherapy. Some of the best controlled studies have indicated that the combination of cognitive therapy and pharmacotherapy is more efficacious than either therapy alone, although other studies have not found that additive effect. At least one study, the NIMH Treatment of Depression Collaborative Research Program, found that

pharmacotherapy, either alone or with psychotherapy, may be the treatment of choice for patients with severe major depressive episodes. Interpersonal Therapy. Interpersonal therapy, developed by Gerald Klerman, focuses on one or two of a patient's current interpersonal problems. This therapy is based on two assumptions. First, current interpersonal problems are likely to have their roots in early dysfunctional relationships. Second, current interpersonal problems are likely to be involved in precipitating or perpetuating the current depressive symptoms. Controlled trials have indicated that interpersonal therapy is effective in the treatment of major depressive disorder and, not surprisingly, may be specifically helpful in addressing interpersonal problems. Some studies indicate that interpersonal therapy may be the most effective method for severe major depressive episodes when the treatment choice is psychotherapy alone. The interpersonal therapy program usually consists of 12 to 16 weekly sessions and is characterized by an active therapeutic approach. Intrapsychic phenomena, such as defense mechanisms and internal conflicts, are not addressed. Discrete behaviors—such as lack of assertiveness, impaired social skills, and distorted thinking—may be addressed but only in the context of their meaning in, or their ePect on, interpersonal relationships.

**Behavior Therapy.**

Behavior therapy is based on the hypothesis that maladaptive behavioral patterns result in a person's receiving little positive feedback and perhaps outright rejection from society. By addressing maladaptive behaviors in therapy, patients learn to function in the world in such a way that they receive positive reinforcement. Behavior therapy for major depressive disorder has not yet been the subject of many controlled studies. The limited data indicate that it is an effective treatment for major depressive disorder. Psychoanalytically Oriented Therapy. The psychoanalytic approach to mood disorders is based on psychoanalytic theories about depression and mania. The goal of psychoanalytic psychotherapy is to effect a change in a patient's personality structure or character, not simply to alleviate symptoms. Improvements in interpersonal trust, capacity for intimacy, coping mechanisms, the capacity to grieve, and the ability to experience a wide range of emotions are some of the aims of psychoanalytic therapy. Treatment often requires the patient to experience periods of heightened anxiety and distress during the course of therapy, which may continue for several years. Family Therapy. Family therapy is not generally viewed as a primary therapy for the treatment of major depressive disorder, but increasing evidence indicates that helping a patient with a mood disorder to reduce and cope with stress can lessen the chance of a relapse. Family therapy is indicated if the disorder jeopardizes a patient's marriage or family functioning or if the mood disorder is promoted or maintained by the family situation. Family therapy examines the role of the mood-disordered member in the overall psychological wellbeing of the whole family; it also examines the role of the

entire family in the maintenance of the patient's symptoms. Patients with mood disorders have a high rate of divorce, and about 50 percent of all spouses report that they would not have married or had children if they had known that the patient was going to develop a mood disorder.

**Vagal Nerve Stimulation**

Experimental stimulation of the vagus nerve in several studies designed for the treatment of epilepsy found that patients showed improved mood. This observation led to the use of left vagal nerve stimulation (VNS) using an electronic device implanted in the skin, similar to a cardiac pacemaker. Preliminary studies have shown that a number of patients with chronic, recurrent major depressive disorder went into remission when treated with VNS. The mechanism of action of VNS to account for improvement is unknown. The vagus nerve connects to the enteric nervous system and, when stimulated, may cause release of peptides that act as neurotransmitters. Extensive clinical trials are being conducted to determine the efficacy of VNS.

**Transcranial Magnetic Stimulation**

Transcranial magnetic stimulation (TMS) shows promise as a treatment for depression. It involves the use of very short pulses of magnetic energy to stimulate nerve cells in the brain. It is specifically indicated for the treatment of depression in adult patients who have failed to achieve satisfactory improvement from one prior antidepressant medication at or above the minimal effective dose and duration in the current episode. Repetitive transcranial magnetic stimulation (rTMS) produces focal secondary electrical stimulation of targeted cortical regions. It is nonconvulsive, requires no anesthesia, has a safe side effect profile, and is not associated with cognitive side effects. The patients do not require anesthesia or sedation and remain awake and alert. It is a 40-minute outpatient procedure that is prescribed by a psychiatrist and performed in a psychiatrist's office. The treatment is typically administered daily for 4 to 6 weeks. The most common adverse event related to treatment was scalp pain or discomfort. TMS therapy is contraindicated in patients with implanted metallic devices or nonremovable metallic objects in or around the head. Sleep Deprivation Mood disorders are characterized by sleep disturbance. Mania tends to be characterized by a decreased need for sleep, but depression can be associated with either hypersomnia or insomnia. Sleep deprivation may precipitate mania in patients with bipolar I disorder and temporarily relieve depression in those who have unipolar depression. Approximately 60 percent of patients with depressive disorders exhibit significant but transient benefits from total sleep deprivation. The positive results are typically reversed by the next night of sleep. Several strategies have been used in an attempt to achieve a more sustained response to sleep deprivation. One method used serial total sleep

deprivation with a day or two of normal sleep in between. This method does not achieve a sustained antidepressant response because the depression tends to return with normal sleep cycles. Another approach used phase delay in the time patients go to sleep each night, or partial sleep deprivation. In this method, patients may stay awake from 2 AM to 10 PM daily. Up to 50 percent of patients get same-day antidepressant effects from partial sleep deprivation, but this benefit also tends to wear off in time. In some reports, however, serial partial sleep deprivation has been used successfully to treat insomnia associated with depression. The third, and probably most effective, strategy combines sleep deprivation with pharmacological treatment of depression. A number of studies have suggested that total and partial sleep deprivation followed by immediate treatment with an antidepressant or lithium (Eskalith) sustains the antidepressant effects of sleep deprivation. Likewise, several reports have suggested that sleep deprivation accelerates the response to antidepressants, including fluoxetine (Prozac) and nortriptyline (Aventyl, Pamelor). Sleep deprivation has also been noted to improve premenstrual dysphoria.

**Phototherapy**

Phototherapy (light therapy) was introduced in 1984 as a treatment for SAD (mood disorder with seasonal pattern). In this disorder, patients typically experience depression as the photoperiod of the day decreases with advancing winter. Women represent at least 75 percent of all patients with seasonal depression, and the mean age of presentation is 40 years. Patients rarely present older than the age of 55 years with seasonal affective disorder. Phototherapy typically involves exposing the affected patient to bright light in the range of 1,500 to 10,000 lux or more, typically with a light box that sits on a table or desk. Patients sit in front of the box for approximately 1 to 2 hours before dawn each day, although some patients may also benefit from exposure after dusk. Alternatively, some manufacturers have developed light visors, with a light source built into the brim of the hat. These light visors allow mobility, but recent controlled studies have questioned the use of this type of light exposure. Trials have typically lasted 1 week, but longer treatment durations may be associated with greater response. Phototherapy tends to be well tolerated. Newer light sources tend to use lower light intensities and come equipped with filters; patients are instructed not to look directly at the light source. As with any effective antidepressant, phototherapy, on rare occasions, has been implicated in switching some depressed patients into mania or hypomania. In addition to seasonal depression, the other major indication for phototherapy may be in sleep disorders. Phototherapy has been used to decrease the irritability and diminished functioning associated with shift work. Sleep disorders in geriatric patients have reportedly improved with exposure to bright light during the day. Likewise, some evidence suggests that jet lag might respond to light therapy. Preliminary

data indicate that phototherapy may benefit some patients with OCD that has a seasonal variation.

**1. Psychopharmacologic.**

Major Depressive Disorder. The use of specific pharmacotherapy approximately doubles the chances that a depressed patient will recover in 1 month. All currently available antidepressants may take up to 3 to 4 weeks to exert significant therapeutic effects, although they may begin to show their effects earlier. Choice of antidepressants is determined by the side effect profile least objectionable to a given patient's physical status, temperament, and lifestyle. That numerous classes of antidepressants (Table 8.1-10) are available, many with different mechanisms of action, represents indirect evidence for heterogeneity of putative biochemical lesions. Although the first antidepressant drugs, the monoamine oxidase inhibitors (MAOIs) and tricyclic antidepressants (TCAs), are still in use, newer compounds have made the treatment of depression more "clinician and patient friendly."

**GENERAL CLINICAL GUIDELINES.**

The most common clinical mistake leading to an unsuccessful trial of an antidepressant drug is the use of too low a dosage for too short a time. Unless adverse events prevent it, the dosage of an antidepressant should be raised to the maximum recommended level and maintained at that level for at least 4 or 5 weeks before a drug trial is considered unsuccessful. Alternatively, if a patient is improving clinically on a low dosage of the drug, this dosage should not be raised unless clinical improvement stops before maximal benefit is obtained. When a patient does not begin to respond to appropriate dosages of a drug after 2 or 3 weeks, clinicians may decide to obtain a plasma concentration of the drug if the test is available for the particular drug being used. The test may indicate either noncompliance or particularly unusual pharmacokinetic disposition of the drug and may thereby suggest an alternative dosage.

**DURATION AND PROPHYLAXIS.**

Antidepressant treatment should be maintained for at least 6 months or the length of a previous episode, whichever is greater. Prophylactic treatment with antidepressants is effective in reducing the number and severity of recurrences. One study concluded that when episodes are less than 21/2 years apart, prophylactic treatment for 5 years is probably indicated. Another factor suggesting prophylactic treatment is the seriousness of previous depressive episodes. Episodes that have involved significant suicidal ideation or impairment of psychosocial functioning may indicate that clinicians should consider prophylactic treatment. When antidepressant treatment is stopped, the drug dose should be tapered gradually over 1 to 2 weeks, depending on the half-

life of the particular compound. Several studies indicate that maintenance antidepressant medication appears to be safe and effective for the treatment of chronic depression. Prevention of new mood episodes (i.e., recurrences) is the aim of the maintenance phase of treatment. Only patients with recurrent or chronic depressions are candidates for maintenance treatment.

**INITIAL MEDICATION SELECTION.**

The available antidepressants do not differ in overall efficacy, speed of response, or long-term effectiveness. Antidepressants, however, do differ in their pharmacology, drug–drug interactions, short- and long-term side effects, likelihood of discontinuation symptoms, and ease of dose adjustment. Failure to tolerate or to respond to one medication does not imply that other medications will also fail. Selection of the initial treatment depends on the chronicity of the condition, course of illness (a recurrent or chronic course is associated with increased likelihood of subsequent depressive symptoms without treatment), family history of illness and treatment response, symptom severity, concurrent general medical or other psychiatric conditions, prior treatment responses to other acute phase treatments, potential drug–drug interactions, and patient preference. In general, approximately 45 to 60 percent of all outpatients with uncomplicated (i.e., minimal psychiatric and general medical comorbidity), nonchronic, nonpsychotic major depressive disorder who begin treatment with medication respond (i.e., achieve at least a 50 percent reduction in baseline symptoms); however, only 35 to 50 percent achieve remission (i.e., the virtual absence of depressive symptoms).

**TREATMENT OF DEPRESSIVE SUBTYPES**.

Clinical types of major depressive episodes may have varying responses to particular antidepressants or to drugs other than antidepressants. Patients with major depressive disorder with atypical features may preferentially respond to treatment with MAOIs or SSRIs. Antidepressants with dual action on both serotonergic and noradrenergic receptors demonstrate greater efficacy in melancholic depressions. Patients with seasonal winter depression can be treated with light therapy. Treatment of major depressive episodes with psychotic features may require a combination of an antidepressant and an atypical antipsychotic. Several studies have also shown that ECT is effective for this indication—perhaps more effective than pharmacotherapy. For those with atypical symptom features, strong evidence exists for the effectiveness of MAOIs. SSRIs and bupropion (Wellbutrin) are also of use in atypical depression.

**COMORBID DISORDERS.**

The concurrent presence of another disorder can affect initial treatment selection. For example, the successful treatment of OCD associated with depressive symptoms usually results in remission of the depression. Similarly, when panic disorder occurs with major depression, medications with demonstrated efficacy in both conditions are preferred (e.g., tricyclics and SSRIs). In general, the nonmood disorder dictates the choice of treatment in comorbid states. Concurrent substance abuse raises the possibility of a substance-induced mood disorder, which must be evaluated by history or by requiring abstinence for several weeks. Abstinence often results in remission of depressive symptoms in substance-induced mood disorders. For those with continuing significant depressive symptoms, even with abstinence, an independent mood disorder is diagnosed and treated. General medical conditions are established risk factors in the development of depression. The presence of a major depressive episode is associated with increased morbidity or mortality of many general medical conditions (e.g., cardiovascular disease, diabetes, cerebrovascular disease, and cancer).

**THERAPEUTIC USE OF SIDE EFFECTS.**

Choosing more sedating antidepressants (e.g., amitriptyline [Elavil, Endep]) for more anxious, depressed patients or more activating agents (e.g., desipramine) for more psychomotor-retarded patients is not generally helpful. For example, any short-term benefits with paroxetine, mirtazapine, or amitriptyline (more sedating drugs) on symptoms of anxiety or insomnia may become liabilities over time. These drugs often continue to be sedating in the longer run, which can lead to patients prematurely discontinuing medication and increase the risk of relapse or recurrence. Some practitioners use adjunctive medications (e.g., sleeping pills or anxiolytics) combined with antidepressants to provide more immediate symptom relief or to cover those side effects to which most patients ultimately adapt. A patient's prior treatment history is important because an earlier response typically predicts current response. A documented failure on a properly conducted trial of a particular antidepressant class (e.g., SSRIs, tricyclics, or MAOIs) suggests choosing an agent from an alternative class. The history of a Orst-degree relative responding to a particular drug is associated with a good response to the same class of agents in the patient.

**ACUTE TREATMENT FAILURES.**

Patients may not respond to a medication, because (1) they cannot tolerate the side effects, even in the face of a good clinical response; (2) an idiosyncratic adverse event may occur; (3) the clinical response is not adequate; or (4) the wrong diagnosis has been made. Acute phase medication trials should last 4 to 6 weeks to determine if meaningful symptom reduction is attained. Most (but not all) patients who ultimately respond fully show at least a partial response (i.e., at

least a 20 to 25 percent reduction in pretreatment depressive symptom severity) by week 4 if the dose is adequate during the initial weeks of treatment. Lack of a partial response by 4 to 6 weeks indicates that a treatment change is needed. Longer time periods—8 to 12 weeks or longer—are needed to define the ultimate degree of symptom reduction achievable with a medication. Approximately half of patients require a second medication treatment trial because the initial treatment is poorly tolerated or ineffective.

**SELECTING SECOND TREATMENT OPTIONS.**

When the initial treatment is unsuccessful, switching to an alternative treatment or augmenting the current treatment is a common option. The choice between switching from the initial single treatment to a new single treatment (as opposed to adding a second treatment to the first one) rests on the patient's prior treatment history, the degree of benefit achieved with the initial treatment, and patient preference. As a rule, switching rather than augmenting is preferred after an initial medication failure. On the other hand, augmentation strategies are helpful with patients who have gained some benefit from the initial treatment but who have not achieved remission. The best-documented augmentation strategies involve lithium (Eskalith) or thyroid hormone. A combination of an SSRI and bupropion (Wellbutrin) is also widely used. In fact, no combination strategy has been conclusively shown to be more effective than another. ECT is effective in psychotic and nonpsychotic forms of depression but is recommended generally only for repeatedly nonresponsive cases or in patients with very severe disorders. A new therapy involves the use of the anesthetic agent ketamine, which has been shown to be ePective in treatment resistant depression. It has a mechanism of action that inhibits the postsynaptic glutamate binding protein N-methyl-D-aspartate (NDMA) receptor. Because abnormalities in glutamatergic signaling have been implicated in major depressive disorder, this may account for its eQcacy. Patients usually receive a single infusion of ketamine over a 30-minute period at a concentration of 0.5 mg/kg. A positive response is usually seen within 24 hours, and improved mood lasts for about 2 to 7 days. The most common side ePects are dizziness, headache, and poor coordination, which are transitory. Dissociative symptoms, including hallucinations, may also occur.

**COMBINED TREATMENT.**

Medication and formal psychotherapy are often combined in practice. If physicians view mood disorders as fundamentally evolving from psychodynamic issues, their ambivalence about the use of drugs may result in a poor response, noncompliance and probably inadequate dosages for too short a treatment period. Alternatively, if physicians ignore the psychosocial needs of a patient, the outcome of pharmacotherapy may be compromised. Several trials of

a combination of pharmacotherapy and psychotherapy for chronically depressed outpatients have shown a higher response and higher remission rates for the combination than for either treatment used alone

**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**

**CLASSIFICATION OF DEPRESSION AND ITS TREATMENT METHODS- 1ST YEAR STUDENTS**

| S.No | Register No | Students List | Department | SIGNATURE |
|---|---|---|---|---|
| 1 | U14MB311 | SHALINI. T. C. | Psychiatry | |
| 2 | U14MB312 | SHANMUGA RAJA. A | Psychiatry | |
| 3 | U14MB313 | SHANMUHA PRIYA. S | Psychiatry | |
| 4 | U14MB314 | SHAREEFA AKHTAR.S | Psychiatry | |
| 5 | U14MB315 | SHEMBIYAN. R.M. | Psychiatry | |
| 6 | U14MB316 | SIKKANDAR. A | Psychiatry | |
| 7 | U14MB317 | SINDHU. M | Psychiatry | |
| 8 | U14MB318 | SIVARAJ. S | Psychiatry | |
| 9 | U14MB319 | SOUNDARYA. S | Psychiatry | |
| 10 | U14MB320 | SOWMYA DEVI. N | Psychiatry | |
| 11 | U14MB321 | SOWWMYA. S | Psychiatry | |

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| | | | | |
|---|---|---|---|---|
| 12 | U14MB322 | SOWMYAMANJA MADHA.I | Psychiatry | Sowmya |
| 13 | U14MB323 | SREEDEVI. B | Psychiatry | Sree |
| 14 | U14MB324 | SREEPADMA PURUJITH. S.S. | Psychiatry | Sreepadma |
| 15 | U14MB325 | SRI JAYALAKSHMI. A | Psychiatry | Sri Jaya |

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# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**MULTIPLE CHOICE QUESTIONS**

**Classification of depression and its treatment methods**

**Course Code: PSYC02**

| Candidate Name | | Assessor Name | |
|---|---|---|---|
| Date of Assessment | | Assessor Position | |

## I. Multiple Choice Question

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

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

5) Which of the following is a chronic mood disturbance that can cause depressive symptoms, but does not disrupt normal functioning?

a) Cyclothymic Disorder.

b) Dysthymic Disorder.

c) Dissociative disorder.

d) Personality disorder.

Check your answer

7) What percentage of adults who live in temperate climates are affected by Seasonal Affective Disorder (SAD)?

a) 1-3%.

b) 5-8%.

c) 10-12%.

d) 15-20%.

Check your answer

8) Physical symptoms of Chronic Fatigue Syndrome (CFS) include which of the following?

a) Extreme fatigue.

b) Muscle pain.

c) Chest pain.

d) All of the above.

Check your answer

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:

a) Hyperventilation.

b) Hypomania.

c) Hypothermia.

d) Hypoxia.

Check your answer

11) In Major Depression, which of the following is a significant neurotransmitter?

a) Serotonin.

b) Dopamine.

c) Betacarotine.

d) Acetylcholine.

XX. Check your answer

12) Which of the following neurotransmitters is associated specifically with Bipolar Disorder:

a) Serotonin.

b) Norepinephrine.

c) Dopamine.

d) Acetylcholine.

Check your answer

13) Lower levels of activation in the Prefrontal Cortex results in:

a) Failure to regulate emotions.

b) Deficit in the will to change.

c) Failure to anticipate incentives.

d) Inability to understand the context of affective reactions.

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

## MULTIPLE CHOICE QUESTIONS

## Classification of depression and its treatment methods

**Course Code: PSYC02**

| | | | |
|---|---|---|---|
| Candidate Name | SIKKANDAR. A | Assessor Name | DR. ARUN |
| Date of Assessment | 16.5.2016 | Assessor Position | ASSISTANT PROFESSOR |

UNIVERSITY REG NO:- U14MB316

11/13

I. Multiple Choice Question

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- b) Compulsive checking.
- c) Stay in bed for long periods.
- d) Ritualised behaviour.

Check your answer

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

4) DSM-IV-TR criteria for a major depressive episode includes which of the following?

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5) Which of the following is a chronic mood disturbance that can cause depressive symptoms, but does not disrupt normal functioning?

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Check your answer

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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

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- c) Mood episodes are not better accounted for by psychotic disorders.
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Check your answer

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- b) Hypomania.
- c) Hypothermia.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

- d) Hypoxia.

Check your answer

11) In Major Depression, which of the following is a significant neurotransmitter?

- a) Serotonin.
- b) Dopamine.
- c) Betacarotine.
- d) Acetylcholine.

Check your answer

12) Which of the following neurotransmitters is associated specifically with Bipolar Disorder

- a) Serotonin.
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- c) Dopamine.
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Check your answer

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- a) Failure to regulate emotions.
- b) Deficit in the will to change.
- c) Failure to anticipate incentives.



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# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

## MULTIPLE CHOICE QUESTIONS

## Classification of depression and its treatment methods

**Course Code: PSYC02**

| Candidate Name | SEMBIYAN.R.M | Assessor Name | DR. ARUN |
|---|---|---|---|
| Date of Assessment | 16.5.2016 | Assessor Position | ASSISTANT PROFESSOR |

UNIVERSITY REG NO:-U14MB315

12/13

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- 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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# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

4) DSM-IV-TR criteria for a major depressive episode includes which of the following?

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Check your answer

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- a) Hyperventilation.
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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

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XX

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CERTIFICATE OF MERIT

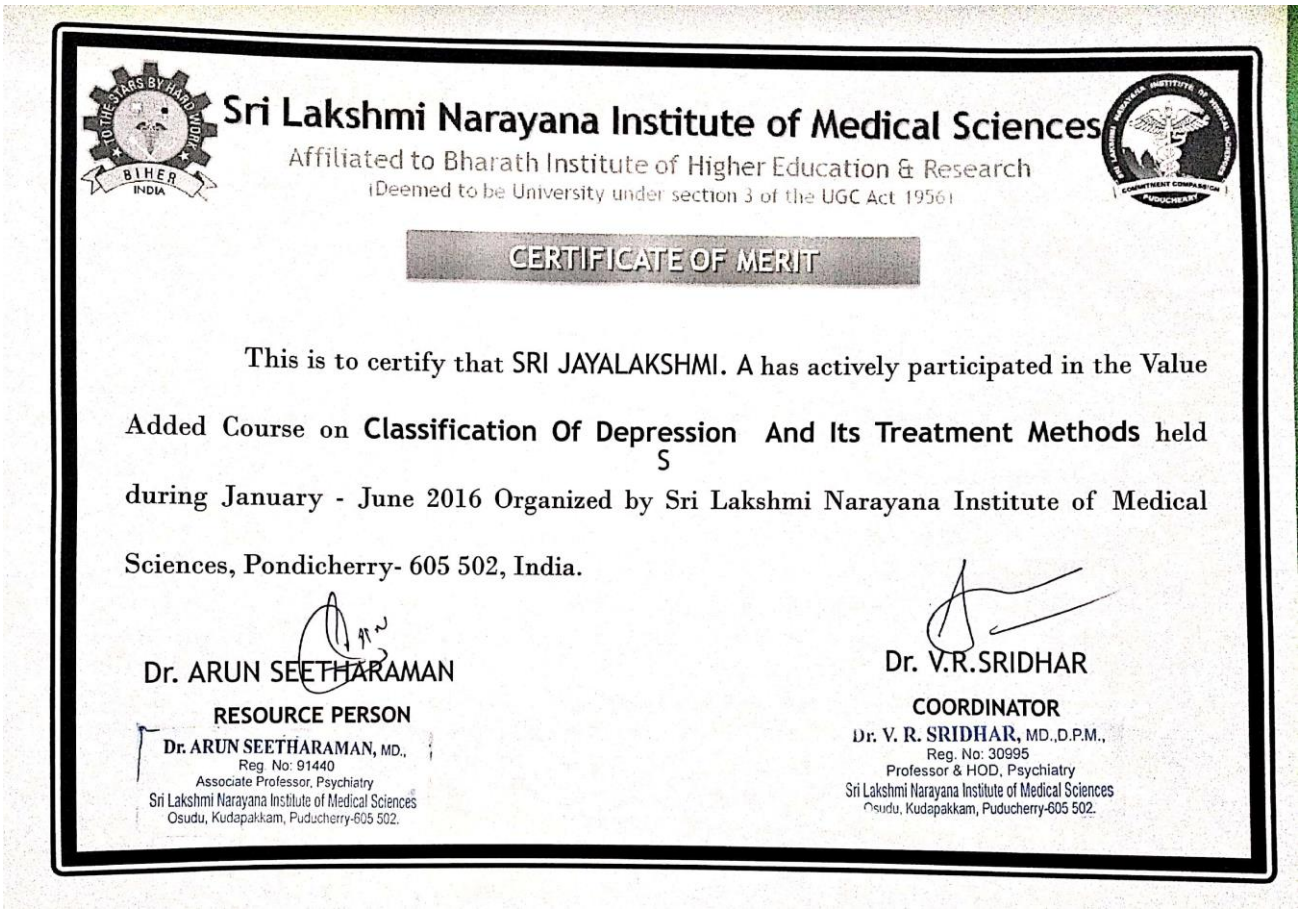
This is to certify that SREEPADMA PURUJITH. S.S. has actively participated in the Value Added Course on **Classification Of Depression And Its Treatment Methods** held during January - June 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. ARUN SEETHARAMAN
RESOURCE PERSON
Dr. ARUN SEETHARAMAN, MD.,
Reg. No: 91440
Associate Professor, Psychiatry
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Osudu, Kudapakkam, Puducherry-605 502.

Dr. V.R.SRIDHAR
COORDINATOR
Dr. V. R. SRIDHAR, MD.,D.P.M.,
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Sri Lakshmi Narayana Institute of Medical Sciences

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CERTIFICATE OF MERIT

This is to certify that SRI JAYALAKSHMI. A has actively participated in the Value Added Course on **Classification Of Depression And Its Treatment Methods** held during January - June 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. ARUN SEETHARAMAN

RESOURCE PERSON

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Dr. V.R.SRIDHAR

COORDINATOR

Dr. V. R. SRIDHAR, MD.,D.P.M.,
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# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

**Student Feedback Form**

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# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Course Name: **DEPRESSION**

Subject Code: **PSYC02**

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: **DEPRESSION**

Subject Code: **PSYC02**

Name of Student: SEMBIYAN · R · M Roll No.: U14MB315

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 HIGHER EDUCATON AND RESEARCH

## Student Feedback Form

Course Name: **DEPRESSION**

Subject Code: **PSYC02**

Name of Student: SIKKANDAR . A Roll No.: U14MB316

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 | | | | ✓ | |
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| 8 | Overall rating of the course | 1 | 2 | 3 | 4 | 5 |

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Suggestions if any:

Signature




# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Date: 30-6-2016

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# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

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: Identification And Classification Of Depression And Its Management**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Awareness, Identification And Classification Of Depression 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

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



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**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**
**Osudu, Agaram Village, Koodapakkam post, Puducherry - 605502**

From

Date: 06.01.2016

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: Permission to conduct value-added course: Therapeutic drug Monitoring**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Therapeutic Drug Monitoring on February to August 2016** .We solicit your kind permission for the same.

Kind Regards

Dr.Somasekar.HS

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr.Jayakumar HOD: Dr.Somasekar.HS Expert Dr. Somasekar.HS., Dr.Jaikumar

The committee has discussed about the course and is approved.

Dean Subject Expert HOD

Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-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** **Date:**08.01.2016

**Sub: Organising Value-added Course: Therapeutic Drug Monitoring**

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical sciences is organizing **"Therapeutic Drug Monitoring" February to August 2016**. 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 31st 2016**.Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502.

Encl: Copy of Course content.

– Course Proposal

**Course Title: Therapeutic Drug Monitoring**

**Course Objective**

1. Introduction
2. Purpose Of Therapeutic Drug Monitoring
3. Measuring Plasma Drug Concentration In Therapeutic Drug Monitoring
4. Analytical Issues In Therapeutic Drug Monitoring
5. Practical Issues In Therapeutic Drug Monitoring
6. Pharmacoeconomic Impact Of Therapeutic Drug Monitoring
7. Pharmacogenetics and TDM
8. Role of clinician in TDM
9. Recognize clinical areas where implementation of TDM may have a positive impact on patient care

**Course Outcome:** TDM plays an important role in the development of safe and effective therapeutic medications and individualization of these medications. Additionally, TDM can help to identify problems with medication compliance among noncompliant patient cases

**Course Audience: 2nd Year MBBS Students**

**Course Coordinator: Dr.Somasekar.HS**

**Course Faculties with Qualification and Designation:** Dr.Somasekar.HS
Prof&HOD,Dept of Pharmacology

Dr.s.Jaikumar
Asst.Prof,Dept of Pharmacology

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

| SlNo | Date | Topic | Time | Hours | FACULTY |
|---|---|---|---|---|---|
| 1 | 02.02.2016 | Introduction | 4-7 pm | 3 | Dr.Somasekar.HS |
| 2 | 16.02.2016 | Purpose Of Therapeutic Drug Monitoring | 4-7 pm | 3 | |
| 3 | 01.03.2016 | Measuring Plasma Drug Concentration In Therapeutic Drug Monitoring | 4-7 pm | 3 | |
| 4 | 08.03.2016 | Analytical Issues In Therapeutic Drug Monitoring | 4-7 pm | 3 | |
| 5 | 05.04.2016 | Practical Issues In Therapeutic Drug Monitoring | 4-7 pm | 3 | |
| 6 | 03.05.2016 | Pharmacoeconomic Impact Of Therapeutic Drug Monitoring | 4-7 pm | 3 | Dr.S.Jaikumar |
| 7 | 07.06.2016 | Pharmacogenetics and TDM | 3-7 pm | 3 | |
| 8 | 12.07.2016 | Role of clinician in TDM | 3-7 pm | 3 | |
| 9 | 02.08.2016 | Recognize clinical areas where implementation of TDM may have a positive impact on patient care | 3-7 pm | 3 | |
| | | | Total Hours | 30 | |

**REFERENCE BOOKS: (Minimum 2)**

**Introduction to Therapeutic Drug Monitoring:Pages 1-39Dasgupta, Amitava, PhD**

Monitoring Free Drug Concentration: Dasgupta, Amitava, PhD, Pages 41-65

# VALUE ADDED COURSE

**1. Name of the programme & Code**

THERAPEUTIC DRUG MONITORING

**2. Duration & Period**

February to August 2016

**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:**

February – August 2016

**8. Year of discontinuation: 2016**

**9. Summary report of each program year-wise**

| Value Added Course- February – August 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | PH02 | Therapeutic drug monitoring | Dr.HS.Somasekar<br>Dr.S.Jaikumar | 2nd MBBS | 20 (Feb-Aug-16) |

10. Course Feed Back

*Enclosed as Annexure- V*

**RESOURCE PERSON**

**COORDINATOR**

# Therapeutic drug monitoring

| Particulars | Description |
|---|---|
| Course Title | Therapeutic drug monitoring |
| Course Code | PH02 |
| Objective | 1. Introduction<br>2. Purpose Of Therapeutic Drug Monitoring<br>3. Measuring Plasma Drug Concentration In Therapeutic Drug Monitoring<br>4. Analytical Issues In Therapeutic Drug Monitoring<br>5. Practical Issues In Therapeutic Drug Monitoring<br>6. Pharmacoeconomic Impact Of Therapeutic Drug Monitoring<br>7. Pharmacogenetics and TDM<br>8. Role of clinician in TDM<br>9. Recognize clinical areas where implementation of TDM may have a positive impact on patient care |
| Further learning opportunities | TDM plays an important role in the development of safe and effective therapeutic medications and individualization of these medications. Additionally, TDM can help to identify problems with medication compliance among noncompliant patient cases |
| Key Competencies | On successful completion of the course the students will have skill to interpret the values in therapeutic drug monitoring |
| Target Student | II MBBS Students |
| Duration | 30hrs Every Feb to Aug 2016 |
| Theory Session | 10hrs |
| Practical Session | 20hrs |
| Assessment Procedure | MCQ |




**INTRODUCTION**

Therapeutic drug monitoring (TDM) is generally defined as the clinical laboratory measurement of a chemical parameter that, with appropriate medical interpretation, will directly influence drug prescribing procedures. Otherwise, TDM refers to the individualization of drug dosage by maintaining plasma or blood drug concentrations within a targeted therapeutic range or window . By combining knowledge of pharmaceutics, pharmacokinetics, and pharmacodynamics, TDM enables the assessment of the efficacy and safety of a particular medication in a variety of clinical settings. The goal of this process is to individualize therapeutic regimens for optimal patient benefit. Traditionally, TDM involves measuring drug concentrations in various biological fluids and interpreting these concentrations in terms of relevant clinical parameters. Clinical pharmacists and pharmacologists use pharmacokinetic principles to assess these interpretations. The science of TDM introduced a new aspect of clinical practice in the 1960s with the

publication of initial pharmacokinetic studies linking mathematical theories to patient outcomes From there, clinical pharmacokinetics emerged as a discipline in the late 1960s and early 1970s. Pioneers of drug monitoring in the 1970s focused on adverse drug reactions and demonstrated clearly that by constructing therapeutic ranges, the incidence of toxicity to drugs such as digoxin phenytoin, lithium, and theophylline could be reduced. The emergence of clinical pharmacokinetic monitoring was encouraged by the increasing awareness of drug concentration-response relationships, the mapping of drug pharmacokinetic characteristics, the advent of high-throughput computerization, and advancements in analytical technology . The more recent explosion of pharmacogenetic and pharmacogenomic research has been fuelled by the tremendous amount of genetic data generated by the Human Genome Project (HGP). In 1990, the HGP began its quest to map the complete set of genetic instructions of the human genome consisting of approximately 3.2 billion base pairs encoding up to 100,000 genes located on 23 pairs of chromosomes Although originally conceived as a 15-yr project, the HGP was essentially completed by 2001. Recent advancements in gene chip technology have ushered in a new era of gene-based medicinal and drug therapies.

## PURPOSE OF THERAPEUTIC DRUG MONITORING

Performing TDM requires a multidisciplinary approach. Accurate and clinically meaningful drug concentrations are attainable only by complete collaboration by a TDM team, typically comprised of scientists, clinicians, nurses, and pharmacists. Excellent communication among team members is necessary to ensure that best practices in TDM are achieved

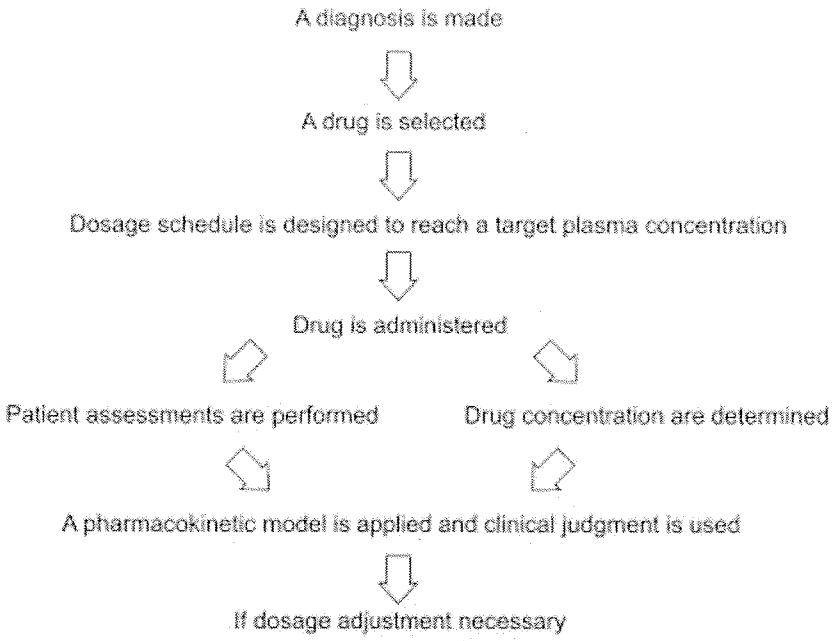



Figure 1

Process for reaching dosage decisions with therapeutic drug monitoring.

The indications for drug monitoring have widened to include efficacy, compliance, drug-drug interactions, toxicity avoidance, and therapy cessation monitoring (Table 1). Plasma drug concentration measurements alone may be helpful in several circumstances, although each indication may not apply equally to every drug Measuring plasma concentrations may be helpful, however, as a low measurement reflects either poor recent compliance or under treatment. Poor compliance is implicated if the patient is prescribed a dose that is unlikely to be associated with a measured low concentration or if a previous measurement suggested that the plasma concentration should be higher for the given dose. When initiating drug therapy, the physician may find it useful to measure the plasma drug concentration and tailor the dosage to the individual. This directive applies to all drugs, although it is most important for those with narrow therapeutic ranges such as lithium, cyclosporine, and aminoglycoside antibiotics.

Table 1

Indications for requesting plasma drug concentrations

| |
|---|
| Monitoring compliance |
| Individualizing therapy |
| during early therapy |
| during dosage changes |
| Diagnosing undertreatment |
| Avoiding toxicity |
| Monitoring and detecting drug interactions |
| Guiding withdrawal of therapy |

If the dosage regimen must be altered for any reason at a later stage of treatment, for example, in patients with renal failure, measuring plasma concentrations again may be helpful. Undertreatment of an established condition may be concluded if a poor clinical response is observed. However, when the drug is being used as prophylaxis, it is impossible to monitor a response. Thus, the physician can select a dosage that will produce a certain target plasma concentration. This dictum applies particularly to lithium in preventing manic-depressive attacks, to phenytoin in preventing fits after neurosurgery or trauma, and to cyclosporine in preventing transplant rejection. In all cases, plasma concentration measurements obtained and scrutinized during the early treatment stages enable the physician to avoid toxic plasma concentrations. In many cases, drug toxicity can be diagnosed clinically. For example, it is relatively easy to recognize acute phenytoin toxicity, and measuring the plasma concentration may not be necessary for diagnosis, although it may be helpful in adjusting the dosage subsequently. On the other hand, digoxin toxicity may mimic certain symptoms of heart disease, and measuring the

plasma concentration in cases in which toxicity is suspected may be helpful in confirming the diagnosis. In a study by Aronson and Hardman measurement of the plasma digoxin concentration in 260 patients treated with digitalis lanata preparations (digoxin, lanatoside C, betamethyl-digoxin) enabled the monitoring of certain outcomes that would not be apparent otherwise. Notably, the important overlap between "toxic" and "nontoxic" plasma concentration values limits use of the method in the diagnosis of digitalis toxicity (Fig. 2) However, in digitalis-treated patients with toxicity associated with digitalis plasma concentrations under 2.0 ng/mL, the method can detect digitalis sen-sitivity. Aronson and Hardman determined that a dosage selection based on plasma drug concentration assessment led to a decrease of digitalis toxicity to below 4%. This method is not yet widely available. Thus, it should be noted that plasma digoxin concentration measurements should be obtained and evaluated in digitalis-treated patients with borderline renal function, in aged subjects, and in patients with rapid atrial fibrillation who require higher digitalis doses for heart rate control (Fig. 3).

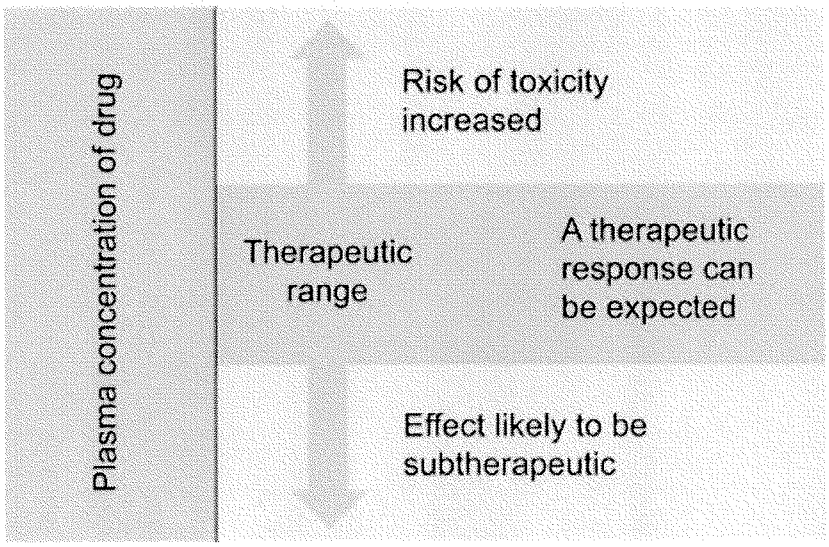
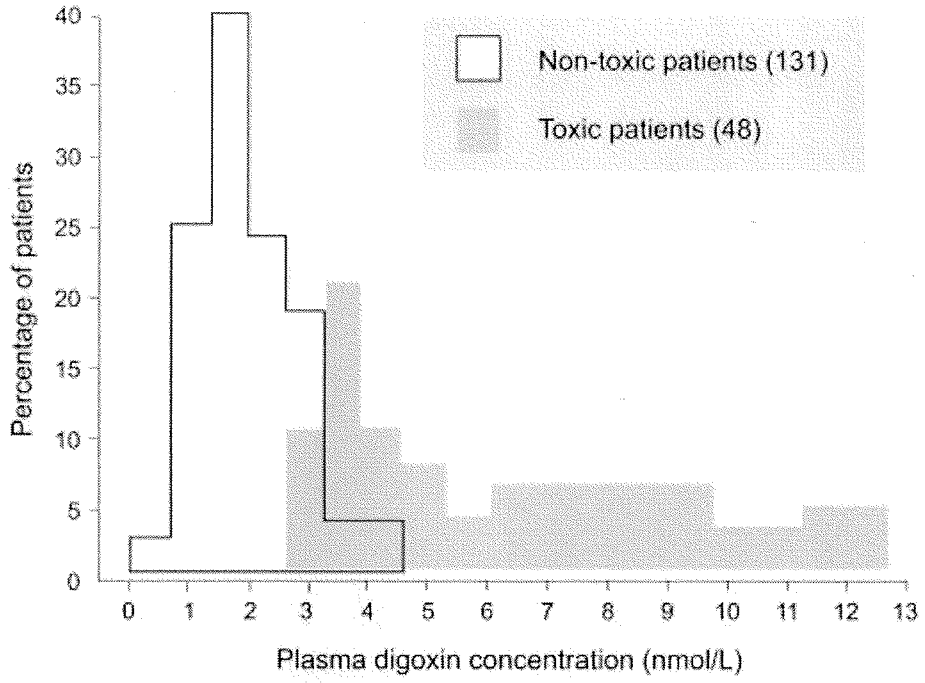



Figure 2

Concept of the therapeutic range [20].




## MEASURING PLASMA DRUG CONCENTRATION IN THERAPEUTIC DRUG MONITORING

The contribution of pharmacokinetic variability to differences in dose requirements can be identified by measuring the drug concentration at steady state and modifying the dose to attain a

desired concentration known to be associated with efficacy. However, there is substantial inter-individual pharmacodynamic variability at a given plasma concentration hence a range of concentrations rather than a single level is usually targeted. For a limited number of drugs for which there is a better relationship between plasma or blood concentration-response than dose-response, the measurement of plasma or blood concentrations has become a valuable surrogate index of drug exposure in the body

Pressures continue within the health care system to provide services at the lowest possible cost. Thus, the role of many drug assay laboratories is to measure the concentration of a therapeutic drug in a blood sample and relate this number to a therapeutic range published in the literature. Therapeutic drug measuring is only one part of TDM that provides expert clinical interpretation of drug concentration as well as evaluation based on pharmacokinetic principles. Expert interpretation of a drug concentration measurement is essential to ensure full clinical benefit. Clinicians routinely monitor drug pharmacodynamics by directly measuring the physiological indices of therapeutic responses, such as lipid concentrations, blood glucose, blood pressure, and clotting. For many drugs, either no measure of effect is readily available, or the method is insufficiently sensitive Therefore, the process of TDM is predicted on the assumption that a definable relationship exists between dose and plasma or blood drug concentration, and between the blood drug concentration and pharmacodynamic effects . Measuring the plasma drug concentration may guide clinicians to stop treatment under two known circumstances. First, treatment should cease if the plasma digoxin concentration is below the therapeutic range in a patient whose clinical condition is satisfactory so that digoxin withdrawal is unlikely to lead to clinical deterioration. Note that this use of the plasma concentration measurement depends on the concept that there is a lower end to the therapeutic range. This is not true for other drugs,

particularly phenytoin. If there is no response to lithium and the serum concentration is at the upper end of the therapeutic range, then increased dosage is unlikely to be beneficial, and the risk of toxicity is high. Withdrawal of lithium and the use of a different treatment would be justified. Drug concentration measurements are requested to assist the management of a patient's current medication regimen or to screen for a medicine. Procedures may also be implemented to assess whether requests for drug assays are warranted before the assays are actually performed, thereby ensuring the rational utilization of resources. This is often time consuming for senior personnel, but can be cost-effective as it may prevent expensive tests that do not assist either immediate or long-term patient management.

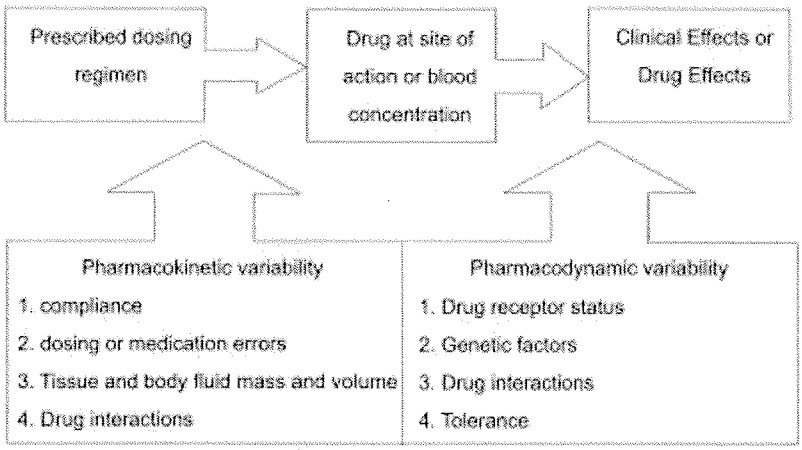



Figure 4

Relationships of pharmacokinetics and pharmacodynamics and factors that affect pharmacokinetic and phamacodynamic variability

For a small number of drugs, measuring the plasma concentration is helpful in clinical practice. Table 2 presents the criteria that must be satisfied for the drug plasma concentration to be useful

Table 2

Criteria that a drug should satisfy for plasma concentration measurements to be useful

| |
|---|
| Difficulty in interpreting clinical evidence of therapeutic or toxic effects |
| A good relationship between the plasma drug concentration and the therapeutic or toxic effect, or both |
| A low toxic: therapeutic ratio |
| Dose does not metabolize to important active metabolites |

Even for drugs that fulfill these criteria, some controversy exists about the usefulness of monitoring their plasma concentrations First, it has been argued that no good evidence demonstrates that targeting plasma concentrations improves the therapeutic outcome and that the therapeutic value of plasma monitoring must be tested .However, these arguments ignore the underlying principle: a stronger relationship exists between plasma concentration and effect than between dose and effect suggesting that it should be possible to improve therapy with a drug by monitoring its plasma concentrations. Second, it is argued that the value of the technique is reduced by problems in defining therapeutic ranges, such as those encountered when conditions alter a drug's pharmacodynamic effects However this argument merely emphasizes the need for proper interpretation of plasma drug concentrations under such conditions. Third, some argue that the plasma concentration itself is being treated rather than the patients, and that monitoring is rendered useless by, for example, an inappropriate timing of sampling. We argue that this last point indicates that the information provided by plasma drug concentration monitoring is being misused . There is no justification for routine measurements of plasma drug concentrations

without a definite purpose. Indeed, routine measurement of the plasma drug concentration without a clear purpose is as irresponsible as obtaining no measurement at all

## SUMMARY

The use of TDM requires a combined approach encompassing pharmaceutical, pharmacokinetic, and pharmacodynamic techniques and analyses. The appropriate use of TDM requires more than a simple measurement of patient blood drug concentration and a comparison to a target range. Rather, TDM plays an important role in the development of safe and effective therapeutic medications and individualization of these medications. Additionally, TDM can help to identify problems with medication compliance among noncompliant patient cases. When interpreting drug concentration measurements, factors that need to be considered include the sampling time in relation to the dose, the dosage history, the patient's response, and the desired clinical targets. This information can be used to identify the most appropriate dosage regimen to achieve the optimal response with minimal toxicity.

ANNEXURE -II

# VALUE ADDED COURSE

## SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Participant list of Value added course: **Therapeutic drug Monitoring Feb to AUG 2016**

| Sl. No | Name of the Student | Register No | Signature |
|---|---|---|---|
| 1 | POOJA KUMARI | U16MB351 | Pooja Kumari |
| 2 | PRADEEP .T | U16MB352 | Pradeep |
| 3 | PRASHANT.S | U16MB353 | |
| 4 | PRIYADARSHINI .K | U16MB354 | Priya |
| 5 | PRIYADARSHINI .S | U16MB355 | Dharshini |
| 6 | PRIYADARSHINI .U | U16MB357 | Priyadarshini |
| 7 | PRIYADHARSHINI .V | U16MB358 | V. Priyadharshini |
| 8 | PRIYADHARSHINI.S | U16MB356 | Priyadharshini |
| 9 | PRIYANK VATS | U16MB359 | Priyank VS |
| 10 | RADHIKA .C | U16MB360 | Radhika. C. |
| 11 | RAJASHREE .M | U16MB361 | Rajashree. |
| 12 | RAJAT TYAGI | U16MB362 | Rajat Tyagi |
| 13 | RAJEEV RANJAN SINGH | U16MB363 | Rajeev |
| 14 | RAMAPRIYA .M | U16MB364 | |
| 15 | RIYAS AHAMED .M | U16MB365 | Riyas Ahamed |
| 16 | RUCHI YADAV | U16MB366 | Ruchi Yadav |
| 17 | RUPESH RANJAN | U16MB367 | Rupesh Ranjan |
| 18 | SAI PAVAN KUMAR .B | U16MB368 | Sai Pavan Kumar |
| 19 | SAJUTI DEY | U16MB369 | Sajuti |
| 20 | SAKTHIMALAR .R | U16MB370 | Sakthimalar |

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502

## Annexure – I THERAPEUTIC DRUG MONITORING

## MCQ

**Course Code: PH 02**

1. The time period that must elapse between the time of administration of a drug and the time that a serum level can be drawn depends on which of the following pharmacokinetic parameters of that drug? A. Elimination half-life

B. Distribution half-life

C. Clearance

D. Steady-state serum concentration

2. A drug that causes hepatic enzyme induction and increases the metabolism of other drugs is

A. phenobarbital.

B. digoxin.

C. theophylline.

D. lithium

3. A change in the dosing regimen of a patient receiving phenobarbital is made. Phenobarbital has a half-life of 90 hours. The patient receives a dose every 12 hours. To verify that the new dose is appropriate, a sample should be drawn and tested

A. the next morning.

B. after 5 doses have been given.

C. in 4 to 5 days.

D. in about 15 days

4. Serum drug assays typically measure

A. total drug (both protein-bound drug and unbound drug).

B. unbound drug only.

C. protein-bound drug only.

D. volume of distribution

5. A patient has a phenytoin concentration of 15 ug/mL. Upon calling the physician with this result, the technologist is informed that the patient appears toxic. Given the nature of phenytoin, which of the following steps will most readily indicate that a total concentration of 15 ug/rnL is consistent with toxicity and therefore an analytically correct value?

A. Recheck the analytical run to ensure that all quality control is correct.

B. Recheck the result by rerunning a fresh sample from the original collection tube.

C. Request a fresh sample from the patient.

D. Check to see if the patient has a decreased albumin concentration

6. When a drug is being administered on a repeating pattern, steady-state serum drug concentrations are achieved after approximately how many drug half-lives have elapsed?

A. One

B.Two

C. Five

D. The number varies with the drug.

7. Ultrafiltration is clinically useful when used for the following:

A. Removal of DLIF and measurement of free phenytoin, free valproic acid, and free digoxin in the presence of Digibind

B. Measurement of free phenytoin, free valproic acid, and free digoxin in the presence of digibind

C. Measurement of free phenytoin and free valproic acid

D. Measurement of free digoxin in the presence of digibind and removal of DLIF

8. Factors that can affect the results of therapeutic drug monitoring include

A. interactions between drugs.

B. accurate documentation of draw times.

C. drug metabolism and elimination.

D. All of the above

9. Which of the following drugs have long distribution phases so that samples must be drawn 6 to 12 hours after a dose?

A. Cyclosporine, carbamazepine

B. Lithium, digoxin

C. Phenytoin, phenobarbital

D. Procainamide, primidone

10. The initial peak serum drug concentration achieved after a drug is administrated by intravenous bolus is influenced most by which pharmacokinetic parameter?

A. Clearance

B. Elimination half-life

C. Steady-state serum concentration

D. Volume of distribution

# 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 **POOJAKUMARI** has actively participated in the Value Added Course on ***Therapeutic drug monitoring*** held during Feb 2016 – Aug 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr.Somasekar.HS
Dr.S.Jaikumar
RESOURCE PERSON

Dr.Somasekar.H
COORDINATOR

## Student Feedback Form

Course Name: Therapeutic Dry Monitoring

Subject Code: PH02

Name of Student: Poojakumari Roll No.: U16MB351

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: 01.09.2016**

**From**
G.Somaundaram,
Department Of Pharmacology,
Sri Lakshmi Narayana Institute ofMedical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute ofMedical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

**Sub: Completion of value-added course: Therapeutic Drug Monitoring**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Therapeutic Drug Monitoring** on **Feb to Aug 2016**. 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.

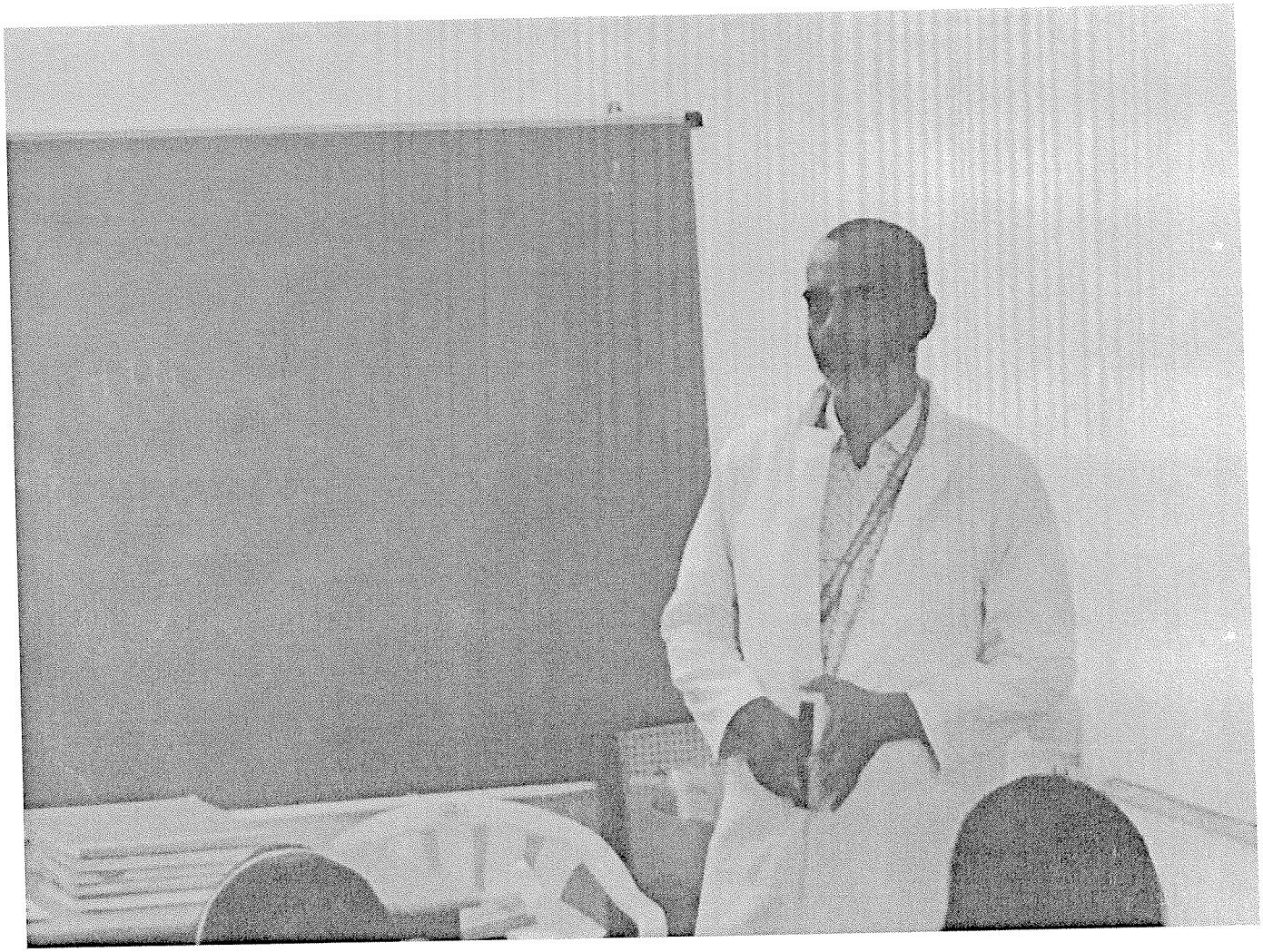
Kind Regards

Dr.Somasekar.HS

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

**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 15/1/15

From
Dr.Boblee James,
Professor and Head,
Orthopaedics,
SLIMS,
Pondicherry.

To
The Dean,
SLIMS,
pondicherry.

**Sub: Permission to conduct value-added course: benign bone tumors**

Respected Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: BENIGN BONE TUMORS on 2/2/16. We solicit your kind permission for the same.

Kind Regards

DR.BOBLEE JAMES

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean:Dr.Jayakumar

The HOD:Dr.Boblee james

The Expert:Dr.Vijayakumaran.

The committee has discussed about the course and is approved.

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 ]

| Dean | Subject Expert | HOD |
|---|---|---|
| (Sign & Seal) | (Sign & Seal) | (Sign & seal |

PROFESSOR & HOD
DEPARTMENT OF PHARMACOLOGY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502.

Department of Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Pondicherry - 605 502.

PROFESSOR & HOD
Department of Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Pondicherry - 605 502.

OFFICE OF THE DEAN

# Sri Lakshmi Narayana Institute of Medical Sciences

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[ 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:** BENIGN BONE TUMORS

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 **BENIGN BONE TUMORS** 30 hrs & FEB 2016-may 2016

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 2016- MAY62016. Applications received after the mentioned date shall not be entertained under any circumstances.

**Dean**

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.
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# COURSE PROPOSAL

**Course Title: Benign bone tumors**

**CourseObjective: To assess the benign bone tumors**

**CourseOutcome: types & management**

**Course Audience:20**

**Course Coordinator:dr.Jayakumar**

**Course Faculties with Qualification and Designation:**

**1. DR.BOBLEE JAMES Ms ortho**
**Course Curriculum/Topics with schedule (Min of 30 hours)**

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 2/2/16 | BONE FORMING TUMORS | 4.30 to 5 | 1/2 |
| 2 | 9/2/16 | CARTILAGENOUS TUMORS | 4 to 6 | 2 |
| 3 | 16/2/16 | FIBROUS LESIONS | 4.30 to 5.30 | 1 |
| 4 | 23/2/16 | FATTY TUMORS | 4 to 7 | 3 |
| 5 | 29/2/16 | VASCULAR TUMORS | 4.30 to 6.30 | 2 |
| 6 | 05/03/16 | SOFT TISSUE TUMORS | 6.30 to 7 | 1/2 |
| 7 | 11/3/16 | ANEURYSMAL BONE CYST | 4.30 to5.30 | 1 |
| 8 | 18/3/16 | PRACTICAL SESSION | 4 to 7 | 3 |
| 9 | 24/3/16 | PRACTICAL SESSION | 4 to 6 | 2 |
| 10 | 31/3/16 | PRACTICAL SESSION | 3 to 7 | 4 |
| 11 | 07/04/16 | PRACTICAL SESSION | 4 to 6 | 2 |
| 12 | 15/04/16 | PRACTICAL SESSION | 4 to 7 | 3 |
| 13 | 23/04/16 | PRACTICAL SESSION | 4 to 6 | 2 |
| 14 | 11/05/16 | PRACTICAL SESSION | 4 to6 | 2 |
| 15 | 24/05/16 | PRACTICAL SESSION | 4 to 6 | 2 |
| | | | Total Hours | 30 |

**REFERENCE BOOKS:**

DABLIN'S BONE TUMOR KRISHNAN UNNI

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## VALUE ADDED COURSE

**1. Name of the programme & Code**
Benign bone tumors – OR02

**2. Duration & Period**
30 hrs & FEB 2016-may 2016

**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**

| **Value Added Course-** FEB 2016-MAY 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | OR02 | Benign bone tumors | Dr. Boblee james | THIRD YEAR MBBS | 20 (FEB 2016-may 2016) |

*Enclosed as Annexure- IV*

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

1 FEB 2016- may2016

**8. Year of discontinuation: 2017**

**9. Summary report of each program year-wise**

**10. Course Feed Back** *Enclosed as Annexure- V*

PROFESSOR & HOD
Department of Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Pondicherry - 605 502.

**RESOURCE PERSON**
**DR.BOBLEE JAMES**

DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

**COORDINATOR**
**DR.JAYAKUMAR**

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# BENIGN BONE TUMORS

**2/2/16**

## BENIGN BONE TUMORS

| Particulars | Description |
|---|---|
| Course Title | BENIGN BONE TUMORS |
| Course Code | OR02 |
| Objective | 1. BONE FORMING TUMORS<br>2. CARTILAGENOUS TUMORS<br>3. FIBROUS LESIONS<br>4. FATTY TUMORS<br>5. VASCULAR TUMORS<br>6. SOFT TISSUE TUMORS<br>7. ANEURYSMAL BONE CYST |
| Further learning opportunities | RARE CASES OF BENINGN TUMORS |
| Key Competencies | On successful completion of the course the students will have a understanding of diagnosing a bone tumors . |
| Target Student | Pre final years |
| Duration | 30hrs February – may 2016 |
| Theory Session | 10hrs |

| | |
|---|---|
| Practical Session | 20hrs |
| Assessment Procedure | Short notes. |

CLASSIFICATION:

BONE FORMING TUMORS

- Osteoid Osteoma

- Bone Island

CARTILAGENOUS TUMORS

-Chondroma

-Osteochondroma

FIBROUS LESIONS

- Non-ossifying fibroma

- Cortical Desmoid

- Benign Fibrous Histiocytoma

- Fibrous Dysplasia

- Osteofibrous Dysplasia

- Desmoplastic Fibroma

CYSTIC LESIONS

- Unicameral Bone Cyst

-Aneurysmal Bone Cyst

FATTY TUMORS

- Lipoma

VASCULAR TUMORS

- Haemangioma

NON-NEOPLASTICCONDITIONS MIMICKING BONE TUMORS

- Pagets' Disease

- Brown Tumor

- Bone infarct, osteomyelitis, stress fracture, post traumatic osteolysis

BENIGN/AGGRESSIVE TUMORS

-Giant Cell Tumor

- Chondroblastoma

- Chondromyxoid Fibroma

- Osteoblastoma

- Langerhans' Cell Histiocytosis

**CLASSIFICATION OF SOFT TISSUE TUMORS:**

FATTY

- Lipoma

NERVE SHEATH TUMORS

- Neurilemmoma (Schwannoma)

- Neurofibroma

SYNOVIAL LESIONS

- Synovial chondromatosis

- Pigmented Villonodular Synovitis

-Germ Cell Tumor of Tendon Sheath

VASCULAR

- Intramuscular haemangioma

-GlomusTumor

FIBROUS LESIONS

- Nodular Fascitis

- Desmoid tumors

**OSTEOID OSTEOMA:**

Common in 2nd -3 rd decades

M:F – 3:1

Common sites – Lower extremities – long bones, Spine

Typical pain – worse at night, relieved by NSAIDS.

Joint – Stiffness, swelling, contracture

Spine – Scoliosis

Imaging – Cortical radiolucent nidus <1.5cm with marked cortical thickening (Xray/CT).

Marked uptake on TC99 bonescans

Histology –Trabeculae surrounded by loose fibrovascular tissue

Treatment

- NSAIDS

- Burr Down Technique

- RF ablation

BONE ISLAND A.K.A "Enostoses"

- Benign lesions of cancellous bone
- Common in adults, sites – Pelvis, femur
- Usually asymptomatic

Imaging studies - Small round area of increased density in cancellous bone with radiating spicules at periphery.

Mature bone with thickened trabeculae that merge with normal bone at the periphery

Treatment – Observation.

If patient experiences pain and lesion grows, biopsy done to rule out more aggressive lesions such as sclerosing osteosarcoma, blastic metastasis or a sclerotic myeloma.

**CARTILAGENOUS TUMORS CHONDROMA:**

Benign lesions of hyaline cartilage

Common in adults; M=F

Common sites – Phalanges of the hand, small bones of hand and feet

Asymptomatic usually, discovered incidentally/after a pathologic fractureIntramedullary canal – "Enchondroma"

Olliers' Disease – Multiple enchondromatosis – cartilaginous tumors appear in the large and small tubular bones and in flat bones – due to failure of normal enchondral ossification.

Olliers' + Haemangiomas = Maffucci syndrome

Imaging - Lobulated areas of stippled calcification (Popcorn/punctate calcification), Minimal cortical erosion (except in hand).

Histology - Benign-appearing hyaline cartilage. Solitary Enchondromas – Observation with serial radiographs. If stable radiographically, no further intervention is indicated.

- Symptomatic – Curretage
- Multiple enchondromatoses – Deformities treated by osteotomy

**OSTEOCHONDROMA:**

More developmental malformations than true neoplasms

- Originate within the periosteum as small cartilaginous models
- Slight male predominance. 2nd -3 rd decade.

Metaphysis of long bones

 Multiple hereditary exostoses (MHE) is autosomal dominant —mutation of *EXT1 or EXT2*

Presentation - Mass; may be painful secondary to irritation of soft tissue structures, fracture, or overlying bursa.

Two types – Pedunculated or Sessile.

Pedunculated more common.Imaging studies – Plain radiograph/CT/MRI (Confirmatory) – Pedunculated or sessile bone lesion that communicates with the intramedullary canal of the host bone + Cartilage cap

Histological features – Similar to epiphysis of the bone which undergoes enchondral ossification

Treatment – Observation if asymptomatic

En bloc resection – if symptomatic, with removal of the cartilage cap.

 Malignant degeneration – rare – 1% solitary,

5% in multiple hereditary exostoses.

**FIBROUS LESION- NON OSSIFYING FIBROMA:**

AKA – metaphyseal fibrous defects, fibrous cortical defects and fibroxanthomas

Common developmental abnormalities – 1 st - 2 nd decade

Site – Metaphyseal region of long bones; mostly in distal femur, tibia and fibulaRadiology – Well defined lobulated lesion located eccentrically in the metaphysis with sclerotic margins

Presentation – Incidental finding on xrays / pathological fracture at the site of lesion

Histology – Bland appearing spindle cells Arranged in a storiform pattern within a collagenous matrix. Fibroblastic proliferation is present.

Jaffe-Campanacci syndrome – Multiple nonossifying fibromas with café-au-lait spots.

Treatment – Observation, curettage if large Fractures are usually treated non-operatively.

**CORTICAL DESMOID:**

Irregularity in the posteromedial aspect of the distal femoral epiphysis, possibly a reaction to the pull of adductor magnus 2 nd decade of life. Males.

Usually asymptomatic. Xray shows erosion of the posteromedial distal femoral cortex with a sclerotic base. Best seen with LL externally rotated 20-45 degrees.

Histology – Fibrous tissue with collagenous stroma. Similar to NOF.

Treatment - Observation

**BENIGN FIBROUS HISTIOCYTOMA:**

Dahlin in 1978

Common in 4th – 5 th decades. Equal predilection in both sexes.

More common in soft tissues than bone. Pelvis, femur

Histologically similar to non-ossifying fibroma but much more aggressive in behaviour and radiological characteristics.

Presentation – progressive pain

Xray – Lytic, expanding lobulated centrally lucent lesion with sclerotic rim with little periosteal reaction.

Treatment – Curretage – extended or wide resection d/t local recurrence.

**FIBROUS DYSPLASIA:**

Replacement of normal bone and marrow by fibrous tissue and small, woven spicules of bone. Monostotic/Polyostotic.

Common – 1 st to 3rd decades. M=F

Can occur in the epiphysis, metaphysis or diaphysis

Presentation – Pain, deformity, cutaneous pigmentation and endocrine abnormalities

(McCune Albright Syndrome), sexual precocity, intramuscular myxoma (Mazabraud syndrome) and thyroid disease.

Histology – Irregularly woven bone spicules

with a fibrous stroma

Imaging –Ground glass appearance, granular with a well-defined sclerotic rim. Small areas of cartilaginous metaplasia and cystic changes may be present

Treatment – Surgical treatment – significant deformity or pathological fracture or pain – intramedullary fixation/osteotomy.

Treatment with bisphosphonates for extensive disease

**OSTEOFIBROUS DYSPLASIA:**

A.K.A Campanacci disease

- Ossifying fibroma of long bones
- Common 2nd -3 rd decade of life – usually affecting the tibia and fibula
- Presentation –Asymptomatic unless there's a pathological fracture – anterior bowing.

Radiologically – Multicentric radiolucent lesions of the cortex of the tibia

 Histologically – Irregular trabeculae with prominent osteoblastic rimming in a loose fibrous stroma

 Treatment – Observation, Fractures usually non-operatively, deformity correction.

**DESMOPLASTIC FIBROMA:**

Extremely rare, locally aggressive benign bone tumor – bony counterpart of the desmoid tumor.

All age groups – comm0n in 2nd and 3rd decade

Long tubular bones most often involved apart from skull, mandible, pelvis and spine

 Pain is the chief complaint + Pathological fracture

Radiological – Radiolucent lesion with cortical erosion; may have septations; soft tissue mass

 Histologically – Fibroblastic, hypocellular, much collagen and few mitosesTreatment options – extended curettage, wide resection. Adjuvant treatments – radiation, anti-inflammatory agents, tamoxifen and cytotoxic agents.

**CYSTIC LESIONS- UNICAMERAL BONE CYST:**

Developmental/reactive lesion

 1 st – 2 nd decades. M:F = 2:1

 Any extremity; most common – proximal humerus and femur. Ilium and calcaneum.

 Active during skeletal growth and heal spontaneously at maturity

Asymptomatic unless pathological fracture

 Radiologically – Centrally located, purely radiolucent lesion which concentrically expands the cortex. No cortical destruction

 Cyst filled with straw colored fluid. Thin fibrovascular lining.

Observation

Aspiration

Injection of steroids/bone marrow/bone graft substitutes

Curretage

**ANEURYSMAL BONE CYST:**

Locally destructive, blood filled reactive lesions of bone.

 Any bone. Most commonly proximal humerus, distal femur, proximal tibia and spine – 15% (posterior elements)

Common in 1st -2 nd decade, female predominance.Presentation – Pain. Rapid growth can mimic a malignancy. Spinal lesions – neurological deficits.

 Radiology – Eccentric, expansile radiolucent lesion, thin cortical shell. Fluid levels evident on MRI

Histology – Haemorrhagic cavernous spaces, septae of fibroblasts, histiocytes, haemosiderin laden macrophages and giant cells.

Solid variant of aneurysmal bone cyst – "giant cell reparative granuloma"

Surgical treatment – extended curretage and grafting with a bone graft substitute under tourniquet control.

 Spine/Pelvic lesions – Preoperative embolization.

 Low dose radiation – associated with malignant transformation.

**INTEROSSEOUS GANGLION CYST:**

Occur in the ends of long bones of middle aged men – particularly distal tibia.

- Intraosseous extensions of ganglia of local soft tissues
- Xray/MRI – uniloculated or multiloculated, well demarcated with a rim of sclerotic bone.
- Treatment 0 Local excision of overlying soft tissue and curretage

**DERMOID CYST:**

Cysts filled with keratinous material

- Histologically lined with squamous epithelium.
- Resemble epidermal inclusion cysts of the skin.
- Rarefied defects surrounded by sclerotic bone

**RARE TUMORS: INTEROSSEOUS LIPOMA**

Relatively rare

- Adults, M=F
- Asymptomatic, discovered as incidental findings.
- Radiology –Well defined lucencies with a thin rim of reactive bone. Histologically – Fatty tissue with focal areas of necrosis.

- Surgery – only if symptomatic – simple curretage

**HEMANGIOMA:**

Common benign bone lesion. 10% population has asymptomatic lesions in vertebral bodies.

- Skull, long bones uncommon.
- Usually incidental findings.
- Rarely symptomatic unless there is vertebral collapse or nerve root or cord compression.

Radiographic appearance – Characteristic thickened vertically oriented trabeculae – "Jailhouse" appearance

Cross section – "Polka-dot" pattern

MRI – bright on T1 and T2 weighted images.

- Asymptomatic – no treatment required
- Vertebral collapse with neurological deficit – decompression with spinal stabilization.

Long bones – extended curretage

Pre-op embolization to prevent blood loss.

Low dose radiation – risk of malignant transformation

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## VALUE ADDED COURSE

Benign bone tumors

OR02

**4. List of Students Enrolled feb 2016 – may- 2016**

| Pre final Year MBBS Student | | | |
|---|---|---|---|
| **Sl. No** | **Name of the Student** | **Roll No** | **sign** |
| 1 | BALASUBRAMANIAN.R. | U13MB171 | |
| 2 | BENCY.L. | U13MB172 | |
| 3 | BHARANIDARAN.E. | U13MB173 | |
| 4 | BRINDHA.M. | U13MB174 | |
| 5 | CHRIS ANDREW AJAY SRIPATHAM | U13MB175 | |
| 6 | CHRISTOPHER. A. | U13MB176 | |
| 7 | DHATCHAYANI. | U13MB178 | |
| 8 | DEVIKA. G. | U13MB177 | |
| 9 | DINESH KUMAR.P. | U13MB179 | |
| 10 | DIVYA.A. | U13MB180 | |
| 11 | ELAVAZHAGHAN. R. | U13MB181 | |
| 12 | GANESH. S. | U13MB182 | |
| 13 | GAYATHRI.T. | U13MB183 | |
| 14 | GNANAKANNAN.G. | U13MB184 | |
| 15 | HARESH.S. | U13MB185 | |
| 16 | HEMA PRIYA.K. | U13MB186 | |
| 17 | INDHUJA. M. | U13MB187 | |
| 18 | IREEN SUGITHA RANI.J. | U13MB188 | |
| 19 | JAVEED IBRAHIM.J. | U13MB189 | |
| 20 | JEEVIHA.R. | U13MB190 | |

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## Course/Training Feedback Form

**Course: benign bone tumors**
**Date: 24/5/16**
**Name:CHRISTOPHER.A**
**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 _____

1) How to assess & evaluate various types of Bone tumours
2) Mg. of various types of Bone tumours

1) Assessment and evaluation of Bone tumor

— The differential diagnosis is based on history, physical examination, diagnostic studies

— AGE: < 5 yrs → malignant tumour is often metastatic neuroblastoma
5 - 15 yrs → osteosarcoma, Ewing sarcoma
> 40 yrs → metastasis / myeloma

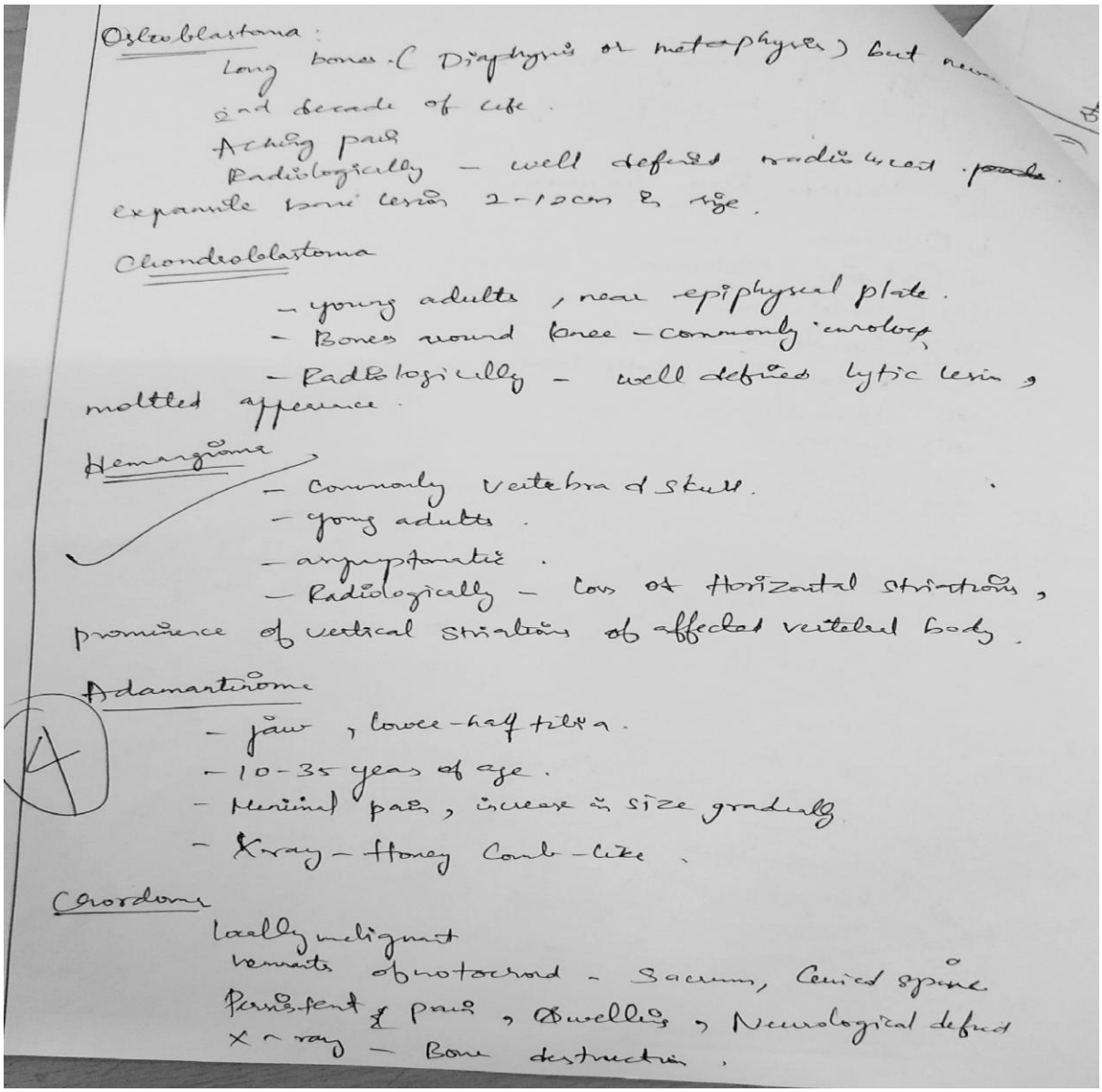
— Diagnostic studies ✓ X-Rays ✓ Bone scan ✓ CT ✓ MRI ✓ PET ✓ Biopsy

X-rays show location, size, shape;
chest x Ray — to detect presence of lung metastasis

Bone scan small amount of radioactive material is injected into Blood vessels it then collects in the bones, detected by a scanner

Biopsy: needle biopsy
incisional biopsy

Blood test alkaline Phosphatase (elevated)



Osteoblastoma :
Long bones (Diaphysis or metaphysis) but rare
2nd decade of life.
Aching pain
Radiologically - well defined radiolucent
expansile bone lesion 2-10cm in size.

Chondroblastoma
- young adults, near epiphyseal plate.
- Bones round knee - commonly involved
- Radiologically - well defined lytic lesion, mottled appearance.

Hemangioma
- Commonly vertebra & skull.
- young adults.
- asymptomatic.
- Radiologically - loss of horizontal striations, prominence of vertical striations of affected vertebral body.

Adamantinoma
- jaw, lower - half tibia.
- 10-35 years of age.
- Painless, increase in size gradually
- Xray - Honey Comb - like.

Chordoma
locally malignant
remains of notochord - Sacrum, Cervical spine
Persistent pain, Dysphagia, Neurological defect
X-ray - Bone destruction.

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1) Various types of benign bone tumours.
2) Signs and Symptoms of benign bone tumours.

1) TYPES OF BENIGN BONE TUMOURS :-

i) Osteoma
ii) Osteoid Osteoma
iii) Osteoblastoma
iv) Chondroblastoma
v) Hemangioma of the bone.
vi) Adamantinoma
vii) Chordoma.

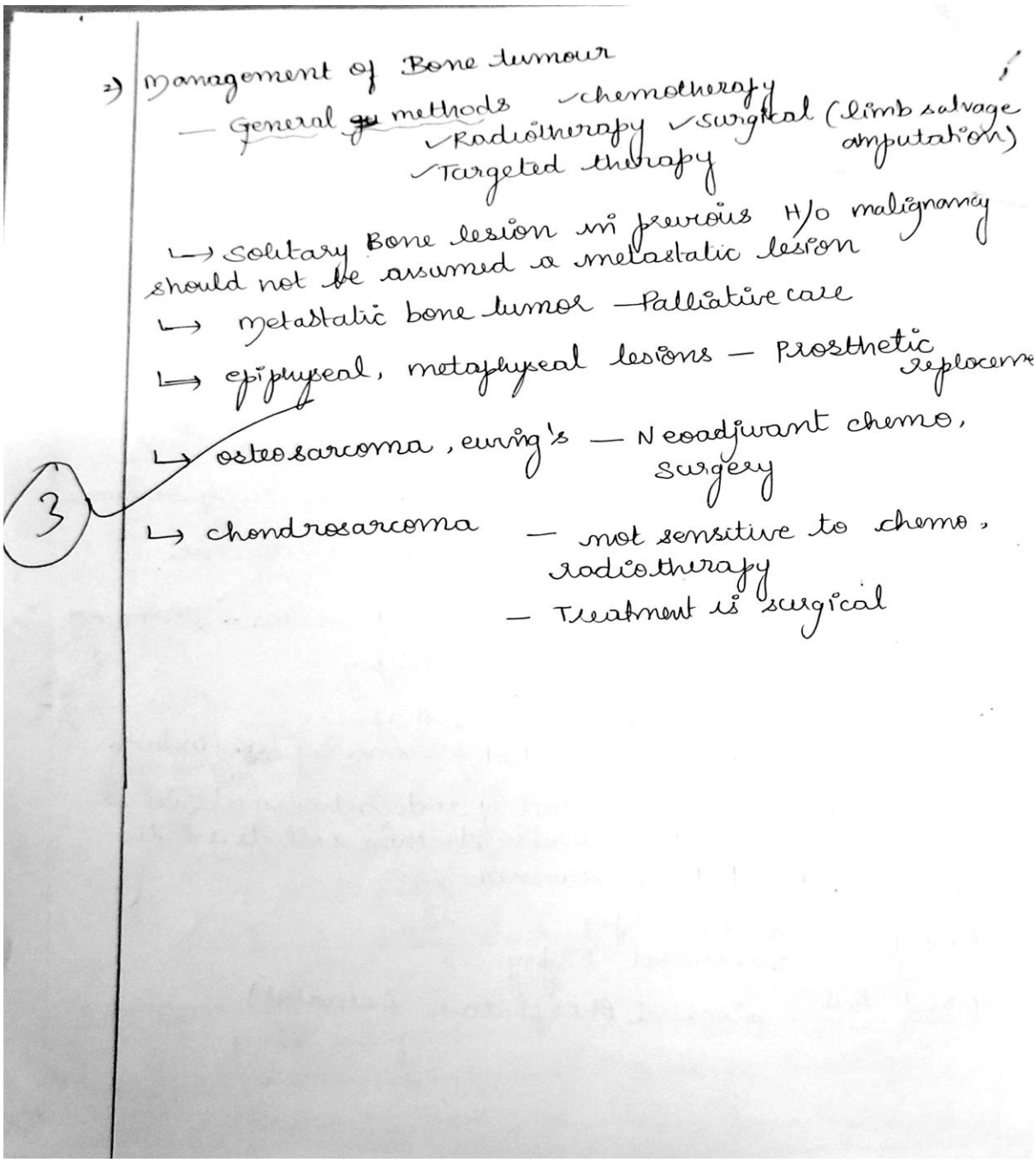
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3

2) Signs and Symptoms

Osteoma
- Visible swelling
- Bulge into adj sinuses (frontal, ethmoidal or others) and cause obstruction to sinus cavity — leading to pain
- most often skull and facial bones.

Osteoid Osteoma
- common in 5 - 25 years.
- bones of lower extremity (tibia)
- Generally located in the diaphysis of long bone.
posterior elements of vertebra.
- Nagging pain, worst at night, relieved by salicylates
- Tenderness at site of lesion.
- X-ray - visible zone of sclerosis surrounding a radiolucent nidus.



3) Management of Bone tumour

— General methods ✓chemotherapy
✓Radiotherapy ✓surgical (limb salvage amputation)
✓Targeted therapy

↳ Solitary Bone lesion in previous H/o malignancy should not be assumed a metastatic lesion

↳ metastatic bone tumor — Palliative care

↳ epiphyseal, metaphyseal lesions — Prosthetic replacem

↳ osteosarcoma, ewing's — Neoadjuvant chemo, surgery

↳ chondrosarcoma — not sensitive to chemo, radiotherapy
— Treatment is surgical

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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 _CHRISTOPHER . A_ has actively participated in the Value Added Course on *Benign bone tumors* held during FEB2016 – MAY 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. BOBLEE JAMES
RESOURCE PERSON

Dr. JAYAKUMAR
COORDINATOR

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Vivo V15Pro
AI Triple Camera

## Student Feedback Form

Course Name: **BENIGN BONE TUMORS**
Subject Code: OR02

Name of Student: Anbazhagan D Roll No.: U13MB159

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: 24/5/16

Anbazhagan
Signature

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Date:25/5/16

From
Dr.Boblee James ,
Orthopaedics,
SLIMS,
Pondicherry.

Through Proper Channel

To
The Dean,
SLIMS,
Pondicherry.

**Sub: Completion of value-added course: Benign bone tumors**

Respected Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: _**benign bone tumors**__ on 24/05/16_. 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.Boblee James

PROFESSOR & HOD
Department of Orthopaedics
Sri Lakshmi Narayana Institute of Medical Sciences
Pondicherry - 605 502.

**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 ]



**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

**OSSUDU AGARAM VILLAGE; KUDAPAKKAM POST,PONDICHERRY - 605003**

Date 4.1.2016

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:** Hematoxylin and Eosin staining

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Hematoxylin and Eosin staining

On Feb - April 2016. We solicit your kind permission for the same.

Kind RegardS

Dr. Pammy sinha

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayakumar

The HOD: Dr. PAMMY SINHA

The Expert: Dr. PAMMY SINHA

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 & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
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** 11.1.16

**Sub: Organising Value-added Course:** Hematoxylin and Eosin staining

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"Hematoxylin and Eosin staining" from **Feb 2016** . 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 30.1.2016 . Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Encl: Copy of Course content

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

## Course Proposal

Course Title: Hematoxylin and Eosin Staining

**Course Objective:**

1. To define the staining properties and charteristics
2. Should know about the principles of hematoxylin and eosin staining.
3. Should be able to perform the hematoxylin and eosin staining and should also know about the trouble shooting

**Course Outcome:** Should know about the hematoxylin and eosin staining in detail
**Course Audience: IInd year MBBS**
**Course Coordinator: Dr.Pammy sinha**
**Course Faculties with Qualification and Designation:**
**1. Dr.Pammy sinha, Professor & HOD**
**2. Dr.Sivaganesh@Porko, Assistant Professor**
**Course Curriculum/Topics with schedule**

| SlNo | Date | Topic | Faculty | Time | Hours |
|---|---|---|---|---|---|
| 1. | 4.02.2016 | Hematoxylin properties and classification | Dr.Pammy Sinha | 1.30-4 pm | 2.5 hrs |
| 2. | 11.02.2016 | Types of Alum hematoxylin | Dr.Sivaganesh @porko | 1.30-4 pm | 2.5 hrs |
| 3. | 18.02.2016 | Iron hematoxylin | Dr.Pammy Sinha | 1.30-4 pm | 2.5 hrs |
| 4. | 25.02.2016 | Tungsten hematoxylin | Dr.Sivaganesh @porko | 1.30-4 pm | 2.5 hrs |
| 5. | 4.03.2016 | Lead hematoxylin | Dr.Pammy Sinha | 1.30-4 pm | 2.5 hrs |
| 6. | 11.03.2016 | Molbdenum hematoxylin | Dr.Sivaganesh @porko | 1.30-4 pm | 2.5 hrs |
| 7. | 18.03.2016 | Eosin Characteristics and Types | Dr.Pammy Sinha | 1.30-4 pm | 2.5 hrs |
| 8. | 25.03.2016 | Automation | Dr.Sivaganesh @porko | 1.30-4 pm | 2.5 hrs |
| | | **Practical Class** | | | |

| | | | | | |
|---|---|---|---|---|---|
| 9. | 1.04.2016 | Hands on training of Hematoxylin and Eosin staining | Dr.Pammy Sinha | 1.30-4 pm | 2.5 hrs |
| 10. | 8.04.2016 | Drying and Mounting | Dr.Sivaganesh @porko | 1.30-4 pm | 2.5 hrs |
| 11. | 15.04.2016 | Labelling | Dr.Pammy Sinha | 1.30-4 pm | 2.5 hrs |
| 12 | 22.04.2016 | Assessment and giving feedback | Dr.Sivaganesh @porko | 1.30-4 pm | 2.5 hrs |
| | | **Total** | | | 30 hrs |

**REFERENCE BOOKS:**

1Theory and Practice of Histological Techniques
Book by John D Bancroft

2 Culling histotechniques

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Hematoxylin and Eosin Staining and PA02

**2. Duration & Period**

30 hrs & Feb – April 2016

**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:**

**8. Year of discontinuation: 2017**

**9. Summary report of each program year-wise**

| Value Added Course- Feb – April 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | PA02 | **Hematoxylin & Eosin Staining** | Dr. Pammy Sinha | 2nd MBBS | Feb - April 2016 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

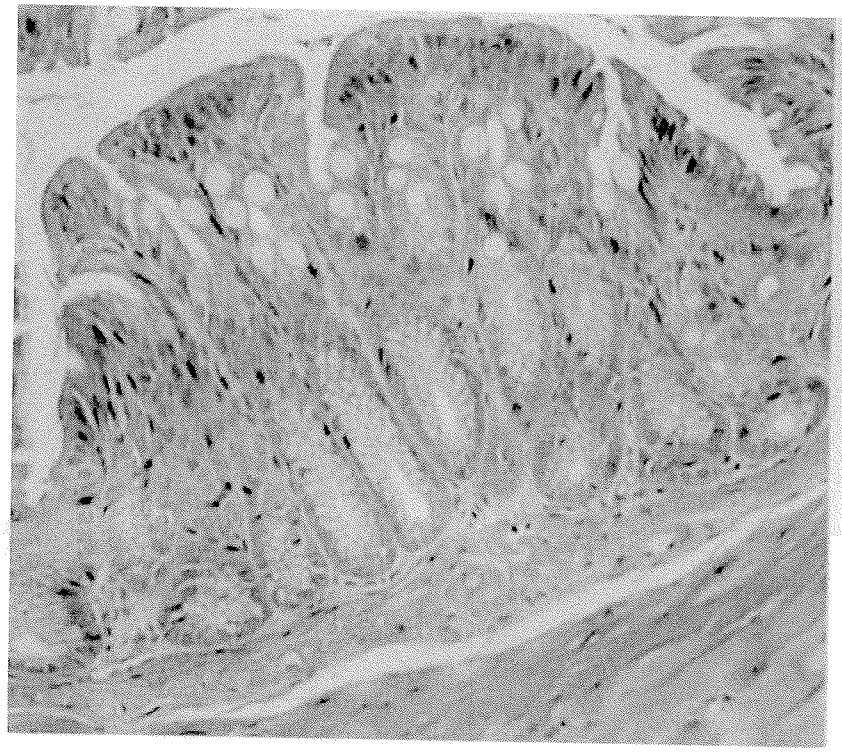
**RESOURCE PERSON**

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

**COORDINATOR**

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

# Hematoxylin & Eosin Staining






# PARTICIPANT HAND BOOK

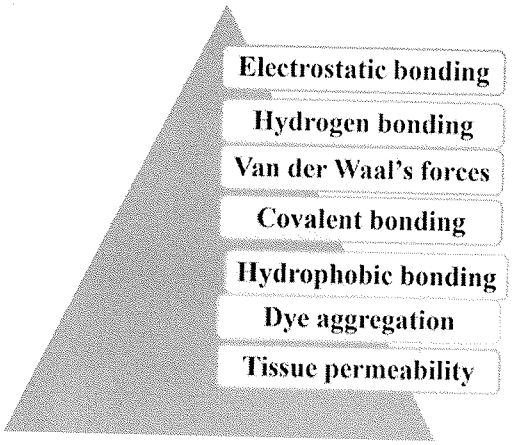
# COURSE DETAILS

| Particulars | Description |
|---|---|
| Course Title | Hematoxylin & Eosin Staining |
| Course Code | PA02 |
| Objective | ϖ Hematoxylin<br>• Principles of hematoxylin<br>• Oxidation<br>• Mordant<br>ϖ Classification of hematoxylin<br>ϖ Alum hematoxylin<br>• Method of use of alum hematoxylin<br>• Bluing<br>• Differentiation<br>• Deterioration of the hematoxylin<br>• Types of alum hematoxylin<br>• Staining time with alum hematoxylin<br>• Disadvantages of alum hematoxylin<br>ϖ Eosin<br>• Introduction<br>• Types of eosin commercially available<br>• Substitutes for eosin<br>• Differentiation<br>• Difficulties encountered |
| Further learning opportunities | **Automated H&E Staining** |
| Key Competencies | On successful completion of the course the students will have skill in performing H&E staining |
| Target Student | 2nd MBBS Students |
| Duration | 30hrs Feb-April 2016 |
| Theory Session | 20hrs |
| Practical Session | 10hrs |
| Assessment Procedure | Short Notes |

## STAINING

It is the process of coloring cells, cellular constituent & tissue fibers to facilitate optical differentiation by microscopic examination. It is the union between a colored dye & a tissue substrate which resists simple washing. It involves visual labeling of some entity by attaching, or depositing in its vicinity a marker of characteristic color or shape. Stain is the marker or reagent used to generate the marker.

## STAINING MECHANISMS




## INTRODUCTION

Hematoxylin & eosin stain is the most widely used histologic stain. Hematoxylin component stains ◊ cell nuclei blue/black with good intranuclear detail. Eosin stains cell cytoplasm & most connective tissue fibers in varying shades & intensities of pink, orange & red. Hematoxlin - Greek word Haimato(blood) and Xylon(wood), reffering to its dark red color in natural state and to its origin(wood). It is extracted from the core of the tree HAEMATOXYLON CAMPECHIANUM. The hematoxylin is extracted from logwood with hot water and then precipitated out from the aqueous solution using urea.

| NATURALLY RIPENED HEMATOXYLINS | CHEMICALLY RIPENED HEMATOXYLINS |
|---|---|
| Ripening by exposure to light & air | Ripening by exposure to chemical oxidizing agents. |
| Slow process (3-4 months) | Ripening instantaneous, ready to use immediately after preparation |
| Long shelf life, retain stability for a long time | Shorter shelf life (because of continuing oxidation process in air & light eventually destroys much of the hematein converting it into a colourless compound) |
| Example<br>• Ehrlich's hematoxylin<br>• Delafield's hematoxylin. | Example<br>• Sodium iodate in Mayer's hematoxylin (SIM)<br>• Mercuric chloride in Harris's hematoxylin (MCh) |

**MORDANTS**

Biological staining – substance intermediate between dye and tissue.Hematin is anionic. Tissue is also anionic. Therefore, hematin has poor affinity for tissue Making hematin inadequate as a nuclear stain without the presence of a 3rd element (mordant). Mordant forms a link between the "tissue and the stain"

**MOLECULAR PROPERTY OF MORDANTS**

Mordants are always di-valent and tri-valent salts or hydroxides of metals. • They combine as hydroxides with the dye by displacing a hydrogen atom from the dye. • The remaining valences of the mordant serves to attach/bind the dye-mordant complex to the tissue components (phosphate groups of the nucleic acid) . Although simple salts such as sulfates and chlorides will do, generally double sulfates or alums are used. The double sulfates have

A. An active usually trivalent metal such as iron, aluminium or chromium,

B. Together with potassium or ammonium as a second cation. Most Commonly Used

1) Salts of aluminium in the form of potash alum or ammonium alum.

2) Salts of iron

3) Salts of Tungsten.

**CLASSIFICATION OF HEMATOXYLIN**

I. **Based on the Oxidation Procedure**

1. Natural oxidation – Ehrlich's and Delafield's
2. Chemical Oxidation - Mayer's and Harris

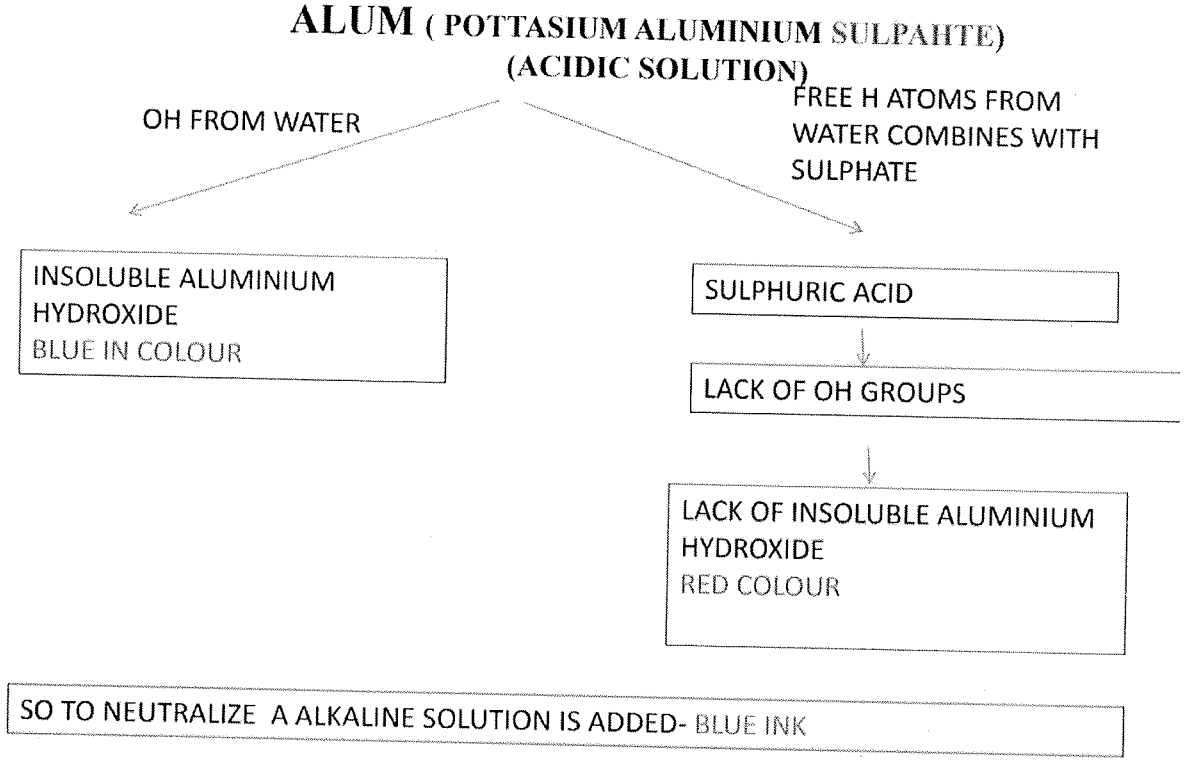
II. **Based on the Mordant Used**

1.Alum hematoxylin
2. Iron hematoxylin
3. Tungsten hematoxylin
4. Lead hematoxylin
5. Molybedenum hematoxylin
6. Hematoxylin without mordant

**ALUM HEMATOXYLIN**: Routinely used. Mordant - "potash alum" (aluminium potassium sulfate) or "ammonium alum" (aluminium ammonium sulfate). Alum hematoxylin can be used in 2 ways Regressively - the section is over stained & then differentiated in acid alcohol, followed by "bluing". Progressively – stained for a pre-determined time so as to adequately stain the nuclei but leave the background tissue relatively unstained.

**BLUING**: After differentiating the hematoxylin with acid alcohol, the nuclei in tissue are red colour. This red colour is converted to blue black when section is washed in weak alkali solution.

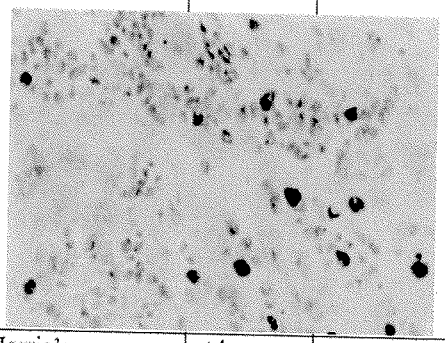
## Principle of bluing




**TYPES OF ALUM HEMATOXYLIN**

1. Ehrlich's hematoxylin (Ehrlich 1886)
2. Delafield's hematoxylin (Delafield 1885)
3. Mayer's hematoxylin (Mayer 1903)
4. Harris hematoxylin (Harris 1900)
5. Cole's hematoxylin (Cole 1943)
6. Carazzi's hematoxylin (Carazzi 1991)
7. Gill's hematoxylin (Gill et al 1974)

| | | | | | |
|---|---|---|---|---|---|
| Delafield's | Alum | Natural | Hematoxylin (4g)<br>**15g/100ml**<br>**Saturated aqueous Ammonium alum (400ml)**<br>95% alcohol (125g)<br>Glycerin (100ml) | Nuclear stain | Lasts long |
| Mayer's Progressive + regressive | Alum | **Sodium iodate** | Hematoxylin<br>Potassium/ammonium alum<br>Sodium iodate (mordant)<br>Distilled water<br>Citric acid(acidifying agents)<br>Chloral hydrate(preservative | Nuclear stain. Nuclear counterstain – during demonstration of **glycogen**. | Glycogen demonstration - Stain is applied for short time (5 – 10 mins) until the nuclei is stained and is then "blued" **without any differentiation** |
| Harris's Progressive (cytology) + regressive | Alum | **Mercuric chloride** | Hematoxylin<br>**Potassium alum**<br>**Mercuric oxide or Sodium iodate**<br>Distilled water<br>Absolute alcohol<br>Glacial acetic acid | General purpose hematoxylin. Nuclear stain | Differentiation is required.<br>Mercuric chloride - highly toxic, environmental unfriendly, corrosive on automated staining machines |
| Cole's | Alum | **Alcoholic Iodine** | Hematoxylin<br>Potash alum<br>1% **iodine** in 95% alcohol | Nuclear staining with eosin | |





| Hematoxylin | Mordant | Oxidizing /ripening agent | Composition | Application | Other features |
|---|---|---|---|---|---|
| Ehrlich's **Progressive** | Alum | Natural | Hematoxylin<br>**Potassium alum**<br>Distilled water<br>Glacial acetic acid<br>Absolute alcohol<br>Glycerin | **Nuclear stain.**<br>Mucins<br>MPS of cartilage.<br>Staining of bone. | Takes 2 months to ripen<br>Emergency -***sodium iodate***<br>**Glycerin - slow the oxidation**<br>Lasts long<br>suitable for tissues that have been subjected to acid decalcification or, more valuably, tissues that have been stored for a long period in formalin fixatives which have gradually become acidic over the storage period<br>not ideal for frozen sections |

**STEPS IN STAINING PROCEDURE FOR ALUM HEMATOXYLIN**

1) Dewaxing the sections (hot plate and then into xylene)

2) Hydrating the sections (through graded alcohols 100%, 90%, 80%)

3) Bring the sections to water

4) Nuclear stain (Hematoxylin – harris – 5 – 10 mins)

5) Differentiation (1% acid alcohol = 1% HCl in 99ml 70% alcohol) – 5-10s

6) Wash well in tap water until sections are 'blue'(10-15 minutes)

7) Bluing - Blue by dipping in an alkaline solution (eg.ammonia water), followed by 5 min tap water wash.

8) Stain in 1% Eosin Y for 10 min

9) Dehydration

10) Clearing

11) Mounting

**EOSIN**: Most suitable stain to combine with alum hematoxylin. It has the ability for proper differentiation to distinguish Between the cytoplasm of different types of cells & Between the different types of connective tissue fibers and matrices, by staining them different shades of red and pink. Eosins are xanthine dyes (tetrabromofluorescein)

**TYPES OF EOSIN** - commercially available

ϖ Eosin Y

ϖ Ethyl eosin

ϖ Eosin B

**SUBSTITUTE FOR EOSIN**: Phloxine, Bierbrich scarlet – gives a more intense red color to the tissues. They are rarely as amenable to subtle differentiation as eosin and are generally less valuable

**DIFFERENTIATION OF EOSIN**: Occurs in the subsequent tap water wash .Further differentiation occurs during the dehydration through the alcohols.

**DIFFICULTIES ENCOUNTERED** Under circumstances Eosin staining is intense and difficulty may be experienced in obtaining adequate differentiation (this may occur after mercuric fixation). Over differentiation of the eosin may be continues until only red blood cells and granules of eosniphil polymorph are stained red. This is occasionally used to facilitate the location and identification of eosinophils.

| RESULTS | |
|---|---|
| Nuclei, RNA rich cytoplasm | Blue/black |
| Cytoplasm | Varying shades of pink |
| Muscle fibers | Deep pink/red |
| RBCs | Orange/red |
| Fibrin | Deep pink |
| Fungal hyphae | Faintly hematoxyphilic |
| Calcium deposits | Deep blue-black |
| Keratin | Bright red |

**Annexure- II**

# VALUE ADDED COURSE

## Hematoxylin & Eosin Staining and PA 102

**List of Students Enrolled** Feb - April 2016

| 2ND Year MBBS Student | | | |
|---|---|---|---|
| **Sl. No** | **Roll NO** | **Name of the Student** | **Signature** |
| 1 | U15MB250 | AARTHI .H | |
| 2 | U15MB251 | ABARNA. M | |
| 3 | U15MB252 | ABINAYA.J | |
| 4 | U15MB253 | ADARSH .S | |
| 5 | U15MB254 | AGILAN .A | |
| 6 | U15MB255 | AKSHAYA .S | |
| 7 | U15MB256 | AKSSHAYA .M.R | |
| 8 | U15MB257 | AMARNATH. S | |
| 9 | U15MB258 | AMUDHESAR .K.M | |
| 10 | U15MB259 | ANANDH.S | |
| 11 | U15MB260 | ARCHITH VIGNESH .B | |
| 12 | U15MB261 | ARJUNBALAJI .A | |
| 13 | U15MB262 | ARUL NIVETHINI V.A | |
| 14 | U15MB263 | ARUL PRINCE. E | |
| 15 | U15MB265 | ARUN PRASAD. K | |
| 16 | U15MB266 | ARUNA .S | |
| 17 | U15MB264 | ARUNKUMAR .S | |
| 18 | U15MB267 | ASAN THASTHAGIR. M | |
| 19 | U15MB268 | ASWIN. B | |
| 20 | U15MB269 | BALAMANI KANDAN. S | |

**RESOURCE PERSON**

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
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

## HEMATOXYLIN & EOSIN STAINING

## SHORT NOTES

**Course Code: PA02**

I. **ANSWER ALL THE QUESTIONS**

1.WRITE SHORT NOTES ON DIFFERENT TYPES OF HEMATOXYLIN?

2.STAINING PROCEDURE FOR HEMATOXYLIN & EOSIN STAINING?

3.WRITE SHORT NOTES ON PRINCIPLE OF STAINING?

4.EXPLAIN THE TYPES OF EOSIN AND ITS SOURCE?

5.PRINCIPLE OF BLUING?

PAGE No.

AKSHAYA·S
U15MB255

# Hemaloxylin & Eosin Staining

27/30

1. Different types of Hemaloxylin
   - Alum
   - Iron
   - Tungsten
   - Molybdenum
   - Lead
   - Hemaloxylin with mordants

2. Staining procedure
   - Dewax
   - Hydrate with graded alcohols
   - Harris hemaloxylin - 5-10 min
   - Differentiation with 1% acid alcohol
   - Bluing for 10-15 min
   - Stain with 1% Eosin - 10 min

ABARNA.M

hematoxylin and eosin staining.

1. Write short notes on different types of hematoxylin ?

22/30

There are 6 different types of hematoxylin :

(1) Alum haematoxylins
(2) Iron haematoxylins
(3) Tungsten haematoxylins
(4) Molybdenum haematoxylins
(5) Lead haematoxylins
(6) Haematoxylin without mordants

(1) Alum haematoxylin - Mordant used are aluminium salts, either aluminum potassium sulphate or aluminium ammonium sulphate.

(2) Iron haematoxylin - Iron salts are used as mordant, these are also oxidizing agents.

Types:
- Weigerts haematoxylin
- Heidenhain's hematoxylin
- Verhoeff's hematoxylin
- Loyez hematoxylins.

(3) Tungsten haematoxylin - Mallory phosphotungstic acid hematoxylin (PTAH) and phosphotungstic acid is used as mordant.

# 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 ABARNA.J has actively participated in the Value Added Course on *HEMATOXYLIN & EOSIN STAINING* held during Feb - April 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. PAMMY SINHA

**RESOURCE PERSON**

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
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

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## CERTIFICATE OF MERIT

This is to certify that ANANDH.S has actively participated in the Value Added Course on *HEMATOXYLIN & EOSIN STAINING* held during Feb - April 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. PAMMY SINHA

**RESOURCE PERSON**

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 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: **HEMATOXYLIN & EOSIN STAINING**

Subject Code: **PA02**

Name of Student: AKSHAYA·S Roll No.: U15MB255

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:*

Signature

# Student Feedback Form

Course Name: **HEMATOXYLIN & EOSIN STAINING**

Subject Code: **PA02**

Name of Student: ASWIN·B Roll No.: U15MB268

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:*

Date: 22.04.2016

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:** Hematoxylin and Eosin Staining

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: Hematoxylin and Eosin Staining in IInd MBBS ,FEB- APRIL 2016 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.

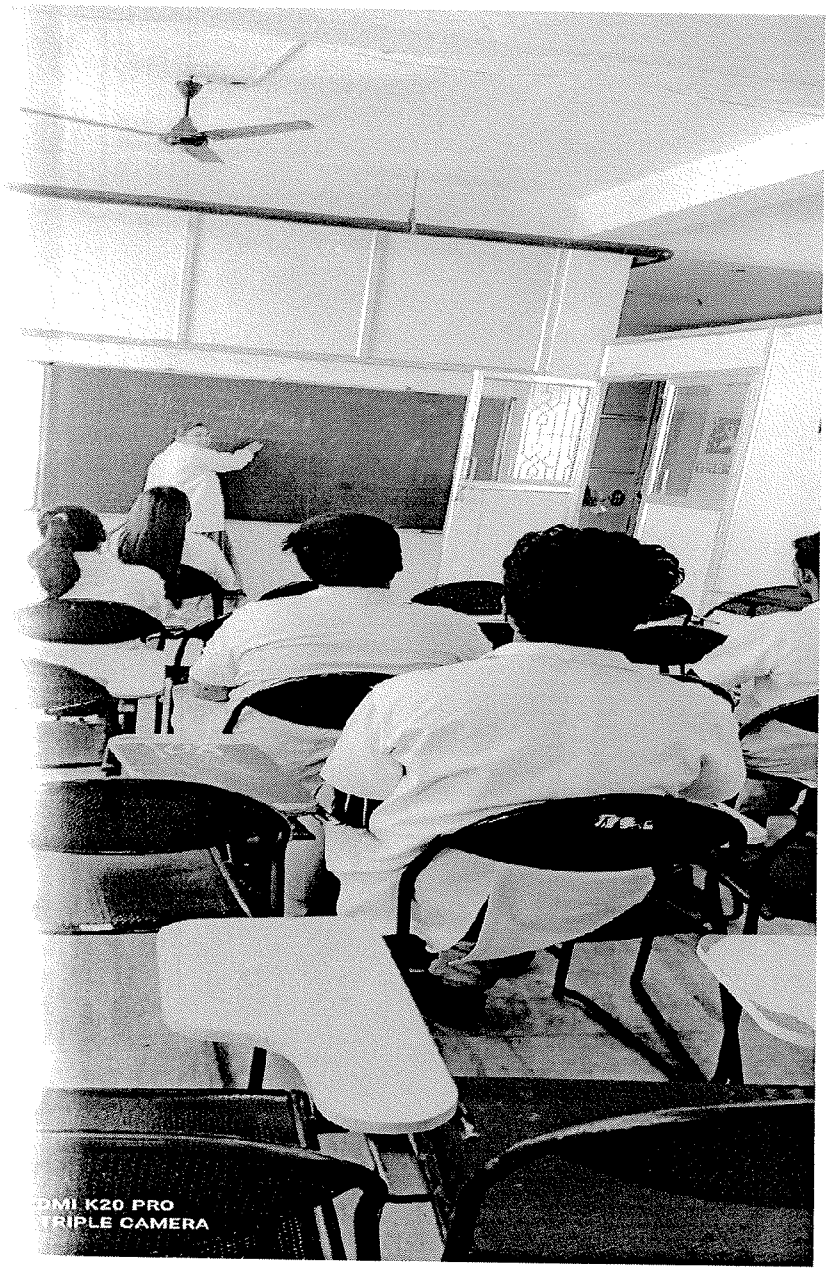
Kind Regards,

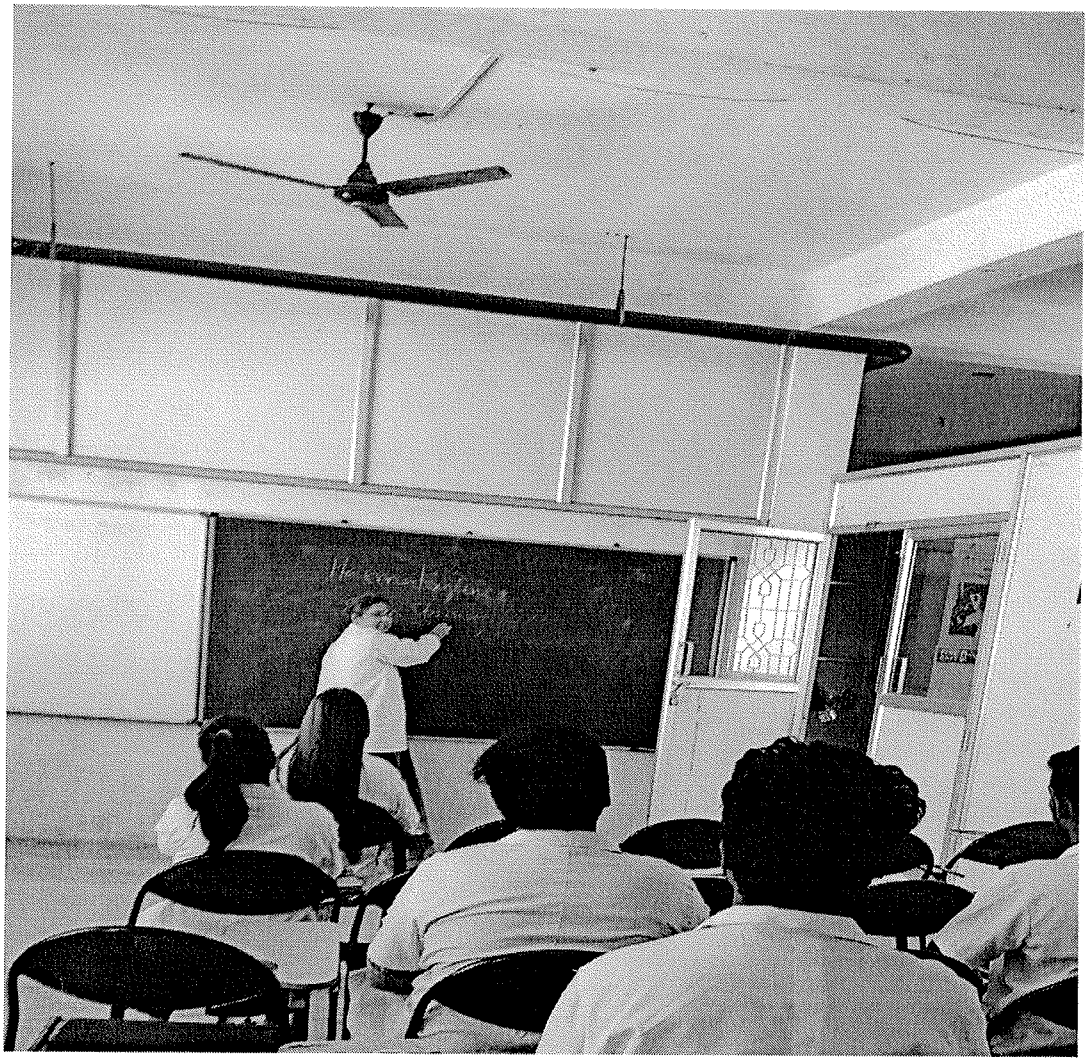
Dr. Pammy sinha

PROFESSOR & HEAD, DEPT. OF PATHOLOGY.
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY 605 502.

**Encl: Certificates**

**Photographs**


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# Sri Lakshmi Narayana Institute of Medical Sciences

**OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,**
**PUDUCHERRY – 605 502**

Date 19-02-2016

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

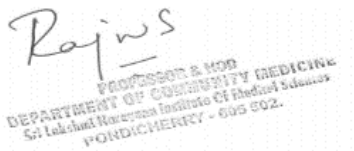
To
The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Puducherry

**Sub: Permission to conduct value-added course: Communication skill**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Communication skill for III MBBS students from March 2016 to Aug 2016 We solicit your kind permission for the same.

Kind Regards




**HEAD OF 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.Jayakumar

The HOD: Dr.Rajini

The Expert: Dr.Kannan.K

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
Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502

DEAN

# Sri Lakshmi Narayana Institute of Medical Sciences

**OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,**
**PUDUCHERRY – 605 502**

**Circular**

19-02-2016

**Sub: Organising Value-added Course: Communication skill 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 "**Communication skill course"**

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 March 2016 Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN
Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502

Dean

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Communication skills and PSM01

**2. Duration & Period**

30 hrs & March 2016 – August 2016

**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: - 2017**

**9. Summary report of each program year-wise**

| **Value Added Course-** 2016 March – August 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | PSM01 | Communication skills | Dr. Rajini.S<br>Dr.Kannan.K<br>Dr.Kameshvell.C | III[rd] MBBS | 15 (March 16 – August 16) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

Rajini S
PROFESSOR & HOD
DEPARTMENT OF COMMUNITY MEDICINE
Sri Lakshmi Narayan Institute of Medical Sciences
PONDICHERRY - 605 502.

**RESOURCE PERSON** **COORDINATOR**

**Annexure I**

**Course Proposal**

**Course Title: "Communication skill"**

**Course Objective:** To gain an understanding in various communication techniques

- the general introduction and the need of proper communication;
- common difficulties encountered by the professionals and patients in a clinical setting.
- listening techniques which encourage the patients to talk more and facilitate the interaction between the patient and the professional;
- common barriers which occur in our communication practice. This will enable the student to understand that we often express distancing behaviour unknowingly, which can strain the relationship with the patient.

**Course Outcome:** To apply the knowledge gained in various communication skills

**Course Audience:** III MBBS students

**Course Coordinator:** Dr.Rajini.S

**Course Faculties with Qualification and Designation:**

1.Dr.Rajini.S Professor
2.Kameshvell.C Associate Prof
3.Dr.Kannan.K Asst Prof

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

| SlNo | Date | Topic | Facualty Name | Time | Hours |
|---|---|---|---|---|---|
| 1 | 2-3-16 | Introduction to Communication | Dr.Rajini | 4-5p.m | 1 |
| 2 | 9-3-16 | Types of communication | Dr.Kannan.K | 4-6p.m | 2 |
| 3 | 16-3-16 | Core skills in communication | Dr.Rajini | 2-4p.m | 2 |
| 4 | 23-3-16 | Sensitive topic discussion | Dr.Kannan.K | 4-6p.m | 2 |
| 5 | 30-3-16 | Gathering information | Dr.Rajini | 4-6p.m | 2 |
| 6 | 6-4-16 | Sharing information | Dr.Kannan.K | 4-6p.m | 2 |
| 7 | 13-4-16 | Communication with people from different cultural background | Dr.Kameshvell.C | 4-5p.m | 1 |
| 8 | 20-4-16 | Breaking bad news | Dr.Rajini | 4-5p.m | 1 |
| 9 | 04-05-16 | Attending | Dr.Kameshvell.C | 2-4p.m | 2 |
| 10 | 11-05-16 | Responding | Dr.Rajini | 4-5p.m | 1 |
| 11 | 01-06-16 | Paraphrasing | Dr.Kannan.K | 4-6p.m | 2 |
| 12 | 8-06-16 | Considering technology | Dr.Kameshvell.C | 4-6p.m | 2 |
| 13 | 15-06-16 | Common barriers | Dr.Kannan.K | 4-6p.m | 2 |
| 14 | 06-07-16 | Case scenario session 1 | Dr.Rajini | 4-6p.m | 2 |
| 15 | 13-07-16 | Case scenario session 2 | Dr.Kannan.K | 4-6p.m | 2 |

| | | | | | |
|---|---|---|---|---|---|
| 16 | 03-08-16 | Assessment I | Dr.Rajini | 4-6p.m | 2 |
| 17 | 10-08-16 | Assessment II | Dr.Kameshvell.C | 4-6p.m | 2 |
| | | Total Hours | | | 30 |

**REFERENCE BOOKS: (Minimum 2)**


1. Margaret Lloyd Robert Bor Lorraine Noble. Core skills in clinical communication. In :Margaret Lloyd editor.Clinical communication skills for medicine 3rd edition Elsevier publisher;2009:9-15
2. Rajashree K. Training programs in communication skills for health care professionals and volunteers. Indian J Palliat Care. 2011;17(Suppl):S12-S13. doi:10.4103/0973-1075.76232

# STUDENTS

# HANDBOOK

# COMMUNICATION SKILLS

**Topics Covered**

Active Listening

Verbal and Non-verbal Messages

Attending

Responding

Paraphrasing

Summarizing

Ask Questions

**ACTIVE LISTENING**

Since counseling is a conversation or dialogue between the counselor and client, the counselor needs certain communication skills in order to facilitate change. The counselor needs the basic communication skills to do effective counseling.

Active listening means using a set of skills that encourage the person counselor are listening to talk, to help them feel heard and understood. It is called 'active' because counselor intentionally do things to help them feel able to talk, and because counselor engage with all your attention on what the speaker is saying, how they are acting, and how they are feeling. Active listening happens when you 'listen for meaning'. The listener says very little but conveys empathy, acceptance and genuineness. The listener only speaks to find out if a statement (or two or twenty) has been correctly heard and understood.

Some active listening skills are -

- Using minimal encouragers - small signals or words that let the speaker know you are listening and understanding - words like 'uh-huh', 'yes', 'no', 'mmm', and little actions like nodding that show you are engaged in listening.
- Using open body language - helping make the speaker feel comfortable and safe with you.
- Repeating back some of the speaker's words, or a phrase, to help prompt them to say more.
- Paraphrasing - putting what the speaker says into your own words.
- Summarizing - putting in a nutshell, in a sentence or two, what the speaker has been talking about over an extended period.
- Mirroring the speaker - adopting aspects of their body language, voice tone and language to develop rapport and help them feel more at ease.
- Reflecting - picking up on the speaker's feeling or mood and feeding your perceptions back to them.
- Using silence - so that the speaker has a respectful space to stay with their feelings and to work up to what they want to say.
- Questioning skills - when and how to use questions to help the speaker to open up and tell you more.

Four Important Rules of Active Listening

1. *Seek to understand before seeking to be understood.* We can be better understood, if first we better understand. Often, when we enter into conversation, our goal is to be better understood. With age, maturity, and experience comes silence. It is most often a wise person who says little or nothing at the beginning of a conversation or

listening experience. We need to remember to collect information before we disseminate it. We need to know it before we say it.

2. *Be non judgmental.* We need to avoid sharing our judgment until we have learned their judgment. Empathetic listening demonstrates a high degree of emotional intelligence. There is a reason kids do not usually speak with adults about drugs, sex, and rock and roll. The kids already know what the adults have to say. Once a child knows your judgment, there is little reason to ask the question unless the intention is to argue.
3. *Give your undivided attention to the speaker.* The speaker maintains eye contact to be sure the listener or listeners are paying attention. From their body language the speaker can tell if s/he is speaking too softly or loudly, too quickly or slowly, or if the vocabulary or the language is inappropriate. Listeners can also send messages to speakers using body language. Positive feedback is an endorphin releaser for the giver and the sender. Eye contact can be a form of positive feedback. We should be careful how we use it when listening. If we want to provide undivided attention to a child, a better way to show your attention is to do a 'walk and talk'.
4. *Use silence effectively.* The final rule for active or empathic listening is to effectively use silence. Some of the finest police interrogators, counselors, teachers and parents learn more by maintaining silence than by asking questions. As an active or empathic listener, silence is a very valuable tool. Don't interrupt unless absolutely necessary. If someone is speaking, and we want them to continue talking, we do not interrupt. Rather, we do provide positive feedback using body language, eye contact, and non word sounds like 'uh-huh'.

Actively listening not only conveys information, but also encourages the client to continue talking. It is an essential skill counselors can exploit to develop a positive and healthy interaction with a client. Active listening intentionally focuses on who you are listening to, whether in a group or one-on-one, in order to understand what s/he is saying. As the listener, you should then be able to repeat back in your own words what they have said to their satisfaction. This does not mean you agree with, but rather understand, what they are saying. There are numerous situations in which counselors can utilize active listening to build rapport with clients and improve overall communication. Some of these are explored below.

- Information - getting a clear picture. This means asking questions to find out about needs, instructions and context of a client. Counselors should check back to ensure they've heard and understood the relevant details, and that the client agrees on the facts.

*Aim of the speaker:* To tell them what you want.

*Aim of the listener:* To find out and confirm what they are saying.

- Affirmation - affirming, acknowledging, and exploring the problem. Listening actively to a person who would benefit from having their problem acknowledged by the counselor. The problem may or may not involve the counselor directly. Counselors may reflect back the client's feelings and perhaps the content of the problem with a single statement of acknowledgment or during a dialogue over a period of time, exploring the difficulty in more depth.
  *Aim of the speaker:* To tell someone (counselor) about the problem.

*Aim of the listener:* To help them hear what they are saying. The listener is assisting the speaker to explore the problem further, so the speaker can find greater clarity and understanding for themselves.

- Inflammation - responding to a complaint. When clients tell the counselor they are unhappy with them, criticizing them, complaining about them, or getting it off their chest, the best thing the counselor can do (although challenging) is to effectively listen.
  *Aim of the speaker:* To tell the counselor that they are the problem.

*Aim of the listener:* Let them know that they have taken in what they are saying and to defuse the strong emotion.

Active listening is hard but rewarding work. It is so tempting to interrupt, so easy to be distracted. Below is a list of what a counselor should and shouldn't do in relation to applying active listening skills to a therapeutic situation.
A counselor should -

- Before the session, make sure your physical needs are taken care of (thirst, hunger, bathroom, stretching).
- Give the person speaking their full attention.
- Encourage the speaker to continue with short, gentle comments like 'uh-huh', 'really?', 'tell me more', etc.
- Repeat the conversation back to them, in their own words, providing their interpretation or understanding of the client's meaning (paraphrasing).
- By reflecting the content of what is being said back to the speaker, check their understanding of the message.
- Be as accurate in summarizing the client's meaning as much as they can.
- Try again if their paraphrasing is not accurate or well received.
- Feed back to the client their feelings as well as the content (e.g. how did you feel when…? How did that affect you? It looks like that made you really angry).
- Challenge in a non-threatening and subtle manner.

- Not try to force conversation, allow silences - and be aware of body language, notice changes and respond accordingly.

Counselors should refrain from -

- Talking about themselves and introducing their own reactions or well intended comments.
- Changing topics and thinking about what they will say next.
- Advising, diagnosing, reassuring, encouraging, criticizing or baiting a client.
- Using 'mm' or 'ah ah' exclusively or inappropriately or parrot their words.
- Pretending to have understood the person or their meaning if they haven't.
- Allowing the client to drift to a less significant topic, because they feel the counselor doesn't understand.
- Fixing, changing or improving what they have said - or finishing their sentences for them.
- Filling every space with talk.
- Ignoring their feelings in the situation.

Active listening involves the following four skills -

- Listening to and understanding the client's verbal messages. When a client tells you his/her story, it usually comprises a mixture of experiences (what happened to him/her), behaviors (what the client did or failed to do), and affect (the feelings or emotions associated with the experiences and behavior). The counselor has to listen to the mix of experiences, behavior and feelings the client uses to describe his/her problem situation. Also 'hear' what the client is not saying.
- Listening to and interpreting the client's nonverbal messages. Counselors should learn how to listen to and read nonverbal messages such as bodily behavior (posture, body movement and gestures), facial expressions (smiles, frowns, raised eyebrows, twisted lips), voice-related behavior (tone, pitch, voice level, intensity, inflection, spacing of words, emphases, pauses, silences and fluency), observable physiological responses (quickened breathing, a temporary rash, blushing, paleness, pupil dilation), general appearance (grooming and dress), and physical appearance (fitness, height, weight, complexion). Counselors need to learn how to 'read' these messages without distorting or over-interpreting them.
- Listening to and understanding the client in context. The counselor should listen to the whole person in the context of his/her social settings.
- Listening with empathy. Empathic listening involves attending, observing and listening (being with) in such a way that the counselor develops an understanding of the client and his/her world. The counselor should put his/her own concerns aside to be fully 'with' their clients.

Counselors should be aware of the following hindrances to effective listening (Egan, 1998) -

Inadequate listening: Counselors are often distracted because they have problems of their own, feel ill, or because they become distracted by social and cultural differences between themselves and their clients. All these factors make it difficult to listen to and understand their clients.

Evaluative listening: Most people listen evaluatively to others. This means that they are judging and labeling what the other person is saying as either right/wrong, good/bad, acceptable/unacceptable, relevant/irrelevant etc. They then tend to respond evaluatively as well.

Filtered listening: We tend to listen to ourselves, other people and the world around us through biased (often prejudiced) filters. Filtered listening distorts our understanding of our clients.

Labels as filters: Diagnostic labels can prevent you from really listening to your client.

Fact-centered rather than person-centered listening: Asking only informational or factual questions won't solve the client's problems. Listen to the client's whole context and focus on themes and core messages.

Rehearsing: If you mentally rehearse your answers, you are also not listening attentively. Counselors who listen carefully to the themes and core messages in a client's story always know how to respond. The response may not be a fluent, eloquent or practiced one, but it will at least be sincere and appropriate. Sympathetic listening: Although sympathy has its place in human transactions, the use of sympathy is

Here are 10 tips to help counselor to develop effective listening skills - Step 1: Face the speaker and maintain eye contact.

Step 2: Be attentive, but relaxed.

Attend another person means to -

- be present;
- give attention;
- apply or direct yourself;
- pay attention;
- remain ready to serve;
- don't be distracted by your own thoughts, feelings, or biases. Step 3: Keep an open mind.

Step 4: Listen to the words and try to picture what the speaker is saying. Step 5: Don't interrupt and don't impose your 'solutions'.

Interrupting sends a variety of messages. It says -

- I'm more important than you are.
- What I have to say is more interesting, accurate or relevant.
- I don't really care what you think.
- I don't have time for your opinion.
- This isn't a conversation, it's a contest, and I'm going to win.

Step 6: Wait for the speaker to pause to ask clarifying questions.

When you don't understand something, of course you should ask the speaker to explain it to you. But rather than interrupt, wait until the speaker pauses. Then say something like, "Back up a second. I didn't understand what you just said about…"

Step 7: Ask questions only to ensure understanding. Step 8: Try to feel what the speaker is feeling.

Step 9: Give the speaker regular feedback.

Step 10: Pay attention to what isn't said - to nonverbal cues.

## VERBAL AND NON-VERBAL MESSAGES

Verbal communication is the most common way people relay messages. Verbal refers to the spoken word. When speaking to people, your message should always be conveyed respectfully. Using language the receiver can interpret easily means it is more likely your message will be clearly understood. The language used should be both age appropriate and culturally appropriate.

Jargon should only be used amongst colleagues who are also involved with the care of children. It should be avoided when discussing a child's day with their parents. People with a hearing impairment consider sign language to be another form of verbal communication.

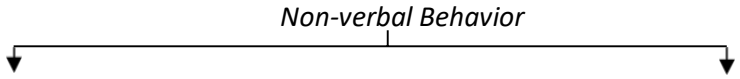
Non-verbal communication includes body language, gestures, facial expressions, and even posture or any other communication that is not spoken. The only exception is sign language, which is considered to be a form of verbal communication. Non-verbal communication sets the tone of a conversation, and can seriously undermine the message contained in your words if you are not careful to control it.

The major differences between verbal and nonverbal communication are as under -

- The use of words in communication is verbal communication. The communication which is based on signs, not on words is non-verbal communication.
- There are very fewer chances of confusion in verbal communication between the sender and receiver. Conversely, the chances of misunderstanding and confusion in non-verbal communication are very much as the use of language is not done.
- In verbal communication, the interchange of the message is very fast which leads to rapid feedback. In opposition to this, the non-verbal communication is based more on understanding which takes time and hence it is comparatively slow.
- In verbal communication, the presence of both the parties at the place of communication is not necessary, as it can also be done if the parties are at different locations. On the other hand, for an effective non-verbal communication, both the parties must be there, at the time of communication.
- In verbal communication, the documentary evidence is maintained if the communication is formal or written. But, there is no conclusive evidence in case of non-verbal communication.

- Verbal communication fulfills the most natural desire of humans - talk. In case of Non-verbal communication, feelings, status, emotions, personality, etc. are very easily communicated, through the acts done by the parties to the communication.
- Verbal and Non-verbal communication are not contradictory to each other, but they are complementary as somebody has rightly said, "Actions are louder than words". Both goes side by side and helps a human being, to interact and respond to other human beings.

Verbal communication is obviously an important part of life as we use words to communicate. But have you ever thought that a small baby cannot use language or words to speak, but s/he chooses signs to show his/her anger, happiness, and sorrow. Similarly, deaf and dumb persons also use sign language for communicating with other people. So, this is the significance of non-verbal communication in many lives. *It's not what you say but how you say it.* The majority of communication is non- verbal. Counselors need to be aware of what they may be communicating to their clients through their non-verbal behavior. They also need to give attention to what is being communicated through the non-verbal behavior of their clients.




Body language

- Gestures
- Facial expressions
- Posture
- Body orientation
- Body proximity/distance
- Eye contact
- Mirroring
- Remove barriers (e.g. desks)

Paralinguistic

- Sighs
- Grunts
- Groans
- Voice pitch change
- Voice volume
- Voice fluency
- Nervous giggles

Quick Reference for Counseling Micro-skills

| Verbal | Non-verbal |
|---|---|
| Uses language that the client understands | Uses a tone of voice similar to the client's |
| Repeats the client's story in other words | Looks client in the eye (as appropriate) |
| Clarifies client's statements | Nods occasionally |
| Explains clearly and adequately | Uses facial expressions |
| Summarizes | Uses occasional gestures |
| Responds to primary message | Keeps suitable conversational distance |
| Encourages - I see, Yes, Mm-hmm | Speaks at an appropriate pace |
| Addresses client in a manner appropriate to the client's age | Physically relaxed |
| Gives needed information | Open posture |

| Examples of Non-Supportive Behavior in a Selected Culture | |
|---|---|
| Advising | Looking away frequently |
| Preaching and moralizing | Keeping an inappropriate distance |
| Blaming, judging and labeling | Sneering |
| Cajoling (persuading by flattery or deceit) | Frowning, scowling and yawning |
| "Why" questions, interrogating | Using an unpleasant tone of speech |
| Directing, demanding | Speaking too quickly |
| Excessive reassuring | Speaking too slowly |
| Straying from the topic | Having a blank facial expression |
| Encouraging dependence | Staring |
| Patronizing (condescending) attitude | Moving around too much, fidgeting |
| Criticizing or censuring | Environmental barriers or distractions |

**ATTENDING**

Attending refers to the ways in which counselors can be 'with' their clients, both physically and psychologically. Attending also means a counselor must pay attention to everything a client says and does. This includes reading the client's body language and also taking into consideration all the silences and pauses in the conversation. Effective attending tells clients that you are with them and that they can share their world with you. Effective attending puts counselors in a position to listen carefully to what their clients are saying or not saying. Attending behavior is a counseling micro- skill used to encourage clients to talk and show that the counselor is interested in what's being said. It is used throughout the entire counseling interview.

The acronym SOLER can be used to help you to show your inner attitudes and values of respect and genuineness towards a client -

- **S**: **S**quarely face your client. Adopt a bodily posture that indicates involvement with your client. (A more angled position may be preferable for some clients - as long as you pay attention to the client.) A desk between you and your client may, for instance, create a psychological barrier between you.
- **O**: **O**pen posture. Ask yourself to what degree your posture communicates openness and availability to the client. Crossed legs and crossed arms may be interpreted as diminished involvement with the client or even unavailability or remoteness, while an open posture can be a sign that you are open to the client and to what s/he has to say.
- **L**: **L**ean toward the client (when appropriate) to show your involvement and interest. To lean back from your client may convey the opposite message.
- **E**: **E**ye contact with a client conveys the message that you are interested in what the client has to say. If you catch yourself looking away frequently, ask yourself why you are reluctant to get involved with this person or why you feel so uncomfortable in his/her presence. Be aware of the fact that direct eye contact is not regarded as acceptable in all cultures.
- **R**: Try to be **R**elaxed or natural with the client. Don't fidget nervously or engage in distracting facial expressions. The client may begin to wonder what it is in himself/herself that makes you so nervous. Being relaxed means that you are comfortable with using your body as a vehicle of personal contact

Attending involves giving all of your physical attention to another person. The process of attending has a considerable impact on the quality of communication that goes on between two people. By attending we are saying to another person "I am interested in what you have to say".

**How to Attend**

- To begin and maintain attendance a counselor must first welcome the client warmly. Making him/her feel comfortable in the counseling environment; will make the client feel more relaxed about disclosing personal information about their emotions, feelings and thoughts. By maintaining eye contact with the client, a counselor shows they value what the client has to say.
- Looking at the client, as they speak, also shows the counselor is respectful.
- A counselor should also be aware of the tone of their voice, during time in the client's presence. Slowing down speech will make the client feel more relaxed and less rushed. It will convey that the counselor has adequate time to listen to the client's problems and concerns. The counselor's facial expressions must also convey interest and comprehension.
- Tracking or following the flow of what the client is saying, is a key skill that the counselor must also be confident demonstrating. Without the ability to do this a counselor will not be able to provide the level of supportive service that a counseling client requires.

Selective Attending: By selective attending a counselor is choosing to pay particular close attention to an element of what is being said by the client. The counselor may decide to focus on the way the client is speaking - whether they are displaying distress, discomfort, anger etc. or on a particular phrase or sentence. A counselor may be listening out for clues to why the client exhibits a particular behavior pattern or holds limiting beliefs, or any number of other things. It is the counselor's job to gather as much information about a client as possible, and to interpret the disclosure so that they can support and encourage the individual through the counseling process.

Focus Control: Controlling your focus can sometimes be difficult. We are all open to outside distractions and can momentarily lose our concentration and focus. Attending requires that a counselor's physical and psychological attention is directed at the client for the whole duration of the one-to-one counseling session.

Attending Behavior: Good attending behavior demonstrates that you respect a person and are interested in what s/he has to say. The effect of attending is an encouragement to the person to go on talking about his/her ideas or feelings freely. Without using words, you are communicating that you are listening to the person. There are several

components of good attending behavior -

- Eye Contact - Looking at a person is one way of showing interest in that person. However, you can make a person feel uncomfortable if you stare at them too intensely. The best way of showing that you are listening to someone is by looking at them naturally.
- Posture - This is a natural response of interest. It's best to lean slightly towards the person in a relaxed manner. Relaxation is important, since you want to shift focus from yourself so that you are better able to listen to the person you are talking with.
- Gesture - You communicate a great deal with your body movements. If you flail wildly with your hands or if you cross your arms over your chest and hunch your shoulders with your head bent downwards, you are very likely to communicate some unintended messages.
- Facial Expressions - A good listener's facial expressions indicate responsiveness. For examples, smiling; eye-brow raising; frowning etc. when appropriate.
- Verbal Behavior - A good listener's comments relate to what the other person is saying. By directing your comments and questions to the topics provided by your friend, you show interest in what he or she is saying.

**RESPONDING**

Responding, in a counseling environment, requires that the counselor's attention is focused on the client's feelings and verbal expression at all times. There are many occasions when we respond - perhaps by offering a nod of the head - without really listening to what is being said. In a counseling situation a counselor must pay close attention and check that a client is not agreeing with a suggestion, without actually fully comprehending what has been voiced.

Responding in a positive manner requires focus, concentration and an interest in the other person, and what is being expressed. A counselor must provide this supportive service throughout a client's counseling experience. Without the use of clear responding and reflecting skills, the level of counseling offered to a client will not be sufficient to motivate and encourage the client to continue with open disclosure. Being encouraging, motivating, reassuring, coaxing, being challenging and praising all provide the client with a positive response to their comments. Asking questions, making statements and suggestions, offering solutions and informing also provide effective methods of good response. Offering a nod of the head, an um-hmm or by encouraging the client to continue speaking by saying "And then?" provide a further positive response, which will keep the comments flowing.

As with any form of communication there is a right time and a wrong time to use reflective counseling skills. Reflecting is another way of responding, which expresses the counselor's attitude to the client. It must therefore be a positive response to the client, and must also demonstrate the core conditions of acceptance, value and respect.

Right Time

- Client expresses a problem, issue or concern.
- Client is unclear about something that has been said.
- Client is upset.
- Client's behavior surprises the counselor in some

way. Wrong Time

- When the client, or counselor, is tired, stressed or anxious.

**How to Respond Effectively/ Responding Skills**

Responding firstly involves the skills of attending, observing, and listening. From this base of 'being in touch' with the client the counselor employs reflecting skills and probing. The four levels of reflecting skills are - reflecting content (paraphrasing); reflecting feelings; reflecting meanings; and summative statements.

Reflecting Content: Content refers to the facts and ideas of the client. Reflecting content is a concise response to the speaker that restates the essence of communication in the counselors own words. The first task for the counselor is to sift through all of the details and to arrive at the central message that the client is trying to convey. The counselor then needs to express this to the client concisely. This expression needs to be in the counselor's own words. This is one of the differences between parroting (repeating the speaker's words) and effective responding. Responding requires us to see things from the client's point of view. We need to understand what the client is saying from their perspective and then to express this in our own words. For example, Client: At the moment, I am trying to organize school for the children, get shoes for the young one, get medical treatment for my mother, and register for a training scheme for myself. Counselor: You've clearly got a lot on your plate at the moment. I guess more than you can comfortably handle? The first part of the counselor's response is a straightforward example of reflecting content. The second part extends that reflection to take into account some of the feelings that might have been expressed.

Reflections are often delivered in a tentative tone which implies the question - "Is that right?" This tone invites either agreement, or else a negotiation of meaning if we are

not quite accurate. The important thing to remember is that the counselor is not trying to tell the client what they are thinking or feeling, but rather, the counselor is attempting to share and confirm their understanding with the client.

Reflecting Feelings: It is mirroring back of the counselors' emotions as they make their statements. It gives the counselor an opportunity to evaluate how s/he is responding to the problem situation. A response to the example above might be – "You're feeling overwhelmed?" This invites confirmation. For example, "Yes, I am overwhelmed and I just don't know if I am going to be able to cope". Alternatively, the response invites a correction if it is not accurate. For example, "No, I am not overwhelmed, I am just exhausted. I'll be okay if I can get a good night's sleep". The challenge in reflecting feelings is to be able to use the right words to describe the counselor's feelings. Whilst we all experience a myriad of feelings, and each to a wide range of degrees, and whilst we are able to recognize many of these emotions in others, it is often difficult for us to find the right words. There are at least two ways of framing an accurate feeling response. Both involve asking a feeling question. In the first way, we ask - "If I was the client, how would this make me feel?" In the second way, we seek to ask how a person in this unique set of circumstances might feel - "How does it feel to be this person (race/age/sex/role) in these (circumstances) with this (history) and these (expectations) under these (pressures or constraints) from (within or without)?" Either way, the purpose of the question is to identify a feeling word. It should be as accurate as possible and with the right degree of intensity. It should also be a word that the client would be likely to use or understand.

Above all, our attempts to identify how others are feeling should be from a basis of genuineness and respect. If we make a genuine attempt to understand how our clients are feeling, they will most likely tolerate any inaccuracies in our understanding, and will probably assist us (and themselves) by volunteering more precise statements of feeling.

Reflecting Meanings: If counselors get the feelings or the content wrong then they can't understand the clients. It allows counselors to be sure that they are getting what the client is saying. Once we have learned how to reflect content and feelings separately, it is reasonably easy to combine them into reflections of meaning or empathy statements. Some people are helped in constructing reflections of meaning (or empathy statements) by the formula, "You feel ... because …". For example, you feel overwhelmed because you have so many different things that you have to do.

Client: I just want to cry. My 19-year-old daughter just doesn't want to stay home any more. She doesn't want to visit friends with us, nor stay and eat dinner when friends come over. What has happened to her? What can we do about it?

Counselor: Your daughter's withdrawing from the family [reflection of content]. Client: That's right. She is like that with all of the family. It's heart-breaking.
Counselor: You're really hurt and disappointed [reflection of feelings]. Client: Yes, I am.
Counselor: You feel hurt and disappointed because your daughter is drifting away from the family [reflection of meaning].

Reflecting meanings is assisted by building a base of negotiated understanding through frequent use of content and feeling responses. Again meaning statements should be concise, with minimal interruption to the client's train of thought.

Summative Reflections: A summative reflection (or summary) is a brief statement that attempts to draw together the thoughts and feelings that have been expressed through a session or part of a session. It recaps the major themes of the conversation. It helps the counselor to sort through the litter and to construct a more complete and compact conceptualization of the issue being discussed. The counselor attempts to identify the main themes, common thread, or essential issue to emerge during that period of time. Summative reflections are appropriate at the end of a session, but are also useful during a session to help a client refocus on central issues, or to help the listener check their understanding of the issues. Summative reflections provide opportunities to confirm shared understandings, to conclude discussions about a particular issue, or to make a transition to an action stage of the helping process.

Probing: Probing means asking for additional information. Effective probing is non judgmental and flows from what was previously said. Good probing questions ask for elaboration, classification and repetition. It helps client to fill in missing pieces.

## PARAPHRASING

Paraphrasing means rewording (not the same words) speakers' verbal utterances. Paraphrasing occurs when the counselor states what the client has just said, using fewer words but without changing the meaning of what the client said. It is one of the competent skills of how you show understanding in active listening. Paraphrasing must be decided upon some goals (reinforce, clarify, highlight, double-check, etc.). The function of paraphrasing is that it acts a promoter for discussion. Examples - Client: I feel terrible. Counselor: You feel terrible. Client: I heard a noise.
Counselor: A noise?

A good paraphrase can provide mirror reflections that are clearer and more to the point than original statements. If so, clients may show appreciation with comments such as "That's right". Tip for paraphrasing is to start your responses with the

personal pronoun 'you' to indicate that you reflect clients' internal viewpoints. Another tip is to slow your speech rate down to give you more time to think. You need a good memory and a good command of vocabulary to paraphrase well. Confidence and fluency in the skill require much practice. The counselor rephrases the content of the client's message. Example - Client: I know it doesn't help my depression to sit around or stay in bed all day. Counselor: It sounds like you know you should avoid staying in bed or sitting around all day to help your depression.

*Purposes of Paraphrasing*

- To convey that you are understanding him/her.
- Help the client by simplifying, focusing and crystallizing what they said.
- May encourage the client to elaborate.
- Provide a check on the accuracy of your perceptions.

*When to Use It*

- When you have an hypothesis about what's going on with the client.
- When the client is in a decision making conflict.
- When the client has presented a lot of material and you feel confused.

*Steps in Paraphrasing*

There are four steps in effective paraphrasing -

1. Listen and recall.
2. Identify the content part of the message by deciding what event, situation, idea, or person the client is talking about.
3. Rephrase, in as concise a manner as possible, the key words and ideas the client has used to communicate their concerns in a fresh or different perspective.
4. Perception check is usually in the form of a brief question, e.g., "It sounds like..."; "Let me see if I understand this", which allows the client to agree or disagree with the accuracy of your paraphrasing.

Example - Client, a 40-year-old woman, "How can I tell my husband I want a divorce? He'll think I'm crazy. I guess I'm just afraid to tell him".

*Steps -*

a) Recall the message and restate it to yourself covertly. Wants divorce, but hasn't told husband because he will think she's crazy.
b) Identify the content part of the message. Select an appropriate beginning - e.g., It sounds like; You think; I hear you saying.
c) Translate the key content into your own words - Want a divorce, break off, split; e.g., It sounds like you haven't found a way to tell your husband you want to end the relationship because of his possible reaction. Is that right?
d) Confirm the accuracy of the paraphrase.

**SUMMARIZING**

Summarizing means that the counselor concisely reiterates several of the major highlights from the client's discussion. By tying together the different elements from a client's session, summarizing can help a counselor review overall progress. Summarizing can also allow the counselor and the client to recognize a theme in what the client is saying.

*Purposes of a Summary*

- To clarify emotions for both the helper/counselor and the client.
- To tie together multiple elements of client messages.
- To review the work done so far, and to take stock.
- To bring a session to a close, by drawing together the main threads of the discussion.
- To interrupt excessive rambling.
- To start a session.
- To end a session.
- To pace a session.
- To review progress.
- To serve as a transition when changing topics.
- To move the counseling process forward.

*Steps in a Summary*

Example - Client, an young girl.

- At the beginning of the session -

I don't understand why my parents can't live together anymore. I'm not blaming anybody, but it just feels very confusing to me [Said in a low, soft voice with lowered, moist eyes].

- Near the middle of the same session -

I wish they could keep it together. I guess I feel like they can't because they fight about me so much. Maybe I'm the reason they don't want to live together anymore.

(a) Recall key content and affect messages -

- Key content: wants parents to stay together.
- Key affect: feels sad, upset, responsible.

(b) Identify patterns or themes -

She is the one who is responsible for her parents' break-up.

(c) Use an appropriate sentence stem and verbalize the summarization response - "I sense" or "You are feeling".

(d) Summarize -

Earlier today you indicated you didn't feel like blaming anyone for what's happening to your parents. Now I'm sensing that you are feeling like you are responsible for their break-up.

(e) Assess the effectiveness of your summarization.

Paraphrasing and summarizing are both related terms. They are often confusing. Paraphrasing and summarizing are essential techniques for an effective communication. Both paraphrasing and summarizing are allowed and accepted till due credit is given to the original source, and only till the work is not copied and is free from any kind of plagiarism.

Paraphrasing -

- does not match the source word for word;
- involves putting a passage from a source into your own words;
- changes the words or phrasing of a passage, but retains and fully communicates the original meaning; and
- must be attributed to the original source.

Summarizing -

- does not match the source word for word;
- involves putting the main idea(s) into your own words, but including only the main point(s);
- presents a broad overview, so is usually much shorter than the original text; and
- must be attributed to the original source.

Table 5.1

*Summary versus Paraphrase*

| Summary | Paraphrase |
|---|---|
| A brief restatement, in your own words, of the content of a passage, focusing on the central idea(s). | A precise restatement, in your own words, of the written or spoken words of someone else. |
| A summary is in your own words, but some key words may not be able to be changed. | A paraphrase is in your own words, but you must change both the words and the sentence structures of the original passage. |
| A summary does not distort the meaning of the original passage. | A paraphrase does not distort the meaning of the original passage. |

| | |
|---|---|
| A summary can be selective. | A paraphrase is specific and should not be selective. |
| A summary is much shorter than the original passage. | A paraphrase is roughly the same length, and even sometimes a bit longer, than the original passage. |

**ASK QUESTIONS**

Questioning is an important part of counseling. It helps us understand the client's situation and it helps us assess clinical conditions. Questions during the counseling session can help to open up new areas for discussion. They can assist to pinpoint an issue and they can assist to clarify information that at first may seem ambiguous to the counselor. Questions that invite clients to think or recall information can aid in a client's journey of self-exploration. Counselors should be knowledgeable about the different types of questioning techniques, including the appropriate use of them and likely results. It is also important to be aware and cautious of over-questioning. In determining effective questioning techniques it is important to consider the nature of the client, their ongoing relationship with the counselor and the issue/s at hand.

There are essentially three styles of questions -

**Open Questions:** An open question is likely to receive a long answer. Although any question can receive a long answer, open questions deliberately seek longer answers, and are the opposite of closed questions. Open questions encourage the client to speak and offer an opportunity for the counselor to gather information about the client and their concerns. Typically open questions begin with - what, when, where, why, how or could. For example - Why do you think that? How did you come to consider this? Could you tell me what brings you here today?

'What' questions more often lead to the emergence of facts. 'When' questions bring about information regarding timing of the problem, and this can include events and information preceding or following the event. 'Where' questions reveal the environment, situation or place that the event took place, and 'Why' questions usually give the counselor information regarding the reasons of the event or information leading up to the event. 'How' questions tend to invite the client to talk about their feelings.

Most often -

- What? leads to facts and information.
- When? brings out the timing of the problem.
- Where? enables discussion about the environment and situations.

- Why? brings out reasons.
- How? enables talk about feelings and/or process.

It should be noted that care must be taken by the counselor when asking 'why' questions. Why questions can provoke feelings of defensiveness in clients and may encourage clients to feel as though they need to justify themselves in some way.

Hence, open questions have the following characteristics -

- They ask the respondent to think and reflect.
- They will give you opinions and feelings.
- They hand control of the conversation to the respondent. This makes open questions useful in the following situations -

| Usage | Example |
|---|---|
| To develop a conversation and open up someone who is rather quiet. | What did you do on you holidays?<br>How do you keep focused on your work? |
| To find out more about a client, his/her wants, needs, problems, and so on. | What's keeping you awake these days?<br>Why is that so important to you? |
| To get the clients to realize the extent of their problems (to which, of course, you have the solution). | I wonder what would happen if you go out late?<br>What happened to Robi? |
| To get them to feel good by asking after their health or otherwise demonstrating human concern about them. | How have you been after your operation?<br>You're looking down. What's up? |

**Closed Questions**: Closed questions are questions that can be answered with a minimal response (often as little as 'yes' or 'no'). They can help the counselor to focus the client or gain very specific information. Such questions begin with - is, are or do. For example - Is that your coat? Are you living alone? Do you enjoy your job? Closed questions have the following characteristics -

- They give you facts.
- They are easy to answer.
- They are quick to answer.
- They keep control of the conversation with the questioner.

This makes closed questions useful in the following situations -

| Usage | Example |
|---|---|
| As opening questions in a conversation, as it makes easy for the client to answer, and | It's great weather, isn't it?<br>Where do you live? |

| | |
|---|---|
| doesn't force to reveal too much about him/herself. | What time is it? |
| For testing him/her understanding (asking yes/no questions). This is also a great way to break into a long ramble. | So, you want to move into our apartment, with your own bedroom and bathroom - true? |
| For setting up a desired positive or negative frame of mind in him/her (asking successive questions with obvious answers either yes or no). | Are you happy with your current life?<br>Does your family give you all that you need?<br>Would you like to find a better life? |
| For achieving closure of a persuasion (seeking yes to the big question). | If I can deliver this tomorrow, will you sign for it now? |

**Leading Questions**: Leading questions are questions where the counselor guides the client to give the answer they desire. These questions are usually judgmental. For example - You came to consider this, didn't you? You are enjoying your job, aren't you?

While questioning techniques can be used positively to draw out and clarify issues relevant to the counseling session, there is also the very real danger of over-using questions or using questioning techniques that can have a negative impact on the session. The wrong types of questioning techniques, at the wrong time, in the hands of an unskilled interviewer or counselor, can cause unnecessary discomfort and confusion to the client.

## PROBING

Probing involves statements and questions from the counselor that enable clients to explore more fully any relevant issue of their lives. Probes can take the form of statements, questions, requests, single word or phrases and non-verbal prompts. In broad terms, probing questions often begin with "What" or "How" because they invite more detail. Questions that begin with "Do you…" or "Are you…" invite personal reflection. "Why" questions can be problematic. They may put the respondent on the defensive or result in little useful information and require additional probing.

Probes serve the following purposes -

- to encourage non-assertive or reluctant clients to tell their stories;
- to help clients to remain focused on relevant and important issues;
- to help clients to identify experiences, behaviors and feelings that give a fuller picture to their story, in other words, to fill in missing pieces of the picture;
- to help clients to move forward in the helping process; and

- to help clients understand themselves and their problem situations more fully.

In summary, good probing questions -

- are general and widely useful;
- don't place blame on anyone;
- allow for multiple responses;
- help create a paradigm shift;
- empower the person with the dilemma to solve his/her own problem (rather than deferring to someone with greater or different expertise);
- avoid yes/no responses;
- are usually brief;
- elicit a slow response;
- move thinking from reaction to reflection;
- encourage taking another party's perspective.

Keep the following in mind when you use probes -

- Use questions with caution.
- Don't ask too many questions. They make clients feel 'grilled', and they often serve as fillers when counselors don't know what else to do.
- Don't ask a question if you don't really want to know the answer.
- If you ask two questions in a row, it is probably one question too much.
- Although close-ended questions have their place, avoid asking too many close- ended questions that begin with 'does', 'did', or 'is'.
- Ask open-ended questions - that is, questions that require more than a simple yes or no answer. Start sentences with - 'how', 'tell me about', or 'what'. Open-ended questions are non-threatening and they encourage description.

# ANNEXURE II

**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

**TOPIC :COMMUNICATION SKILL**

| SL | UNIVERSITY REG. NO. | NAME OF THE STUDENT | SIGNATURE |
|---|---|---|---|
| 1 | U11MB233 | DEEPTHI .M.S. | |
| 2 | U11MB234 | DERISHA QUEENSLIN .C | |
| 3 | U11MB236 | DEVIKA .D | |
| 4 | U11MB237 | DHANASHREE. S | |
| 5 | U11MB238 | DHILEEPANRAJ .N | |
| 6 | U11MB239 | DIVYA .S | |
| 7 | U11MB240 | EZHIL SINDHANAI M. PARVATH | |
| 8 | U11MB235 | G. DEVARAJ | |
| 9 | U11MB241 | GANGA .R | |
| 10 | U11MB242 | GIRIDHARAN A.B. | |
| 11 | U11MB243 | GNANAKUMAR S.P. | |
| 12 | U11MB244 | GOMATHI .G | |
| 13 | U11MB245 | HARIHARAN .B | |
| 14 | U11MB246 | MERLI.S | |
| 15 | U11MB247 | MERLIN SHEEBA.B | |

**Annexure - III**

**COMMUNICATION SKILLS**

**MULTIPLE CHOICE QUESTIONS**

**Course Code: PSM01**

## I. ANSWER ALL THE QUESTIONS

1. Communication is a non stop_____.

(A) paper (B) process (C) programme (D) plan

2. Communication is a part of _____ skills.

(A) soft (B) hard (C) rough (D) short

3. The _____ is the person who transmits the message.

(A) receiver (B) driver (C) sender (D) cleaner

4. _____ is the person who notices and decodes and attaches some meaning to a message.

(A) receiver (B) driver (C) sender (D) cleaner

5. Message is any signal that triggers the response of a _____

(A) receiver (B) driver (C) sender (D) cleaner

6. The response to a sender's message is called _____

(A) food bank (B) feedback (C) food (D) back

7. _____ context refers to the relationship between the sender and the receiver

(A) social (B) physical (C) cultural (D) chronological

8. _____ context refers to the similarity of backgrounds between the sender and the receiver.

(A) physical (B) social (C) chronological (D) cultural

9. _____ refers to all these factors that disrupt the communication.

(A) nonsense (B) noise (C) nowhere (D) nobody

10. Environmental barriers are the same as _____ noise.

A) physiological (B) psychological (C) physical (D) sociological

11. Our dress code is an example of _____ communication.

(A) verbal (B) nonverbal (C) written (D) spoken

12. Communication strengthens _____ & _____ relationship is an organization.

(A) employer-father (B) employer-employer (C) mother-employer (D) mother-child

13. _____ communication includes tone of voice body language, facial expressions etc.

(A) non verbal (B) verbal (C) letter (D) notice

14. When there is similarity of background between the sender and the receives such as age, language nationality, religion, gender then this is called _____ context.

(A) social (B) cultural (C) physical (D) dynamic

15. Letter, e-mail telephone are examples of _____

(A) message (B) feedback (C) channel (D) encoding

16. Understanding _____different parts of speech forms the base of leaning grammar

(A) Five (B) Eight (C) Six (D) Seven

17. It is of paramount importance that one need to construct a _____sentence in the day to day affairs

(A) Wrong (B) Correct (C) Incorrect (D) Night

18. A_____way be defined as the name of a person place or thing

(A) Verb (B) Noun (C) Pronoun (D) Adverb

19. According to hoben “communication is the _____ nituchange of thought or idea.

(A) Visual (B) Audio (C) Verbal (D) Written

20. The person who transmits the message is called the ____ or

(A) Sender (B) Gives (C) Taker (D) Receiver

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

## COMMUNICATION SKILLS

## MULTIPLE CHOICE QUESTIONS

**Course Code: PSM01**

**I. ANSWER ALL THE QUESTIONS**

1. Communication is a non stop_____.

(A) paper (B) process (C) programme (D) plan

2. Communication is a part of _____ skills.

(A) soft (B) hard (C) rough (D) short

3. The _____ is the person who transmits the message.

(A) receiver (B) driver (C) sender (D) cleaner

4. _____ is the person who notices and decodes and attaches some meaning to a message.

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# 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 **DHILEEPANRAJ.N** has actively participated in the Value Added Course on **Communication skills** held during Mar 2016 – Aug 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

**DR.C.KAMESHVELL MD,**
**RESOURCE PERSON,**
**ASSOCIATE PROFESSOR**

**DR.S.RAJINI MD,**
**COORDINATOR,**
**PROFESSOR & HOD,**
**DEPT OF COMMUNITY MEDICINE**

**DR.JAYAKUMAR , 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 **GOMATHI.G** has actively participated in the Value Added Course on **Communication skills** held during Mar 2016 – Aug 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

**DR.C.KAMESHVELL MD,**
**RESOURCE PERSON,**
**ASSOCIATE PROFESSOR**

**DR.S.RAJINI MD,**
**COORDINATOR,**
**PROFESSOR & HOD,**
**DEPT OF COMMUNITY MEDICINE**

**DR.JAYAKUMAR** , MD
**DEAN, SLIMS**

# ANNEXURE-V

Course Name:**COMMUNICATION SKILLS**

Subject Code: **PSM01**

Name of Student: MERLIN. S Roll No.: 68

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: 5/4/2016

Signature

Course Name:**COMMUNICATION SKILLS**

Subject Code: **PSM01**

Name of Student: MERLINE SHEEBA . B Roll No.: 69.

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: 5/4/2016

Signature

# Sri Lakshmi Narayana Institute of Medical Sciences

**OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,**
**PUDUCHERRY – 605 502**

Date 29.08.2016

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: Communication skill**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Communication skill** from March 2016 to August 2016. 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.

**HEAD OF THE DEPARTMENT**



**SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES**

**Date:10.01.2015**

**From**
Dr, Padma,
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 : Nutrition in Pregnancy and Lactation** Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled : **Nutrition in Pregnancy and Lactation** on MAR 2016 - MAY 2016 . We solicit your kind permission for the same.

Kind Regards

Dr. Padma,

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayakumar

The HOD: Dr. Padma

The Expert: Dr, Nivedhana

The committee has discussed about the course and is approved.

dean

Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502.

Subject Expert

ASSISTANT PROFESS
DEPT. OF OBSTETRICS & GYNAEC
Sri Lakshmi Narayana Instit
Medical Sciences
OSUDU, PUDUCHERR

HOD

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**

**15.02.2016**

**Sub: Organising Value-added Course: : NUTRITION IN PREGNANCY AND LACTATION**

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 **"NUTRITION IN PREGNANCY AND LACTATION "**. 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 1.03.2016. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502

Encl: Copy of Course content and Registration form.

# Course Proposal

**Course Title: Nutrition in Pregnancy and Lactation**

**Course Objective:**

**Overview in Nutrition**

**Energy expenditure during pregnancy**

**Lab tests during pregnancy**

**Nutrients**

**Gestational weight gain**

**Special considerations**

**Obesity**

**Eating disorders**

**Lactation**

**Bariatric surgery**

**Summary and future considerations**

**Course Outcome: Knowledge about Nutrition in Pregnancy and Lactation**

**Course Audience: Final MBBS Undergraduates**

**Course Coordinator: Dr. Akansha agarwal**

**Course Faculties with Qualification and Designation:**

**Dr. Padma, Prof. and HOD, OBGY**

**Dr. Akansha agarwal , Assistant Professor, OBGY**

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

| Sl No | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1 | 3.03.2016 | Overview in Nutrition | 4.00pm -5.00pm | 1 |
| 2 | 10.03.2016 | Energy expenditure during pregnancy | 4.00pm -7.00pm | 3 |
| 3 | 16.03.2016 | Lab tests during pregnancy | 4.00pm -7.00pm | 3 |
| 4 | 24.04.2016 | Nutrients | 4.00pm -6.00pm | 2 |
| 5 | 2.04.2016 | Gestational weight gain | 4.00pm -7.00pm | 3 |
| 6 | 12.04.2016 | Special considerations | 4.00pm- 7.00pm | 3 |
| 7 | 28.04.2016 | obesity | 4.00pm -6.00pm | 2 |
| 8 | 2.05.2016 | Eating disorders | 4.00pm -7.00pm | 3 |
| 9 | 8.05.2016 | Lactation | 4.00pm -7.00pm | 3 |
| 10 | 14.05.2016 | Bariatric surgery | 4.00pm -6.00pm | 2 |
| 11 | 20.05.2016 | Summary and future considerations | 4.00pm -7.00pm | 3 |
| 12 | 24.05.2016 | Do's and DONT's | 4.00pm -6.00pm | 2 |
| | | | Total Hours | 30 |

**REFERENCE BOOKS: (Minimum 2)**

**Willaims Obstetrics Edition 21**

**Strat OG**

## VALUE ADDED COURSE

**1. Name of the programme & Code**

Nutritional recommendations in Pregnancy and Lactation OBGY 3

**2. Duration & Period**

30 hrs & MARCH 2016- MAY 2016

**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 questions- *Enclosed as Annexure- III*

**6. Certificate model**

*Enclosed as Annexure- IV*

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

1 Time MARCH 2016- MAY 2016

**8. Year of discontinuation: 2016**

**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 3 | Nutritional recommendations in Pregnancy and Lactation | Dr. Akansha agarwal | Final Year MBBS | MARCH 2016- MAY 2016 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

ASSOCIATE PROFESS
DEPT. OF OBSTETRICS & GYNAEC
Sri Lakshmi Narayana Instit
Medical Sciences
OSUDU, PUDUCHERRY

**COORDINATOR**

Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502

# NUTRITION RECOMMENDATIONS IN PREGNANCY AND LACTATION

## PARTICIPIANT HAND BOOK

**BIHER** **SLIMS**

| Particulars | Descriptions |
|---|---|

| | |
|---|---|
| Course Title | Nutrition Recommendations in Pregnancy and Lactation |
| Course Code | OBG-03 |
| Objectives | 1. **Introduction**<br>2. **Energy expenditure during pregnancy**<br>3. **Lab tests during pregnancy**<br>4. **Nutrients**<br>5. **Gestational weight gain**<br>6. **Special considerations**<br>7. **Obesity**<br>8. **Eating disorders**<br>9. **Lactation**<br>10. **Bariatric surgery**<br>11. **Summary and future considerations**<br>12. **References and feedback** |
| Further learning Opportunities | Nutritional requirements in newborn |
| Key Competencies | On successful completion of course the students will have knowledge in nutritions requirements |
| Target Students | Final Year MBBS Students |
| Theory Session | 30 hours every April 2016 to August 2016 and September 2016 to January 2017 |
| Assessment Procedure | Short Questions |
| Durations | |

COURSE DETAILS

30 Hours

Nutrition Recommendations in Pregnancy and Lactation

## Introduction

Nutrition counselling is a cornerstone of prenatal care for all women during pregnancy. A woman's nutritional status not only influences her health, but also pregnancy outcomes and the health of her fetus-neonate. Physicians and other healthcare providers need to be cognizant of nutritional needs during pregnancy, as they differ significantly compared to non-pregnant populations. Furthermore, an individualized approach to nutritional counseling that considers a woman's access to food, socioeconomic status, race-ethnicity and cultural food choices, and body mass index (BMI) is recommended. In addition, many of the recommendations are geared for uncomplicated pregnancies, so adjustments need to be made when complications, such as gestational diabetes, arise. A nutritionist or registered dietitian can help facilitate dietary counselling and interventions. In this

chapter, the maternal physiological adaptations as well as macronutrient and micronutrient requirements during pregnancy and lactation will be reviewed. Other discussions on these topics will include multiple gestations, obesity in pregnancy, pregnancies after bariatric surgery, special diets, and common exposures during pregnancy.

## PREGNANCY

### Energy Expenditure during Pregnancy

Caloric intake should increase by approximately 300 kcal/day during pregnancy. This value is derived from an estimate of 80,000 kcal needed to support a full-term pregnancy and accounts not only for increased maternal and fetal metabolism but for fetal and placental growth. Dividing the gross energy cost by the mean pregnancy duration (250 days after the first month) yields the 300 kcal/day estimate for the entire pregnancy.[1,2] However, energy requirements are generally the same as non-pregnant women in the first trimester and then increase in the second trimester, estimated at 340 kcal and 452 kcal per day in the second and third trimesters, respectively. Furthermore, energy requirements vary significantly depending on a woman's age, BMI, and activity level. Caloric intake should therefore be individualized based on these factors.

### Laboratory Testing during Pregnancy

Physiological changes during pregnancy alter the normal ranges of several laboratory values. Both total red blood cell mass and plasma volume increase, but plasma volume increases to a greater extent resulting in hemodilution and anemia during pregnancy. Consequently, a hemoglobin

<10.5 g/dl or a hematocrit <32% is considered anemic during the second trimester (Table 1). Serum total protein and albumin also decrease by approximately 30% compared to non-pregnant values.[3] Additionally, because estrogen increases the hepatic production of certain proteins, there is greater protein binding of corticosteroids, sex steroids, thyroid hormones, and vitamin D during pregnancy, resulting in lower free levels.

Table 1

Definitions of anemia during pregnancy

| **Trimester** | **Hemoglobin (g/dl)** | **Hematocrit (%)** |
|---|---|---|
| First | <11.0 | <33 |
| Second | <10.5 | <32 |
| Third | <11.0 | <33 |

| | | |
|---|---|---|
| Normal values for non-pregnant women | 12.1 to 15.1 | 37-48% |

## Nutrients

### Macronutrients

Recommended protein intake during pregnancy is 60g/day, which represents an increase from 46g/d in non-pregnant states. In other words, this increase reflects a change to 1.1g of protein/kg/day during pregnancy from 0.8g of protein/kg/day for non-pregnant states.[2] Carbohydrates should comprise 45-64% of daily calories and this includes approximately 6-9 servings of whole grain daily. Total fat intake should comprise 20-35% of daily calories, similar to non-pregnant women.

### Micronutrients

The recommendations for daily micronutrient intake for a pregnant woman are determined by the “Recommended Dietary Allowances” or RDA data. In general, these RDA refer to the levels of intake of essential nutrients that are judged by the Food and Nutrition Board of the Institute of Medicine (IOM) to be adequate to meet the known nutrient needs of practically all healthy persons. The RDA have been modified for pregnant women. Table 2 shows the dietary allowances for most vitamins and minerals during pregnancy and they are reviewed in further detail below.

### Table 2

Recommended daily dietary allowances for pregnant and lactating women

| Nutrient | Non-Pregnant | Pregnant* | Lactation* |
|---|---|---|---|
| Vitamin A (µg/d) | 700 | 770 | 1300 |
| Vitamin D (µg/d) | 5 | 15 | 15 |
| Vitamin E (mg/d) | 15 | 15 | 19 |
| Vitamin K (µg/d) | 90 | 90 | 90 |
| Folate (µg/d) | 400 | 600 | 500 |
| Niacin (mg/d) | 14 | 18 | 17 |
| Riboflavin (mg/d) | 1.1 | 1.4 | 1.6 |
| Thiamin (mg/d) | 1.1 | 1.4 | 1.4 |
| Vitamin $B_6$ (mg/d) | 1.3 | 1.9 | 2 |
| Vitamin $B_{12}$ (µg/d) | 2.4 | 2.6 | 2.8 |

| | | | |
|---|---|---|---|
| Vitamin C (mg/d) | 75 | 85 | 120 |
| Calcium (mg/d) | 1,000 | 1,000 | 1,000 |
| Iron (mg/d) | 18 | 27 | 9 |
| Phosphorus (mg/d) | 700 | 700 | 700 |
| Selenium (µg/d) | 55 | 60 | 70 |
| Zinc (mg/d) | 8 | 11 | 12 |

*Applies to women >18 years old

*Data from* Otten JJ, Pitzi Hellwig J, Meyers LD, Editors. *Dietary reference intakes. The essential guide to nutrient requirements.* Washington, DC.

A daily prenatal multivitamin is generally recommended before conception and during pregnancy. Table 3 describes the typical composition of a prenatal vitamin. The critical difference compared to other multivitamins is the folic acid dose, which is necessary to support rapid cell growth, cell replication, cell division, and nucleotide synthesis for fetal and placental development. While there is data to support additional folic acid and iron supplementation during pregnancy, there is no high quality evidence

demonstrating that all women require the increased levels of nutrients in a prenatal vitamin.

Table 3

Typical composition of micronutrients in a prenatal vitamin

| **Component** | **Amount** | **% Daily Value for Pregnant and Lactating Women** |
|---|---|---|
| Vitamin A | 4,000 IU as beta carotene | 50% |
| Vitamin $D_3$ | 400 IU as Cholecalciferol | 100% |
| Vitamin E | 11 IU as dl-Alpha Tocopheryl acetate | 37% |
| Folic acid | 800 µg | 100% |

| | | |
|---|---|---|
| Niacin | 18 mg as niacinamide | 90% |
| Riboflavin | 1.7mg as thiamin mononitrate | 85% |
| Thiamin | 1.5 mg | 88% |
| Vitamin $B_6$ | 2.6 mg as pyridoxine hydrochloride | 104% |
| Vitamin $B_{12}$ | 4 µg as cyanocobalamin | 50% |
| Vitamin C | 100 mg as ascorbic acid | 167% |
| Calcium | 150 mg as calcium carbonate | 12% |
| Iron | 27 mg as ferrous fumarate | 150% |
| Zinc | 25 mg as zinc oxide | 167% |

Folic acid is the synthetic form of the naturally occurring B vitamin, folate. Folic acid is the form used in most vitamin supplements and food fortification. As mandated by the Food and Drug Administration, commonly fortified foods include bread, cereal, and pasta. Folate-rich food sources are citrus fruits,

dark-green leafy vegetables, nuts, and liver. Folate requirements increase during pregnancy as a result of rapidly dividing cells related to fetal growth. Notably, folic acid supplements (400-800µg daily) taken prior to conception can reduce the risk for neural tube defects in the fetus.[4] Since the FDA mandate, blood folate levels have increased and neural tube defects have declined.[4] In order to reduce the risk for neural tube defects in their offspring, women are recommended to take folic acid from fortified food or supplements daily in addition to consuming a diet rich in food sources of folate.[5] Women with a history of a neural tube defect in a prior pregnancy should take a higher dose (4mg) of folic acid daily for subsequent pregnancies. Deficiencies in folate have been associated with megaloblastic anemia in pregnancy, though not with other pregnancy outcomes such as preterm birth or stillbirths.[6]

Iron supplements have routinely been recommended in pregnancy because iron needs nearly double during pregnancy. A standard prenatal vitamin contains 27 mg of elemental iron. Vitamin C supplements can assist with iron absorption, whereas milk and tea can inhibit iron supplementation. Women with iron deficiency, defined by a ferritin level <15 µg/L, can increase their hemoglobin by 2 g/dL over a one month period with a daily replacement of 60-120 mg of elemental iron. Common side effects of iron, such as stomach pain, constipation, nausea, and vomiting are often reasons why women are not compliant with iron supplementation. Iron-rich foods include red meat, pork, fish, and eggs.

Vitamin D is a fat-soluble vitamin that is primarily found in fortified milk or juice; natural sources include eggs and fish such as salmon. The skin also manufactures vitamin D when it is exposed to sunlight. Regardless of the

source – oral ingestion vs. skin absorption – further processing in the liver and then the kidney is required to create the active form, 1,25-dihydroxyvitamin D, which promotes calcium absorption from the intestines and thereby allows appropriate bone mineralization and growth. Vitamin D deficiency is common in pregnancy, especially in high-risk groups such as vegetarians, women who live in cold climates, and ethnic minority women with darker skin. Severe vitamin D deficiency has been associated with congenital rickets and fractures, but this is less common in the United States. While Vitamin D levels can be measured via a serum level of 25-hydroxy vitamin D, an optimal level during pregnancy has not been established. Furthermore, there is insufficient evidence to recommend screening all pregnant women for vitamin D deficiency. If vitamin D deficiency is discovered during pregnancy, then supplements (1000-2000 IU per day) can be given.[7] In addition, routine vitamin D supplementation during pregnancy to prevent preeclampsia is also not recommended.[8]

Vitamin A is essential for cell differentiation and proliferation as well as development of the spine, heart, eyes, and ears. Offspring of mothers with vitamin A deficiency, which is rare in the United States, have a higher mortality rate, which may be associated with decreased immune function. Although most micronutrients have a wide safety margin with little concern for teratogenic effects, vitamin A is one exception.[9] Excessive doses of Vitamin A (>10,000 IU/day) have been associated with cranial-facial (face, palate, ears) and cardiac birth defects. The maximal supplement in pregnancy is 8000 IU/day. It is the retinol form of Vitamin A that is associated with teratogenic effects, not the carotenoid version found in food sources such as carrots.

Studies regarding the risks and benefits of fish during pregnancy can often seem contradictory.[10] This is in part due to that that most fish contain competing benefits and risks in the forms of omega-3 fatty acids and mercury.[11,12] Omega-3 fatty acids are critical for fetal brain development and have been associated with improved vision in preterm infants, as well as better cardiovascular health later in life.[13] Higher mercury levels in children, however, have been associated with deficits in memory, learning, and behavior.[14] Ideally, pregnant women would consume those fish that are low in mercury and high in omega-3 fatty acids such as salmon, sardines, and anchovies.(Table 4) High mercury fish such as shark, swordfish, tilefish, and king mackerel should be avoided. The Federal Drug Administration (FDA) and the Environmental Protection Agency (EPA) websites offer information regarding local fish and their mercury content.[15] Available data suggest that fish-oil supplements do not confer the same health benefits as consumption of the actual fish.

Table 4

Fish to Avoid During Pregnancy and Lactation

Shark

Swordfish

Tilefish

King Mackerel

## Gestational Weight Gain

Pregnancy has traditionally been considered a time for weight gain, not weight loss. The obligatory weight gain during pregnancy is approximately 8 kg which accounts for the fetus, the placenta, amniotic fluid volume, and adaptations to maternal tissues (e.g., uterus, breast, blood volume). A weight gain less than this amount implies that existing maternal adipose and protein stores would be mobilized in order to support the pregnancy. Metabolic changes of women who lose weight during pregnancy are not well-described, but ketonemia, increased urinary nitrogen excretion, and decreased gluconeogenic amino acid production result after a period of fasting during pregnancy.[17] Pregnancy is often considered a time of "accelerated starvation" due to the increase in insulin resistance, with an increased risk for developing ketonuria and ketonemia.[18] This physiologic change is important to consider in the setting of weight loss during pregnancy because maternal ketonemia or ketonuria may subsequently be associated with abnormal fetal growth or later neurocognitive development.[19-21]

A woman's pre-pregnancy BMI determines the total amount of weight gain and rate of weight gain during pregnancy (Table 5).[22] Of note, the gestational weight gain guidelines that IOM published in 2009 differ from their original 1990 recommendations in that women with a pre-pregnancy BMI ≥ 30kg/m$^2$ should gain 5-9 kg or 11-20 pounds during pregnancy.[22,23] Women who are overweight or have obesity have lower ranges for recommended

total gestational weight gain compared to normal-weight women, yet >50% of all women exceed the gestational weight gain recommendations.[24] The IOM 2009 guidelines also recommend that women should conceive at a normal weight so as to achieve optimal maternal and neonatal outcomes.[22] One study found that women who gain weight in the appropriate range for their BMI during pregnancy have fewer adverse perinatal outcomes than those gaining above the described thresholds.[25]

Table 5

Gestational weight gain recommendations

| **Pre-pregnancy BMI** | **Total weight gain at term** | **Rate of weight gain in the 2nd and 3rd trimester; Mean (range)** |
|---|---|---|
| Underweight (<18.5 kg/m$^2$) | 12.5-18 kg<br>28-40 lbs. | 0.51 (0.44-0.58) kg/week<br>1 (1-1.3) lbs./week |
| Normal weight (18.5-24.9 kg/m$^2$) | 11.5-16 kg<br>25-35 lbs. | 0.42 (0.35-0.50) kg/week<br>1 (0.8-1) lbs./week |
| Overweight (25.0-29.9 kg/m$^2$) | 7-11.5 kg<br>15-25 lbs. | 0.28 (0.23-0.33) kg/week<br>0.6 (0.5-0.7) lbs./week |
| Obesity | 5-9 kg | 0.22 (0.17-0.27) kg/week |

| | | |
|---|---|---|
| (≥ 30.0 kg/m$^2$) | 11-20 lbs. | 0.5 (0.4-0.6) lbs./week |

*Data from* Institute of Medicine. Weight gain during pregnancy: reexamining the guidelines. Washington, DC: Institute of Medicine; 2009.

## Special considerations

### Multiple gestations

In twins, the maternal metabolic rate is approximately 10% greater than in singletons.[26]

Furthermore, the physiological changes in a singleton pregnancy are exacerbated in multiple gestations. This includes an increase in plasma volume which results in further decreases in hemoglobin, albumin, and water soluble vitamins.[27] There are no standardized nutritional guidelines for multiple gestations, but they have been inferred from singletons. One recommendation for macronutrient composition is 20% protein, 40% fat, and 40% carbohydrates.[28,29] It is estimated that a 40% higher-calorie diet may maintain a woman's nutritional state during a twin pregnancy. Rates of iron deficiency anemia are 2.4-4 times higher in twins than in singletons.[28] Anemia due to folate deficiency is 8 times more common in twins compared to singletons.[27] As such, a 1 mg folic acid daily supplement has been recommended for twin gestations.[30] Some experts recommend 1000IU of vitamin D and 2000-2500mg/d of calcium daily for twins.[28] Multiple gestations have a higher risk of complications such as premature birth and low birth weight. The IOM 2009 guidelines for gestational weight gain in twin gestations are presented in Table 6. Of note, these guidelines are considered provisional, as the evidence to support them is not as strong as it

is for singletons. Interestingly, a weight gain of 24 pounds by 24 weeks has been associated with higher rates of birth weights >2500g.[31,32] Evidence for nutritional management of higher order multiples (triplets, quadruplets, etc.) is lacking, but they can be managed similarly to twin gestations.

Table 6

Gestational weight gain recommendations for twins

| **Pre-pregnancy BMI** | **Total weight gain at term** |
|---|---|
| Underweight ($<18.5$ kg/m$^2$) | 17-25 kg<br>37-54 lbs. |
| Normal weight (18.5-24.9 kg/m$^2$) | 17-25 kg<br>37-54 lbs. |
| Overweight | 14-23 kg |

| | |
|---|---|
| (25.0-29.9 kg/m$^2$) | 31-50 lbs. |
| Obesity<br>(≥ 30.0 kg/m$^2$) | 11-19 kg<br>25-42 lbs. |

*Data from* Institute of Medicine. Weight gain during pregnancy: reexamining the guidelines. Washington, DC: Institute of Medicine; 2009.

## Obesity

The World Health Organization and the National Institutes of Health define normal weight as a BMI of 18.5–24.9 kg/m$^2$, overweight as a BMI of 25–29.9 kg/m$^2$, and obesity as a BMI of 30 kg/m$^2$ or greater. Obesity is further categorized by BMI into Class I (30–34.9 kg/m$^2$), Class II (35–39.9 kg/m$^2$), and Class III or extreme obesity (≥ 40 kg/m$^2$).[33,34] Trends in adult weight over the past couple of decades highlight the escalating role that obesity plays in women's health; 31.8% of reproductive age women (20-39 years) had obesity in 2011-2012.[35] Women with a higher pre-pregnancy BMI have a greater risk for adverse perinatal outcomes.[36,37] These include both maternal complications such as gestational diabetes, pregnancy-related hypertension, and cesarean deliveries along with adverse fetal effects such as birth defects, stillbirth, and abnormal fetal growth. As such, weight loss prior to pregnancy is strongly recommended in order to reduce the risk of these complications.[38]

Table 7

Risks of Obesity in Pregnancy

| **During Pregnancy** | **During Labor & Delivery** | **Postpartum complications** |
|---|---|---|
| Spontaneous miscarriage | Difficult fetal monitoring | Postpartum hemorrhage |
| Birth defects | Cesarean delivery | Wound infection |
| Limitations to ultrasound | Decreased success of a vaginal birth after cesarean delivery | Obesity in offspring |
| Gestational diabetes | Difficult anesthesia | |
| Hypertensive disease | | |
| Stillbirth | | |

| | | |
|---|---|---|
| Fetal growth abnormalities | | |

Guidelines for the management of obesity during pregnancy differ among countries; those practices endorsed by the American Congress of Obstetricians and Gynecologists are listed below:[38]

- Gestational weight gain recommendations should be individualized by the BMI at the first prenatal visit and based on the IOM 2009 guidelines (11-20 pounds).
- Early screening for glucose intolerance (gestational diabetes or overt diabetes) is recommended. If the initial early diabetes screening result is negative, a repeat diabetes screening generally is performed at 24–28 weeks of gestation.
- Behavioral interventions employing changes to diet and exercise can improve postpartum weight reduction in contrast to exercise alone.

With respect to health behavior interventions, randomized and non-randomized studies of interventions to promote optimal gestational weight gain have emphasized combinations of dietary counseling, weight monitoring, and exercise programs. Although a few studies have shown a reduction in gestational weight gain for women with obesity after exposure to a health behavior intervention, the majority have found no benefit. For example, in one study in which women were randomized to a low glycemic index diet, the majority of women with obesity exceeded the gestational weight gain goals regardless of the study arm (57% control vs. 60% intervention, $p=0.8$).[39] When the results of multiple studies have been

examined cumulatively in meta-analyses, the interventions for women who are overweight or obese have been shown to have moderate or no influence at all on gestational weight gain or other perinatal outcomes.[40-44] Further research is indicated to determine how to promote adherence to gestational weight gain guidelines with health behavior interventions. Another concern is the influence maternal obesity has on childhood weight, resulting in a propagation of the cycle of obesity. It is likely that environmental and epigenetic influences and not just genetic mechanisms play a role in the obesity epidemic. Several theories suggest that in utero nutrition may impact chronic diseases such as diabetes, hypertension, and other metabolic diseases later in life in the offspring.[45,46] As this research continues to evolve, clinicians should consider that maternal nutrition during pregnancy may have life-long consequences for the offspring.

## Pregnancy after bariatric surgery

Pregnancy after bariatric surgery is not uncommon as fertility often improves after a bariatric surgery procedure.[47-49] Given that bariatric procedures can create deficiencies of micro- and macronutrients, a pregnancy occurring after a bariatric surgery procedure requires particular attention to nutritional status. As stated previously, requirements for calories, vitamins, and minerals increase during pregnancy, so nutritional deficiencies in the bariatric surgery patient can be exacerbated during pregnancy. The most common deficiencies that occur after bariatric surgery are vitamin $B_{12}$, folate, and iron.[50] Because malabsorptive procedures (e.g., Roux-en-y gastric bypass [RYGB], biliopancreatic diversion) have a higher risk for nutritional deficiencies, closer surveillance in pregnancies that occur after these types of surgeries is appropriate.[51] However, derangements in nutrients can also

occur after restrictive-type procedures (e.g., laparoscopic adjustable gastric banding), so it may be reasonable to screen all women who are pregnant post-bariatric surgery for nutritional deficiencies.[52] Guidelines for screening and management of nutritional deficiencies during pregnancy are adapted from those designed for non-pregnant states and include laboratory testing once a trimester or every 3 months if the levels are normal (Table 8).[53,54] Iron deficiency anemia is frequently a long-term complication of bariatric surgery, occurring in 6% to 50% of patients after RYGB.[55-58] In pregnancies after bariatric surgery, iron deficiency anemia can be diagnosed in the usual manner with a low mean corpuscular volume, and abnormal iron studies (e.g., low serum iron, high total iron-binding capacity, and a low serum ferritin) keeping in mind the physiologic anemia that occurs during pregnancy (Table 1). Treatment of vitamin and mineral deficiencies during pregnancy, in terms of dose and duration, is similar to that of non-pregnant states.

Table 8

Diagnostic testing along with prophylaxis and treatment of micro and macronutrient deficiencies in pregnancies after bariatric surgery

| **Component** | **Diagnostic testing (serum)** | **Prophylaxis** | **Treatment if deficient** |
|---|---|---|---|
| Protein | Serum albumin and prealbumin | 60g protein/day | Protein supplements |

| | | | |
|---|---|---|---|
| Vitamin A | Vitamin A, if clinically indicated | 4000 IU/day in prenatal vitamin | Vitamin A not to exceed 8000 IU/day |
| Vitamin D | 25-hydroxy vitamin D, if clinically indicated | 400-800 IU/day in prenatal vitamin | Calcitriol (vitamin D) 1000 IU/day |
| Vitamin K | Vitamin $K_1$, if clinically indicated | Not routinely given | Vitamin $K_1$ 1 mg/day Consult with hematologist |
| Folic acid | Complete blood count, red blood cell folate | 600-800 µg/day in prenatal vitamin | Folic acid 1000 µg/day |
| Vitamin $B_{12}$ | Complete blood cell count, Vitamin $B_{12}$ | 4 µg/day in prenatal vitamin | Oral vitamin B12 350 µg/day or Intramuscular 1000 µg/month Consult with hematologist |
| Calcium | Total and ionized | 250 mg/day in | Calcium citrate 1000 mg/day with Vitamin |

| | | | |
|---|---|---|---|
| | calcium | prenatal vitamin | D |
| Iron | Complete blood count, iron, ferritin, total iron binding capacity | 30 mg/day in prenatal vitamin | Ferrous sulfate 325mg twice-three times/day with vitamin C |

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*Data from* Mechanick JI, Youdim A, Jones DB, et al. Clinical practice guidelines for the perioperative nutritional, metabolic, and nonsurgical support of the bariatric surgery patient--2013 update: cosponsored by American Association of Clinical Endocrinologists, The Obesity Society, and American Society for Metabolic & Bariatric Surgery. Obesity (Silver Spring) 2013;21(Suppl 1):S1-27; and American Academy of Pediatrics and the American College of Obstetricians and Gynecologists. Guidelines for perinatal care. 7th ed. Washington, DC: American Academy of Pediatrics and the American College of Obstetricians and Gynecologists; 2012.

## Eating disorders

For women with either a history of or current eating disorder (e.g., anorexia nervosa, bulimia), additional questions regarding their weight should be asked including how they feel about weight gain, being weighed at every prenatal visit (which is customary in prenatal care practices in the United States), and the ongoing changes in their body.[59] With respect to weighing, a woman's preference about weighing (i.e., whether or not she prefers to see the numbers) should be assessed and documented in the chart. Counseling on gestational weight gain goals is still important for these women as weight

influences the growth and development of the fetus. Similar to management prior to pregnancy, a collaborative team of experts in eating disorders should continue to manage and treat these women during the pregnancy.

### Vegetarians

There are varying types of vegetarian diets such as ovolactovegetarian (includes dairy and egg products), ovovegetarian (includes eggs), lactovegetarian (includes dairy products), and vegan (excludes eggs, dairy, and any other animal products). Alternative protein sources for these women include beans, peas, soy, nuts, nut butter, and milk and egg products. Minerals that may be deficient in their diets include iron, calcium, zinc, and vitamin $B_{12}$. Laboratory testing for these specific nutrients may be indicated.

### Common Exposures

Historically, pregnant women were advised to abstain from caffeine. However, those earlier studies that demonstrated an increased risk of adverse obstetric outcomes such as miscarriage, poor fetal growth, and stillbirth were subject to substantial bias.[60] Additionally, the risk of those outcomes occurring generally increased with fairly substantive doses of caffeine, such as greater than 4 cups of coffee a day.[61,62] Most current research suggests that smaller amounts of caffeine intake, less than 200-300mg daily, are not associated with increased perinatal risk.

It is particularly important that general food safety precautions such as ensuring meat and dairy-containing foods are appropriately refrigerated are followed during pregnancy because pregnant women are more susceptible to the effects of infections from certain microorganisms. Ensuring foods are

pasteurized and/or appropriately cooked can lower the risk of acquiring infections such as Listeria and Toxoplasmosis. Listerial infections are associated with increased risk for pregnancy complications such as preterm delivery and stillbirth.[63] Toxoplasmosis infections can result in ventriculomegaly and other fetal-neonatal complications.[64] Wearing gloves when gardening may also reduce the risk of exposure to toxoplasmosis.[65]

While current recommendations from professional organizations do not recommend universal screening for lead exposure, risk assessment should be performed at the first prenatal visit and testing of lead levels performed if any risk factors are identified. High lead levels have been associated with a greater risk of obstetric complications such as miscarriage, poor fetal growth, and neurodevelopmental impairment.[66]

## LACTATION

### Physiology and Production

Breastfeeding and breast milk are the global standard for infant feeding. The World Health Organization, the U.S. Surgeon General, the American Academy of Pediatrics, the American Congress of Obstetricians and Gynecologists, the American Academy of Family Practice, and the Academy of Breastfeeding Medicine all support this statement. The American Academy of Pediatrics further recommends exclusive breastfeeding for the first 6 months and breastfeeding at least through the first year of life.[67] Similar to pregnancy, energy and nutritional requirements also differ during lactation and breastfeeding.

Women who breastfeed require approximately 500 additional kcal/day beyond what is recommended for non-pregnant women.[68] The estimate is derived from the mean volume of breast milk produced per day (mean 780 mL, range 450-1200 mL) and the energy content of milk (67 kcal/100 mL).[69] During pregnancy, most women store an extra 2 to 5 kg (19,000 to 48,000 kcal) in tissue, mainly as fat, in physiologic preparation for lactation. If women do not consume the extra calories, then body stores are used to maintain lactation. It is not unusual for lactating women to lose 0.5-1.0 kg/month after the first postpartum month.[70]

There are even less evidence-based recommendations for nutrient intake during breastfeeding compared to pregnancy. Lactation is considered successful when the breast-fed infant is gaining an appropriate amount of weight. The recommended daily allowance for protein during lactation is an additional 25 g/day. Requirements of many micronutrients increase compared to pregnancy, with the exception of vitamins D and K, calcium, fluoride, magnesium, and phosphorus. As such, it is recommended that women to continue to take a prenatal vitamin daily while they are breastfeeding (Tables 2,,3).3). Weight loss during lactation does not usually impact the quantity or quality of breast milk, but maternal deficiencies in magnesium, vitamin $B_6$, folate, calcium, and zinc have been described during lactation.[69,71] Both fat (vitamins A, D, K) and water-soluble vitamins (vitamins C, $B_1$, $B_6$, $B_{12}$, and folate) are secreted into breast milk and their levels are reduced in breast milk when there is a maternal vitamin deficiency.[72-74] Fortunately, these vitamin deficiencies in breast milk respond to maternal supplementation. On the other hand, calcium, phosphorus, and magnesium levels in breast milk are independent of maternal serum levels

and diet.[75] Maternal factors such as stress, anxiety, and smoking can decrease milk production, but the quantitative and caloric value of breast milk does not change with dieting and exercise.[76-83] Moreover, a woman's weight, BMI, body fat percentage, and weight gain during pregnancy do not influence milk production.[84-86]

## Special Considerations

### Multiple Gestations

Approximately 40-90% of mothers of twins initiate breastfeeding.[87] The production of milk is primarily determined by infant demand rather than the maternal capacity to lactate. As such, for women attempting to breastfeed twins and triplets, the supply will meet the demand. Continuation of micronutrient supplementations given antenatally in the form of a prenatal vitamin is appropriate for women who are breastfeeding twins. Twins can breastfeed either simultaneously or separately.

### Obesity

Several studies have demonstrated that women with obesity have decreased rates of initiating breastfeeding and breastfeed for shorter durations compared to normal weight women.[88] Biological (i.e. delayed lactation), psychological (i.e., embarrassment related to body size and difficulty in breastfeeding discreetly), mechanical (i.e., larger breasts and nipples that create difficulties with latching), and medical (i.e., cesarean deliveries, diabetes, thyroid dysfunction) factors have been theorized to explain these findings, but the exact etiology is likely a combination of factors. To combat this trend and increase the likelihood that women with obesity attain their breastfeeding goals, they need additional support and

encouragement to breastfeed, including assistance with appropriate latching techniques and demonstration of appropriate infant positions, to aid with initiation and continuation of lactation.

### Bariatric surgery

Women who have had bariatric surgery are also advised to follow the recommendation of breastfeeding for at least 6 months. Laboratory evaluation of micronutrient levels, as described in Table 8 for pregnant women, is also recommended for breastfeeding women after bariatric surgery, with one group suggesting they be tested as frequently as every 3 months.[89] The infant's provider also should be aware of the mother's history of bariatric surgery as well as any of her specific dietary restrictions or identified nutrient deficiencies. For women who have a gastric banding procedure, one recommendation is to keep the band deflated until the successful establishment of breastfeeding.[90] Though few studies have evaluated the nutritional content of breast milk produced by lactating women after bariatric surgery, it is likely similar to other women. While infants who are born to women with obesity have a higher rate of early childhood obesity, this may be offset by the reduced risk of early childhood obesity in infants who are predominantly breastfed.[91-93]

### Vegetarians

Recommended dietary guidelines for vegetarians during lactation are lacking. Vitamin D supplements are recommended for women who do not drink milk or other food fortified with vitamin D. A vitamin $B_{12}$ supplement (2.6 µg/d) is also recommended for women who consume ovolactovegetarian and vegan diets.[94] Another recommendation is to consume 1200-1500

mg/day of calcium because of the possible decreased intake and absorption from a plant-based diet.[95] The FDA recommends similar precautions regarding avoiding higher mercury fish during lactation. Adverse neonatal effects have not been demonstrated with ordinary maternal fish consumption during breastfeeding.

## ONLINE RESOURCES FOR CLINICIANS

www.phenxtoolkit.org Screening questions to identify nutritional issues or deficiencies in patients.

http://resources.iom.edu/Pregnancy/WhatToGain.html?_ga=1.247807815.195235449.1445895119 BMI calculator

http://fnic.nal.usda.gov/interactiveDRL. Calculators for daily energy needs and interactive dietary reference intakes for healthcare professionals

http://www.choosemyplate.gov/supertracker-tools/daily-food-plans/moms.html Allows health care professionals to estimate energy and nutrient requirements during pregnancy and lactation

www.marchofdimes.com/pregnancy/nutrition_indepth.html Resource for general prenatal dietary guidelines from the March of Dimes

http://iom.nationalacademies.org/Activities/Children/PregnancyWeightDissemination/2013-SEP-09/~/media/Files/About%20the%20IOM/Pregnancy-Weight/ProvidersBro-Final.pdf?_ga=1.148168439.195235449.1445895119 Review on how to implement the IOM gestational weight gain guidelines

http://iom.nationalacademies.org/Activities/Children/PregnancyWeightDissemination/2013-SEP-09/ToolKit.aspx Webinar that reviews a toolkit on implementing the IOM gestational weight gain guidelines

http://iom.nationalacademies.org/Activities/Children/PregnancyWeightDissemination/2013-SEP-09/~/media/Files/About%20the%20IOM/Pregnancy-Weight/IOMPregnancyMythsFactsEnglish.pdf Myths for providers to dispel during the course of prenatal care

http://www.foodsafety.gov/risk/pregnant/chklist_pregnancy.html Checklist of foods to avoid during pregnancy

http://www.fda.gov/food/foodborneillnesscontaminants/metals/ucm393070.htm Resource from the FDA on fish consumption during pregnancy

https://www.breastfeeding.asn.au/bf-info/common-concerns%E2%80%93mum/dietBreastfeeding information and nutrition

## Summary and Future Considerations

Nutrition counseling is a cornerstone of prenatal care for all women during pregnancy and it also extends to lactation. Clinicians should be aware of the physiological adaptations that occur during pregnancy and lactation and how these changes influence the nutritional needs of pregnant and lactating women. One area of research that would assist providers and women in meeting their nutritional requirements and gestational weight gain goals is the measurement of diet and physical activity that is specific to pregnancy. Effective interventions that target health behaviors are also needed to improve a woman’s nutritional status and assist her in meeting the gestational weight gain goals.

## Key points

1. Energy, macronutrient, and micronutrient requirements increase during both pregnancy and lactation.
2. Gestational weight gain goals vary according to the pre-pregnancy body mass index. Women who meet the weight gain goals have improved perinatal outcomes.
3. Special attention is required in the nutritional management of multiple gestations, obesity, and pregnancies after bariatric surgery.

## Synopsis

The nutritional status of a woman during pregnancy and lactation is not only critical for her health, but for future generations. While a nutritionist or registered dietitian can help facilitate dietary counseling and interventions, physicians also need to be cognizant of nutritional needs during pregnancy, as they differ significantly compared to non-pregnant populations. Furthermore, an individualized approach to nutritional counseling that considers a woman's nutritional status and body mass index is recommended.

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## Footnotes

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## VALUE ADDED COURSE

### NUTRITIONAL RECOMMENDATIONS IN PREGNANCY AND LACTATION

### COURSE CODE : OBGY 03

### List of Students Enrolled MARCH 2016 - MAY 2016

| .NO | UNIVERSITY REG.NO | STUDENT NAME ADDRESS | SIGNATURE |
|---|---|---|---|
| 1 | U13MB151 | ABDUL RAHMAN.A. | |
| 2 | U13MB152 | ABIRAMI KAMBAN K.S | |
| 3 | U13MB153 | ABIRAMI.A. | |
| 4 | U13MB154 | AFRAA.S. | |
| 5 | U13MB155 | AHILA. M. | |
| 6 | U13MB156 | AKMAR JEBIN.V.P. | |
| 7 | U13MB157 | AKSHAYA. S. | |
| 8 | U13MB158 | ALLADI SANATH KUMAR | |
| 9 | U13MB159 | ANBAZHAGAN. D | |
| 10 | U13MB160 | ANGELIN JEEVA PUSHPAM.S | |
| 11 | U13MB161 | ANIK GHORAI | |
| 12 | U13MB162 | ANUPRIYA. B. | |
| 13 | U13MB163 | ANUPRIYA.S. | |
| 14 | U13MB164 | ANUSUYA.V., | |
| 15 | U13MB165 | ARIKO IMCHEN | |
| 6 | U13MB166 | ARULMOZHI. T. | |
| 7 | U13MB167 | ARUN KUMAR. K. | |
| | U13MB170 | BALA PRIYADHARSHINI. P | |
| | U13MB168 | BALAJI. S. | |
| | U13MB169 | BALAKRISHNAN.R. | |

**Annexure - IV**

## NUTRITIONAL RECOMMENDATIONS IN PREGNANCY AND LACTATION

## MCQs

**Course Code: OBGY03**

**1. Recommended Protein during Pregnancy period is…….**

a) 60 mg b) 14 mg c) 32 mg d) 75 mg

**2. what is the adequate intake of calcium for pregnant mother ?**

a) 1100mg b) 1000mg c) 1200mg d) 1300mg

**3. How many calories are recommended for breast feeding mother ?**

a) 2500 b) 3000 c) 2000 d) 1500

**4. Pregnant mother should follow a which diet ?**

a) consisting mainly of dairy products b) That contains no fat

c) That Nutritious consisting of variety of food d) that includes twice a many calories

**5. How many times a day do newborns generally need a food ?**

a) 5-6 times b) 3-4 times c) 8-12 times d) 9-10 times

**6. How does breast feeding help mothers ?**

a) to get back normal weight b) reduces risk of ovarian cancer

c) increases bone strength d) both A and B

**7. Getting enough vit c in pregnancy will help in absorbing……..**

a) Ca++ b) K+ c) Fe d) Zn

**8. How much you need to put on atleast while pregnant to cover the growth of your baby ?**

a) 7kg b) 9kg c) 11kg d) 5kg

**9. Which fatty acid is essential for development of CNS of fetus ?**

a) Linolevic acid b) Omega 3 c) Gamma - linolenic acid d) LDH

Reg NO:- U13MB15E

# NUTRITIONAL RECOMMENDATIONS IN PREGNANCY AND LACTATION (3)

## MCQs

Course Code: OBGY03

**1. Recommended Protein during Pregnancy period is.....**

a) 60 mg b) 14 mg c) 32 mg d) 75 mg

**2. what is the adequate intake of calcium for pregnant mother ?**

a) 1100mg b) 1000mg c) 1200mg d) 1300mg

**3. How many calories are recommended for breast feeding mother ?**

a) 2500 b) 3000 c) 2000 d) 1500

**4. Pregnant mother should follow a which diet ?**

a) consisting mainly of dairy products b) That contains no fat

c) That Nutritious consisting of variety of food d) that includes twice a many calories

**5. How many times a day do newborns generally need a food ?**

a) 5-6 times b) 3-4 times c) 8-12 times d) 9-10 times

**6. How does breast feeding help mothers ?**

a) to get back normal weight b) reduces risk of ovarian cancer

c) increases bone strength d) both A and B

**7. Getting enough vit c in pregnancy will help in absorbing.....**

a) Ca++ b) K+ c) Fe d) Zn

**8. How much you need to put on atleast while pregnant to cover the growth of your baby ?**

a) 7kg b) 9kg c) 11kg d) 5kg

**9. Which fatty acid is essential for development of CNS of fetus ?**

a) Linolevic acid b) Omega 3 c) Gamma - linolenic acid d) LDH

**10. how much extra calories needed for pregnant women per day ?**

a) 400 b) 300 c) 500 d) 1000

# 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** has actively participated in the Value Added Course on **NUTRITIONAL RECOMMENDATIONS IN PREGNANCY AND LACTATION** held during March 2016 – May 2016 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**

Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-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 **ARUN KUMAR. K** has actively participated in the Value Added Course on **NUTRITIOPNAL RECOMMENDATIONS IN PREGNANCY AND LACTATION** held during March 2016 – May 2016 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**

Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-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:** NUTRITION IN PREGNANCY AND LACTATION
**Date:** 24/01/2016
**Name:** ABDUL RAHMAN.A
**Reg NO.** U13 MB151
**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:** NUTRITION IN PREGNANCY AND LACTATION
**Date:** 21/08/2015
**Name:** ANUSUYA.V
**Reg NO.** U13MB3164
**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: 24.05.2016**

From
Dr. Padma,
Professor,
Obstetrics and Gynaecology,
Sri Lakshmi Narayana institute of Medical sciences,
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

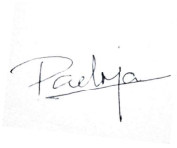
To
The Dean,
Sri Lakshmi Narayana institute of Medical Sciences,
Bharath Institute of Higher Education and Research,
Chennai.

**Sub: Completion of value-added course: Nutrition in Pregnancy and Lactation**

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled**: Nutrition in Pregnancy and Lactation** on MARCH 2016-MAY 2016. 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.Padma

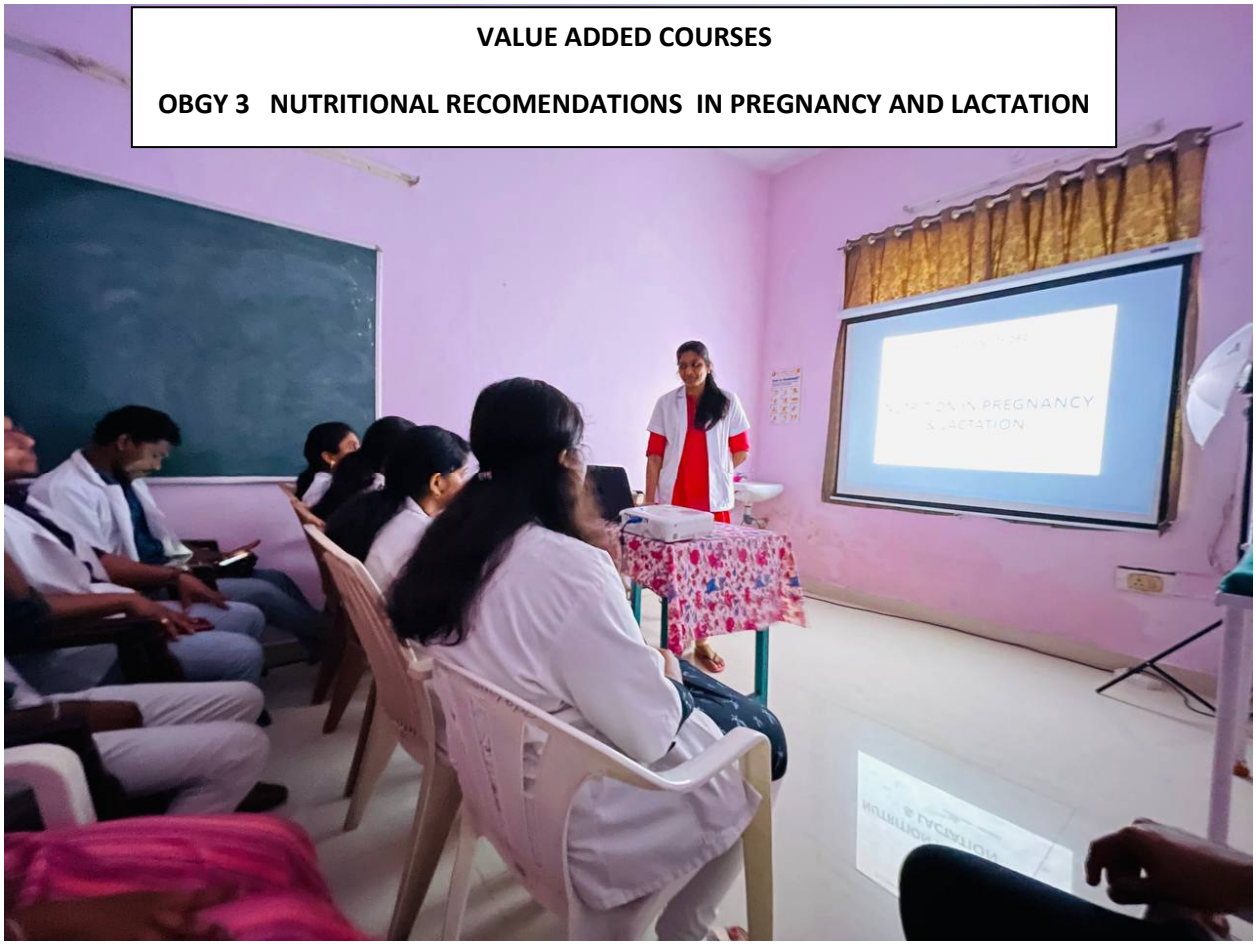
PROFESSOR & HEAD
DEPT. OF OBSTETRICS & GYNAECOLOGY
Sri Lakshmi Narayana Institute of
Medical Sciences
OSUDU, PUDUCHERRY.

**Encl: Certificates**

**Photographs**

**VALUE ADDED COURSES**

**OBGY 3 NUTRITIONAL RECOMENDATIONS IN PREGNANCY AND LACTATION**



# Sri Lakshmi Narayana Institute of Medical Sciences

**Annexure 1**

Date 20/03/2016

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: DRY EYE**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **DRY EYE** on **APR 2016 TO JUNE 2016**. 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
The Expert:Prof.K.Rathnakumar, M.S,D,O,
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 PONDICHERRY

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 / OPH05** **Date: 20.03.2016**

**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 2016-2017 - 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. APPLANATION TONOMETER
2. DRY EYE
3. CHEMICAL INJURIES

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, PUDUCHERRY

**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. APPLANATION TONOMETER
2. DRY EYE
3. CHEMICAL INJURIES

**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 / OPH05** **Date: 25.03.2016**

**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 2016-2017 – Reg.
**Ref:** Ref. No. SLIMS/Dean Off/VAC /OPH05 Dated: 20.03.2016

*****

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 2016– 2017. The abstract of the VAC course completion detail should be submitted to the Registrar office.

1. APPLANATION TONOMETER
2. DRY EYE
3. CHEMICAL INJURIES

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

26.03.2016

**Sub: Organising Value-added Course: DRY EYE**

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 **"DRY EYE"**. 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 MAR 2016. 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**

Dry Eye

**2. Duration & Period**

30 hrs & April-2016 – June -2016

**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-2016 – Apr-2016 (1)

**8. Year of discontinuation: 2017**

**9. Summary report of each program year-wise**

| Value Added Course- April-2016 – June -2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| 1 | OPH05 | Dry Eye | Prof.K.Rathnakumar, M.S, D.O, | 30 | 2016 |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**Prof. K. Rathnakumar, M.S, D.O,**
**(Prof-Ophthalmology)**
**RESOURCE PERSON**

**Prof. D. Baba, M.S,**
**(Prof & HOD-Ophthal)**
**COORDINATOR**

PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-605 502.

# DRY EYE

## Anatomy

The lacrimal drainage system consists of the following structures

• **The puncta** are located at the posterior edge of the lid margin, at the junction of the lash-bearing lateral five-sixths (pars ciliaris) and the medial non-ciliated one-sixth (pars lacrimalis). Normally they face slightly posteriorly and can be inspected by everting the medial aspect of the lids. Treatment of watering caused by punctal stenosis or malposition is relatively straightforward.
• **The canaliculi** pass vertically from the lid margin for about 2 mm (ampullae). They then turn medially and run horizontally for about 8 mm to reach the lacrimal sac. The superior and inferior canaliculi usually (>90%) unite to form the common canaliculus, which opens into the lateral wall of the lacrimal sac. Uncommonly, each canaliculus opens separately into the sac. A small flap of mucosa (Rosenmüller valve) overhangs the junction of the common canaliculus and the lacrimal sac (the internal punctum) and prevents reflux of tears into the canaliculi. Treatment of canalicular obstruction may be complex.
• **The lacrimal sac** is 10–12 mm long and lies in the lacrimal fossa between the anterior and posterior lacrimal crests. The lacrimal bone and the frontal process of the maxilla separate the lacrimal sac from the middle meatus of the nasal cavity. In a dacryocystorhinostomy (DCR) an anastomosis is created between the sac and the nasal mucosa to bypass an obstruction in the nasolacrimal duct.
• **The nasolacrimal duct** is 12–18 mm long and is the inferior continuation of the lacrimal sac. It descends and angles slightly laterally and posteriorly to open into the inferior nasal meatus, lateral to and below the inferior turbinate. The opening of the duct is partially covered by a mucosal fold (valve of Hasner).

## Physiology

Tears secreted by the main and accessory lacrimal glands pass across the ocular surface. A variable amount of the aqueous component of the tear film is lost by evaporation, with the remainder of the tears hypothesized to drain substantially as follows
• Tears flow along the upper and lower marginal strips pooling in the lacus lacrimalis medial to the lower puncta, then entering the upper and lower canaliculi by a combination of capillarity and suction.
• With each blink, the pretarsal orbicularis oculi muscle

compresses the ampullae, shortens and compresses the horizontal canaliculi, and closes and moves the puncta medially, resisting reflux. Simultaneously, contraction of the lacrimal part of the orbicularis oculi creates a positive pressure that forces tears down the nasolacrimal duct and into the nose, mediated by helically arranged connective tissue fibres around the lacrimal sac
• When the eyes open, the canaliculi and sac expand, creating negative pressure that draws tears from the canaliculi into the sac

## Definitions

Dry eye occurs when there is inadequate tear volume or function, resulting in an unstable tear film and ocular surface disease. It is an extremely common condition, particularly in postmenopausal women and the elderly.
• **Keratoconjunctivitis sicca** (KCS) refers to any eye with some degree of dryness.
• **Xerophthalmia** describes a dry eye associated with vitamin A deficiency.
• **Xerosis** refers to the extreme ocular dryness and keratinization that occurs in eyes with severe conjunctival cicatrization.
• **Sjögren syndrome** is an autoimmune inflammatory disease of which dry eyes is a feature

## Physiology

*Tear film constituents*
The tear film has three layers
• **Lipid** layer secreted by the meibomian glands.
• **Aqueous** layer secreted by the lacrimal glands.
• **Mucous** layer secreted principally by conjunctival goblet cells.
The constituents are complex, with as many as a hundred distinct proteins identified.
*Spread of the tear film*
The tear film is mechanically distributed over the ocular surface through a neuronally controlled blinking mechanism. Three factors are required for effective resurfacing of the tear film:
• Normal blink reflex.
• Contact between the external ocular surface and the eyelids.
• Normal corneal epithelium.

*Lipid layer*
• **Composition**
  ○ The outer lipid layer is composed of a polar phase containing phospholipids adjacent to the aqueous-mucin phase and a non-polar phase containing waxes, cholesterol esters and triglycerides.

- The polar lipids are bound to lipocalins within the aqueous layer. These are small secreted proteins that have the ability to bind hydrophobic molecules and may also contribute to tear viscosity.
- Lid movement during blinking is important in releasing lipids from glands. The thickness of the layer can be increased by forced blinking, and conversely reduced by infrequent blinking.

• **Functions**

- To prevent evaporation of the aqueous layer and maintain tear film thickness.
- To act as a surfactant allowing spread of the tear film.
- Deficiency results in evaporative dry eye.

*Aqueous layer*

• **Secretion**

- The main lacrimal glands produce about 95% of the aqueous component of tears and the accessory lacrimal glands of Krause and Wolfring produce the remainder.
- Secretion of tears has basic (resting) and much greater reflex components. The latter occurs in response to corneal and conjunctival sensory stimulation, tear break-up and ocular inflammation, and is mediated via the fifth cranial nerve. It is reduced by topical anaesthesia and falls during sleep. Secretion can increase 500% in response to injury.

• **Composition**

- Water, electrolytes, dissolved mucins and proteins.
- Growth factors derived from the lacrimal gland, the production of which increases in response to injury.

*Mucous layer*

• **Composition**

- Mucins are high molecular weight glycoproteins that may be transmembrane or secretory in type.
- Secretory mucins are further classified as gel-forming or soluble. They are produced mainly by conjunctival goblet cells but also by the lacrimal glands.
- The superficial epithelial cells of the cornea and conjunctiva produce transmembrane mucins that form their glycocalyx (extracellular coating).
- Staining of diseased epithelium with rose Bengal indicates that the transmembrane and gel mucous layers are absent and the cell surface exposed. Damage to the epithelial cells will prevent normal tear film adherence.

• **Functions**
  - To permit wetting by converting the corneal epithelium from a hydrophobic to a hydrophilic surface.
  - Lubrication.
  - Deficiency of the mucous layer may be a feature of both aqueous deficiency and evaporative states. Goblet cell loss occurs with cicatrizing conjunctivitis, vitamin A deficiency, chemical burns and toxicity from medications.

*Regulation of tear film components*

• **Hormonal**
  - Androgens are the prime hormones responsible for regulation of lipid production.
  - Oestrogens and progesterone receptors in the conjunctiva and the lacrimal glands are essential for the normal function of these tissues.

• **Neural** via fibres adjacent to the lacrimal glands and goblet cells that stimulate aqueous and mucus secretion.

## Classification

*Aqueous-deficient*

• **Sjögren syndrome** dry eye (primary or secondary).
• **Non-Sjögren syndrome** dry eye.

*Evaporative*

• **Intrinsic**
  - Meibomian gland deficiency, e.g. posterior blepharitis, rosacea.
  - Disorders of lid aperture, e.g. excessive scleral show, lid retraction, proptosis, facial nerve palsy.
  - Low blink rate, e.g. Parkinson disease, prolonged computer monitor use, reading, watching television.
  - Drug action, e.g. antihistamines, beta-blockers, antispasmodics, diuretics.

• **Extrinsic**
  - Vitamin A deficiency.
  - Topical drugs including the effect of preservatives.
  - Contact lens wear.
  - Ocular surface disease such as allergic conjunctivitis

*Symptoms*

The most common ocular symptoms are feelings of dryness, grittiness and burning that characteristically worsen over the course of the day. Stringy discharge, transient blurring of vision, redness and crusting of the lids are also common.

*Signs*

• **Posterior (seborrhoeic) blepharitis** with meibomian gland dysfunction is often present

• **Conjunctiva**

- Redness.
- Staining with fluorescein and rose Bengal
- Keratinization.
- Conjunctivochalasis is a common response to, and exacerbating factor for, the chronic irritation of dry eye, such that a self-sustaining cycle is maintained. It also commonly occurs in other ocular surface disease (

• **Tear film**

- In the normal eye, as the tear film breaks down the mucin layer becomes contaminated with lipid but is washed away.
- In the dry eye, the lipid-contaminated mucin accumulates in the tear film as particles and debris that move with each blink

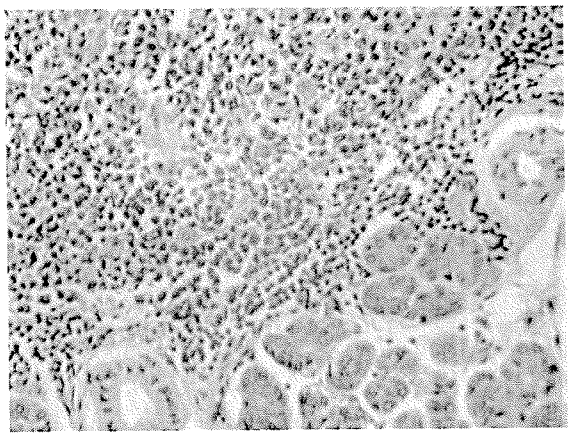
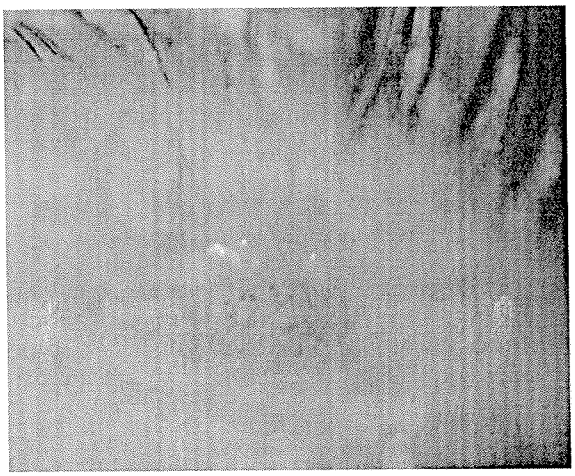
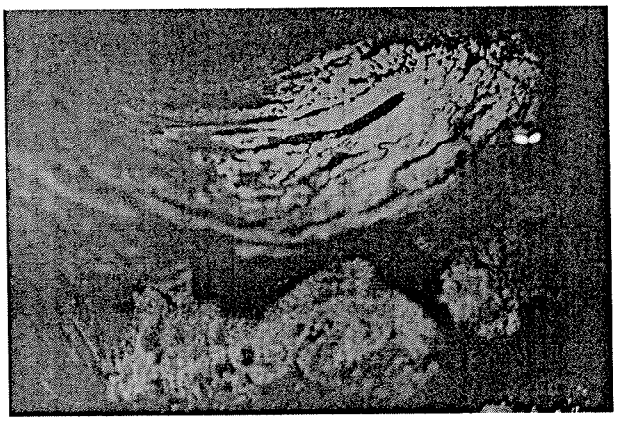


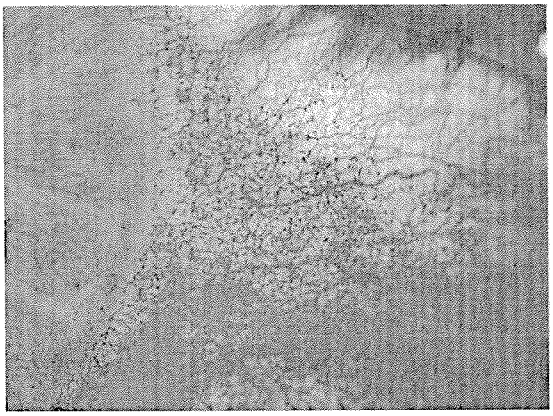
FIG N0.1 shows histology of lacrimal gland in sjogren's syndrome with lymphocytic infiltration



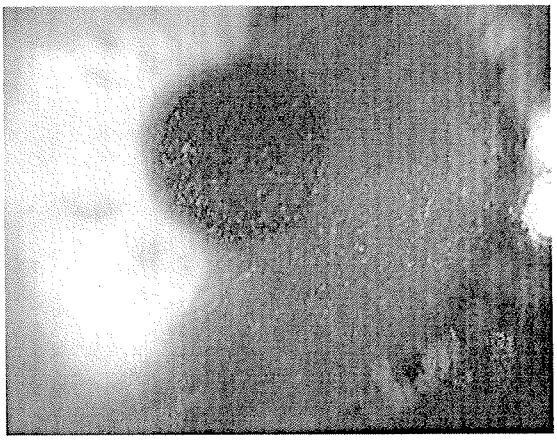
*Posterior blepharitis in dry eye.* (A) *Oil globules at meibomian gland orifices;*



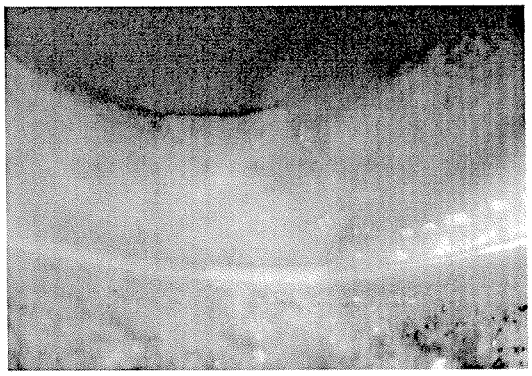
*Conjunctival staining in dry eye.* (A) *Fluorescein;*



*rose Bengal*



*Tear film abnormalities in dry eye.* (A) *Mucous debris;*



*thin marginal tear meniscus*

## CORNEAL SIGNS IN DRY EYE

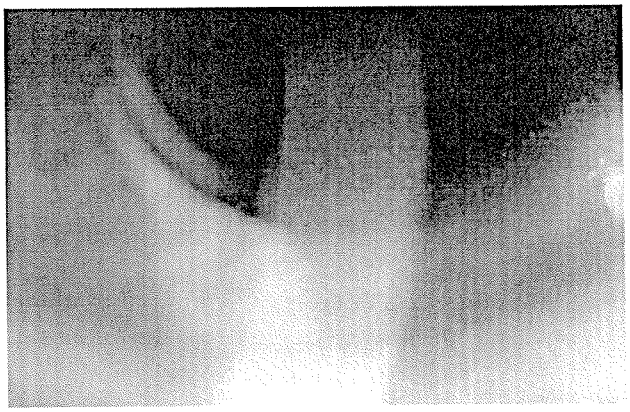


FIG: A

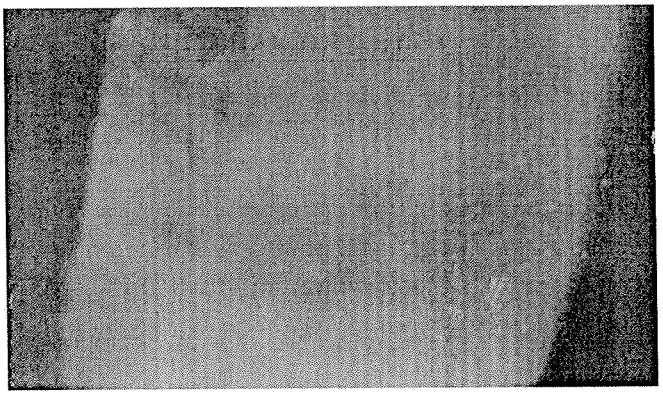


FIG : B



FIG: C

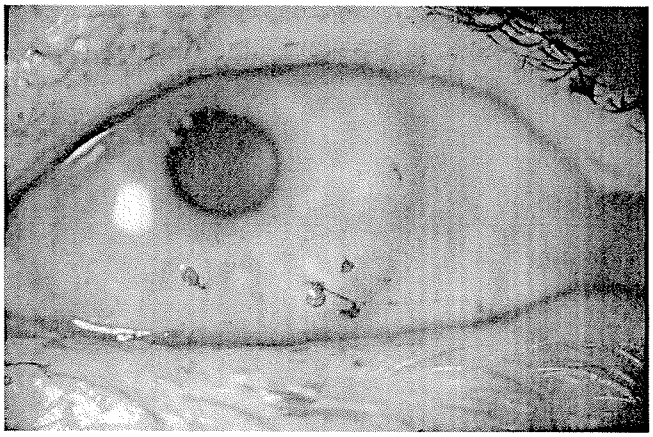


FIG: D

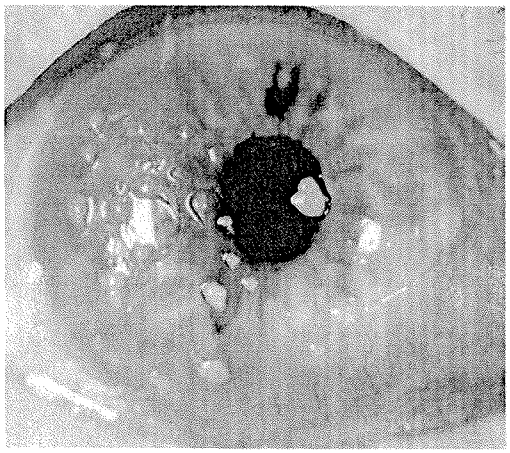
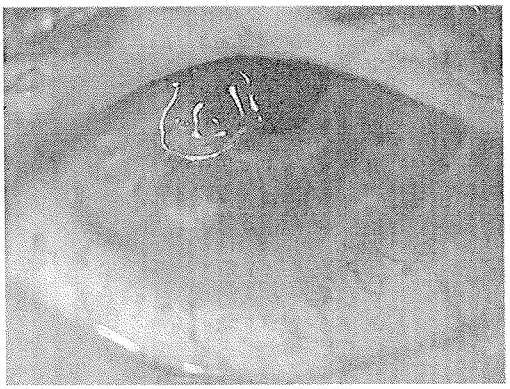


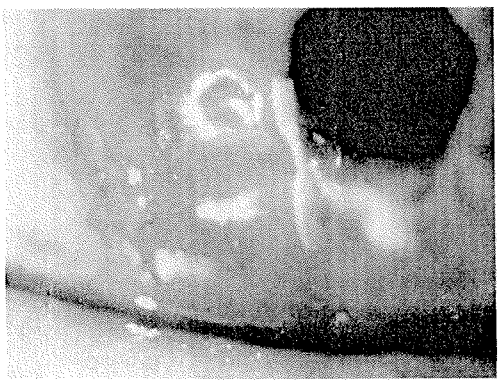
FIG: E

*Corneal signs in dry eye.* (A) *and* (B) *Punctate erosions stained with fluorescein;* (C) *corneal filaments;* (D) *mild (rose Bengal stain) and* (E) *severe mucous plaque Formation*

## CORNEAL COMPLICATIONS IN DRY EYE



*A*



*B*



*C*

*Severe corneal complications of dry eye.* (A) *Melting;* (B) *perforation with iris plugging;* (C) *bacterial infectio*

INVESTIGATION :

The aim of investigation is to confirm and quantify a clinical diagnosis of dry eye. Unfortunately, although the repeatability of symptoms is good, that of clinical tests is poor, as is the correlation between symptoms and tests. The reliability of tests improves as the severity of dry eye increases. The tests measure the following parameters:

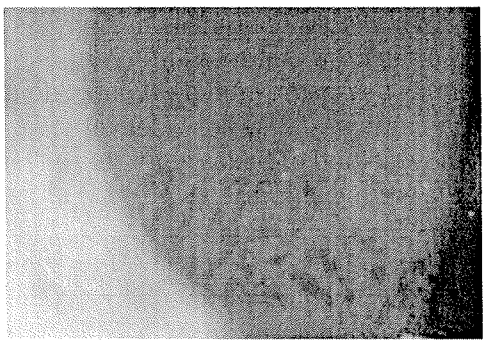
- Stability of the tear film as related to its break-up time (BUT).
- Tear production (Schirmer, fluorescein clearance and tear osmolarity).
- Ocular surface disease (corneal stains and impression cytology).

*Tear film break-up time*

The tear film BUT is abnormal in aqueous tear deficiency and meibomian gland disorders. It is measured as follows:

- Fluorescein 2% or an impregnated fluorescein strip moistened with non-preserved saline is instilled into the lower fornix.
- The patient is asked to blink several times.
- The tear film is examined at the slit lamp with a broad beam using the cobalt blue filter. After an interval, black spots or lines appear in the fluorescein-stained film indicating the formation of dry areas.
- The BUT is the interval between the last blink and the appearance of the first randomly distributed dry spot. A BUT of less than 10 seconds is suspicious.

The development of dry spots always in the same location may indicate a local corneal surface abnormality (e.g. epithelial basement membrane disease) rather than an intrinsic instability of the tear film.



*Tear film break-up time – numerous dry spots are present in a fluoresceinstained tear film;*

*Schirmer test*

The Schirmer test is a useful assessment of aqueous tear production. The test involves measuring the amount of wetting of a special (no. 41 Whatman) filter paper, 5 mm wide and 35 mm long. The test can be performed with or without topical anaesthesia. In theory, when performed with an anaesthetic (Schirmer 2) basic secretion is measured and without anaesthetic (Schirmer 1) it measures maximum basic plus reflex secretion. In practice, however, topical anaesthesia cannot abolish all sensory and psychological stimuli for reflex secretion. The test is performed as follows:

- Excess tears are delicately dried. If topical anaesthesia is applied the excess should be removed from the inferior fornix with filter paper.
- The filter paper is folded 5 mm from one end and inserted at the junction of the middle and outer third of the lower lid, taking care not to touch the cornea or lashes
- The patient is asked to keep the eyes gently closed.
- After 5 minutes the filter paper is removed and the amount of wetting from the fold measured.
- Less than 10 mm of wetting after 5 minutes without anaesthesia or less than 6 mm with anaesthesia is considered abnormal.

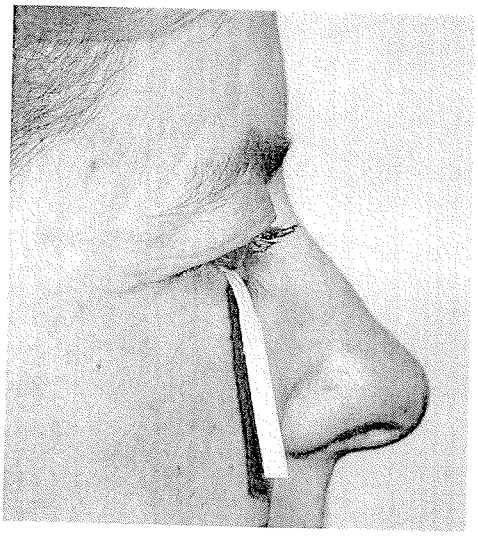
Results can be variable and a single Schirmer test should not be used as the sole criterion for diagnosing dry eye, but repeatedly abnormal tests are highly supportive.

*Ocular surface staining*

- **Fluorescein** stains corneal and conjunctival epithelium (see where there is sufficient damage to allow the dye to enter the tissues.
- **Rose Bengal** is a dye that has an affinity for dead or devitalized epithelial cells that have a lost or altered mucous layer . Corneal filaments and plaques (see are also shown up more clearly by the dye and the use of a red-free filter may help visualization. A 1% solution of rose Bengal or a moistened impregnated strip can be used. The dye may cause intense stinging that can last for up to a day, particularly in patients with severe KCS; to minimize irritation a very small drop should be used, immediately preceded by a drop of topical anaesthetic, and the excess washed out with saline.
- **Lissamine green** stains in a similar fashion to rose Bengal but causes less irritation and may be preferred.
- **The pattern** of staining may aid diagnosis:
  - Interpalpebral staining of the cornea and conjunctiva is common in aqueous tear deficiency.
  - Superior conjunctival stain may indicate superior limbic

keratoconjunctivitis.

- Inferior corneal and conjunctival stain is often present in patients with blepharitis or exposure.



Schirmer's Test

*Other investigations*

- **Fluorescein clearance test**
- **Tear film osmolarity**
- **Tear constituent** measurement. Tear samples can be assayed for the presence of markers known to be elevated (e.g. matrix metalloproteinase-9) or decreased (e.g. lactoferrin) in dry eye.
- **Phenol red thread test**
- **Tear meniscometry**
- **Impression cytology** can determine goblet cell numbers.

## TREATMENT

### Strategy

The underlying causative processes of dry eye are generally not reversible and management is therefore structured around the control of symptoms and the prevention of surface damage. DEWS have produced guidelines based on earlier International Taskforce Guidelines for Dry Eye, in which suggested treatment options depend on the level of severity of disease graded from 1 to 4. The DEWS guidelines can also be applied in a graded approach, proceeding to the next level if the preceding measures are inadequate.

*Level 1*

- **Education and environmental/dietary modifications**
  - Establishment of realistic expectations and emphasis on the importance of compliance.
  - Lifestyle review including the importance of blinking whilst reading, watching television or using a computer screen (which should be orientated below eye level to minimize palpebral aperture size), and the management of contact lens wear.
  - Environmental review, e.g. increasing humidity may be possible for some environments.
  - Instillation aids for eye drops (manufacturer-supplied or makeshift, such as nut-crackers to hold plastic bottles) should be advocated for patients with reduced dexterity (e.g. rheumatoid arthritis).
  - Caution the patient that laser refractive surgery can exacerbate dry eye.
- **Systemic medication review** to exclude contributory effects and eliminate offending agents. Discontinuation of toxic/ preserved topical medication if possible.
- **Artificial tear substitutes including gels and ointments** – see below; some authorities advocate that use of preserved drops should fall within level 1, and categorize nonpreserved drops as a level 2 measure. Mucolytic agents may be specifically indicated for some patients.
- **Eyelid therapy.** Basic measures such as warm compresses and lid hygiene for blepharitis; reparative lid surgery (e.g. entropion, ectropion, excessive lid laxity or scleral show) may be considered as an early measure. Nocturnal lagophthalmos can be addressed by taping the lids closed at bedtime, wearing swimming goggles during sleep, or in extreme cases by lateral tarsorrhaphy.

*Level 2*

- **Non-preserved tear substitutes** are categorized as level 2 treatment by some authorities.

• **Anti-inflammatory agents** such as topical steroids, oral omega fatty acids and other agents such as topical ciclosporin.
• **Tetracyclines** (for meibomianitis, rosacea).
• **Punctal plugs.**
• **Secretagogues**, e.g. pilocarpine, cevilemine, rebamipide.
• **Moisture chamber spectacles and spectacle side shields.**

*Level 3*

• **Serum eye drops.** Autologous or umbilical cord serum.
• **Contact lenses.**
• **Permanent punctal occlusion.**

*Level 4*

• **Systemic anti-inflammatory agents.**
• **Surgery**

- Eyelid surgery, such as tarsorrhaphy.
- Salivary gland autotransplantation.
- Mucous membrane or amniotic membrane transplantation for corneal complications.

Tear substitutes

• **Drops and gels.** A large range of preparations is available; one agent or category of preparation has not demonstrated superiority, and particular agents are often preferred by individual patients with limited rationale.

- Cellulose derivatives (e.g. hypromellose, methylcellulose) are appropriate for mild cases.
- Diquafosol is a newer agent that works as a topical secretagogue.

• **Ointments**

• **Eyelid sprays** contain a liposome-based agent that may stabilize the tear film and reduce evaporation

• **Artificial tear inserts** emplaced once or twice daily offer extended duration treatment and are preferred by some patients.
• **Mucolytic agents.** Acetylcysteine 5% drops may be useful in patients with corneal filaments and mucous plaques, which acetylcysteine dissolves; it may cause stinging on instillation. Acetylcysteine is malodorous and has a limited shelf life. Manual debridement of filaments may also be useful.

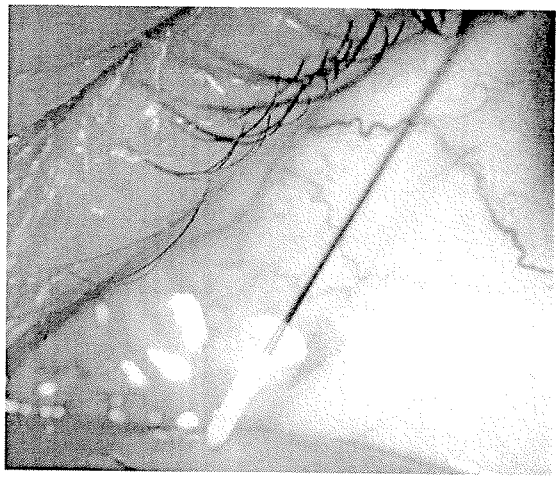
• **Preservatives** can be a potent source of toxicity, especially after punctal occlusion. Numerous non-preserved drops are now available, including some multi-dose products, and in general should be used in preference to preservativecontaining

preparations in any more than mild disease or with instillation more than three or four times daily.

### Punctal occlusion

Punctal occlusion reduces drainage and thereby preserves natural tears and prolongs the effect of artificial tears. It is of greatest value in patients with moderate to severe KCS who have not responded to frequent instillation of topical agents.

- **Temporary** occlusion can be achieved by inserting collagen plugs into the canaliculi; these dissolve over a number of weeks. The main aim is to ensure that epiphora does not occur following permanent occlusion.
  - Initially the inferior puncta are occluded and the patient is reviewed after 1 or 2 weeks.
  - If the patient is now asymptomatic and without epiphora, the plugs can be removed and the inferior canaliculi permanently occluded (see below).
  - In severe KCS both the inferior and superior canaliculi can be plugged.
- **Reversible** prolonged occlusion can be achieved with silicone or long-acting (2–6 months) collagen plugs.
  - Problems include extrusion, granuloma formation and distal migration.
  - Plugs that pass into the horizontal portion of the canaliculus cannot be visualized and although they can usually be flushed out with saline, if they cause epiphora this is not always possible and surgical retrieval may be needed.
- **Permanent** occlusion should be undertaken only in patients with severe dry eye who have had a positive response to temporary plugs without epiphora. It should be avoided in patients, especially if young, who may have reversible pathology. All four puncta should not be occluded at the same time.
  - Permanent occlusion is performed following punctal dilatation by coagulating the proximal canaliculus with cautery; following successful occlusion, it is important to watch for signs of recanalization.
  - Laser cautery seems to be less consistently effective than surgical thermal coagulation.



A



B

(A) *Insertion of a silicone plug;* (B) *plug in place*
*(Courtesy of S Tuft – fig. A)*

## Anti-inflammatory agents

- **Topical steroids,**
- **Omega fatty acid supplements**
- **Oral tetracyclines**
- **Topical ciclosporin**

## Contact lenses

Although contact lens wear can exacerbate dry eye, particularly due to inflammatory, sensory and evaporative effects, these can be outweighed by the reservoir effect of fluid trapped behind the lens, and they are effective at relieving symptoms from secondary corneal changes. Patients should be cautioned regarding the possibility of bacterial keratitis.

- **Low water** content HEMA lenses may be successfully fitted to moderately dry eyes.
- **Silicone** rubber lenses that contain no water and readily transmit oxygen are effective in protecting the cornea in extreme tear film deficiency, although deposition of debris on the surface of the lens can blur vision and be problematic. The continued availability of these lenses is in doubt.

- **Occlusive** gas permeable scleral contact lenses provide a reservoir of saline over the cornea. They can be worn on an extremely dry eye with exposure.

## Optimization of environmental humidity

- **Reduction of room temperature**
- **Room humidifiers**

## Miscellaneous options

- **Botulinum toxin injection**
- **Oral cholinergic agonists**
- **Submandibular gland transplantation**
- **Serum eye drops.**

Debaditya Nath
U16 MB282

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

(19)

## DRY EYE

## MULTIPLE CHOICE QUESTIONS

Course Code: OPH05

I. ANSWER ALL THE QUESTIONS

1. How many layers in tear film have?

   Ans : 3

2. Which is the inner layer of tear film?

   Ans: Mucous layer.

3. The outer oilap layer os deceived from which part of the eye?

   Ans: Meibomian gland.

4. Name three symptoms of dry eye?

   Ans: i) Sensitivity to light.
   ii) Redness
   iii) Dryness.

5. Do contact lens weares get dry eye?

   Ans: Yes.

6. Disease causing dry eye are

   Ans: i) Keratoconjuctivitis sicca.
   ii) Sjogren syndrome.
   iii) Sclerodesma.
   iv) Graft v/s Host disease.

7. Which vitamin deficiency is associated with dry eye?

   Ans: D

8. Investigations done for dry eye?

   a) Tear film break up time

   b) Schmim's test

9. Treatment for dry eye includes all except?

   a) Lubricants

   b) Paracetamol

   c) Punctal cauterization

   d) Autologins serum tears

10. Dyes commonly used in TBUT?

i) Fluorescein dye.

ii) _____

iii) _____

**Annexure- II**

# VALUE ADDED COURSE

## DRY EYE

### 4. List of Students Enrolled Jan-2016 – Apr-2016

| Sl. No. | Univ. Reg. No. | Name of the Student | SIGNATURE |
|---|---|---|---|
| 1 | U16MB281 | DASARI VENKATA SAI MOUNISH | |
| 2 | U16MB282 | DEBARPITA NATH | |
| 3 | U16MB283 | DEEBAK .I | |
| 4 | U16MB284 | DEEKSHITH D.R | |
| 5 | U16MB285 | DEEPIKAA D.V | |
| 6 | U16MB268 | DELFI MARY .E | |
| 7 | U16MB287 | DEVIKA.U.M | |
| 8 | U16MB288 | DHAKSHANA .M | |
| 9 | U16MB289 | EDA SAI VENKATA TEJA | |
| 10 | U16MB290 | GAURAV KUMAR | |
| 11 | U16MB291 | GOKUL SRIRAM .D | |
| 12 | U16MB292 | GOLLA SRUTHI | |
| 13 | U16MB293 | GOMATHI .M | |
| 14 | U16MB294 | GRACELIN RINI .J | |
| 15 | U16MB295 | GUNASUNDARI .M | |
| 16 | U16MB296 | GUNTI YAGNA NARAYAN | |
| 17 | U16MB297 | HANEESHA PALETI | |
| 18 | U16MB298 | HARIHARAN .J.K | |
| 19 | U16MB299 | HARIPRIYA .T | |
| 20 | U16MB300 | HARISHKA.S | |
| 21 | U16MB301 | HARITHA SHREE .K | |

| | | | |
|---|---|---|---|
| 22 | U16MB302 | HARSHITHA CHOWDARY .P | |
| 23 | U16MB303 | HEMAPRIYA .G | |
| 24 | U16MB304 | JADHAV MAHESH MOHANRAO | |
| 25 | U16MB305 | JAGAIPRIYA .M | |
| 26 | U16MB306 | JAYASRI .J | |
| 27 | U16MB307 | JESTIN K.J | |
| 28 | U16MB308 | JEYACHANDRAN .S | |
| 29 | U16MB309 | JINCY J MANU | |
| 30 | U16MB310 | KARTHIK .K | |

**Prof.K.Rathnakumar, MS,DO**

**RESOURCE PERSON**

**Prof.D.Baba, MS, -HOD**

**COORDINATOR**

PROFESSOR & HOD
DEPARTMENT OF OPHTHALMOLOGY,
SRI LAKSHMI NARAYANA 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 DASARI VENKATA SAI MOUNISH (U16MB281) has actively participated in the Value Added Course on DRY EYE held during APR 2016 TO JUNE 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Prof.K.Rathnakumar, MS, DO,
RESOURCE PERSON

Prof.D.Baba, MS,
COORDINATOR

# Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

Accredited by the University under section 3 of the UGC Act 1956

## CERTIFICATE OF MERIT

This is to certify that DEBARPITA NATH (U16MB282) has actively participated in the Value Added Course on DRY EYE held during APR 2016 TO JUNE 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Prof.K.Rathnakumar, MS, DO,
RESOURCE PERSON

Prof.D.Baba, MS,
COORDINATOR

# Student Feedback Form

Course Name: **DRY EYE**

Subject Code: **OPH05**

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 : 30/4/2016

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: DRY EYE**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **DRY EYE** for 30students in APR - JUNE 2016. 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.

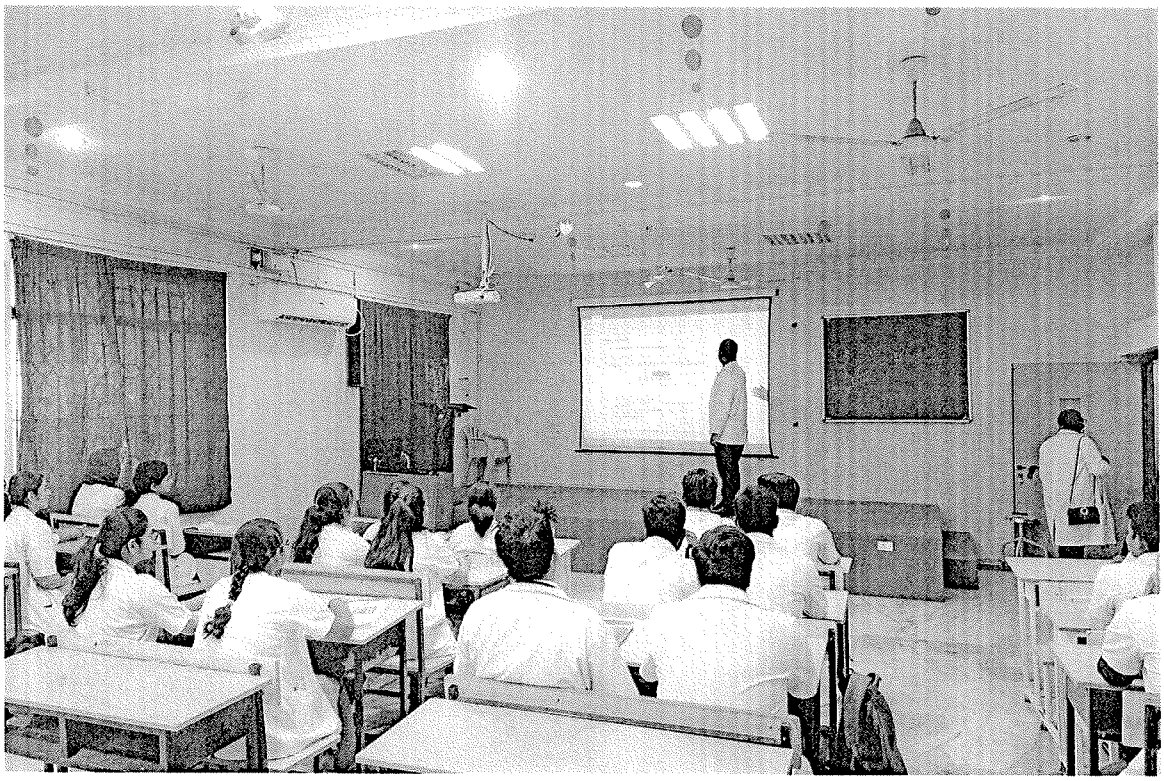
Kind Regards

Prof.D.Baba, MS

HOD ,Ophthalmology

**Encl: Certificates**

**Photographs**



# Sri Lakshmi Narayana Institute of Medical Sciences

Date: 04.06.2016

From

Dr. Thangapannerselvam
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 concepts of nutrition and the immune system**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled **Basic concepts of nutrition and the immune system** for interns May to June 2016. We solicit your kind permission for the same.

Kind Regards

Dr. Thangapannerselvam

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayakumar

The HOD: Dr. Thangapaneerselvam

The Expert: Dr. Prabhakar Reddy

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 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

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

07.05.2016

**Sub: Organising Value-added Course: Nutrition and the Immune System. reg**

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Basic concepts of Nutrition and the Immune System"**. 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 2016. 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**

Nutrition and the Immune System-BIO-04

**2. Duration & Period**

30 hrs & May –June 2016

**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 May –June 2016

**8. Year of discontinuation:** 2016

**9. Summary report of each program year-wise**

| **Value Added Course-** May –June 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | BIO 04 | Nutrition and the Immune System-BIO-01 | Dr. Thangapannerselvam<br><br>Dr. Prabhakar Reddy | CRRI Interns | 20 students MAY-JUNE 2019) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

1. Dr. Thangapannerselvam
2. **Dr. Prabhakar Reddy**

**COORDINATOR**
Dr. Thangapannerselvam

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

## Course Proposal

Course Title: **Basic concepts of Nutrition and the Immune System**

**Course Objective:**

Course Outcome:

Course Audience: MBBS and Allied health sciences

Course Coordinator: Dr. Pannerselvam

Course Faculties with Qualification and Designation:

1.Dr. Pannerselvam, Professor & HOD

2.Dr.Prabhakar Reddy, Assistant Professor

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

| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1. | 11-5-2016 | Introduction to food and nutrition<br>a. Relationship between Food,<br>b. Nutrition and Health<br>c. c. Relationship between Food,<br>d. d. Nutrition and Health<br>e. Digestion, absorption and utilization of nutrients Digestion, absorption and utilization of nutrients<br>f. Nutrient requirements Recommended dietary allowances | 4-6p.m | 2 |
| 2. | 12-5-016 | Meal planning<br>a. Guidelines for diet practice aspects of food selection<br>b. Hygine of food and food sanitation | 2-3p.m | 1 |
| 3. | 13-5-2016 | a. Absorption and digestion of carbohydrate<br>b. Absorption and digestion of protein | 4-6p.m | 2 |

| | | | | |
|---|---|---|---|---|
| | | c. Absorption and digestion of lipids<br>d. Absorption and digestion of nucleic acid | | |
| 4. | 14-5-2016 | Therapeutic Nutrition<br>a. Principles of therapeutic nutrition<br>b. Relationship between lung diseases and diet content<br>c. Relationship between fever and diet content<br>d. Relationship between heart failure and diet content<br>e. Relationship between Gastrointestinal and diet content<br>f. Relationship between and diabetes mellitus | 4-6p.m | 2 |
| 5. | 15-5-2016 | Therapeutic Nutrition<br>a. Principles of therapeutic nutrition<br>b. Relationship between lung diseases and diet content<br>c. Relationship between fever and diet content<br>d. Relationship between heart failure and diet content<br>e. Relationship between Gastrointestinal and diet content<br>f. Relationship between and diabetes mellitus | 4-6p.m | 2 |
| 6. | 16-5-2016 | Therapeutic Nutrition<br>a. Principles of therapeutic nutrition<br>b. Relationship between lung diseases and diet content<br>c. Relationship between fever and diet content<br>d. Relationship between heart failure and diet content<br>e. Relationship between Gastrointestinal and diet content | 4-6p.m | 2 |

| | | | | |
|---|---|---|---|---|
| | | f. Relationship between and diabetes mellitus | | |
| 7. | 17-5-2016 | Pregnancy Nutrients | 4-6PM | 2 |
| 8. | 18-5-2016 | Nutri-genetics and Nutri-genomics | 4-6PM | 2 |
| 9. | 19-5-2016 | Nutri-genetics and Nutri-genomics | 4-6PM | 2 |
| 10. | 20-5-2016 | Role of Nutrients in neuroscience | 4-6 | 2 |
| 11. | 21-5-2016 | Medical Nutrients | 4-6P.M | 2 |
| 12. | 22-5-2016 | Nutrients disorders | 4-6p.m | 2 |
| 13. | 23-5-2016 | Nutrients disorders | 4-6p.m | 2 |
| 14. | 24-5-2016 | Relationship between Micronutrients and immunity | 4-5p.m | 2 |
| 15. | 25-5-2016 | Meal planning, sanitation and therapeutic nutrients | 4-6P.M | 2 |
| 16. | 26-5-2016 | Meal planning, sanitation and therapeutic nutrients | 4-6p.m | 2 |
| | | **Total** | | 31hrs |

**REFERENCE BOOKS:**


1. Calder PC . Feeding the immune system. Proc. Nutr. Soc. 2013;72:299–309.doi:10.1017/S0029665113001286
2. Assessment of Dietary Intake and Nutrient Gaps, and Development of Food-Based Recommendations, among Pregnant and Lactating Women in Zinder, Niger: An Optifood Linear Programming Analysis

3. Comparison of Vitamin D Levels in Naive, Treated, and Inactive Carriers with Chronic Hepatitis B Virus ShahnazTavakolpour Sali et al., Journal of Clinical and Translational Hepatology, 2016
4. The Cardio Connection: CVH Influences Ocular Diseases, Study Says Cardiology Advisor, 2020

# Basic concepts of Nutrition and the Immune System




## PARTICIPANT HAND BOOK

*Annexure- I*

## INTRODUCTION:

In recent years, evidence has accumulated on the effects of nutrients on metabolic processes. The role of specific nutrients in modulating immune function has received much attention because of the significant role of the immune system in a variety of disease states. The immune system depends on the complex interactions of its various parts. In response to an "antigen" or foreign substance that penetrates the external protective barriers of the human body, nonspecific (phagocytes, complement) defense mechanisms and antigen-specific factors are activated. The antigen-specific immune system relies on both humoral (antibodies and B cells) and cellular (T cells and lymphokines) defenses. Malnutrition causes a decline in all aspects of host defense. Correction of malnutrition in hospitalized patients and restoration of immunocompetence has become a goal of nutrition support practitioners today. The application of current research findings to patient care requires a basic understanding of immunology.

Assessing the bidirectional relationship between diet and the immune system can be undertaken utilizing multiple approaches. In human intervention studies, investigators have assessed the impact of bioenergetic status [1], isolated nutrients [2–6], and dietary patterns, such as the Mediterranean Diet [7,8], in both controlled feeding and free-living intervention studies on numerous indices of immune function (e.g., circulating cytokines, high-sensitivity C-reactive Protein, antibodies, tissue-specific Nutrients 2020, 12, 818; doi:10.3390/nu12030818 www.mdpi.com/journal/nutrients Nutrients 2020, 12, 818 2 of 15 transcriptomes). To complement such intervention approaches, a growing body of literature, utilizing observational study designs, has assessed dietary intakes via self-reported measures and circulating biomarkers, and

assessed their associations with similar immune function outputs, as well as disease endpoints (e.g., allergy incidence, chronic disease risk). Such investigations have occurred in a variety of populations, including pregnant women and young infants, adults, individuals with chronic disease, metabolic syndrome, allergic, inflammatory and/or autoimmune diseases. Typically, these clinical observations follow and are complemented by investigations in laboratory animals and cultured cells to provide mechanistic insights, although important differences in immune system development and function and lack of in vivo interactions limit the direct translation of findings in animal studies to humans. It is critical to note that, at present, few large, randomized controlled trials exist with clinical endpoints (e.g., event reduction; disease remission) that demonstrate an impact of diet on immune-mediated disease risk. In some instances, such as the case of early dairy protein exposure and risk of beta-cell autoimmunity, bioplausible hypotheses have not been confirmed in large clinical trials. The difficulties facing nutritional immunology and the caveats of relying on surrogate endpoints are made further evident by the long history of testing the inflammation-atherosclerosis hypothesis; researchers have spent decades employing numerous anti-inflammatory agents prior to demonstrating an effect of interleukin (IL)-1 beta inhibition on cardiovascular event risk reduction. While enthusiasm for nutrition and immune-mediated disease risk abounds, careful consideration of the nature and quality of the data are paramount

**AIM OF THE COURSE:**

To evaluate the enhancement of Nutrition and the Immune System in human body system

**OBJECTIVE**

1. Basic knowledge of nutrition and immune interactions can be utilized to formulate nutritional recommendations and interventions that may reduce illness and improve chances of survival.

- To identify the Immune responses are sensitive and functional indices of nutritional status and can aid in assessing prognosis in medical and surgical patients.

## METHODOLOGY

1. 20 MBBS students willing to take part in the study were included.
2. The study group students were briefed about the role of specific nutrients in modulating immune function has received much attention because of the significant role of the immune system in a variety of disease states.
3. Taken class about Nutrients and Immunity and awareness created about nutrients among students
4. Feedback was given by students for improvement based on performance.

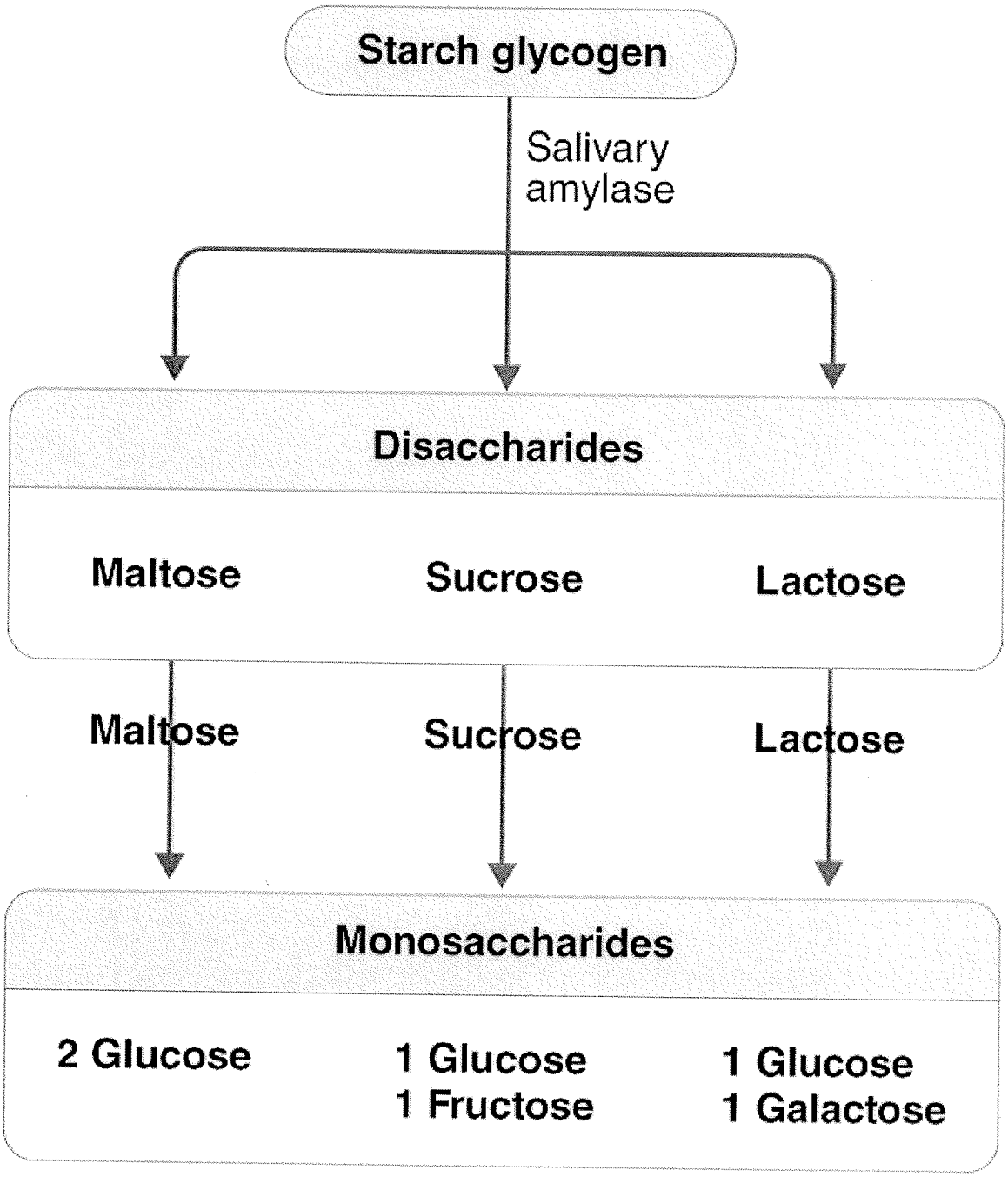
The foods we eat contain nutrients. Nutrients are substances required by the body to perform its basic functions. Nutrients must be obtained from our diet, since the human body does not synthesize or produce them. Nutrients have one or more of three basic functions: they provide energy, contribute to body structure, and/or regulate chemical processes in the body. These basic functions allow us to detect and respond to environmental surroundings, move, excrete wastes, respire (breathe), grow, and reproduce. There are six classes of nutrients required for the body to function and maintain overall health. These are carbohydrates, lipids, proteins, water, vitamins, and minerals. Foods also contain non-nutrients that may be harmful (such as natural toxins common in plant foods and additives like some dyes and preservatives) or beneficial (such as antioxidants).

Carbohydrates (a.k.a. "carbs") are the main fuel source for the body and are basically many sugar molecules strung together. "Simple carbohydrates" are actually just one isolated simple sugar molecule such as glucose, sucrose or galactose. "Complex carbohydrates" are many sugar molecules linked together. Not all carbohydrates are considered equal as you will see in the dedicated Carbohydrate section. A high carbohydrate diet from only good sources such as fruits, vegetables and whole grains NOT from processed refined foods is the recommendation.

Fat is not always bad, but its intake should be quite low to protect your heart from heart disease. While fat from animal sources will carry with it large amounts of the deadly fat cholesterol and harmful saturated fat, when you get fat from plant sources it will cholesterol free and mostly unsaturated. Certain fats such as omega-3 and omega-6 fatty acids are essential nutrients, but only small amounts are needed in the diet. Knowing where to get the right type fat and amount of fat in your diet can make all the difference in being heart healthy or having a heart attack.

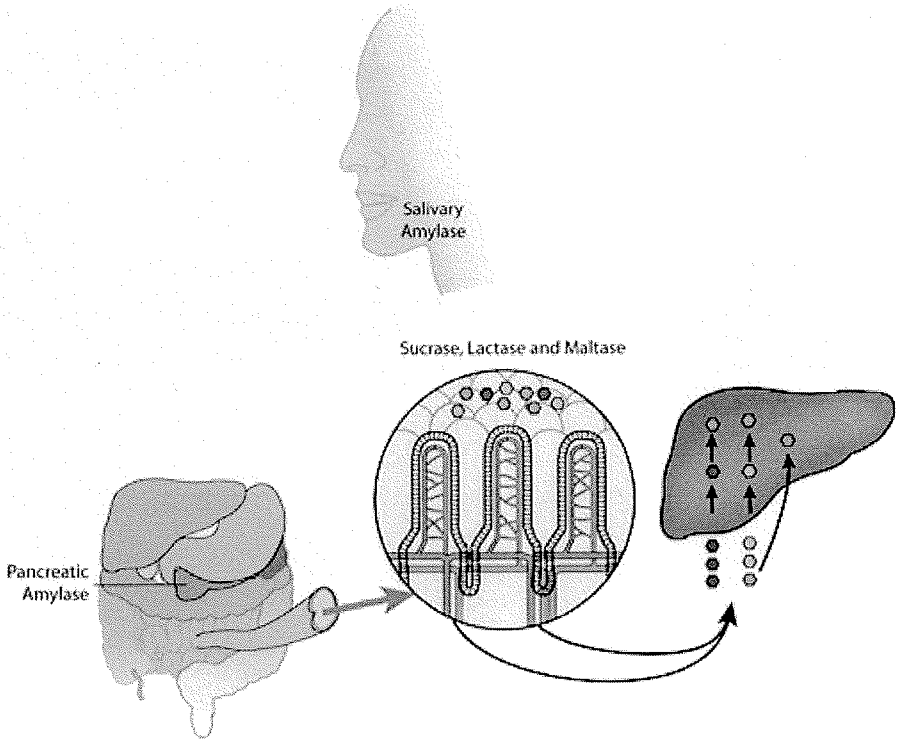
Protein is a chain of "amino acids" put together in a complex way to perform one specific molecular task. All amino acids originate from plant sources initially. Humans are not able to make new amino acids, but can convert one to another. When you eat protein, you digest the protein down into its basic amino acids. Like carbohydrates and fats, not all protein was created equal from a health perspective. Hint: Plant protein is the healthiest.

Digestion and Absorption of Carbohydrates




Carbohydrates are one of the essential nutrients in the human diet. There are two types of carbohydrates that can be digested by the human digestive system– sugar and starch.

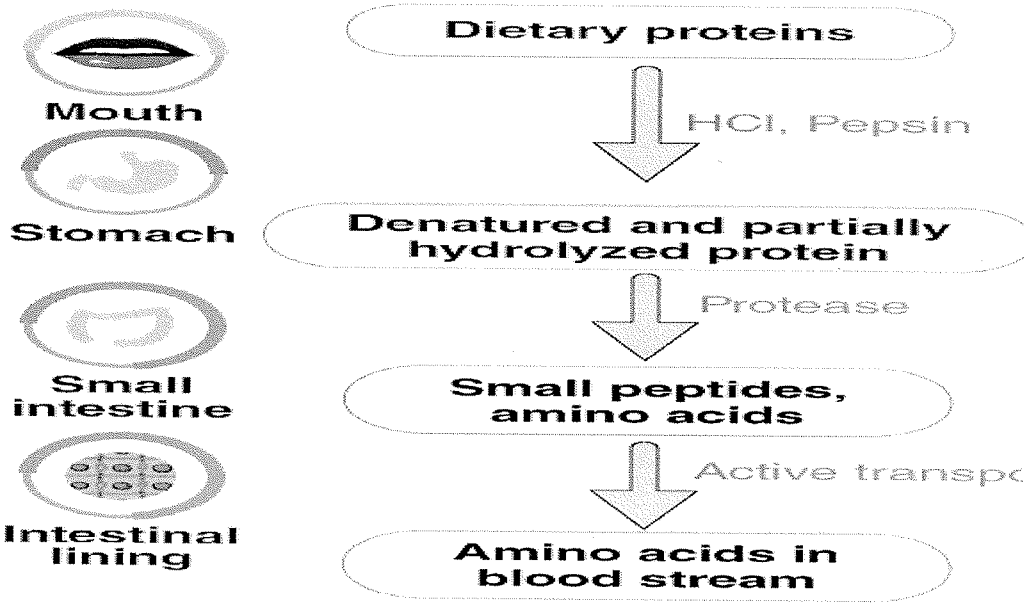
Sugar is broken down in the gastrointestinal tract by the small intestine and three enzymes present in the mouth, namely, Lactase, Sucrase, and Maltase.




In the same way, starch is broken down with the help of the Amylase enzymes which are present in the mouth and the stomach. After digestion, carbohydrates are absorbed in the small intestine with the help of minute finger-shaped projections known as Villi.

The chemical digestion of carbohydrates begins in the mouth. The below flowchart explains in detail about the series of steps involved in breaking down the carbohydrates into their monomers.

# Digestion and Absorption of Proteins




Proteins play a vital role in the growth and replenishment of body cells and tissues.

The digestion of proteins takes place in the stomach with the help of protease and pepsin enzymes, which breaks down the proteins into amino acids. The process is facilitated by the hydrochloric acid present in the stomach.

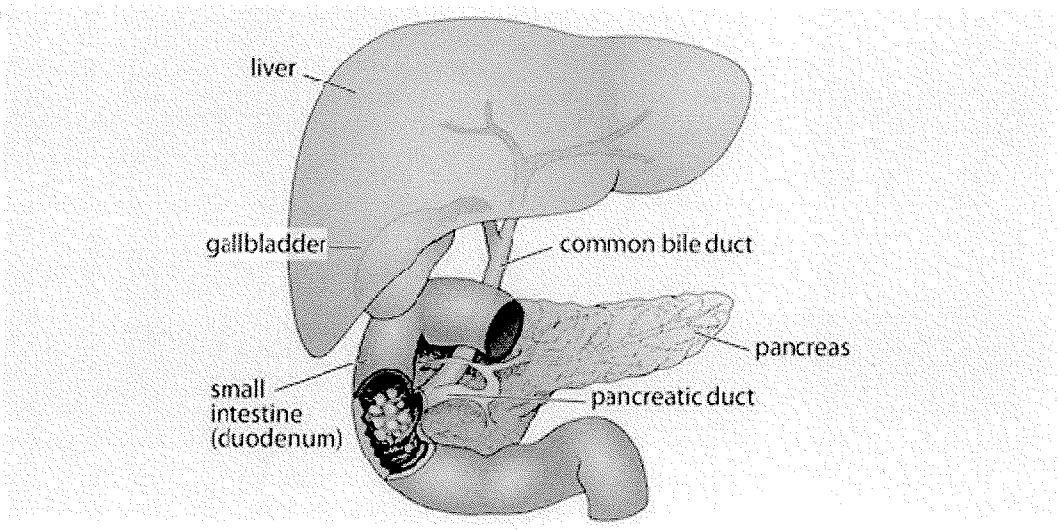
Amino acids are tiny elements which get absorbed into the blood system through the wall of the small intestine.

**Digestion and Absorption of Lipids**

Lipids are organic compounds comprising fatty acids, which are insoluble in water. Fats are the most common examples of lipids. The insoluble property of lipids makes the digestion and absorption of fats a complicated process.

Since they are hydrophobic, fats stick together as a large glob of insoluble mass after reaching the stomach. It is broken down with the help of bile juice, which

contains bile salts. These broken molecules are then acted upon by pancreatic lipase, the major fat-absorbing enzymes in the body.




**Micronutrients**

Micronutrients play a central part in metabolism and in the maintenance of tissue function. An adequate intake therefore is necessary, but provision of excess supplements to people who do not need them may be harmful. Single micronutrient deficiency states are comparatively easily recognised and treated. Subclinical deficiency, often of multiple micronutrients, is more difficult to recognise, and laboratory assessment is often complicated by the acute phase response. Clinical benefit is most likely in those people who are severely depleted and at risk of complications, and is unlikely if this is not the case. There is little evidence for supplements leading to a reduction in the incidence of infections in the elderly population, in coronary artery disease, or in malignant disease. The best evidence for benefit is in critical illness, and in children in developing countries consuming a deficient diet. More clinical trials are required with good clinical outcomes to optimise intake in prevention and treatment of disease.

- Cofactors in metabolism—trace elements are frequently involved in modulating enzyme activity or are an integral part of enzyme prosthetic groups—for example, zinc is a cofactor for over 100 enzymes, whereas selenium is required in the form of selenocysteine within the enzyme glutathione peroxidase.
- Coenzymes in metabolism—many vitamins or metabolites of vitamins are required to play an active part within complex biochemical reactions, for example, riboflavin and niacin in the electron transport chain, or folic acid as part of methyl group transfer. These reactions are critical to intermediary metabolism and ensure utilisation of the major nutrients to provide energy, proteins and nucleic acids.
- Genetic control—zinc "fingers" are transcription control factors that bind to DNA and regulate transcription of receptors for steroid hormones and other factors.
- Antioxidants—much of the popular interest in the micronutrients stems from the recognition that many of the micronutrients have antioxidant properties. Oxidative metabolism inevitably leads to generation of reactive oxygen species (ROS) or "free radicals", which have the potential to cause further oxidative reactions, especially to those parts of the cell in a relatively reduced state, such as cell membranes or nucleic acids.[1] The potential to cause damage is limited by mechanisms that include direct quenching of oxidant activity by tocopherols (vitamin E) or carotenoids (vitamin A), or enzyme systems to dispose of the products of oxidation—superoxide dismutase (either zinc/copper or manganese dependent) and glutathione peroxidase (selenium dependent).

Depending on the size of the molecule, carbohydrates may be simple or complex.

- **Simple carbohydrates:** Various forms of sugar, such as glucose and sucrose (table sugar), are simple carbohydrates. They are small molecules, so they can be broken down and absorbed by the body quickly and are the quickest source of energy. They quickly increase the level of blood glucose (blood sugar). Fruits, dairy products, honey, and maple syrup contain large amounts of simple carbohydrates, which provide the sweet taste in most candies and cakes.
- **Complex carbohydrates:** These carbohydrates are composed of long strings of simple carbohydrates. Because complex carbohydrates are larger molecules than simple carbohydrates, they must be broken down into simple carbohydrates before they can be absorbed. Thus, they tend to provide energy to the body more slowly than simple carbohydrates but still more quickly than protein or fat. Because they are digested more slowly than simple carbohydrates, they are less likely to be converted to fat. They also increase blood sugar levels more slowly and to lower levels than simple carbohydrates but for a longer time. Complex carbohydrates include starches and fibers, which occur in wheat products (such as breads and pastas), other grains (such as rye and corn), beans, and root vegetables (such as potatoes and sweet potatoes).

Carbohydrates may be

- Refined
- Unrefined

**Refined** means that the food is highly processed. The fiber and bran, as well as many of the vitamins and minerals they contain, have been stripped away. Thus, the body processes these carbohydrates quickly, and they provide little

nutrition although they contain about the same number of calories. Refined products are often enriched, meaning vitamins and minerals have been added back to increase their nutritional value. A diet high in simple or refined carbohydrates tends to increase the risk of obesity and diabetes.
If people consume more carbohydrates than they need at the time, the body stores some of these carbohydrates within cells (as glycogen) and converts the rest to fat. Glycogen is a complex carbohydrate that the body can easily and rapidly convert to energy. Glycogen is stored in the liver and the muscles. Muscles use glycogen for energy during periods of intense exercise. The amount of carbohydrates stored as glycogen can provide almost a day's worth of calories. A few other body tissues store carbohydrates as complex carbohydrates that cannot be used to provide energy.

Most authorities recommend that about 50 to 55% of total daily calories should consist of carbohydrates. Fewer than 10% of total daily calories should come from added sugars. Added sugars are syrups and other caloric sweeteners used in other food products. Added sugars are listed as an ingredient in food labels. They include brown sugar, corn sweetener, corn syrup, dextrose, fructose, glucose, high-fructose corn syrup, honey, invert sugar, lactose, malt syrup, maltose, molasses, raw sugar, sucrose, trehalose, and turbinado sugar. Naturally occurring sugars, such as those in fruit or milk, are not added sugars.

Glycemic index
The glycemic index of a carbohydrate represents how quickly its consumption increases blood sugar levels. Values range from 1 (the slowest) to 100 (the fastest, the index of pure glucose). However, how quickly the level actually increases also depends on what other foods are ingested at the same time and other factors.

The glycemic index tends to be lower for complex carbohydrates than for simple carbohydrates, but there are exceptions. For example, fructose (the sugar in fruits) has little effect on blood sugar.

The following also influence a food's glycemic index:

- **Processing:** Processed, refined, or finely ground foods tend to have a higher glycemic index.
- **Type of starch:** Different types of starch are absorbed differently. For example, potato starch is digested and absorbed into the bloodstream relatively quickly. Barley is digested and absorbed much more slowly.
- **Fiber content:** The more fiber a food has, the harder it is to digest. As a result, sugar is absorbed more slowly into the bloodstream.
- **Ripeness of fruit:** The riper the fruit, the more sugar it contains, and the higher its glycemic index.
- **Fat or acid content:** The more fat or acid a food contains, the more slowly it is digested and the more slowly its sugars are absorbed into the bloodstream.
- **Preparation:** How a food is prepared can influence how quickly it is absorbed into the bloodstream. Generally, cooking or grinding a food increases its glycemic index because these processes make food easier to digest and absorb.
- **Other factors:** The way the body processes food varies from person to person, affecting how quickly carbohydrates are converted to sugar and absorbed. How well a food is chewed and how quickly it is swallowed also have an effect.

The glycemic index is thought to be important because carbohydrates that increase blood sugar levels quickly (those with a high glycemic index) also quickly increase insulin levels. The increase in insulin may result in low blood

sugar levels (hypoglycemia) and hunger, which tends to lead to consuming excess calories and gaining weight.

Carbohydrates with a low glycemic index do not increase insulin levels so much. As a result, people feel satiated longer after eating. Consuming carbohydrates with a low glycemic index also tends to result in more healthful cholesterol levels and reduces the risk of obesity and diabetes mellitus and, in people with diabetes, the risk of complications due to diabetes.

In spite of the association between foods with a low glycemic index and improved health, using the index to choose foods does not automatically lead to a healthy diet. For example, the glycemic index of potato chips and some candy bars—not healthful choices—is lower than that of some healthful foods, such as brown rice. Some foods with a high glycemic index contain valuable vitamins and minerals. Thus, this index should be used only as a general guide to food choices.

Glycemic load

The glycemic index indicates only how quickly carbohydrates in a food are absorbed into the bloodstream. It does not include how much carbohydrate a food contains, which is also important. Glycemic load includes the glycemic index and the amount of carbohydrate in a food. A food, such as carrots, bananas, watermelon, or whole-wheat bread, may have a high glycemic index but contain relatively little carbohydrate and thus have a low glycemic load. Such foods have little effect on the blood sugar level.

Glycemic load also includes how changes in blood sugar are affected by the combination of foods eaten together. The glycemic index does not.

## Proteins

Proteins consist of units called amino acids, strung together in complex formations. Because proteins are complex molecules, the body takes longer to break them down. As a result, they are a much slower and longer-lasting source of energy than carbohydrates.

There are 20 amino acids. The body synthesizes some of them from components within the body, but it cannot synthesize 9 of the amino acids—called essential amino acids. They must be consumed in the diet. Everyone needs 8 of these amino acids: isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine. Infants also need a 9th one, histidine.

The percentage of protein the body can use to synthesize essential amino acids varies from protein to protein. The body can use 100% of the protein in egg and a high percentage of the proteins in milk and meats. The body can use a little less than half of the protein in most vegetables and cereals.

The body needs protein to maintain and replace tissues and to function and grow. Protein is not usually used for energy. However, if the body is not getting enough calories from other nutrients or from the fat stored in the body, protein is used for energy. If more protein is consumed than is needed, the body breaks the protein down and stores its components as fat.

The body contains large amounts of protein. Protein, the main building block in the body, is the primary component of most cells. For example, muscle, connective tissues, and skin are all built of protein.

Adults need to eat about 60 grams of protein per day (0.8 grams per kilogram of weight or 10 to 15% of total calories). Adults who are trying to build

muscle need slightly more. Children also need more because they are growing. People who are limiting calories to lose weight typically need a higher amount of protein to prevent loss of muscle while they are losing weight.

## Fats

Fats are complex molecules composed of fatty acids and glycerol. The body needs fats for growth and energy. It also uses them to synthesize hormones and other substances needed for the body's activities (such as prostaglandins).

Fats are the slowest source of energy but the most energy-efficient form of food. Each gram of fat supplies the body with about 9 calories, more than twice that supplied by proteins or carbohydrates. Because fats are such an efficient form of energy, the body stores any excess energy as fat. The body deposits excess fat in the abdomen (omental fat) and under the skin (subcutaneous fat) to use when it needs more energy. The body may also deposit excess fat in blood vessels and within organs, where it can block blood flow and damage organs, often causing serious disorders.

### Fatty acids

When the body needs fatty acids, it can make (synthesize) certain ones. Others, called essential fatty acids, cannot be synthesized and must be consumed in the diet. The essential fatty acids make up about 7% of the fat consumed in a normal diet and about 3% of total calories (about 8 grams). They include linoleic acid and linolenic acid, which are present in certain vegetable oils. Eicosapentaenoic acid and docosahexaenoic acid, which are fatty acids essential for brain development, can be synthesized from linolenic acid. However, they also are present in certain marine fish oils, which are a more efficient source.

Linoleic acid and arachidonic acid are omega-6 fatty acids. Linolenic acid, eicosapentaenoic acid, and docosahexaenoic acid are omega-3 fatty acids. A diet rich in omega-3 fatty acids may reduce the risk of atherosclerosis (including coronary artery disease). Lake trout and certain deep-sea fish contain large amounts of omega-3 fatty acids. In the United States, people tend to consume enough omega-6 fatty acids, which occur in the oils used in many processed foods, but not enough omega-3 fatty acids. (Women who are pregnant or breastfeeding should choose fish that are low in mercury. See Mercury in Seafood for more information.)

There are different kinds of fat:

- Monounsaturated
- Polyunsaturated
- Saturated

Saturated fats are more likely to increase cholesterol levels and increase the risk of atherosclerosis. Foods derived from animals commonly contain saturated fats, which tend to be solid at room temperature. Fats derived from plants commonly contain monounsaturated or polyunsaturated fatty acids, which tend to be liquid at room temperature. Palm and coconut oil are exceptions. They contain more saturated fats than other plant oils.

**Trans fats (trans fatty acids)** are a different category of fat. They are man-made, formed by adding hydrogen atoms (hydrogenation) to monounsaturated or polyunsaturated fatty acids. Fats may be partially or fully hydrogenated (or saturated with hydrogen atoms). In the United States, the main dietary source of trans fats is partially hydrogenated vegetable oils, present in many commercially prepared foods. Consuming trans fats may adversely affect cholesterol levels in the body and may contribute to the risk of atherosclerosis.

Fat in the diet

Authorities generally recommend that

- Fat should be limited to less than about 28% of daily total calories (or fewer than 90 grams per day).
- Saturated fats should be limited to less than 8%.

Eliminating trans fats in the diets is recommended. When possible, monounsaturated fats and polyunsaturated fats, particularly omega-3 fats, should be substituted for saturated fats and trans fats.

**Risk Factors**

**Category I**

- Cigarette smoking
- LDL cholesterol
- High fat/ cholesterol diet
- Hypertension
- Left ventricular hypertrophy
- Thrombogenic factor

**Category II**

Risk factors for which interventions are **likely** to lower CVD risk

- Diabetes mellitus
- Physical inactivity
- HDL cholesterol
- Triglycerides, small dense LDL
- Obesity
- Postmenopausal status

**Category III**

Risk factors associated with increased CVD risk may reduce if the following are modified

- Physiological factors
- Lipoprotein A
- Homoecysteine
- Oxidative stress
- No alcohol consumption

**Category IV**

Risk factors associated with increased CVD risk which **cannot** be modified

- Age
- Male gender
- Family history of early onset of CVD

A paradigm shift in nutritional sciences is underway. Nutrigenetics/nutrigenomics, the study of relationship between gene expression and nutrition, proposes that disease can be prevented and reversed by drastically altering the nutritional environment.[2] Basic premises include: (a) people are genetically predisposed to develop some type of chronic illness; (b) expression of these genes is largely influenced by environment; (c) food is a large part of this environment that affects gene expression; and (d) whole food, plant-based, nutritionally-dense diets positively influence genetic expression and the incidence of disease. Nutrigenetics has given rise to "Nutritional Medicine" or "Nutritional Therapy", a system of healing based on the belief that food, in its whole and natural form, provides the substance needed to obtain and maintain a vibrant state of health.

Nutritional Therapy uses food to prevent and reverse diseases that plague most western societies: diabetes, obesity, heart disease, arthritis, and depression. In

order for food to be therapeutic, it must be nutrient-dense, measured in part by the **nutrients and anti-nutrients**, contained in consumed foods.

**Nutrients** are plant and animal sources providing macronutrients (protein, carbohydrates, fat), micronutrients (vitamins, minerals, phytochemicals, antioxidants, probiotics), and fiber. They are whole and unprocessed vegetables, fruits, beans, legumes, whole grains, and raw nuts/seeds. Free range, grass-fed organic meat, dairy, eggs, and wild fish also qualify.

**Anti-Nutrients** are food products that have no biological necessity. Though edible, these are not considered "food": high fructose corn sweetener, sugars, artificial sweeteners, highly processed and hydrogenated fats, refined flour products, preservatives, and additives. Further, some critical nutrients become anti-nutrients when consumed in excess. For example, while our biological salt need is as low as 250 mg/day, the US recommended allowance (RDA) of salt is under 2400 mg and Americans often consume more than 3500 mg/day. Thus, salt intake within the RDA limits is considered an anti-nutrient.

Nutritional Therapy is also concerned with the way that foods are prepared and delivered for consumption. In order for foods to be **therapeutically beneficial**, the appropriate micro- and macronutrients must be delivered in a nutritionally dense format without contaminants. While plants are the main source of micronutrients, nutrient content can be altered with improper handling. Fruits and vegetables picked before their peak ripeness contain fewer phytochemicals. These phytochemicals protect plants them from all kinds of invaders, and when consumed, transfer these same protective advantages to the human body. Cooking and processing can further destroy vital properties of phytochemicals and antioxidants.

The presence of harmful chemicals in foods, such as pesticides, herbicides, and nitrogen-based fertilizers contribute to altered genetic environments. Organic produce is preferable, particularly for certain fruits and vegetables..

The Aggregate Nutrient Density Index (ANDI) provides a means to judge and calculate the level of micronutrients per calorie and thus therapeutic value of food. Green leafy vegetables, colorful vegetables, fresh fruit, and berries have the most micronutrients per calorie and are the most nutritionally dense foods to choose from. Refined sweets and oils have almost no nutrition density and are not considered food in a nutrition therapy program.

## The Basics of Nutritional Therapy

Nurse practitioners are leaders in treatment of the whole person, valuing approaches that are holistic, safe, and effective. Nutritional therapy is fundamental for patients seeking relief from obesity and chronic illness and for patients pursuing health promotion and wellness. Basic recommendations include:

1. Avoid anti-nutrients, including processed foods. They contribute to obesity, and a wide range of diseases.
2. Eat ONLY whole foods: unprocessed, raw vegetables and fruits, beans, legumes, raw nuts, raw seeds, whole grains, free-range, grass-fed organic animal products, and small wild fish.
3. Eat a variety of whole foods, without as much attention to calories, carbohydrates, and fats.
4. Judge the therapeutic value of the whole food diet by eating a majority of calories from foods that are the most nutritionally dense (micronutrients per calorie), and adjust the macronutrients according to individual caloric needs. For instance, if a person is trying to reverse a disease process, the

focus of the diet should be mostly raw fruits and vegetables, eliminating animal products completely. A diet to maintain health can be more flexible and include some grains and animal products.

Reference:

1. NIH National Center for Complementary and Alternative Medicine. *CAM Basics. Publication 236.* [7/1/10]. Available at: http://nccam.nih.gov/health/backgrounds/D236.pdf.

2. Mutch DM, Wahli W, Williamson G. Nutrigenomics and nutrigenetics: the emerging faces of nutrition. *The Journal of the Federation of American Societies for Experimental Biology.* 2005;19:1602–1616. [PubMed] [Google Scholar]

3. Sarter B, Campbell TC, Fuhrman J. Effect of a high nutrient density diet on long-term weight loss. *Alternative Therapies in Health and Medicine.* 2008;14:48–53. [PubMed] [Google Scholar]

4. Drewnowski A. Concept of a nutritious food: toward a nutrient density score. *American Journal of Clinical Nutrition.* 2005;82:721–732.

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Department of Biochemistry (2016-2017)

| S.No | Register No. | Student List | Signature |
|---|---|---|---|
| 1 | U15MB347 | RAM KUMAR. S | |
| 2 | U15MB379 | SUBALAKSHMI .C | |
| 3 | U15MB382 | SUMATHI .B | |
| 4 | U15MB384 | SURIYA.S | |
| 5 | U15MB385 | SUSHMITHA .K | |
| 6 | U15MB391 | VELMURUGAN .D | |
| 7 | U15MB395 | VIGNESH .V | |
| 8 | U15MB397 | VIJAY KUMAR .C.M | |
| 9 | U15MB398 | VINOTHINI .S | |
| 10 | U15MB370 | SIVA SAKTHI VELAN .A.V | |
| 11 | U15MB372 | SIVANAMBI .S | |
| 12 | U15MB373 | SOPHIYA .L | |
| 13 | U15MB375 | SOWMYA LAKSHMI .I | |
| 14 | U15MB378 | SRUTHI .S | |
| 15 | U15MB379 | SUBALAKSHMI .C | |
| 16 | U15MB381 | SUJI RAKSHANAA.K | |
| 17 | U15MB357 | SARATH KUMAR. A | |
| 18 | U15MB353 | SANDIYA. T | |
| 19 | U15MB356 | SARANYA. E | |
| 20 | U15MB358 | SATHESH. B | |

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY 605 502

Nutrients

**SRI LAKSHMI NARAYANA INSTITITE OF MEDICAL SCIECNES**

**BASIC CONCEPTS OF NUTRITION AND THE IMMUNE SYSTEM**

1. **Which one of the following options represents potential complications of enteral nutrition?**

   A. Osteoporosis and refeeding syndrome

   B. Diarrhea and cholestasis

   C. Esophagitis and pancreatitis

   D. Aspiration and refeeding syndrome

   E. Aspiration and Constipation

2. **. Enteral nutrition is preferred over parenteral nutrition for all of the following reasons EXCEPT:**

   A. Lower risk of electrolyte abnormalities

   B. Lower risk of refeeding

   C. Lower risk of liver disease

   D. Improved Glycemic control

   E. Stimulate gut barrier function

3. **Which of the following is an ABSOLUTE contraindication to parenteral nutrition?**

   A. Diarrhea

   B. Liver cirrhosis

   C. Malignancy

   D. Active Infection

   E. Osteoporosis

E. Osteoporosis

4. **Which one of the following options represents historical features of the Subjective Global Assessment?**

A. Weight loss and gastrointestinal symptoms

B Malignancy and nausea

C. Family history of IBD and personal history of weight loss

D. Family history of Celiac Disease

E. Functional impairment and recent hospitalization

5. **Which of the following is NOT a clinical consequence of refeeding syndrome?**

A. Hypophosphatemia

B. Hypomagnesemia

C. Hypervolemia

D. Hyperphosphatemia

E. Hyperglycemia

6. **Which one of the following micronutrients is routinely added to TPN?**

A. Vitamin D

B. Iron

C. vitamin E

D. Vitamin K

E. Manganese

7. **Which one of the following medications can be added to TPN in the appropriate clinical circumstance?**

A. H2 Receptor Antagonists

B. Proton pump inhibitors

C. Fluroquinolones

D. Narcotics

E. Cephalosporins

8. **Which one of the following gut hormones is responsible for promoting appetite?**

A. Leptin

B. Grehlin

C. Peptide YY

D. CCK

E. Insulin

9. **Which one of the following hormones plays an important role in inhibiting appetite?**

A. Grehlin

B. Resistin

C. TNF α

D. Peptide YY

E. Neurotensin

**10. Which of the following in an example of a *prebiotic*?**

A. Yogurt

B. Inulin

C. Creatinine

D. Fish Oil

E. Vitamin C

**SRI LAKSHMI NARAYANA INSTITITE OF MEDICAL SCIECNES**

**BASIC CONCEPTS OF NUTRITION AND THE IMMUNE SYSTEM**

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E. Neurotensin

**10. Which of the following in an example of a *prebiotic*?**

A. Yogurt

B. Inulin

C. Creatinine

D. Fish Oil

E. Vitamin C

*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

*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

*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

Date: 09.10.2016

From

Dr. Pannerselvam
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: **Road safety measures and awareness on RTA** 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. Pannerselvam

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

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 MOUNIKA.B has actively participated in the Value Added Course on **BASIC CONCEPTS OF NUTRITION AND THE IMMUNE SYSTEM** April – May 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Prabhakar Reddy
**RESOURCE PERSON**
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Dr. Thangapannerselvam
**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 RADHIKA .C has actively participated in the Value Added Course on **BASIC CONCEPTS OF NUTRITION AND THE IMMUNE SYSTEM** April – May 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Prabhakar Reddy

**RESOURCE PERSON**

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502.

Dr. Thangapannerselvam

**COORDINATOR**

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences

# Sri Lakshmi Narayana Institute of Medical Sciences

Date: 04.01.2016

From

Dr.Thangapannerselvam
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: Road safety measures and awareness on RTA**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Road safety measures and awareness on RTA** for interns May to June 2016. We solicit your kind permission for the same.

Kind Regards

Dr. Thangapaneerselvam

---

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayakumar

The HOD: Dr. Thangapaneerselvam

The Expert: Dr. Prabhakar Reddy

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 PO
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

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

07.03.2016

**Sub: Organising Value-added Course: Road safety measures and awareness on RTA. reg**

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Road safety measures and awareness on RTA".** 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 2016. 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**

Road safety measures and awareness on RTA

**2. Duration & Period**

30 hrs & May –June 2016

**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:**

Road safety measures and awareness on RTA - *Enclosed as Annexure- III*

**6. Certificate model**

*Enclosed as Annexure- IV*

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

1 time May –June 2016

**8. Year of discontinuation:** 2016

**9. Summary report of each program year-wise**

| Value Added Course- May –June 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | BIO 03/ I Batch | Road safety measures and awareness on RTA -BIO-01 | Dr. Thangapannerselvam<br><br>Dr. Prabhakara Reddy | MBBS students | 2 0 students MAY-JUNE 2016) |

**10. Course Feed Back**

*Enclosed as Annexure- V*

**RESOURCE PERSON**

**Dr. Prabakara Reddy** E. Prabakara Reddy

**COORDINATOR**

**Dr. Thangapanner selvam**

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

# Course Proposal

Course Title: **Road safety measures and awareness on RTA**

**Course Objective:** To place the finding into perspective, comparisons will be made with other fields in which education is used as preventive measures such as the field of public health.

To assess essential features of evaluation designs in traffic education, the effect criterion to be used and the characteristic of potentially effective programmes.

Safe movement and orientation in traffic Transfer of 'survival techniques' in the short term partnership, safe and responsible behavior in the long-term

**Course Outcome:** Significant improvements in road safety. Safe movement and orientation in traffic transfer of survival techniques in the short term partnership safe and responsible behavior in the long-term

**Course Audience:** MBBS

**Course Faculties with Qualification and Designation:**

1. Dr. Thangapannerselvam, Professor & HOD
2. Dr.Prabahakar reddy, Associate Professor

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

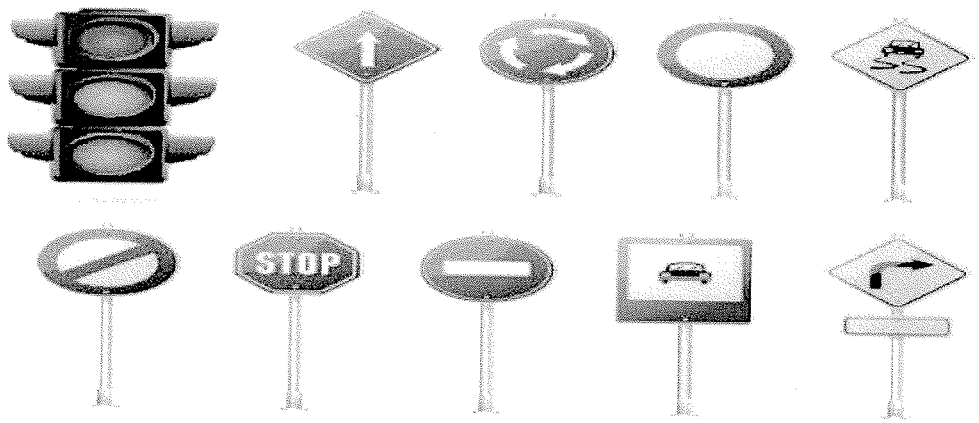
| SlNo | Date | Topic | Time | Hours |
|---|---|---|---|---|
| 1. | 11.5.2016 | Introduction of road safety | 4-6 pm | 2 |
| 2. | 12.5.2016 | Hurdles in road safety | 2-3 pm | 1 |
| 3. | 13.5.2016 | Safe and responsible driving | 4-6 pm | 2 |
| 4. | 14.5.2016 | Road signs | 4-6 pm | 2 |
| 5. | 15.5.2016 | Traffic clubs : a form of road safety education | 4-6 pm | 2 |
| 6. | 16.5.2016 | Road safety education for pedestrians | 4-6 pm | 2 |
| 7. | 17.5.2016 | Road safety education for cyclists | 4-6 pm | 2 |
| 8. | 18.5.2016 | Road safety education for four-wheelers | 4-6 pm | 2 |
| 9. | 19.5.2016 | Encouraging the use of bicycle helmets and safety equipment | 4-6 pm | 2 |
| 10. | 20.5.2016 | Encouraging the use of bicycle helmets and safety equipment | 4-6 pm | 2 |
| 11. | 21.5.2016 | Road safety education for users of public and school transport | 4-6 pm | 2 |
| 12. | 22.5.2016 | Road safety education for Pre-drivers | 4-6 pm | 2 |
| 13. | 23.5.2016 | How to avoid the accidents | 4-6 pm | 2 |
| 14. | 24.5.2016 | How to avoid the accidents | 4-6 pm | 2 |
| 15. | 25.5.2016 | Traffic clubs : a form of road safety | 4-6 pm | 2 |

| | | | | |
|---|---|---|---|---|
| | | education | | |
| 16. | 26.5.2016 | Traffic clubs : a form of road safety education | 4-6 pm | 2 |
| | | Total | | 31 hours |

**REFERENCE BOOKS:**


1. Aeron-Thomas A, Jacobs GD, Sexton B, Gururaj G & Rahman F (2004), *The Impact of Crashes on the Poor*. Study commissioned from TRL by GRSP with funding from the Swedish International Development Cooperation Agency (Sida) and TRL, Crowthorne.
2. AfDB (2012), *Road Safety in Africa: an overview*, African Development Bank, MDBs Training Initiative Global Road Safety Facility, Washington DC.
3. Belin M-A, Tillgren P & Vedung E (2012), *Vision zero – a road safety policy innovation,* International Journal of Injury Control and Safety Promotion Volume 19, Issue 2, 2012, pages 171-179

Road safety measures and awareness on RTA




# PARTICIPANT HAND BOOK

*Annexure- I*

**COURSE DETAILS**

| **Particulars** | **Description** |
|---|---|
| Course Title | Road safety measures and awareness on RTA |
| Course Code | BI03 |
| Topics and content of the course in the Hand book | • Introduction of Road safety<br>• Hurdles in Road Safety<br>• SAFE AND RESPONSIBLE DRIVING<br>• ROAD SIGNS<br>• Road Safety Education for Pedestrians<br>• Road Safety Education for Cyclists<br>• Encouraging the use of bicycle helmets and safety equipment<br>• Road Safety Education for Users of Public and School Transport<br>• Road Safety Education for Pre-drivers<br>• How to Avoid the accidents<br>• Traffic clubs: a form of road safety education |
| Advantages of | Every country finds road safety education important, and in |

| | |
|---|---|
| learning and evaluation | many countries road safety education is compulsory. It seems that there is a general belief that road safety education works. However, although widely accepted as an unavoidable part of the holistic approach to road safety, the question of the specific effectiveness of road safety education is frequently raised. The most important issues in hindering the progress towards effective road safety education, is the lack of evaluation of road safety education programmes |
| Further learning Opportunities | The varying quality of the evaluations which were carried out, establishing the effectiveness of various educational programmes is a challenging task. Nevertheless, some characteristics of possibly effective educational programmes have been identified. |
| Key Competencies | Road safety education |
| Target Student | MBBS |
| Duration | 30hrs Every Nov to Dec 2019 & May to June 2020 |
| Theory Session | 31hours |
| Assessment Procedure | Road safety measures and awareness on RTA |

**INTRODUCTION:**

Some of the major causes of road accidents are as follows. (i) Lack of highway safety (ii) Drunken driving (iii) Driving in an exhausted state for long hours (iv) Using cell phone while driving (v) Overspeeding or rash driving (vi) Driving in wrong lanes (vii) Turning without giving signal (viii) Overtaking from wrong side

Role of Government and Public Sector (i) Develop stricter road safety polices (ii) Generate funds for road safety awareness (iii) Stricter enforcement of rules by government (iv) Building better roads and highways

Role of General Community (i) Acceptance of road safety rules, regulations and policies (ii) Participation in road safety awareness drives to enhance people's knowledge about road safety

Role of Education Sector (i) Inclusion of road safety modules in school curriculum (ii) Impart road safety education with the help of experts in this area (iii) Impart effective driver training for learners as well as existing drivers

Role of Media (i) Communicate road safety messages through print and electronic media (ii) Support road safety initiatives through responsible and objective reporting

Role of Health Professionals (i) Strengthen trauma facilities in our country. (ii) Organise workshops for saving the lives of people in road accidents.

Improvement in Infrastructure (i) Adopt effective and safe traffic management measures while planning and designing infrastructure. For example, government approved road design, design of overbridges, road signages, etc.

**Hurdles in Road Safety** (i) Negligence by civilians (ii) Pathetic condition of roads (iii) Unsafe vehicle design (iv) Violation of road safety standards (v) Lack of emergency services (vi) Defects in highway designing Some measures undertaken by the Road Safety Cell are (i) Publicity programmes (ii) Grants-in-aid to voluntary organisations for organising road safety programmes (iii) National Highway Accident Relief Service Scheme (iv) Refresher training to heavy vehicle drivers in unorganised sector (v) Setting up of Model Driving Training school (vi) Within the Ministry of Road Transport and Highways, massive road sector development programmes, such as observing Road Safety Week or conducting eye check-ups for truck drivers, the government is working closely with agencies like the World Bank, Asian Development Bank to improve road safety. Road Safety Tips Road safety is a result of efforts from all the sectors of the society including civilians and government officials. In addition to the human suffering, the estimated cost of road injuries is a noticeable amount in Gross National Product (GNP) per annum.

A few important **road safety tips** are mentioned below. (i) Do not use your mobile phone while driving. (ii) Use seatbelts even while sitting at the back seat of the vehicle. (iii) Do not drink and drive. (iv) Always adhere to the speed limit. (v) Take special care with regard to children, senior citizens and pedestrians. (vi) Do not drive if tired. (vii) Pedestrians should walk cautiously and make use of zebra crossing. (viii) Stay alert and observant while driving. (ix) Keep distance from other vehicles while driving. (x) Always wear helmets and seatbelts.

**Safety Devices** Two-wheeler Helmet, Airbag

**SAFE AND RESPONSIBLE DRIVING** Getting Ready to Drive before Driving (i) Ensure that you are comfortable with your mental and physical condition. (ii) Inspect your vehicle

and observe the driving conditions. While driving, you should carry your driving licence, registration certificate, insurance certificate and pollution control certificate. Transport and commercial vehicle drivers should carry the permits and vehicle fitness certificates also. A combination of knowledge, skill and attitude is required to be a safe driver. • Knowledge of traffic rules and driving practices that help traffic move safely. • Skill to care about the safety of others on the road. We all are responsible for avoiding accidents. • Attitude to cooperate with other drivers to keep traffic moving safely. We must be courteous, giving other drivers space to change lanes, not cutting them off and signalling before turning.

Physical and Mental Alertness One must be in good physical and mental condition before driving (Fig. 4.5). Do not drive if you (i) have been drinking alcohol. (ii) take any medicine or drug that affects your responses. (iii) are tired, as it affects your driving skills and reaction time. (iv) are sick or injured. (v) are angry or upset. In such conditions, you could be risking your life or lives of others on the road. Know Your Vehicle Go through the vehicle owner's manual. You should know the features of the vehicle you are going to drive, for example, anti-lock brakes, four-wheel drive, etc.

Ensure that you know where the controls and instruments are and what they do. Check that all emergency signals and instruments work. You should be able to turn on wipers, washers, headlights, indicators, etc., without having to look at them and without taking your eyes off the road. Seating Position Proper, upright position gives more stability while driving. Make sure you can see over the steering wheel and hood. You should be able to see the ground 1.5–2.0 metre in front of the vehicle for proper judgement. Sit straight and upright in the seat, with your elbows slightly bent. Adjust the seat (Fig. 4.6) so that your feet reach the pedals easily. Place your feet flat on the floor under the brake pedal. You are seated properly if you can do this. Adjust the headrest to an appropriate height. It protects the head in case of collision. Cars with air bags: It is important to note that an air bag cannot prevent injuries if

the seating position is incorrect. Know Your Blind Spots Blind spot (Fig. 4.7) is an area on each side of the vehicle that you cannot see through the mirrors. Mostly blind spots are to the back left and back right of the vehicle. In Fig. 4.7, the red car is in the blind spot area of the silver car. The green areas show the blind spots of the silver car. Adjust the mirrors to get the maximum view and identify your blind spots. You may not see vehicles when they are in these spots.

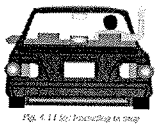
Position the interior mirror so that the centre of the mirror shows the centre of the rear window. When the interior mirror is properly adjusted, you would be able to see directly behind your vehicle (Fig. 4.8). The exterior (wing) mirror adjustment should be made while seated normally for driving. Do not set the right-hand exterior mirror by placing your head against the glass of the driver's door window. Do not adjust the left-hand exterior mirror by leaning to the centre of the vehicle. Side mirrors show only narrow angles of view, so you have to turn your head to make sure there is nothing in your blind spots. Fasten your Seat Belt Fasten your seat belt before you start (Fig. 4.9). Seat belts are for safety and not just for avoiding challans. Seat belts should be worn comfortable enough to keep you in your seat if there is a collision. Put the shoulder strap over your shoulder, never under your arm. The lap belt should be put low over the hips, not over the stomach.

A seat belt saves life in the following ways. (i) It keeps you behind the wheel and in control of the vehicle in case of a collision. (ii) It keeps your head and body from hitting the inside of the vehicle. (iii) It keeps you inside the vehicle in case of a collision. A person who is thrown out of the vehicle during the collision has a higher chance of serious injury. Turn on Headlights at Night and in Poor Light Conditions Turn on headlights around 30 minutes before sunset and keep them on until 30 minutes after sunrise. Turn on your lights when fog or rain reduces your visibility to less than 100 metres. Keep your headlights clean and get them adjusted regularly so that they enable clearer vision while driving. In dim light, use your

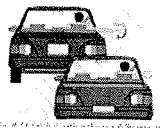
headlights, not parking lights. Parking lights are only for parking. High beams are banned in cities like Delhi, Chandigarh and other cities. You should not use high beams on roads. If you are travelling on a highway and using high beam headlights, switch to low beams within 150 metres of an incoming vehicle. Switch to your low beams when you are less than 60 metres behind another vehicle.

ROAD SIGNS Signals play an important role during smooth movement of traffic. Road signals are to be followed systematically, otherwise it may cause accidents. Arm Signals Arm signals are needed when a vehicle's indicators are not used, or when necessary to reinforce direction indicator signals and stop lights





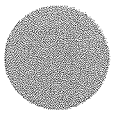




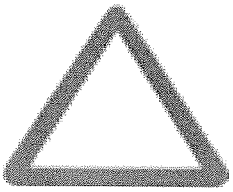
Traffic Signs Traffic signs are divided into three main categories. (i) Mandatory/regulatory signs (ii) Cautionary signs (iii) Information signs



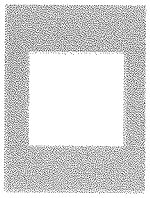
*Red circle instructs what should not be done.*



*Blue circle instructs what should be done.*

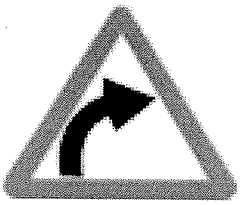


*Triangle cautions*

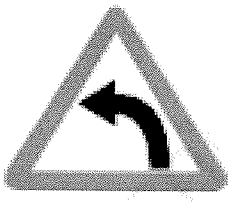


*Blue rectangle informs*

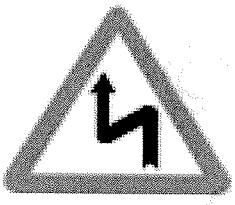
Typical Cautionary Signs

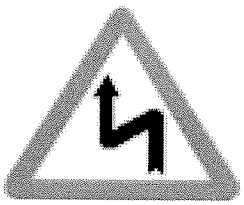


***Right/Left Hand Curve:*** This sign is used where the direction of alignment changes. The sign forewarns the driver to reduce the speed and proceed cautiously along the road.

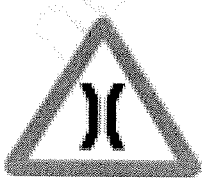


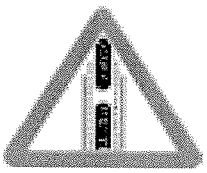
***Right/Left Hair Pin Bend:*** This sign is used where the change in direction is so considerable that it amounts to reversal of direction. The symbol bends to right or left depending upon the road alignment.



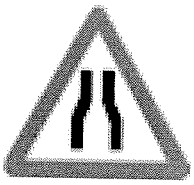


***Right/Left Reverse Bend:*** This sign is used where the nature of the reverse bend is not obvious to approaching traffic and constitutes a hazard. If the first curve is to the right, a right reverse bend shall be used. If the first curve is to the left, a left reverse bend is used.

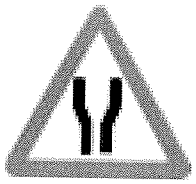




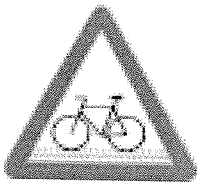
***Narrow Bridge:*** This sign is erected on roads in advance of bridges where the clear width between the wheel guards is less than the normal width of the carriageway.



***Gap in Median:*** This gap is installed ahead of a gap in the median of a divided carriageway, other than an intersection.



***Narrow Road:*** This sign is normally found in rural areas where a sudden reduction in the width of the pavement causes a danger to traffic.



***Road Widens:*** This sign is normally found in rural areas where a sudden widening of road causes a danger to traffic, such as a two-lane road suddenly widening to a dual carriageway.



***Cycle Crossing:*** This sign is erected in advance of all uncontrolled cycle crossings.

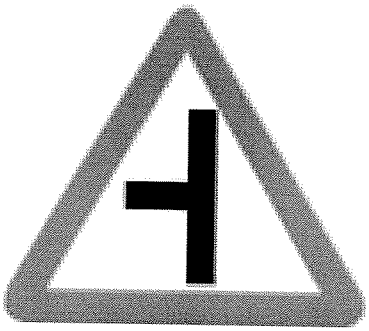


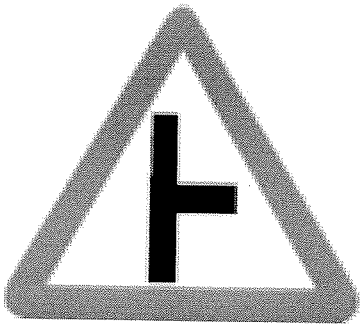
***Pedestrian Crossing:*** This sign is erected in advance of both approaches to uncontrolled pedestrian crossings.



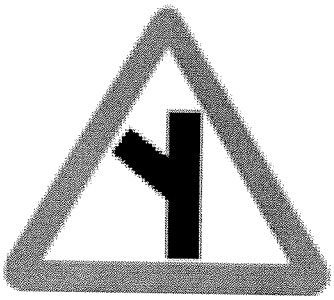
***School:*** This sign is erected where school buildings or grounds are adjacent to the road, where traffic creates a hazard to children.

***Men at Work:*** This sign is displayed only when men and machines are working on the road or adjacent to it or on overhead lines or poles. This sign is removed when the work is completed.

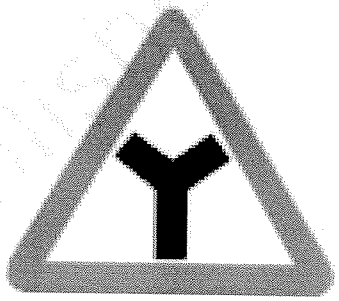




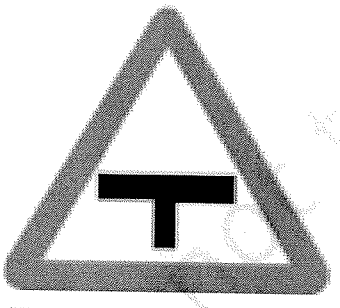
***Side Road Left/Right:*** This sign is displayed in advance of the side road intersections where a large volume of entering traffic, together with restricted sight distance, is likely to constitute a hazard. The driver is warned of the existence of a junction.

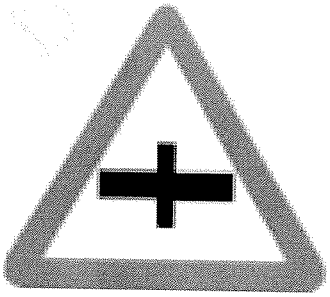




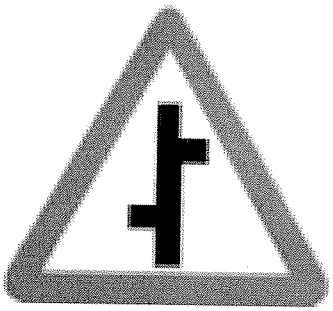


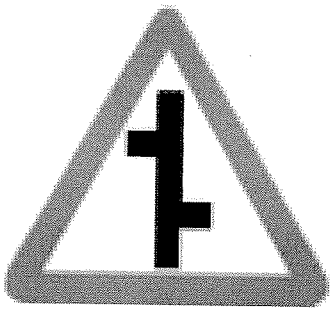
***Y-Intersection:*** These signs are displayed on the approach to a bifurcation of any road. This sign warns of the existence of a junction and no other indication is given.



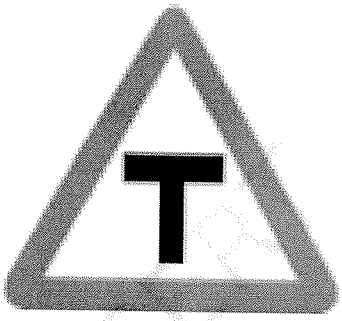


***Major Road:*** These signs are displayed in advance of a crossing with a major road, where a sufficiently large volume of traffic together, with restricted sight, is likely to cause a hazard.

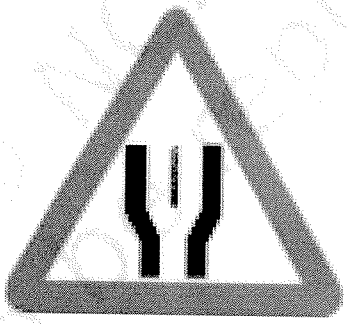




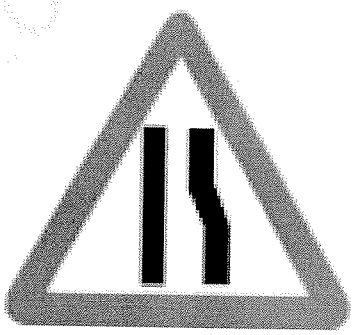
***Staggered Intersection:*** This sign is used to indicate junctions where the distance between two junctions is not more than 60 meters.



***T Intersection:*** This sign is displayed in advance of T-junctions where the nature of intersection is not obvious to approaching traffic. This sign is used to warn the driver of the existence of a junction.



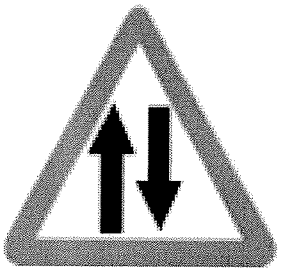
***Start of Dual Carriageway:*** This sign is displayed when a single carriageway ends in a dual carriageway.



***Reduced Carriageway:*** These signs caution the driver about the reduction in the width of the carriageway ahead. This is displayed on undivided carriageways when some portion of the carriageway is closed or reduced for repairs.

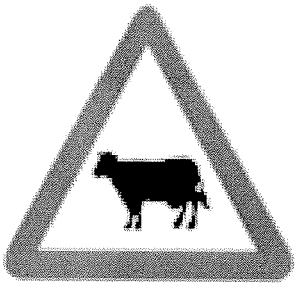
BIHER

SLIMS

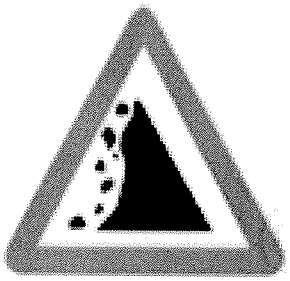


***Two-way Operation:*** This sign is used to caution the driver of a changed pattern of traffic operation of the carriageway expected to carry traffic in one direction only.

Typical Cautionary Signs

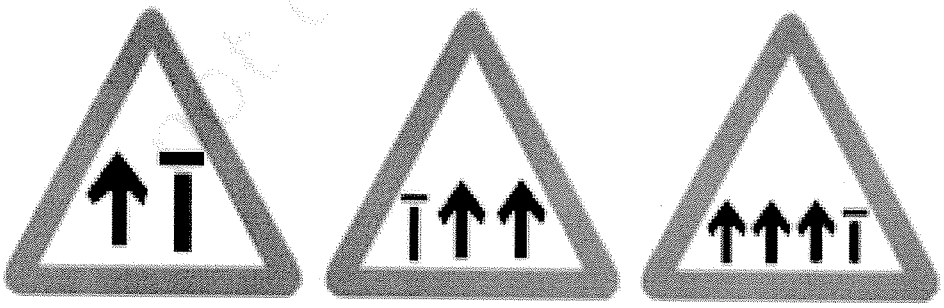


***Cattle:*** This sign is used where there is danger due to farm animals or cattle crossing the road.



***Falling Rocks:*** This sign is used wherever rocks are liable to fall on the road seasonally or throughout the year. The symbol may be reversed to show the side from which rockfall is expected.

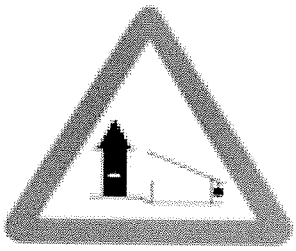
***Lane Closure:*** This sign cautions the drives of the closure of a portion of the carriageway on multilane highways.



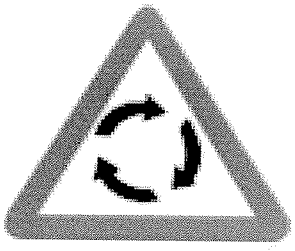
Road Safety



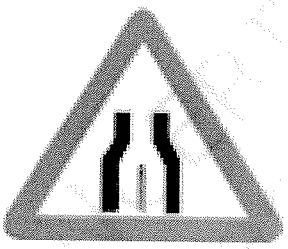
BIHER SLIMS



***Barrier:*** This sign is erected in advance of a gate controlling entry into a road. A definition plate with words 'SLOW BARRIER AHEAD' or 'TOLL BARRIER AHEAD' is also displayed on the sign.

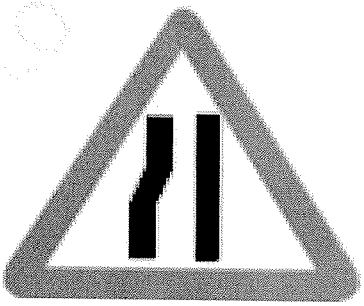


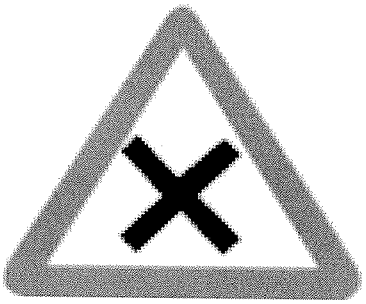
***Roundabout:*** This sign is used where it is necessary to indicate the approach to a roundabout.



***End of Dual Carriageway:*** This sign is displayed when a dual carriageway ends and a single carriageway starts.

***Cross Road:*** This sign is displayed in advance of the cross road where a sufficiently large volume of crossing or entering traffic with restricted sight distance is likely to constitute a hazard.

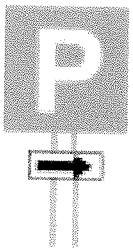




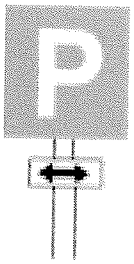
BIHER

SLIMS

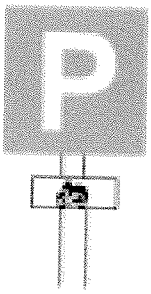
Parking Signs



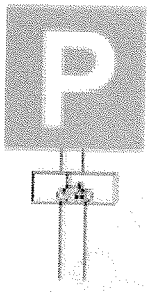
Parking on this Side



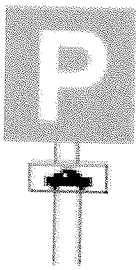
Parking on both Sides



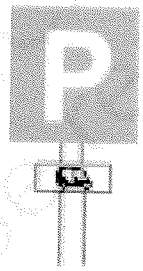
Scooter and Motor Cycle Stand



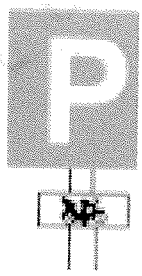
Cycle Stand



Taxi Stand



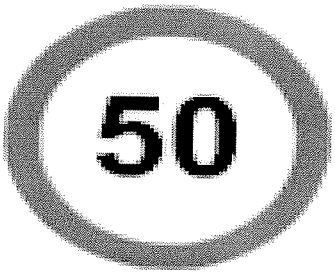
Autorickshaw Stand



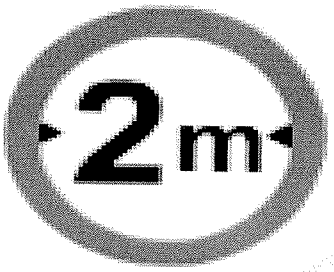
Cycle-Rickshaw Stand



# Speed Limit and Vehicle Control Signs



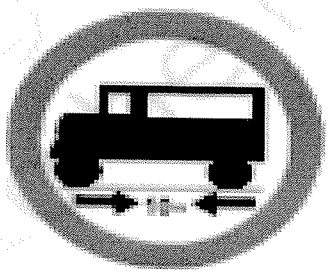

***Speed Limit:*** This sign is erected at the beginning of the section of the road or area covered by a speed restriction, with numerals indicating the speed limit in kilometres per hour.



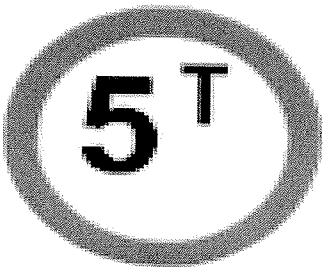

***Width Limit:*** This sign is used where entry of vehicles exceeding a particular width is prohibited.



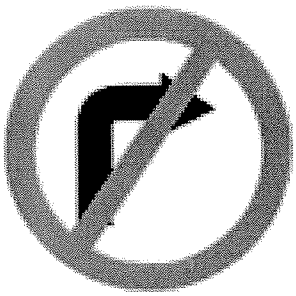

***Height Limit:*** This sign is erected in advance of an overhead structure where entry is prohibited for vehicles whose height exceeds a certain limit.

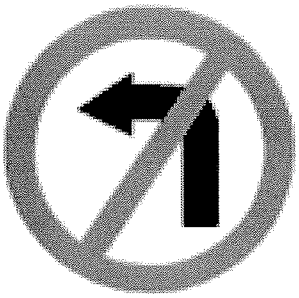


***Length Limit:*** This sign is used where entry of vehicles exceeding a particular length is prohibited.

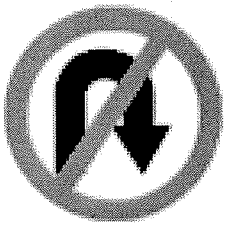



***Load Limit:*** This sign is used where entry of vehicles is prohibited for vehicles whose laden weight exceeds a certain limit.

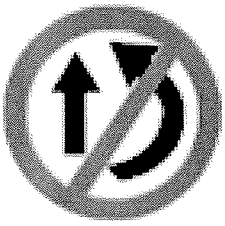




***Right/Left Turn Prohibited:*** These signs are used at places where vehicles are not allowed to turn to the right or left. The signs are also used at the intersections of one-way street to supplement the one-way sign.



***U-Turn Prohibited:*** This sign is used in places where vehicles are forbidden to make a turn to the reverse direction of travel between the sign and the next intersection beyond it.



***Overtaking Prohibited:*** This sign is erected at the beginning of such sections of highways where sight distance is restricted and overtaking could be dangerous.

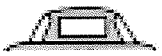


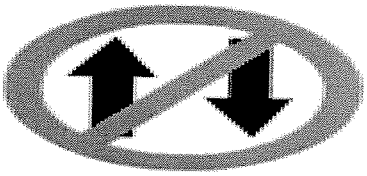
***All Motor Vehicles Prohibited:*** This sign is used at places where entry to all types of motor vehicles is prohibited.



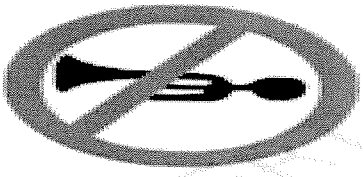
***Trucks Prohibited:*** This sign is used at the entrance to the road where movement of trucks is prohibited.



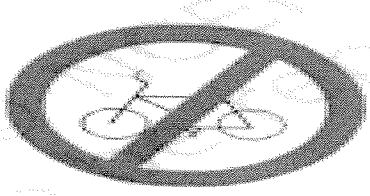




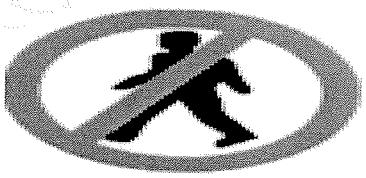
**Vehicles Prohibited in Both Directions:** This sign is used at the approach end of the roads where entry to all types of vehicular traffic is prohibited, especially in areas which have been designed as pedestrian malls.



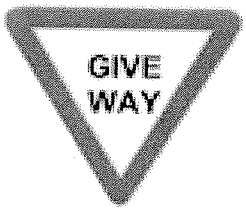
**Horn Prohibited:** This sign is used on stretches of the road where using horn is not allowed, for example, near hospitals and in silence zones.



**Cycle Prohibited:** This sign is erected on each entry to the road where cycles are prohibited.

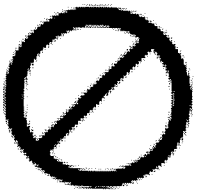


**Pedestrian Prohibited:** This sign is erected on each entry to the road where pedestrians are prohibited.



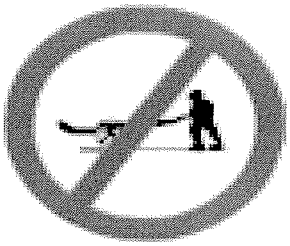

**Give Way Sign:** This sign is used to assign right-of-way to traffic on certain roadways and intersections, the intention being that the vehicles controlled by the sign must give way to the other traffic having the right-of-way.

Restriction End Sign

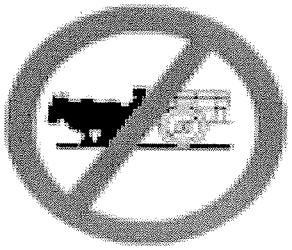


This sign indicates the point at which all prohibitions notified by the prohibitory signs for moving of vehicles cease to apply.

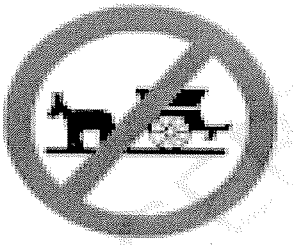
Compulsory Direction Control and Other Signs



***Hand Cart Prohibited:*** This sign is erected on each entry to the road where hand carts are prohibited.



***Bullock Cart Prohibited:*** This sign is erected on each entry to the road where bullock carts are prohibited.

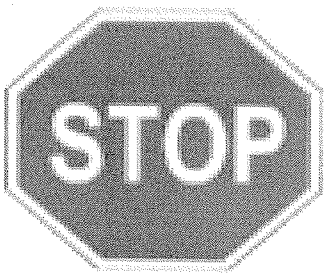


***Tonga Prohibited:*** This sign is erected on each entry to the road where tongas are prohibited.

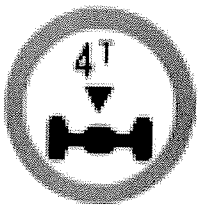


***Bullock Carts and Hand Carts Prohibited:*** This sign is erected on each entry to the road where all types of slow moving vehicles except cycles are prohibited.

Stop and Give Way Signs



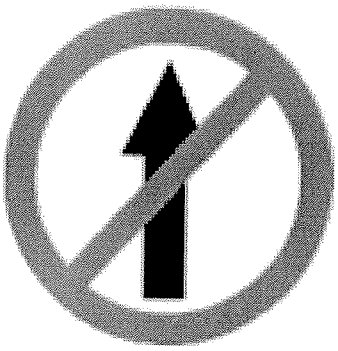

***Stop Sign:*** This sign is used on roadways where traffic is required to stop before entering a major road. The vehicle shall proceed past the stop line only after ascertaining that this will not cause any damage to traffic on the main road.

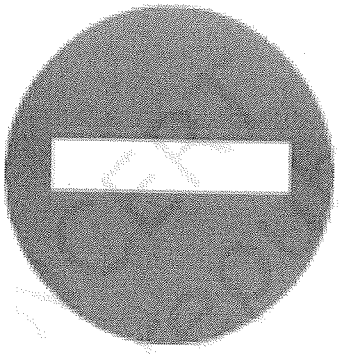



***Axle Load Limit:*** This sign is used where entry of vehicles is prohibited for vehicles whose gross load exceeds a certain limit.

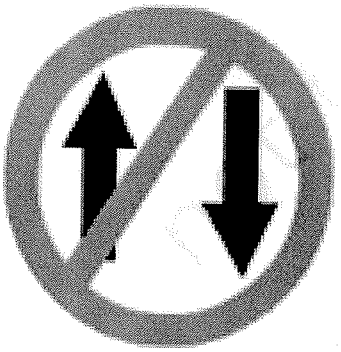
## Prohibitory Signs

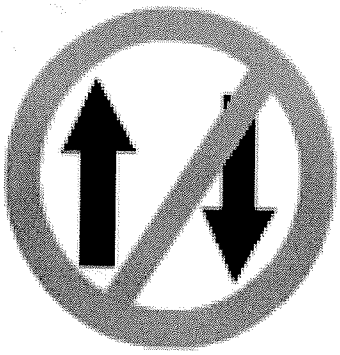
***Straight Prohibited or No Entry:*** These signs are located at places where the vehicles are not allowed to enter. It is generally erected at the end of one-way road to prohibit traffic entering the roadway in the wrong direction and also at each intersection along the one-way road.

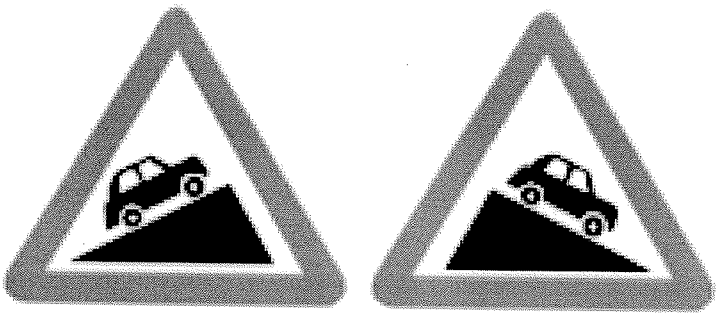




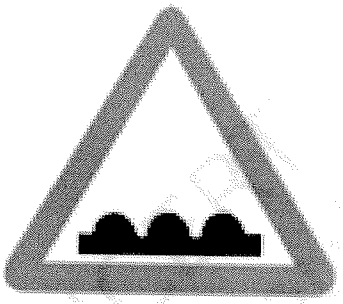
***One way Sign:*** These signs are located at the entry to the one-way street and repeated at intermediate intersections on that street.



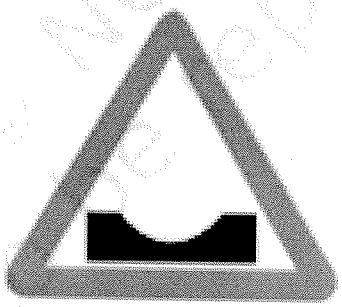




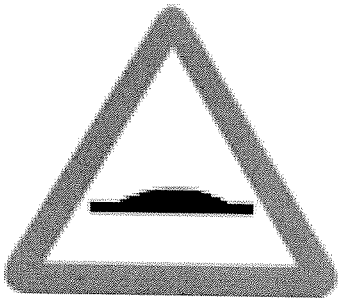
***Steep Ascent or Steep Descent:*** This sign is displayed before a steep upgrade or downgrade that may constitute a hazard to traffic. A gradient of 10 per cent and above is considered steep gradient.



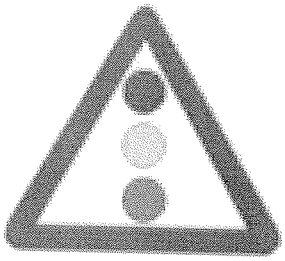
***Rumble Strip:*** This sign is installed in advance of the rumble strips provided on the road to control the speed of the vehicle.



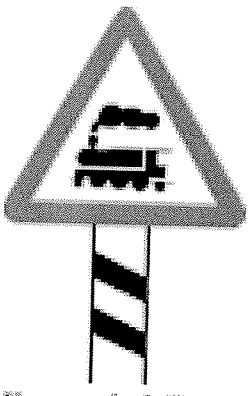
***Dangerous Dip:*** This sign is used where a sharp dip in the profile of the road or a causeway is likely to cause considerable discomfort to traffic.

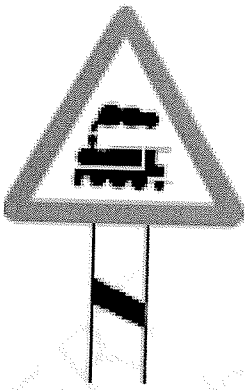


***Speed Breaker:*** This sign warns the drivers about the presence of a speed breaker.

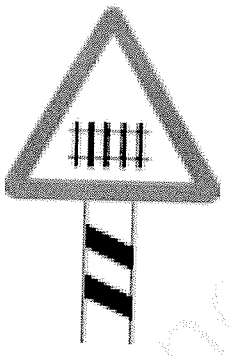


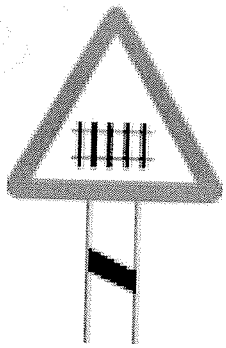
***Traffic Signals:*** This sign is used to caution the drivers about the presence of traffic signals.





***Unguarded Railway Crossing:*** This sign is used on the approaches of level crossings where there are no gates or other barriers. An advance warning sign (with two bars) is installed at a distance of 200 metres and second sign (with one bar) is installed near the crossing.





***Guarded Railway Crossing:*** This sign is used to warn traffic on the approaches to guarded railway crossing. An advance warning sign (with two bars) is installed at a distance of 200 metres and a second sign (with one bar) is installed near the crossing.

Road Safety



BIHER

SLIMS

Road Safety Education for Car Passengers The main topic of these actions concerns safe transport of children by correct use of child restraints and seatbelts. The main target groups addressed are parents/adults, retailers and sometimes children themselves. The data collection of Rose 25 includes 10 actions. Seatbelts and child restraint systems (CRS) are important issues when it comes to injury prevention. Several studies show results of 40-60% lower mortality rates when seatbelts were used. The difference within this 'range' of 40-60% is explained by several factors, one of which includes using seatbelts correctly or incorrectly. The chance of newborns being killed in a car accident decreases by 90% when safety devices are correctly used11. In the past years, several studies on the effectiveness of projects for improved use of seatbelts and CRS have been carried out12. Legislation prescribing compulsory seatbelt use is one of the most important pre-conditions for the use of seatbelts and CRS. Promotion of use without legislation is very difficult and time-consuming. Education alone seems to have a modest effect in increasing the use of child restraints13 14. Educational efforts should be combined with other safety measures, such as enforcement activities and/or incentive programmes. For example, loans for CRS can be an effective strategy to increase the number of children transported safely, at least in the short-term, but more research is needed to determine the long-term effectiveness of combined education and incentive programmes. Some studies suggest that the use of child safety seats may decline when the incentive is removed15. Table 2 provides an overview of most important topics and methods in RSE concerning in-car safety. This, and the following tables, does not enter a claim on completeness.

Road Safety Education for Pedestrians Being pedestrian is the first active involvement of children in traffic. Parents should play a key role during this phase. It is important to provide parents with knowledge and know-how at an early stage because many parents tend to

overestimate the abilities of their children in traffic16. The younger the child, the stronger this tendency of overestimation is. The main reason is that parents do not properly assess the importance of distraction: safe behaviour patterns vanish when children are distracted. This might be the case if, for example, the child sees friends on the other side of the road. In addition parents should become aware of the fact that: • Children will have only limited experience as pedestrians in traffic when they are raised mostly as car passengers. They have no possibilities to train important skills, such as estimation of vehicle speed and vehicle distance. These skills become crucial when crossing a road without a traffic light. • If parents and children spend only very limited time in traffic as pedestrians, the parents cannot observe their child's behaviour. Thus, they obtain only scarce evidence of their children's behaviour as pedestrians. • Practical roadside training at kindergarten and at school cannot cover the full amount of training needed to make children safe and reliable pedestrians

Road Safety Education for Cyclists Road Safety Education for cyclists is most relevant in the ages between approximately seven to 15 years. Actual use and attitudes towards cycling differ significantly throughout Europe. In some countries, children use the bicycle very early from the age of four, such as in Germany and the Netherlands, whereas in other countries, bicycle riding is of less importance. Riding a bicycle requires complex multi-tasking. Older children can better cope with these multiple operations than younger children. An important threshold in terms of age seems to be the age of eight years17. This is the reason why it is often recommended that children riding a bicycle should be protracted to the furthest extent possible, and that one should prefer other means to train motor skills. In particular, scooting is a good basis for cycling, because it requires similar motor tasks, but on a markedly lower level of complexion18. In countries with a long-standing tradition of early cycling, such recommendations tend to fail in raising awareness and cannot be enforced due to lack in

political acceptance. In such countries, it is better to actively address parents and children to assist in teaching the safe use of bicycles

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Department of Biochemistry 2016-2017

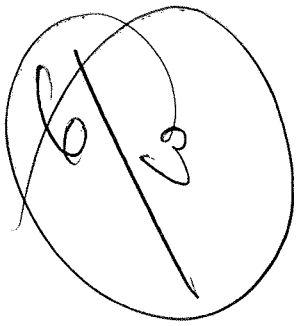
| S.No | Register No. | Student List | Signature |
|---|---|---|---|
| 1 | U16MB337 | MUSKAAN SHAMIM | |
| 2 | U16MB348 | PARTHASARATHY .S | |
| 3 | U16MB349 | PATIL NAMRATA YASHANAND | |
| 4 | U16MB338 | MUSULURI SHYAM SINDHU | |
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| 11 | U16MB342 | NEITOUNUO MARY PIENYII | |
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| 13 | U16MB332 | MONISHA .M | |
| 14 | U16MB335 | MOUNIKA.B | |
| 15 | U16MB345 | NISHA AGRAWAL | |
| 16 | U16MB339 | NAMITA YADAV | |
| 17 | U16MB344 | NIKITA VERMA | |
| 18 | U16MB334 | MOUNIKA .A | |
| 19 | U16MB340 | NAMRATA GHORAI | |
| 20 | U16MB336 | MUHAMMAD SHEBIN | |

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PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY



**Sri Lakshmi Narayana institute of medical sciences**

**Department of Biochemistry**

1. **When crossing a road, which direction should you walk?**
   - A. Diagonally
   - B. in a straight line
   - C. in a wavy line
   - D. Cross sectional
2. **when crossing a road, what should you be doing constantly?**
   - A. Running
   - B. looking and listening
   - C. clossing your eyes
   - D. talk with phone
3. **before your cross the road you should.....?**
   - A. stop,look and run
   - B. stop,listen and talk
   - C. stop,look and listen
   - D. listening song
4. **true or false when crossing the road you should cross a pelican crossing when it is red.**
   - A. True
   - B. Fasle
5. **when is is safe to cross at a zebra crossing?**
   - A. when the traffic one side has stoped
   - B. when the traffic both sides have stoped
   - C. when the traffic lights near you has turned red
   - D. All of the above
6. Who will be fined if a passenger under the age of 16 is not wearing a seat belt or suitable child restraint?
   - A. The owner of the vehicle
   - B. The passenger
   - C. The driver of the vehicle
   - D. All of the above

7. What does a broken white line down the centre of the road mean? You must not cross the broken white line

   a. You may only cross the broken white line to turn right

   b. You may cross the broken white line

c. You may cross the broken white line when overtaking or turning right, if it is safe to do so

d. None of the above

8. What is the rule regarding overtaking at a pedestrian crossing?

a. You must not overtake a vehicle that has stopped at a pedestrian crossing

b. Give way to pedestrians on your right

c. Give way to pedestrians on your left

d. All of the above

9. Are you allowed to park a vehicle on a pedestrian crossing?

a. Yes, if no pedestrians are using it

b. Yes, if it is a passenger vehicle

c. No

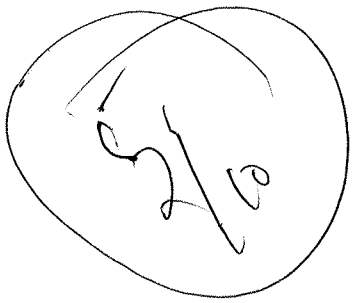
10. f you are travelling in a lane that has a left-turn arrow marked on the road, can you drive straight ahead?

a. Yes, if no other traffic is approaching

b. No

**Sri Lakshmi Narayana institute of medical sciences**

**Department of Biochemistry**



1. **When crossing a road, which direction should you walk?**
   - A. Diagonally
   - B. in a straight line
   - C. in a wavy line
   - D. Cross sectional
2. **when crossing a road, what should you be doing constantly?**
   - A. Running
   - B. looking and listening
   - C. clossing your eyes
   - D. talk with phone
3. **before your cross the road you should.....?**
   - A. stop,look and run
   - B. stop,listen and talk
   - C. stop,look and listen
   - D. listening song
4. **true or false when crossing the road you should cross a pelican crossing when it is red.**
   - A. **True**
   - B. **Fasle**
5. **when is is safe to cross at a zebra crossing?**
   - A. when the traffic one side has stoped
   - B. when the traffic both sides have stoped
   - C. when the traffic lights near you has turned red
   - D. All of the above
6. Who will be fined if a passenger under the age of 16 is not wearing a seat belt or suitable child restraint?
   - A. The owner of the vehicle
   - B. The passenger
   - C. The driver of the vehicle
   - D. All of the above

7. What does a broken white line down the centre of the road mean? You must not cross the broken white line

   a. You may only cross the broken white line to turn right

   b. You may cross the broken white line

c. You may cross the broken white line when overtaking or turning right, if it is safe to do so

d. None of the above

8. What is the rule regarding overtaking at a pedestrian crossing?

a. You must not overtake a vehicle that has stopped at a pedestrian crossing

b. Give way to pedestrians on your right

c. Give way to pedestrians on your left

d. All of the above

9. Are you allowed to park a vehicle on a pedestrian crossing?

a. Yes, if no pedestrians are using it

b. Yes, if it is a passenger vehicle

c. No

10. f you are travelling in a lane that has a left-turn arrow marked on the road, can you drive straight ahead?

a. Yes, if no other traffic is approaching

b. No

# Course feedback form

**Course title:** Travel Safety measures and awareness in RTA.  Date :

Course code: BIO - 06

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

# Course feedback form

**Course title:** Road Safety measures and awareness on RTA  Date :

Course code: BIO - 06

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

Date: 25.10.2016

From

Dr. Pannerselvam
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: **Road safety measures and awareness on RTA** 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. thangapannerselvam

**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 **PRIYADARSHINI .K** has actively participated in the Value Added Course on **Road safety measures and awareness on RTA** April – May 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Prabhakar Reddy
RESOURCE PERSON
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

Dr. Thangapannerselvam
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 **RAJAT TYAGI** has actively participated in the Value Added Course on **Road safety measures and awareness on RTA** April– May 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Prabhakar Reddy

**RESOURCE PERSON**

DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502.

Dr. Thangapannerselvam

**COORDINATOR**

PROFESSOR & HOD
DEPARTMENT OF BIOCHEMISTRY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY 605 502

# Sri Lakshmi Narayana Institute of Medical Sciences

**OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,**
**PUDUCHERRY – 605 502**

18-5-16

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 College
Bharath Institute of Higher Education and Research,
Puducherry

**Sub: Permission to conduct value-added course: Organ Donation**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Organ Donation for III MBBS students from June 2016 to Aug 2016 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**

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**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr.Jayakumar

The HOD: Dr.Rajini

The Expert: Dr.Thiruselvakumar

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
Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502

# Sri Lakshmi Narayana Institute of Medical Sciences

**OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,**
**PUDUCHERRY – 605 502**

**Circular**

(19-5-2016)

**Sub: Organising Value-added Course: Organ Donation-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"**Organ donation course"**

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 June 2016 Applications received after the mentioned date shall not be entertained under any circumstances.

DEAN
Dr. P. JAYAKUMAR, M.S., M.CH.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Pondicherry-605502

# VALUE ADDED COURSE

**1. Name of the programme & Code**

Organ donation and PSM01

**2. Duration & Period**

30 hrs & June 2016 – Aug 2016

**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: - 2017**

**9. Summary report of each program year-wise**

| **Value Added Course-** 2016 June – August 2016 | | | | | |
|---|---|---|---|---|---|
| **Sl. No** | **Course Code** | **Course Name** | **Resource Persons** | **Target Students** | **Strength & Year** |
| **1** | PSM01 | Organ donation | Dr. Rajini.S<br>Dr.Thiruselvakumar | III$^{rd}$ MBBS | 12 (June16 – Aug 16) |

**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 I

# Sri Lakshmi Narayana Institute of Medical Sciences

**OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST, PUDUCHERRY – 605 502**

**Course Title: "Organ donation"**

**CourseObjective:** To gain an understanding in Organ donation including laws, Health expenditure and future perspectives

**CourseOutcome:** To acquire knowledge in Organ donation process NOTTO and legislations like THOTA

**Course Audience:**III MBBS students

**Course Coordinator:**Dr.Rajini.S

**Course Faculties with Qualification and Designation:**

1.Dr.Rajini.S Professor

2.Dr.Thiruselvakumar.D Associate Prof

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

| SlNo | Date | Topic | | Time | Hours |
|---|---|---|---|---|---|
| 1 | 2-06-16 | Introduction to Organ Donation | Dr.Rajini | 4-5p.m | 1 |
| 2 | 6-06-16 | Right to Health | Dr.Thiruselvakumar | 4-6p.m | 2 |
| 3 | 8-06-16 | Laws promoting health | Dr.Rajini | 2-4p.m | 2 |
| 4 | 13-06-16 | THOTA 1994 Features(part I) | Dr.Thiruselvakumar | 4-6p.m | 2 |
| 5 | 20-06-16 | THOTA 1994 Consent (part II) | Dr.Rajini | 4-6p.m | 2 |
| 6 | 27-06-16 | THOTA 1994 Impact assessment,Amendments (part III) | Dr.Thiruselvakumar | 4-6p.m | 2 |
| 7 | 04-07-16 | NOTTO | Dr.Rajini | 4-5P.M | 1 |
| 8 | 11-07-16 | Post mortem organ donation | Dr.Thiruselvakumar | 4-5p.m | 1 |
| 9 | 18-07-16 | Rethinking of Organ donation law | Dr.Rajini | 2-4p.m | 2 |
| 10 | 21-07-16 | States role ,NGO roles in India | Dr.Thiruselvakumar | 4-5p.m | 1 |
| 11 | 25-07-16 | Gaps in Organ donation | Dr.Rajini | 4-6p.m | 2 |
| 12 | 01-08-16 | Forms in NOTTO | Dr.Thiruselvakumar | 4-6p.m | 2 |
| 13 | 08-08-16 | Need for Health legislation | Dr.Rajini | 4-6p.m | 2 |
| 14 | 15-08-16 | Testimony of organ donor and recipients | Dr.Thiruselvakumar | 4-6p.m | 2 |

| | | | | | |
|---|---|---|---|---|---|
| 15 | 22-08-16 | Matching, Recovery and Transport process | Dr.Rajini | 4-6p.m | 2 |
| 16 | 29-08-16 | Assessment I | Dr.Thiruselvakumar | 4-6p.m | 2 |
| 17 | 30-08-16 | Assessment II | Dr.Rajini | 4-6p.m | 2 |
| | | Total Hours | | | 30 |

**REFERENCE BOOKS: (Minimum 2)**


1. Nagral S, Amalorpavanathan J. Deceased organ donation in India: where do we go from here?. Indian journal of medical ethics. 2014 Jul 1;11(3):162-6.
2. Balwani MR, Gumber MR, Shah PR, Kute VB, Patel HV, Engineer DP, Gera DN, Godhani U, Shah M, Trivedi HL. Attitude and awareness towards organ donation in western India. Renal failure. 2015 Apr 21;37(4):582-8.
3. http://nhp.gov.in/Organ-Donation-Day_pg

# ORGAN DONATION HANDBOOK

# ORGAN DONATION: INDIA


I Introduction

II Right to health and the Indian Constitution

III THOTA 1994- impact assessment after two decades

IV Bottlenecks in the implementation of THOTA, 1994

V Overall health expenditure on health/healthcare

VI Need of health legislation

# I Introduction

RECOGNITION OF 'right to health' is the benchmark of developed human societies. International concern for 'right to health' evolved and a framework of norms were developed requiring States to facilitate the right to health of the individual. The Constitution of the World Health Organisation defines health as, "…a state of complete physical, mental and

social well-being and not merely the absence of disease or infirmity."[1] States are under an obligation to make provision of a clean living environment, protections against hazardous working conditions, education about disease-prevention and social security measures in respect of disability, unemployment, sickness and injury at the societal level in order to provide health to an individual. The individual-centric approach for providing curative treatment, medicines etc. to an individual has shifted towards the public health to a larger extent. In the words of K.G. Balakrishnan: "There is an obvious intersection between healthcare at the individual as well as societal level and the provision of nutrition, clothing and shelter".[2] The Supreme Court has held that 'right to health' is an integral part of 'right to life' under article 21 of the Constitution. And that preservation of human life is of paramount importance.[3] Organ transplant technology has emerged on the scientific horizon as a gift of life to people suffering from end stage organ failure disease. The development in transplant technology with immunosuppressant drugs has made the transplant of both (i) living related or/and unrelated and (ii) deceased organs, a viable option for people suffering from organ failure. Their chances of survival and ability to lead a healthy, prolonged life is completely dependent on availability and accessibility of transplantable human organs. The Transplantation of Human Organs and Tissues Act, 1994 regulates the practice and procedure of donation, retrieval and transplantation of human organs. This article deals with the impact assessment of this Act after more than two decades of its implementation to evaluate its efficacy in achieving its two objectives and suggest changes to ensure that the scientific evolution of transplant technology proves beneficial for advancing human health and a life of dignity.

# II RIGHT TO HEALTH AND THE INDIAN CONSTITUTION

Under the Indian Constitution the 'right to health' does not find a mention in the fundamental rights chapter III but finds its place in directive principles of state policies under chapter IV of the Constitution which are non-justiciable in the courts of law.

## Health-a 'state' subject in Indian Constitution

Subject of 'health' falls under entry 6, list-ii (state list) in the seventh schedule to the Constitution of India which reads "Public Health and Sanitation, Hospitals and Dispensaries". The other two lists being the 'The Union List-List I' and 'The Concurrent List-List III'. But under special provisions in the Constitution, the Parliament can also enact laws for the states. Article 252 read with article 249 of the Constitution are special provisions which confer power on the Parliament to legislate for two or more states by consent or by adoption of such legislation by any other state.

In the history of Indian judiciary the case of *Maneka Gandhi* v. *Union of India*[4] has been a watershed in expanding the horizons of fundamental rights in general and article 21 in particular. The court moved from a pedantic to a purposive approach in construing the sweep of the 'right to life' under the Constitution. *Maneka Gandhi* judgment became a springboard for the evolution of human rights jurisprudence and the basis for the subsequent expansion of the understanding of the 'protection of life and liberty' under article 21 through expansive interpretation of Fundamental Rights guaranteed in part III of the Indian Constitution. The Supreme Court of India further went on to adopt an approach of harmonization between fundamental rights and directive principles in Indian Constitution in several cases.[5]

## Judicial activism and right to health

In India during the last four decades or so, the issue of health has gained momentum. Judgments delivered in *Parmanand Katara* v. *Union of India,*[6] *Indian Medical Association* v. *V.P.Shantha*[7] and *Paschim Banga Khet Mazdoor Samiti* v. *State of West Bengal*[8] are few amongst many Supreme Court decisions which strengthened the recognition of the 'right to health'. The apex court's activism through various decisions observed that denial of immediate medical attention to a patient in need amounts to violation of 'protection of life and liberty' guaranteed under article 21. Likewise

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holding that a provision of a medical service (whether diagnosis or treatment) in return for monetary consideration amounts to a

'service' for the purposes of Consumer Protection Act,1986 went a long way in protecting the interests of the patients.[9]

**Laws promoting human health- Transplantation of Human Organs and Tissues Act, 1994** In India there are many health legislations *e.g.,* Drugs and Cosmetics Act,1940, The Prevention of Food Adulteration Act, 1954, The Medical Termination of Pregnancy Act, 1971, Maternity Benefit Act,1961, Insecticides Act 1968, Narcotic Drugs and Psychotropic Substances Act and Rules 1985, The Pre-Natal Diagnostics Techniques Act, 1994, Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011, Food Safety and Standards (Prohibition and Restrictions on Sales) Regulations, 2011, amongst others.

One disease which captured the attention of the medical professionals all over the world in early 1900s and throughout the first half of the 20th century was solid organ failure.[10] With the advent of advanced medical technology in transplant procedures an end stage organ failure patient[11] got a ray of hope to lead a healthy and prolonged life by undergoing organ transplant[12]. Human body has certain essential organs like kidneys, lungs, cornea that are in pairs, making it possible to part away with one of the two during the lifetime and still be able to lead a healthy life. Whereas other significant organs like heart, pancreas etc. can be used only after the death of a human being but before the organs become obsolete on account of discontinuation of blood supply. There are regenerative and non-regenerative transplantable tissues/organs like liver, blood, bone marrow, stem cells *etc.*

Law and medicine join a common pilgrimage towards all pervasive welfare of human life. [13]Over the years, with the revolutionary changes brought about in social, economic, political and scientific fields of human activity, human organ transplant as a curative medical

technique gained public acceptance in India too. To facilitate transplants for saving the lives of organ failure patients and to safeguard the interests of the organ donors, the Transplantation of Human Organs and Tissues Act was passed in India in 1994.[14] The enactment furthers the cause of human existence by regulating and facilitating transplants, gives thrust to policies recognising values which are integral to dignified human existence. It has come as a boon to trillions of humans suffering from ESOF. Various organs can be legally transplanted by virtue of THOTA, 1994 giving gift of life to people otherwise doomed to die on account of ESOF.

The THOTA , 1994 was enacted at the time when in India due to absence of any legislation, rampant sale of human organs was going on. The Act aims to provide for (i) the regulation of removal, storage and transplantation of human organs for therapeutic purpose and for (ii) the prevention of commercial dealings in human organs and for matters connected therewith or incidental thereto. There are two types of organ donations envisaged under the Act *viz*., (i) Living Donation and (ii) Cadaver/Deceased Donations. Broadly, the Act for the first time recognised brain death[15] as the moment of death for facilitating retrieval of organs. Thus owing to THOTA, 1994, persons in vegetative / brain dead state with beating heart have become a viable source of organ pool for the purposes of transplantation and the sale of organs is now a punishable offence. With the acceptance of brain death, it has become possible to undertake solid organ transplants.

## III THOTA 1994- Impact assessment after two decades

The transplantation of organs from one individual to another has increased dramatically in recent years. The advent of new immuno-suppressive drugs and the donor specific blood transfusion have greatly improved the survival of grafted organs. While the medical technology and knowhow continue to expand the possibilities of organ transplantation and increased success rates of such transplant surgeries, the number of organ donors does not increase correspondingly.[16] This gap in demand and supply of transplantable organs results in

illegal trade in organs. Despite the legislation, organ commerce generally and especially kidney scandals are regularly reported in the Indian media.[17] In most of the reported instances, the implementation of the law has been flawed and more often than not its provisions have been abused. Though the living related and unrelated donation program has established itself but the deceased donation program is still in its nascent stage only.

Initially for many years there was a lack of initiative from the government to find solution to rampant sale of organs after the Act was passed. Whenever a kidney scandal was unearthed there was an instant reaction from different quarters, there was some media outcry and if the allegations were found to be serious a few small time brokers were rounded up and life carried on till another such episode came to light and the same act was repeated. Realising the need to move forward with changing needs of the society and to make the regulation of organ transplant procedure with all the incidental paraphernalia meaningfully effective, periodic amendments have been made to the THOTA, 1994 in more than two decades since its enforcement.[18]

Even a cursory look into the statistics available on the official website of National Tissue and Transplant Organisation[19] reveals the fact that despite amendments in the Act, the cadaver organ donation program has not picked up over the years. In the face of all organ donations numbering 14038 from living donation category from 1971-2017, the figures for deceased (cadaver) donation in the same period stand at a dismal 315 only.[20] The high demand of organs has led to its commodification, more so in developing countries where there is a large population base below the poverty line with weak regulatory authorities like in India. But

there are examples of legislations in countries like Spain, Iran and Iraq which have been successful in bridging the gap between demand and supply of transplantable organs. Countries with laws legalising 'presumed consent' and actively involved transplant coordinators[21] in ICUs have succeeded in meeting the dearth of donor organs.

The reason for miniscule organ donation in India can be attributed to lack of awareness about the concept of organ donation in masses. Another important factor is the ethical, religious, and emotional constraints which discourage individuals to go for organ donation.[22] In India, the potential for deceased donation is huge due to the high number of fatal road traffic accidents but this pool is yet to be tapped.[23] Frequent amendments made to the Act are testimony to the fact that in past Indian legislation has somewhere lagged behind in comparison to other countries which have incorporated new ways to find solution to the problem of organ shortage. The following section identifies the stumbling blocks in achieving the objectives of the legislation.

## IV Bottlenecks in the implementation of THOTA, 1994

Patients' silent screams, their family's unending efforts and doctors' helplessness in saving the patient due to scarcity of compatible donor organs, all point in the direction that there still are issues which have been left unattended and need some solutions. The Transplantation of Human Organs and Tissues Act, 1994 banned organ trade more than two decades ago but it cannot be overlooked that an arrangement of buying and selling of organs is still continuing. Some issues which have marred the organ donation and transplantation programme in India have been discussed hereunder.

## 'Consent' and organ donation

In cadaver donation the consent of the deceased before his death is a pre-requisite for removal of his/her organs upon death. There are three processes through which consent may be given. First is 'opt-in' consent, second is 'opt-out' and the third is 'mandated choice.'[24] In India we have the 'opting-in' form of consent for retrieval of organs from deceased. It is based on the principle of 'authorisation', an expression which is intended to convey that people have the right to express, during their lifetime, their wishes about what should happen to their bodies after death, in the expectation that those wishes will be respected. It is a positive concept, representing a positive attitude to the issue, and replaces the lack of objection or 'presumed consent'. Authorisation to remove an organ of a deceased reflects the principle of 'consent' on which the THOTA , Trans1994 is based.

Section 3(1) of the Act permits any donor subject to prescribed conditions and the procedure to donate or authorise the removal of any of his organs or tissues of his body, before his death only for therapeutic purposes.[25] The consent for the donation of organs can also be given by the kin of the deceased, under section 3(3) of the Act provided the deceased had not objected to the donation during his lifetime.

Such consent can be in writing, in presence of two or more witnesses, one of whom has to be a 'near relative'. And if it is so, then besides the relatives in whose possession the dead body is, even the person, other than the relatives, can grant all reasonable facilities to a registered medical practitioner for the removal of the human organ of the deceased person for therapeutic purposes, provided that such removal can be made only and only by a registered medical practitioner. Here only embargo being that relative or person in whose possession the body is, should be sure that deceased had not subsequently revoked that authority or person

other than the relative has a reason to believe that any near relative has no objection to such a removal. This type of consent is known as opt-in concept, in which the deceased person has already opted for the removal of the organ before his death.

## Deceased organ donation- role of relative

Under the Act even if the individual has opted-in or has given his consent for organ donation after his death, his wish to donate his organs cannot come true if his family is not ready for the donation.[26] Despite the open declaration of his consent and wish to donate organs after his death, its the approval of family which is needed for such donation. Thus the provision of free will of the deceased is nothing but a misnomer because inspite of his opting for the organ donation, his wish becomes secondary to the wishes of his family. For the Act to be effective in its real sense the opt-in-consent provision should be made effective meaningfully to respect the wish of the deceased donor. And with large scale awareness programmes about organ donation and more and more people coming forward to pledge their organs, the dual objectives of the Act could easily be achieved.

## Obtaining consent from relatives – emotional, ethical and religious constraints

As per section 3 (2) the person in lawful possession of the dead body of the donor who had during his life time, given consent as required by law for removal of his organs after death, such person has to give approval for removal of organ(s), unless he has reason to believe that deceased had revoked consent afterwards. In practice generally the power given under sec.3

(2) is not used. The relative(s)/person(s) in lawful possession of the dead body, who are authorised to give consent for organ removal, are not prepared for such authorisation and thus no removal of deceased organ is possible. The act of obtaining consent of the relative(s) acts as a stumbling block in successful running of the cadaver donation program. The relatives of the patient are not forthcoming, and the doctors not motivated enough to encourage donation. Additionally, patients may not have relatives or may not have them in attendance when the diagnosis of brain death is made. Generally the grieving relatives are reluctant to even think of donating organs of their loved one

In India, where the cultural ethos and religious beliefs are stronger than other counties,

generating awareness is the need of the hour for effective implementation of cadaver donation program. Cultural perception of charity and donation is different in different religions.[27] In India, religious beliefs generally discourage practices such as stockpiling and collecting organs from cadavers.[28] It is difficult for a grief stricken family to understand the concept of cadaver donation when his loved one has been declared dead and to take a decision of permitting doctors to retrieve organs for which the corpse would be mutilated. Myths and fears dominate their minds. The very thought of dismemberment of the body of their loved one's makes them repulsive to the ides of organ donation. The pre-conceived religious beliefs/myths that in rebirth a person is born in the same state of body condition as he was at the time of death deters them to give consent for removal of any of the body parts. They find taking out organs/tissues very repulsive and perceive it as a kind of disrespect for the dead body of their relative. Though generally all religions permit donation, people are still unwilling to donate organs. Instead they use religious misconceptions as excuses for not donating organs Thus permission for cadaver donation by family of the deceased has still not gained momentum.

## Distrust against the medical staff

It is trickier and very difficult situation to approach a grieving family asking them for donation of organ(s) of their beloved one' especially when his heart is beating which creates a wrong impression in their minds that there can be some mischievous intentions on the part of the medical/ hospital staff. The emotional turmoil of losing a dear one deprives them of their logical thinking. They apprehend that if they agree for donation the hospital staff may not take proper care of their beloved one because somewhere underneath they are unaware about the brain-stem death[29] concept. Hence they believe that their beloved could be saved even after brain death.

Likewise the written consent for donation of organs post demise, that can be given during the life time by a prospective donor, may not be given by the person concerned.

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This would be so

on account of entertaining a belief that in order to generate organ resources the hospital administration might not provide him that standard of medical care as might be required by him to recuperate fully and to walk out of the hospital in a healthy state.

## Ascertaining consent - 'near' relative v. 'nearest' relative hierarchy

section 3(3) of the Act deals with the cases of adult deceased who have not expressed any formal wishes. In such situations the nearest relative or person in lawful possession has the capacity to authorise the removal/donation of organs with a rider that neither the deceased during his lifetime nor his '*near relative*' has any objection to it.[30]

It is suggested that the meaning of term '*near relative*' used in section 3(3) of THOTA should be different from the definition as given in the section 2(i) and read into section 9(1) and section 3(1A) (i)(ii).[31] Reason being if a person is staying away from his family and/or doesn't have close bonds with his '*near relatives*' before his death then in that case his close associates or friends who are with him for considerably long periods before his death, can be contacted to seek organ donation. The author is of the considered view that there is a need of amending the concept of 'near relative' as used in section 3(3) to enlarge it to include close associates/aides/friends associated with the deceased prior to his demise, to ensure that a huge cadaver organ pool/resource does not go waste in the face of either the '*near relative*' as defined by the existing law not being there or where near relative may not be maintaining a good relation with the deceased to be able to give consent on behalf of the deceased. Hence in order to ensure optimal use of organs of a deceased and to rule out the possibility of wastage of organs because of absence of unequivocal consent of the person admitted in ICU or of the brain dead person under section 3(1A) (i)(ii) where near relatives are not present for some reason or the other, the Act should include the 'nearest relative' hierarchy aiming to identify the person closest to the deceased in life. So that the close person may be able to express the deceased's wishes about organ donation.

## Opt-in consent-a misplaced strategy

The underlying premise for organ donation under THOTA 1994 is the existence of opt-in consent. The incorporation of concept of 'brain death' intended for increasing the deceased donor pool along with 'opt-in' consent in Indian law has miserably failed to achieve the two pronged objectives of having (i) a functional Cadaver donation system in place and (ii) removing the organ trade from Indian horizon under THOTA, 1994.[32]

## Respect for the autonomy of the deceased

"All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood."[33] Thus we all have a duty to act at all times in the best interests of human kind. This includes respecting the autonomous choices made by persons regarding the treatment of their body after their death. Autonomy is a kind of deliberated self-rule which makes us to act according to our own wishes on the basis of informed choices, thought and decision, freely and independently.

THOTA 1994 provides that a person can make a wish to donate his organs/tissues or can also register his objection for such donation after his death. Indian legislation in this context is debatable. As per the Act even if the deceased had consented to donation of organs during his life-time, the wishes of his near ones are given priority over the deceased' wishes and organ retrieval cannot be done without the consent of the near relatives.[34] In such a situation autonomy of the deceased is not respected. The wishes of the near relatives of the deceased are given priority over the wishes of the deceased.

But at the same time, if the person had registered his objection to donate organs after his death or had revoked his earlier consent to donate, then in that case even the near relative's authorization to donate is of no consequence.[35] In Indian law autonomy of deceased is respected in objecting to donation but not when he agrees to organ donation. In this context provisions of the THOTA
,1994 seemingly tilt in obstructing rather than facilitating organ donation and are differentially applicable in respecting the autonomy of the deceased.

In England the Human Tissue (Scotland) Act, 2006 sets out that any adult or child aged 12 and over, who is able to make their own decisions, can give permission for donation of their organs or tissue. A person's own decision is most important and to be respected. A relative does not have the right to change this decision after the person has died. Children under the age of 12 cannot give permission themselves. For a child under the age of 12, only their parent(s) or guardian can give permission.[36]

## Section 9 THOTA, 1994 *vis-à-vis* right to life of a specific class of ESOF patients

In the present dismal state of cadaver organ programme, the laws regulating transplants and activities associated with it have adversely affected a particular class of patients. Now the question arises what this particular class of patients is? In the process of fulfilling its objective of regulating and facilitating the transplants and also to curb the organ sale, norms under section 9 of the Act for procurement of organs for transplantation. The ways in which a donor organ can be procured as provided in the Act does not entitle all the ESOF patients to procure a donor organ.

By virtue of section 9 of the Act[37] a 'class' of ESOF patients is excluded from transplant treatment

,who are in desperate need of the transplantable organ to save their lives but neither have a biologically compatible 'near relative' nor an altruistic donor. Nuclear families with one or two children who may not be biologically compatible and the related contextual social architecture of families reduces the possibility of finding a live donor from amongst near relatives. For example an orphan, a person losing his family in a train accident or in floods or in some other natural calamity will not have any 'near relative'. This class of patients are solely dependent on the cadaver donation and in the absence of an efficient and functional cadaver organ donation programme the patients belonging to this class are bound to die waiting for the transplantable organ. Thus this class of ESOF patients is denied their right to health and cannot save their lives in present scenario. At the same time it should not be

forgotten that article 21 besides ensuring 'right to Health' and 'healthcare' also ensures 'right to self-preservation' to everyone.[38]

In its ambitious journey to regulate organ transplantation by promoting cadaver donation and prohibiting commercial dealings in organs, section 9 of THOTA 1994 restricts a critical patient's right to life, to avail the latest available medical procedures more so in the absence of any effective cadaver donation program. The real and direct effect of section 9 of the Act is impairing the right to life of the class of patients who do not have 'near relative', willing relative or no altruistic donor. Though under the Act provisions are laid down for procurement of organs but the special class of patients as noted cannot have access to any type of donor organ and thus the direct effect of the legislation is infringing patient's right to health.

## Public policy for welfare of the community

In a welfare state, legislations should be in consonance with the needs of the society, for the collective good of the people. Such needs/interests defined in broad terms as social welfare, are labelled as public policy for the good of the collective body.

The proposition that enactment and implementation of THOTA, 1994 was in public interest for curbing human organ trafficking and regulation of transplants cannot be denied. At the same time it also has to be evaluated on the touch stone of Fundamental Rights, the nature of the right alleged to have been infringed, the underlying purpose of the restrictions imposed, the extent and urgency of the evil sought to be remedied, thereby, the disproportion of the imposition , if any, the prevailing conditions at the time should all be considered for reaching a judicious conclusion.

But the post THOTA ,1994 legal regime is witness to the recurring reports of organ trade rackets pointing to the hasty passing of THOTA,1994, without developing a well thought out and functional cadaver organ program, leaving the ESOF patients to die by depriving them to exercise their 'right to life' and also their 'right to self- preservation'. No one appreciates the harrowing life experiences of patients in need of donor organs. Patients in need of solid organ transplant and having no one to donate alive or dead are bound to die and become the

victim of indirect prohibition through this legislation.

The Act should have put restrictions as envisaged under Sec.9 and prohibited sale of organs only after developing a very effective working cadaver programme. With the changing needs of the society, progressive laws are welcomed. But having progressive laws alone is not enough, it should also be ensured that they do not impliedly infringe the Fundamental Rights of the people.

## Section 9, THOTA,1994 -Needs rethinking

Currently though organ donation from the brain dead to patients-in-need is facilitated by law but its in a dismal state. The rate of organ donation in India is only 0.16 per 1 million population, compared to 40 in Spain and 35 in the United State.[39] If data pertaining to different countries and specially India is compared, it clearly depicts that even after implementing THOTA, the number of ESOF patients/recipients dying because of unavailability of donors has been on the rise. Though number of donations has increased but still is abysmally low in comparison to demand of donor organs. Consequently section 9 of the Act needs rethinking. It should be amended till the cadaver organ donation network is so well developed throughout the country that not a single ESOF patient is deprived of organ transplant in the absence of available organs. A multipronged approach should be adopted to improve the cadaver organ program, by incorporating strategies and processes established in other countries having successful systems regulating organ transplants.

## Transplant coordinator(s) and organ donation/ retrieval

According to section14 (4) of THOTA,1994,[40] hospitals engaged in transplants and related activities along with organ retrieval centers engaged in organ retrieval activities are required to register. And the registration of such facilities would be done only if they have appointed transplant coordinators[41] who will work for increasing the

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cadaver donor organ pool. The amendments made it mandatory to appoint transplant coordinators in hospitals

having Intensive Care Unit facility, who in consultation with registered medical practitioners are duty bound to make relatives of the brain dead person in the ICU. Aware about the concept of organ donation and consequently their option to donate organs of their loved ones.[42] Though THOTA, 1994 mandates appointment of transplant coordinators, factual analysis reveals that more numbers of transplant coordinators are required for efficacious cadaver donations.

In Delhi only one or two transplant coordinators are there in each leading hospital registered for transplants. With overburdened ICUs and tired nursing staff, technicians coupled with less number of transplant coordinators, it becomes difficult to convert potential donors into real donors. The website of Institute of Liver and Biliary Sciences, Delhi shows Vibhuti Sharma as the only transplant coordinator.[43] Max Hospital Saket, Delhi has only two transplant Coordinators. A.

S. Soin, a renowned surgeon of Medanta Hospital, Gurugram, Haryana has a large team of 130 specially trained staff for conducting transplants in the hospital that consists of 8 Consultant Liver Transplant Surgeons, 4 Consultant Liver Transplant Physicians, 3 Liver Transplant Surgical Fellows, 3 Hepatology Fellows, 7 Consultant Liver Transplant Anaesthetists, 5 Consultant Intensive Care Specialists and other specialists, but have only 5 Transplant Coordinators.[44]

The amendments made in the Act mandating appointment of 'transplant coordinators' for facilitating organ retrieval from 'brain-stem' dead[45] patients hasn't so far changed the state of cadaveric donations in India. Private hospitals are reluctant to appoint team of transplant coordinators which is the need of the hour.

Union Health Minister J.P. Nadda disclosed government's plan to appoint coordinators in each hospital having ICU at government expense. Every hospital that starts retrieval and

transplantation can employ two transplant coordinators at the government's expense.[46] Government felt the need of appointing coordinators at government expense as the private hospitals with overburdened ICUs may not be able to convert potential donors into real donors as they may not employ adequate number of well qualified coordinators in order to save money. Data collected from the websites of few private hospitals as mentioned above proves the fact of underemployment of transplant coordinators for economic reasons.

In Delhi there are 933 private nursing homes[47]or hospitals which are registered under the Delhi Nursing Homes Act 1953.[48] There are approximately 576 hospitals which are registered in Delhi.[49] As per THOTA 1994 'hospital'[50] includes nursing homes etc. As per section 14 (3)[51] only those hospitals would be registered under THOTA, 1994 which have specialised services and facilities, possess skilled manpower and equipment and maintain prescribed standards, necessary for the removal, storage or transplantation of any human organ or tissue or both for therapeutic purposes and as per section 14 (4)[52] appointment of transplant coordinator is a prerequisite for such registration. Thus only well-equipped hospital fulfilling the criteria laid down in section 14(3) will compulsorily appoint transplant

coordinators under section 14(4). Accordingly hospitals other than the well-equipped hospitals are not bound by the Act to appoint transplant coordinators. So even if these provisions of THOTA,1994 are implemented and are not left only on papers, still the number of cadaver donor organs would not increase substantially in the absence of the services of transplant coordinators

.Those hospitals which are registered under the Delhi Nursing Home Registration Act, 1953, but are not equipped and registered for the purpose of transplant activities and organ retrieval activities under THOTA,1994 can play a major role in generating awareness about the cadaver donations. Thus appointment of transplant coordinators should be made mandatory in small nursing homes and medical centres registered under the Nursing Home Registration Act which though do not fulfil the criteria laid down under Rule 26 and Rule 27 of the Act but can have potential donor/brain dead patients.

As per NOTTO website there are only 201 centres all over India which are deemed capable of organ transplant and retrieval centres.[53] Thus it can be concluded that in Delhi 933 registered Nursing homes/ hospitals are there but only 36 fulfil the criteria under the Act and will have transplant coordinators. In Maharashtra, hospitals equipped with an ICU and operation theatre to retrieve organs for harvesting are mandated to officially identify brain dead patients. This would allow hospitals which don't have organ transplant facilities to at least harvest organs from brain dead patients for use by the facilities which can at least increase the availability of organs.[54] Thus to increase cadaver organ pool, appointment of transplant coordinators should be made compulsory in all registered hospitals.

It is estimated that around 1,75,000 kidneys and 100,000 livers are needed every year in India and only about 2-3% get it.[55] By conservative estimates over one lakh Indians die in road accidents every year and 40% of those people are left 'brain dead'.[56] Many NGO

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have been working towards increasing the reach of the THOTA, 1994. Multi-Organ Harvesting Aid

Network is one of such an organisation. [57] Sunil Shroff, Professor and Head of Urology and Renal Transplant, and chairperson of the MOHAN foundation estimates that 50% of all organ donation needs could be met by simply using organs from road accident casualties.[58]

In present scenario even if we presume that these efforts prove fruitful and considerable number of donor organs is generated, it would still be a long journey in the absence of appropriate infrastructure.

## Post mortem and organ donation/retrieval

Initially in Delhi, Subzi –Mandi mortuary was the only one where post-mortems were conducted. Now due to decentralization post-mortem is done in many government hospitals. The post- mortems are done only on the request of the police. After completion of the formalities by the police the body is sent to the mortuary. In all medico-legal cases the body is sent to government hospitals. The office hours of the post-mortem doctors are from 9.00am to 4.00pm on all working days and from 9.00am to 1.00 pm on Saturdays, Sundays and holidays. The request for the post- mortem should reach the doctors till one hour before the closing hour.[59]

In a PIL filed over the grievance pertaining to delay in conducting the post-mortem a Bench of Chief Justice G. Rohini and R. S. Endlaw J directed the City Government and Delhi Police to issue a notification within 60 days to enable the investigating officer to directly approach the hospital concerned and also for constitution of standing and roaster based board of doctors to handle medico-legal cases. The directions were also given for having a continuing panel of doctors for conducting the post-mortem and any one/two/three doctors from which

panel may constitute the board.[60]

The Delhi government also made the declaration in an affidavit in high court that post-mortem examinations and medico-legal tests of prisoners who died in judicial custody will be conducted at thirteen demarcated government hospitals, on Sundays and holidays, too.[61] Only if procedure of post-mortem is expedited, the relatives of the deceased can have a chance of donating the biologically viable organs.

One of the areas in which efforts could be made to increase the cadaver donor pool is to allow autopsy in private hospitals by private doctors. About 95% transplants are being done in private sector. Because facilities required for transplants and organ retrieval are available only in metropolitan cities and that also in private hospitals. So provision of autopsies in private hospitals by private doctors can boost the cadaver organ donation. The chances of private doctors becoming amenable to influence and issue bogus post-mortem certificates can be curtailed by video graphing the whole autopsy procedure and at the same time private doctors can also be made liable. A Division Bench of JJ. S. Rajeswaran and P N Prakash of High Court of Tamil Nadu said in a case before them that, “the IPC had enough provisions to prosecute a doctor. The legislature can also bring in an amendment to the definition of "public servant" found in section 21 of IPC and in section 2(c) of the Prevention of Corruption Act, 1988 by including 'doctors who perform autopsy at the request of a police officer, so that they could be prosecuted."[62]

## Infrastructural constraints

Cadaver transplants require expensive, specialized and diverse infrastructure systems to be in place and functioning. Hospitals need the required facilities, such as equipment, operating rooms, laboratories to conduct cross- matching and trained personnel available at short notice and around the clock for such transplants.[63] Time is of essence in such transplants, because organs have a limited life span, before expiry of which both removal and transplantation have to be effectively carried out.[64] With 17 lives lost in road accidents every hour last year and 390 fatalities recorded daily, the Union Health Ministry said organ donated from such victims with proper consent of their family members can help the country's abysmally low organ donation rate.[65] For brain death patients to convert into real donors a responsive, rapid and efficient medical facility is crucial.

Transplantation operations involving cadavers in India are more complicated and rare due to the lack of facilities *e.g.,* facility for the resuscitation of the victim at the accident spot, lack of well-equipped hospitals, shortage of trained personnel in the ICUs, lack of quick communication and proper transport facilities, as well as inadequate public awareness amongst other reasons. Thus for all practical purposes cadaveric donation technology is almost missing or negligible considering the number of brain-stem death patients in India.. Presence and availability of such an infrastructure along with the availability of cadaver organs together can make transplants possible. And for such specialised, diverse and expensive infrastructure , availability of funds plays a very significant role.

In India, the budgetary allocation of funds for health sector is one of the lowest in comparison to other countries. In order to make the Act really effective funds should be provided in the budget.

**Overall Health Expenditure on Health/Healthcare in Some Countries**

| Country | Expenditure in % of annual Budget |
|---|---|
| **United States** | **19.3** |

| | |
|---|---|
| **New Zealand** | **18.4** |
| **Germany** | **17.9** |
| **Canada** | **17.9** |
| **Norway** | **17.9** |
| **Japan** | **17.9** |
| **Australia** | **17** |
| **France** | **16.7** |
| **U.K.** | **16.3** |
| **Spain** | **15.5** |
| **Italy** | **14.2** |
| **Argentina** | **14.2** |
| **Sweden** | **13.8** |
| **Iran** | **11.5** |
| **Russia** | **10.8** |
| **China** | **9.9** |
| **United Arab Emirates** | **8.7** |
| **India** | **3.4** |
| **Pakistan** | **1.3** |

There is no data available to tell how many ESOF patients have died due to unavailability of donor organs till today. ESOF patients come to the hospital in a hope to walk back healthy, but die enduring pain, suffering, waiting and leaving their families distraught and under huge debt which takes years for them to come back to life.[67] Sanjay Aggarwal, head of nephrology department at AIIMS said:

> …. they have 500 patients register for cadavers at any time. The number of cadaver donation is less than 15 in a year. He also added that about 5.4 lakh patients require kidney transplant every year but only 6,000 are able to get it. The rest either survive on dialysis which in simple terms is cleaning of body waste or die without the transplant.

Dialysis being very costly almost costing Rs.32,000 per month, it is only the rich who can afford to live on dialysis that too for few years. A poor or middle class patient does

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not have economic capacity to survive on dialysis in India. In case an ESOF patient cannot arrange a

biologically compatible 'near relative' organ donor for himself or who has no willing family member to donate and none feeling enough love and affection to donate an organ to save him, is bound to die. And considering the poor and abysmally low organ donation rate what would be the fate of an orphan who is diagnosed as being at the critical state of ESOF having neither family nor friends is not unimaginable. For him going by law means waiting for DEATH.

In retrospect, neither has organ commerce been curtailed nor has cadaveric donation become the norm.[69]Somewhere in all these years various factors have been responsible in failing the Act to achieve its objectives of facilitating transplants and banning organ trade.

## Section 9(3) 'affection' clause most flouted

Indian transplant scenario since the passing of THOTA, 1994 reflects that the law has been more flouted than followed.. The "affection" clause in section 9(3) THOTA,1994[70] is the gateway for the maximum number of transplants in the country so far. In state after state, authorisation committees[71] have rejected a microscopic percentage of applications under this clause, turning a blind eye to what are obviously financial transactions.

Three months data from May-July 2016 regarding number of transplants approved at Sir Ganga Ram Hospital, Delhi reveals that out of total of 29 application 26 applications for transplants were approved, only one was rejected on ground of suspicion as the statements of the donor and the relatives of the donor did not corroborate and one was rejected as the kidneys of donor were not healthy.[72] The data cannot be said to be conclusive on the issue as the website of the hospital in public domain do not show the status of the donor *i.e.,* whether donor and recipient are distant relative or unrelated. But as per the Indian transplant registry data the total live transplants done from 1971 to 2016 are 20612 while the total number of transplants done in the same period is 21395.[73] It gives a strong indication that approving live transplants is the norm

which mainly includes transplants out of affection and attachment.

The arrest of persons involved in transplants done in Indraprastha Apollo Hospital Delhi[74] and Hiranandani Hospital, Mumbai[75] on the basis of fake documents depicts the sad story of how unscrupulous people in medical field are having their way and have made it an industry. The committee noted that there were no medical records, evidence of consent or even evidence of basic medical infrastructure.

In Gurgaon kidney racket senior Delhi police officials confessed that Kumar was first arrested (as Santosh Raut) in 1994 along with a group of surgeons and anaesthetists for conducting kidney transplants at a nursing home in Mumbai which had no license for conducting surgery. Kumar was arrested at least four times between 1994 and 2008, and obtained bail each time, following which he would disappear and resurface, running the same business in another part of the country. A government-appointed committee concluded that as many as 450 kidney transplants on foreign patients had been done in the nursing home within a span of fouryears
i.e. from 1991 to 1994.[76]

In Jan 2016 police arrested Prajapati hailing from Ahmedabad in an organ trade racket having links in Sri Lanka.[77] But despite the arrest the kingpin of the organ sale racket is again out. Large scale organ sale rackets have been often reported in the country in over two decades but only handful of them have been reported to be prosecuted for violating THOTA. India has a flourishing, and illegal, trade in human organs. And the legislation designed to prevent it has failed.

## v Need of health legislation

"The scope of health legislation some 50 or 60 years ago was quite different to what it is today. In a sense, the evolution of health legislation is partly the story of evolution of medical and public health."[78] In the last few decades the WHO has repeatedly advocated the use of health legislation as a potent means to achieve the well declared objective of "health for all" that initiated a global effort to define health and evolve and adopt legal strategies to implement the avowed targets. "This strategy became necessary as the health status of hundreds of millions of people around the globe is not only worrisome but unacceptably pathetic. More than half the population of the world does not have access to adequate health care."[79]

The WHO Constitution and several resolutions of the World Health Assembly have affirmed that health is a basic human right and worldwide social goal. Providing basic human needs and improvement in the quality of life of the people should be the main social plank of governments and WHO in the coming years. All the governments of the world, particularly developing countries like India have to devote their energies, efforts and resources towards the attainment by all citizens of a level of health that will permit them to lead a socially and economically productive life and formulating a health legislation will definitely prove to be effective in safeguarding the right to health of the citizens.

The international community is according more attention to fundamental rights, there has been a greater awareness among health policy-makers, administrators, consumers, and health activists about the rights of individuals with regard to access to health care facilities and related matters. In some countries this awareness has resulted in health-related rights being articulated in national constitutions and health codes.[80] Many Fundamental Rights like 'right to life', 'right to work', 'right to education' and 'right to security' and 'social welfare' etc. are related to 'right to health'. The law conferring a 'right to health' to a citizen correspondingly

confers a duty on the State to protect that right and in an event of infringement of that right, the courts can adjudicate on the issue of infringement of the 'right to health' and provide redressal.

## National Health Policy 2017

The primary aim of the National Health Policy, 2017, is to inform, clarify, strengthen and prioritize the role of the government in shaping health systems in all its dimensions.[81] The policy envisages as its goal the attainment of the highest possible level of health and well- being for all at all ages, through a preventive and promotive health care orientation in all developmental policies, and universal access to good quality health care services without anyone having to face financial hardship as a consequence.[82]

The National Health policy emphasizes the key principles of affordability, universality, accountability from sustainable developmental goals aiming at achieving progressive universal health coverage. Highlighting the need of collaboration between the public and private sectors it specifically states that, "tissue and organ transplantations and voluntary donations are areas where private sector provides services- but it needs public interventions and support for getting organ donations. Recognising the need for awareness, the private sector and public sector could play a vital role in awareness generation."[83] It also envisages the creation of appropriate Standard Regulatory framework for laboratories and imaging centers, specialized emerging services such as assisted reproductive techniques, surrogacy, stem cell banking, organ and tissue transplantation and nano-medicine.[84]

Addressing the fundamental policy question as to whether health rights bill should be made to create right to health as a Fundamental Right at par with right to education , the policy document states, "Right to healthcare covers a wide canvas, encompassing issues of preventive, curative, rehabilitative and palliative healthcare across rural and urban areas, infrastructure availability, health human resource availability, as also issues extending beyond health sector into the domain of poverty, equity, literacy, sanitation,

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nutrition, drinking water availability, etc. Excellent health care system needs to be in place to ensure

effective implementation of the health rights at the grassroots level."[85] The policy while supporting the need for moving in the direction of a rights based approach to healthcare takes note of financial and infrastructural constraints as major challenges to be overcome in order to ensure that the poorest of the poor stand to gain the maximum and are not embroiled in legalities. The policy therefore advocates a progressively incremental assurance based approach, with assured funding to create an enabling environment for realising health care as a right in the future.[86]

A number of international covenants to which India is a joint signatory give us such a mandate and this could be used to make a national law. Indian judiciary has also given rulings to the effect that health care should be seen as fundamental right and a constitutional obligation flowing out of the right to life.

It also aims to improve population health status through concerted policy action in all sectors and expand preventive, promotive, curative, palliative and rehabilitative services provided by the public health sector and to achieve a significant reduction in out of pocket expenditure due to health care costs and also to assure universal availability of free, comprehensive primary health care services, as an entitlement in all spheres of health. The implementation of the policy will transform 'right to health' as enshrined in 'right to life' under article 21 of citizens of India into a reality.

## VI Conclusion

The huge gap between the demand and supply of donor organ in India is evident of the fact that legislation has failed to achieve its purpose. Every year thousands of patients die of ESOF disease. National Organ and Tissue Transplant Organization, a national level organization set up under Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India established in November 2015 in Delhi has to adopt a comprehensive approach for ensuring that ESOF patients do not die for want of a transplantable organ.

Legal tools are a necessity in organ procurement to allow transplant surgeons to remove

organs from potential sources. Legislations regulating transplants must have provisions to increase donor pool. In India THOTA, 1994 was enacted with intent to pave the way for smooth procedure for organ transplants so that lives of patients suffering from organ failure could be saved. "With around 1,60,000 people dying in road mishaps in the country every year, the pool of potential brain dead donors is large. In fact if all brain dead accident victims are declared donors, maintained and taken up for organ retrieval there would be no need for the living to donate organs to relatives."[87] But the law has not been able to fill the gap between demand and supply of organs. The progressive law to promote organ donation has been brought on the statute book but in reality and for practical reasons it has not yielded desired results. It is suggested that we need to switch over to either presumed consent or Opting-out system of consent and tap cadaver organ pool from traffic accidents, brain dead patients along with generating awareness amongst masses about organ donation.

# ANNEXURE II

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

TOPIC: ORGAN DONATION

| SL | UNIVERSITY REG. NO. | NAME OF THE STUDENT | SIGNATURE |
|---|---|---|---|
| 1 | U11MB201 | ABHIJITH .P | |
| 2 | U11MB202 | ABHINAYA .V | |
| 3 | U11MB203 | AJEEZZUNNISHA. A | |
| 4 | U11MB205 | AKSHAYA .E | |
| 5 | U11MB206 | ALAIMANI .V | |
| 6 | U11MB207 | ANAND M.W.P. | |
| 7 | U11MB208 | AMARNATH | |
| 8 | U11MB209 | ARUNA | |
| 9 | U11MB210 | ANLIN JENISHA .M | |
| 10 | U11MB211 | ARAVIND .R | |
| 11 | U11MB212 | ARAVINTHANATHAN .K | |
| 12 | U11MB213 | ARUL PALANI MUNIYAN .G | |

**ANNEXURE III**

**MCQs- ORGAN DONATION**

1. Transplantation of Human Organs Act was passed by Government of India in:

A. 1996
B. 1993
C. 1998
D. 1994

Ans. D

2. Allopurinol is used in organ preservation as:

a. Antioxidant
b. Preservative
c. Free radicals scavenger
d. Precursor for energy

Ans(3)

3. Transplantation of which one of the following organs is most often associated with hyperacute rejection?

a. Heart
b. Kidney
c. Lungs
d. Liver

Ans(2)

4. Transplantation between genetically different members of the same species is termed as:

a. Autograft
b. Isograft
c. Allograft
d. Xenograft

Ans(3)

5. Infection in renal transplant patient is usually caused by

a. CMV
b. HIV
c. Herpes
d. Salmonella
e. Pneumococcus

Ans(1)

6. HLA matching is not necessary for which of the following organ transplantation?

a. Liver
b. Bone marrow
c. Pancreas
d. Kidney

Ans(1)

7. A most important HAL for organ transplantation and tissue typing:

a. HLA-A
b. HLA-B
c. HLA-C
d. HLA-D

Ans(4)

8. Hyperacute rejection is due to:

a. Preformed antibodies
b. Cytotoxic T-lymphocyte medicated injury
c. Calculating macrophage-mediated injury
d. Endothelins caused by donor antibodies

Ans(1)

9. Transplantation of kidney from mother to son is an example of:

a. Autograft
b. Allograft
c. Isograft
d. Xenograft

Ans(2)

10. Hyperacute rejection of graft is seen in?

a. Lung
b. Liver
c. Kidney
d. Pancreas

Ans(3)

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Department of Community Medicine
Value Added Course

MCQ: Organ Donation

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   c. Allograft
   d. Xenograft

5. Infection in renal transplant patient is usually caused by
   a. CMV
   b. HIV
   c. Herpes
   d. Salmonella
   e. Pneumococcus

# SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

6. HLA matching is not necessary for which of the following organ transplantation?

a. Liver
b. Bone marrow
c. Pancreas
d. Kidney

7. A most important HAL for organ transplantation and tissue typing:

a. HLA-A
b. HLA-B
c. HLA-C
d. HLA-D

8. Hyperacute rejection is due to:

a. Preformed antibodies
b. Cytotoxic T-lymphocyte medicated injury
c. Calculating macrophage-mediated injury
d. Endothelins caused by donor antibodies

9. Transplantation of kidney from mother to son is an example of:

a. Autograft
b. Allograft
c. Isograft
d. Xenograft

10. Hyperacute rejection of graft is seen in?

a. Lung
b. Liver
c. Kidney
d. Pancreas

# 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 ABIJITH.P has actively participated in the Value Added Course on **ORGAN DONATION** held during June 2016 – August 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Thiruselvakumar.D, MD
**Resource Person**
**Associate Professor**
**Department of Community Medicine**

**Resource Person**
**Professor & HOD**
**Department of Community Medicine**

Dr.P. Jayakumar, 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 ABINAYA.V has actively participated in the Value Added Course on **ORGAN DONATION** held during June 2016 – August 2016 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Thiruselvakumar.D, MD
**Resource Person**
**Associate Professor**
**Department of Community Medicine**

**Resource Person**
**Professor & HOD**
**Department of Community Medicine**

Dr.P. Jayakumar, MD
**Dean, SLIMS**

# ANNEXURE V

## Student Feedback Form

Course Name: **ORGAN DONATION**

Subject Code: **PSM01**

Name of Student: ABHIJITH P 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:

Course was excellent

Signature

Date: 30/8/16

## Student Feedback Form

Course Name: **ORGAN DONATION**

Subject Code: **PSM01**

Name of Student: ABINAYA . V 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:

Course was an eye opener.

V. Abinaya
Signature

Date: 30/8/16

# Sri Lakshmi Narayana Institute of Medical Sciences

**OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,**
**PUDUCHERRY – 605 502**

30-08-16

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: Organ donation**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Organ donation** from June 2016 to August 2016. 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.

**HEAD OF THE DEPARTMENT**


ORGAN
DONATION
Valve added course

