

# STUDENT STUDY GUIDE



**Integrated Modular System**  
**3<sup>rd</sup> Professional MBBS**  
**Academic Year 2023-24**



**Liaquat University**  
of Medical & Health Sciences,  
Jamshoro

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# P R E F A C E

The MBBS curriculum is designed to prepare the medical student to assume the role of the principal carer for patients. The majority of instruction in the various basic and clinical science disciplines is focused on attaining this objective. The amount of material and specificity that the student must acquire in order to complete the MBBS programme as a whole is substantial. Subject-based instruction affords students the chance to develop comprehensive and profound understanding of each respective subject. However, this instructional framework might result in the student failing to recognize the interconnectedness of knowledge across different disciplines, their interrelation, and most significantly, their significance in the context of patient care.

Over the years, numerous inventive approaches have been devised to tackle these obstacles. One such approach is the integration of instruction at multiple levels, which eliminates and reduces boundaries within subjects, both vertically and horizontally, across phases. LUMHS, while acknowledging the merits of these methodologies, has endeavoured to seize the opportunity to comprehend the interdependencies and minimize duplication in the subjects being instructed through the implementation of an integrated modular approach.

The cardiovascular system, musculoskeletal system, and respiratory system are few examples of system-based modules in an integrated modular curriculum that connects basic scientific knowledge to clinical problems. By means of integrated instruction, subjects are presented as a unified whole. Students can enhance their comprehension of basic scientific principles through consistent application of clinical examples in their learning. A skills lab provides early exposure to the acquisition of skills, case-based discussions, and self-directed learning are all elements of an integrated teaching programme.

## **LEARNING STRATEGIES**

The following instructional and learning strategies are implemented to foster greater comprehension:

- ❖ Interactive Lectures
- ❖ Small group sessions
- ❖ Case-Based Learning (CBL),
- ❖ Self-Study,
- ❖ Practical,
- ❖ Skills lab sessions,
- ❖ Demonstrations
- ❖ Field visits

## **INTERACTIVE LECTURES**

In large group, the lecturer actively involves the students by introducing the topic or common clinical conditions and explains the underlying phenomena by questions, pictures, videos of patients' interviews, exercises, etc. in order to enhance their learning process.

## **SMALL GROUP TEACHING (SGT):**

This strategy is helpful for the students to make their concepts clear, and acquiring skills or attitudes. These sessions are organized with the help of specific tasks such as patient case, interviews or discussion topics. Students are then encouraged to exchange their ideas and apply knowledge gained from lectures, tutorials and self-study. The facilitator employs probing questioning, summarization, or rephrasing techniques to enhance the understanding of concepts.

## **CASE- BASED LEARNING:**

A format of small group discussion that centres on a sequence of questions derived from a clinical scenario, with the aim of facilitating learning. Students engage in discussions and provide answers by applying pertinent knowledge acquired in clinical and basic health sciences throughout the curriculum.

**PRACTICAL:**

Basic science practical related to anatomy, biochemistry, pathology, pharmacology and physiology are scheduled to promote student learning by application.

**SKILLS LAB SESSION:**

Skills relevant to respective module are observed and practiced where applicable in skills laboratory.

**SELF DIRECTED LEARNING:**

Students take on the responsibility of their own learning by engaging in independent study, collaborating and talking with classmates, accessing knowledge from the Learning Resources available, teachers, and other experts. Students can make use of the designated self-study hours provided by the college.

**FIELD VISITS:**

Students visit community health areas to understand the common diseases and their preventive measures.

**HOSPITAL POSTINGS:**

Students attend tertiary care hospital postings and learn common diseases and their management.

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# STUDY GUIDE

A study guide is a strategic and effective approach to:

- ❖ Provide students a detailed framework of the modules organization
  - ❖ Support students in organising and managing their studies throughout academic year.
  - ❖ Provide students information on assessment methods and the rules and regulations that apply.
- 
- It outlines the outcomes which are expected to be achieved at the end of each module.
  - Ascertains the education strategies such as lectures, small group teachings, demonstration, tutorial and case based learning that will be implemented to achieve the module objectives.
  - Provides a list of learning resources for students in order to increase their learning.
  - Emphasizes information on the contribution of attendance, end module tests, block examinations and annual examinations on the student's overall performance.
  - Includes information on the assessment methods that will be held to determine every student's achievement of objectives.

# ABBREVIATIONS

FOUNDATION	Fnd
HAEMATOLOGY	Hem
INFECTIOUS DISEASE	ID
RESPIRATORY	RESP
CARDIOVASCULAR	CVS
GASTROINTESTINAL TRACT & LIVER	GIL
NEUROSCIENCE	NS
MUSCULOSKELETAL	MSK
ENDOCRINOLOGY	End
RENAL & EXCRETORY	EXC
REPRODUCTIVE	Rep
PATHOLOGY	Path
PHARMACOLOGY	Pharm
MEDICINE	Med
SURGERY	Surg
PAEDIATRICS	Paeds
COMMUNITY MEDICINE	CM
SPIRAL	S
MICROBIOLOGY	Micb

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# 1 FOUNDATION & GENETICS-II

## Introduction

Welcome to the Foundation II module. This exciting module will serve as building block and is very essential to your future work as doctors. This module is designed to make your learning both interesting and productive by including several inter active activities.

This module marks the beginning of transition to more focus on clinical learning. This module will introduce students to key concepts essential for understanding diseases process, their prevention and treatment. Students will be able to apply these key concepts in future, system-based modules to understand the diseases processes and their management. This module will deal with cell pathology, Genetics and Hemodynamics. The course covers the molecular level of cell biology including genetics and its role in pathology.

## Rationale

This module will enable the students of third year to recognize the basics of general pathology. The student will develop the understanding of the cell pathology, genetic diseases and their diagnosis and diseases due to disturbance of hemodynamics. Concepts dealt with in this module will be revisited in other modules in the future

## Duration

02 weeks

## Learning Outcomes

At the end of this module students should be able to:

- Define Pathology and Pathogenesis and discuss cellular Responses to the injury and stages of the cellular Response to stress and injurious stimuli.
- Discuss morphological alterations in cell injury including both reversible and irreversible injury
- Discuss causes, morphological and biochemical changes, clinic-pathologic correlations in Apoptosis and Necrosis
- Define edema, effusion, exudate, transudate, hyperemia and congestion.
- Describe the clinical manifestations & consequences of pulmonary & systemic thromboembolism
- Describe the mechanism of three major types of shock and Describe the three stages of shock
- Discuss the transmission pattern of single gene disorder
- Discuss chromosomal abnormalities and define normal karyotype and common cytogenetic terminology

## Themes

Theme 1: Cell Pathology and Genetics  
Theme 2: Hemodynamics

# TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

## Theme 1: Cell Pathology and Genetics

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	<ul style="list-style-type: none"> <li>Enumerate causes of Cell Injury</li> <li>Discuss types of cell injury</li> <li>Describes sequential morphologic changes in Cell Injury</li> </ul>	<b>Fnd-S2-Path-1</b> Cell injury	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> <li>Define Necrosis and its type</li> <li>Describe the nuclear and cytoplasmic features of necrosis.</li> </ul>	<b>Fnd-S2-Path-2</b> Necrosis		
3	<ul style="list-style-type: none"> <li>Define Apoptosis Enumerate pathological and physiological causes of Apoptosis</li> <li>Describe Biochemical Features and Mechanism of Apoptosis</li> </ul>	<b>Fnd-S2- Path-3</b> Apoptosis		
4	<ul style="list-style-type: none"> <li>Define and describe pathological calcification.</li> <li>Discuss Dystrophic and metastatic calcification</li> </ul>	<b>Fnd-S2- Path-4</b> Calcification and Pigmentation		
5	<ul style="list-style-type: none"> <li>Define Mutation and its type.</li> <li>Describe the effects of different types of mutations</li> </ul>	<b>Fnd-S2-Path-5</b> Mutations		
6	<ul style="list-style-type: none"> <li>Define Mendelian Disorder</li> <li>Explain the pattern of inheritance in Mendelian Disorders</li> <li>List the examples of autosomal, Recessive and sex linked disorders.</li> </ul>	<b>Fnd-S2-Path-6</b> Mendelian Disorders		
7	<ul style="list-style-type: none"> <li>Describe normal Karyotype</li> <li>Discuss various numerical and structural abnormalities of chromosomes.</li> </ul>	<b>Fnd-S2-Path-7</b> Chromosomal aberration.		
8	<ul style="list-style-type: none"> <li>Discuss various technique in diagnosis of genetic diseases.</li> </ul>	<b>Fnd-S1- Path-8</b> Diagnosis of Genetic Diseases		
9	<ul style="list-style-type: none"> <li>Define Hypertrophy, Hyperplasia, Atrophy and Metaplasia.</li> <li>Demonstrate gross and microscopic features of cellular adaptations</li> </ul>	<b>Fnd-S2-Path-9</b> Cellular adaptation	Practical	OSPE & OSVE

## Theme 2: Hemodynamics

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
10	<ul style="list-style-type: none"> <li>Define edema</li> <li>Describe Pathophysiology of edema</li> </ul>	<b>Fnd-S2-Path-10</b> Edema	Interactive Lecture	SBQs & OSVE
11	<ul style="list-style-type: none"> <li>Define Hemorrhage, Hyperemia, Congestion</li> <li>Describe their causes and pathophysiology</li> </ul>	<b>Fnd-S2-Path-11</b> Hyperemia, Congestion		
12	<ul style="list-style-type: none"> <li>Define Shock</li> <li>Describe the pathophysiology of different type of Shock.</li> </ul>	<b>Fnd-S2-Path-12</b> Shock		
13	<ul style="list-style-type: none"> <li>Define Infarction</li> <li>Discuss the etiology of infarction</li> <li>Discuss the morphological classification of infarcts</li> <li>Describe the morphological features of infarctions.</li> </ul>	<b>Fnd-S2-Path-13</b> Infarction		
14	<ul style="list-style-type: none"> <li>List and define causes of intracellular accumulation</li> <li>Discuss the role of Intracellular Accumulations in metabolic derangements of cell.</li> </ul>	<b>Fnd-S2-Path-14</b> Intracellular Accumulations	Practical	OSPE & OSVE

Subject in Module	Proportion of subjects in module	Weightage	Test Instrument/tool/method				Explanation
What to assess?			How to assess?				
			MCQs (SBQs) Level 1 & 2	OSVE stations Level 1 & 2	OSPE/OSCE Level 3	Any Other	<b>Proportion of test instruments to be used:</b> Theory MCQs (SBQs)= 100 %; Practical OSVE=80% OSPE/OSCE= 20%  <b>Competency level &amp; Learning Domain at Miller's Pyramid:</b> <b>Cognition:</b> Know (Level-1)& How to know (Level-2) <b>Skills &amp; Attitude:</b> Show (Level-3) & Does (Level-4)
Pathology	14	14	14				
	14	14	14	80%	20%		

# 2 INFECTIOUS DISEASE MODULE

## Introduction

Infectious diseases remain a serious public health problem in the 21st century. WHO has classified Infectious diseases as the second leading cause of death with approximately 15 million deaths worldwide every year. HIV/AIDS, tuberculosis, and malaria have been nicknamed the 'big three' because of their important impact on global human health.

At home, the story is no different. Pakistan is one of several countries, which together bear 95% of the burden of infectious diseases. Pakistan is ranked fifth out of twenty-two on the list of high-burden tuberculosis countries. An alarming average of about one million lives are also claimed yearly by malaria.<sup>1</sup> Worst of all, Pakistan is one of the two remaining countries where polio is still endemic<sup>2</sup>. Hence, it is important to spread knowledge and information on the importance of immunization to the general public. Other factors such as overcrowding, poor hand washing practices and lack of effective prescriptions contribute to further worsening the situation. An estimated 32% of general practitioners in Pakistan fail to administer the proper medication thus increasing the disease burden.

It is therefore important as 3<sup>rd</sup> year medical students to enhance your existing knowledge of the prevalent infectious diseases, and build greater understanding and ability to recognize signs and symptoms, and relate with appropriate investigations, and therapeutics.

## Rationale

Infectious diseases are the most common problems of our community. In the under developed countries, like Pakistan, infectious diseases along with malnutrition are the commonest causes of mortality. Most of the diseases are identifiable and curable if recognized early. It is important for medical graduates to have sound understanding of microbiology of the organisms and the diseases that they cause. Students should also understand the rationale of the investigations to diagnose these diseases. They should also know the pharmacology of the various drugs used to treat infectious disease and the rationale to treat the common diseases.

## Duration:

06 weeks

## Learning Outcomes

After completion of this module student should be able to:

- Describe pathogenesis & clinical presentations of common bacterial, viral, fungal & microbial infections.
- Recognize the clinical presentation of common infectious diseases in community.
- Take history & formulate appropriate plan of investigations for attaining differential diagnosis
- Analyze findings of history, examinations & investigations for diagnosis.
- Practice basic principles of management of infectious diseases.
- Recognize preventive measures & prognosis for counseling the patients.
- Be Aware of the prognosis and be able to counsel their patients accordingly.

## Themes

- Theme 1: Immuno-pathogenesis
- Theme 2: Diagnostic Approach to Infection
- Theme 3: Pyogenic Bacteria
- Theme 4: Pyogenic Bacteria
- Theme 5: Pyrexia of Unknown Origin

# TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

## Revisit

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	Enlist essential and non-essential components of a typical bacterial cell with their function	<b>ID-S2-Path-1</b> Bacterial Structure	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> <li>Classify bacteria on the basis of Gram staining.</li> <li>Differentiate characteristics of gram-positive and gram-negative bacteria</li> <li>Define normal flora.</li> <li>Describe colonization of normal flora.</li> <li>Name the members of normal flora with their appropriate anatomical locations</li> </ul>	<b>ID-S2-Path-2</b> Classification of bacteria & normal flora (human microbiota)		
3	<ul style="list-style-type: none"> <li>Define acute inflammation</li> <li>Describe the sequence of vascular changes</li> <li>Define exudates and transudate and their mechanism of formation</li> </ul>	<b>ID-S2-Path-3</b> General features of inflammation & vascular changes		
4	<ul style="list-style-type: none"> <li>Describe the acute inflammatory cells and their functions.</li> <li>Name the various types of chemical mediators &amp; their role</li> <li>Describe the local and general clinical features of acute inflammation</li> </ul>	<b>ID-S2-Path-4</b> Cellular events of Chemotaxis, phagocytosis		
5	<ul style="list-style-type: none"> <li>Define chronic Inflammation</li> <li>Describe the characteristic features and types of chronic Inflammation</li> <li>Define granuloma, mention a etiological classification of granuloma with examples</li> </ul>	<b>ID-S2-Path-5</b> Chronic inflammation		
<b>Microbiology</b>				
6	<ul style="list-style-type: none"> <li>Outline various methods for transfer of genetic information in bacterium.</li> <li>Describe the phases of bacterial growth.</li> </ul>	<b>ID-S2-Micb-1</b> Bacterial genetics & bacterial growth	Interactive Lecture	SBQs & OSVE
7	<ul style="list-style-type: none"> <li>State the criteria are used in viral classification</li> <li>Describe the characteristics of DNA and RNA viruses</li> <li>Describe structure of virus</li> </ul>	<b>ID-S2-Micb-2</b> Classification & structure of viruses		
8	To demonstrate the principle & procedure of Gram's staining	<b>ID-S2-Micb-3</b> Gram's staining	Practical	OSPE & OSVE
<b>Pharmacology</b>				
9	Describe the classification, mechanism of action & side effects of penicillin's	<b>ID-S2-Pharm-1</b> Beta lactam antibiotics	Interactive Lecture	SBQs & OSVE
10	Describe the classification, mechanism of action & side effects of cephalosporin's & other cell wall synthesis inhibitors	<b>ID-S2-Pharm-2</b> Beta lactam antibiotics		

## Theme 1: Immuno-Pathogenesis

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT		
<b>Microbiology</b>						
11	<ul style="list-style-type: none"> <li>Differentiate b/w true pathogens, opportunists and commensals</li> <li>List the routes of transmission of infection</li> <li>Describe colonization, pathogenesis, spread and excretion of infectious agents.</li> </ul>	<b>ID-S2-Micb-4</b> Bacterial pathogenesis-I	Interactive Lecture	SBQs & OSVE		
12	<ul style="list-style-type: none"> <li>Differentiate b/w true pathogens, opportunists and commensals</li> <li>List the routes of transmission of infection</li> <li>Describe colonization, pathogenesis, spread and excretion of infectious agents.</li> </ul>	<b>ID-S2-Micb-5</b> Bacterial pathogenesis-II				
13	<ul style="list-style-type: none"> <li>Define viral pathogenesis.</li> <li>Describe the effect of virus infection on host cell.</li> <li>Explain specific and non-specific defense mechanism against viral infection.</li> </ul>	<b>ID-S2-Micb-6</b> Viral pathogenesis				
14	<ul style="list-style-type: none"> <li>Describe host defense mechanism against bacteria.</li> <li>Distinguish between passive &amp; active adaptive immunity.</li> <li>To discuss the failure of host defense against infections.</li> </ul>	<b>ID-S2-Micb-7</b> Host defense against bacterial infection				
15	<ul style="list-style-type: none"> <li>Distinguish between innate and acquired immunity</li> <li>Describe the role of interferons, natural killer cells, cytotoxic T cell in viral diseases</li> <li>Explain how interferons limit cell-to-cell spread of viruses.</li> </ul>	<b>ID-S2-Micb-8</b> Host defense against viral infection				
16	<ul style="list-style-type: none"> <li>Describe the steps of viral replication</li> <li>Explain mode of replication of various RNA and DNA viruses.</li> </ul>	<b>ID-S2-Micb-9</b> Viral Replication				
	<ul style="list-style-type: none"> <li>Define sterilization and disinfection</li> <li>Enlist various methods used for sterilization and disinfection</li> </ul>	<b>ID-S2-Micb-10</b> Sterilization and disinfection				
17	To demonstrate the principle & procedure of Acid-fast staining.	<b>ID-S2-Micb-11</b> Acid fast staining			Practical	OSPE & OSVE



Pharmacology				
17	<ul style="list-style-type: none"> <li>Describe classification, mechanism of action &amp; side effects of anti-viral drugs</li> </ul>	ID-S2-Pharm-3 Anti-viral drugs -1	Interactive Lecture	SBQs & OSVE
		ID-S2-Pharm-4 Anti-viral drugs-2		

## Theme 2: Diagnostic Approach to Infection

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Microbiology				
18	<ul style="list-style-type: none"> <li>Compare and contrast the various methods used to diagnose bacterial diseases</li> <li>Describe various microscopic and culture techniques used for diagnosis</li> <li>Discuss molecular techniques in diagnosis of infectious diseases.</li> </ul>	ID-S2-Micb-12 Laboratory diagnosis of bacterial diseases	Interactive Lecture	SBQs & OSVE
20	<ul style="list-style-type: none"> <li>Compare and contrast the various methods used to diagnose viral diseases</li> <li>Describe various microscopic and culture techniques used for diagnosis</li> <li>Discuss molecular techniques in diagnosis of infectious diseases.</li> </ul>	ID-S2-Micb-13 Laboratory diagnosis of viral diseases		
21	<ul style="list-style-type: none"> <li>Distinguish between fungal &amp; bacterial cell</li> <li>Contrast sexual &amp; asexual reproduction of fungi.</li> <li>Define dimorphism</li> <li>Describe pathogenesis, fungal toxins and lab diagnosis of fungi</li> </ul>	ID-S2-Micb-14 Basic Mycology		
	Classify and explain important properties, transmission, pathogenesis, clinical findings and lab. diagnosis of cutaneous, systemic and opportunistic fungi.	ID-S2-Micb-15 Cutaneous, systemic and opportunistic mycosis		
22	<ul style="list-style-type: none"> <li>Classify culture media</li> <li>Enlist various ingredients used for making culture media</li> <li>Demonstrate selective and biochemical test media</li> </ul>	ID-S2-Micb-16 Culture Media	Practical	OSPE & OSVE
Pathology				
23	<ul style="list-style-type: none"> <li>Define healing, repair and regeneration</li> <li>Describe the mechanisms of primary and secondary wound heal</li> </ul>	ID-S2-Path-06 Healing & Repair	Interactive Lecture	SBQs & OSVE

	<ul style="list-style-type: none"> <li>Distinguish the differences between healing by first and secondary</li> <li>intention</li> <li>List the local and general factors influencing healing</li> <li>List the complications of wound healing</li> </ul>			
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### Theme 3: Pyogenic Bacteria

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Microbiology</b>				
25	<ul style="list-style-type: none"> <li>Enlist the species of Staphylococci</li> <li>Enlist the virulence factors &amp; toxins.</li> <li>Describe pyogenic and toxin mediated diseases caused by staphylococcus aureus.</li> <li>Discuss lab diagnosis of staphylococci</li> </ul>	<b>ID-S2-Micb-17</b> Staphylococci	Interactive Lecture	SBQs & OSVE
26	<ul style="list-style-type: none"> <li>Classify medically important streptococci</li> <li>Describe toxins, enzymes &amp; hemolysins produced by streptococci. Discuss their pyogenic, toxigenic &amp; post streptococcal diseases.</li> <li>Describe the lab diagnosis of streptococci.</li> </ul>	<b>ID-S2-Micb-18</b> Streptococci		
27	Describe morphology, pathogenesis, clinical features and lab diagnosis of Pneumococcus.	<b>ID-S2-Micb-19</b> Pneumococci		
28	<ul style="list-style-type: none"> <li>Enlist species of Neisseria.</li> <li>Describe their morphology, pathogenesis and laboratory diagnosis.</li> </ul>	<b>ID-S2-Micb-20</b> Neisseria		
29	<ul style="list-style-type: none"> <li>Define Diphtheria &amp; Listeriosis.</li> <li>Describe important properties, transmission, pathogenesis of diphtheria &amp; Listeria.</li> <li>Discuss the laboratory diagnosis of Corynebacterium diphtheria &amp; Listeria monocytogens.</li> </ul>	<b>ID-S2-Micb-21</b> Corynebacterium diphtheria & Listeria monocytogens		
30	Describe various microscopic and culture techniques used for diagnosis	<b>ID-S2-Micb-22</b> Lab diagnosis of gram positive & negative cocci.	Practical	OSPE & OSVE
<b>Pharmacology</b>				
31	Describe classification, mechanism of action & side effects of Aminoglycosides	<b>ID-S2-Pharm-5</b> Antibiotics-1	Interactive Lecture	SBQs & OSVE
32	Describe classification, mechanism of action & side effects of tetracyclines & chloromphenicol	<b>ID-S2-Pharm-6</b> Antibiotics-2		
33	Describe classification, mechanism of action & side effects of macrolides	<b>ID-S2-Pharm-7</b> Antibiotics-3		

34	Describe classification, mechanism of action & side effects flouroquinolones	<b>ID-S2-Pharm-8</b> Antibiotics-4		
35	Describe classification, mechanism of action & side effects of sulfonamides & trimethoprim	<b>ID-S2-Pharm-9</b> Antibiotics-5		

## Theme 4: Pyogenic Bacteria

S. #	LEANING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Microbiology</b>				
36	Outline morphology, pathogenesis, clinical features and lab diagnosis of Bacillus	<b>ID-S2-Micb-23</b> Bacillus	Interactive Lecture	SBQs & OSVE
37	<ul style="list-style-type: none"> <li>Classify clostridia</li> <li>Describe morphology, pathogenesis, clinical features and lab diagnosis of Clostridia</li> </ul>	<b>ID-S2-Micb-24</b> Clostridia		
38	<ul style="list-style-type: none"> <li>Enlist pathogenic strains of E. coli</li> <li>Describe morphology, virulence factors, cultural characteristics and Lab diagnosis of E.coli and Klebsiella</li> </ul>	<b>ID-S2-Micb-25</b> E.coli & Klebsiella		
39	<ul style="list-style-type: none"> <li>Classify different strains of Salmonella &amp; Shigella</li> <li>Describe antigenic structure and virulence factor of salmonella &amp; Shigella</li> <li>Discuss lab diagnosis of Salmonella &amp; shigella</li> </ul>	<b>ID-S2-Micb-26</b> Salmonella & Shigella		
40	<ul style="list-style-type: none"> <li>Enlist various species of proteus and pseudomonas</li> <li>Describe pathogenesis and lab diagnosis</li> </ul>	<b>ID-S2-Micb-27</b> Proteus & Pseudomonas		
41	Describe various microscopic and cultural characteristics used for diagnosis	<b>ID-S2-Micb-28</b> Lab diagnosis of gram positive bacilli (rods)	Practical	OSPE & OSVE

## Theme 5: Pyrexia of Unknown Origin

S. #	LEANING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Microbiology</b>				
42	<ul style="list-style-type: none"> <li>Classify the medically important Spirochetes.</li> <li>-Describe the important properties, transmission &amp; clinical findings.</li> <li>-Discuss the lab diagnosis of Syphilis</li> </ul>	<b>ID-S2-Micb-29</b> Spirochetes (Treponema, Borrelia, Leptospira)	Interactive Lecture	SBQs & OSVE
46	<ul style="list-style-type: none"> <li>Define Dengue fever</li> <li>Describe vector, life cycle and clinical manifestation of dengue virus</li> <li>Discuss mode of transmission, pathogenesis and clinical feature of polio virus</li> </ul>	<b>ID-S2-Micb-30</b> Dengue & polio virus		SBQs & OSVE

	<ul style="list-style-type: none"> <li>Describe structure of HIV</li> <li>Discuss clinical stages of HIV infection</li> <li>Outline opportunistic infection in late stage of AIDS</li> </ul>	<b>ID-S2-Micb-31</b> HIV		
	<ul style="list-style-type: none"> <li>Classify medically important Trematodes</li> <li>Describe life cycle clinical feature and lab. diagnosis</li> </ul>	<b>ID-S2-Micb-32</b> Trematodes (Flukes)		
	<ul style="list-style-type: none"> <li>Classify medically important Tissue Nematodes</li> <li>Describe their important properties, clinical findings and lab. diagnosis</li> </ul>	<b>ID-S2-Micb-33</b> Tissue Nematodes (Wuchereria, Onchocerca, Loa, Dracunculus)		
<b>47</b>	Describe various microscopic and culture techniques used for diagnosis	<b>ID-S2-Micb-34</b> Lab diagnosis of gram negative bacilli (rods)	Practical	OSPE & OSVE
<b>Pharmacology</b>				
<b>48</b>	Describe the different drug options for treatment of dengue fever	<b>ID-S2-Pharm-10</b> Anti-viral drugs for dengue fever	Interactive Lecture	SBQs & OSVE
	Describe the antiviral drugs used for treatment of HIV with their mechanisms and side effects.	<b>ID-S2-Pharm-11</b> Antiretroviral drugs		
	Classify anti helminths drugs with their mechanism and side effects	<b>ID-S2-Pharm-12</b> Anti-parasitic drugs		
<b>Clinical Lectures</b>				
<b>49</b>	Discuss clinical presentations and management of Syphilis	<b>ID-S2-Med- 1</b> Syphilis	Interactive Lecture	SBQs & OSVE
<b>50</b>	Discuss clinical presentations & management of Dengue fever	<b>ID-S2-Med-2</b> Dengue Fever		
	Discuss clinical presentations and management of AIDS	<b>ID-S2-Med- 3</b> AIDS		

## Blueprint of Assessment

Purpose of Assessment:

Summative Assessment First Professional MBBS

Curriculum:

Integrated Modular Curriculum

Module:

Infectious Disease Module

Subject in Module	Proportion of subjects in module	Weightage	Test Instrument/tool/method				Explanation
What to assess?			How to assess?				
			MCQs (SBQs) Level 1 & 2	OSVE stations Level 1 & 2	OSPE/OSCE Level 3	Any Other	<p><b>Proportion of test instruments to be used:</b> Theory MCQs (SBQs)= 100 %; Practical OSVE=80% OSPE/OSCE= 20%</p> <p><b>Competency level &amp; Learning Domain at Miller's Pyramid:</b> <b>Cognition:</b> Know (Level-1)&amp; How to know (Level-2) <b>Skills &amp; Attitude:</b> Show (Level-3) &amp; Does (Level-4)</p>
Pathology	06 (7.6%)	08	08				
Microbiology	34 (43%)	43	43				
Pharmacology	12 (15.18)	15	15				
Community medicine	24 (30.3%)	30	30				
Clinical Lecture	03 (3.7%)	04	04				
	79	100%	100	80%	20%		

# 3 HEMATOLOGY MODULE-II

## Introduction

Welcome to the Hematology module-II. This module aims to provide the basic understanding of Cancer, chemo therapeutic agents and preventive measures. The module is also designed to provide basic knowledge of hematological diseases to the students in order to deal with various Hematological and Immuno- Hematological disorders of adults and children. In this regard students will also learn to take history, examine patients and relevant Laboratory tests, their interpretations, differential diagnosis, treatment regimens and prognostic values of various disorders.

## Rationale

The module will give the 3<sup>rd</sup> year medical students, an opportunity to know the clinical findings and management of common hematological, immunological and neoplastic disorders. Students will be expected to critically think about the clinical scenarios and participate in case-based learning sessions for clearing your concepts and better learning. It will also help you focus your attention on what you need to achieve from the lectures, practical and clinical rotation that have been scheduled in this module.

## Duration:

05 weeks

## Learning Outcomes

The Outcomes of the Hematology Module are as follows:

- Knowledgeable
- Skillful
- Community Health Promoter
- Problem-solver
- Professional
- Researcher
- Leader and Role Model

## Cognitive Domain

- To Describe Neoplasia, its etiology, pathophysiology, molecular basis, diagnosis of cancers and its therapy.
- Explain the pathophysiology, clinical features and diagnostic approach of various Red cells disorders.
- Explain the pathophysiology, clinical features and diagnostic approach of bleeding disorders
- To describe the hemolytic disease of new born (RH, ABO, Minor group incompatibility).
- To describe the etiology & pathophysiology of lymphadenopathy and hepatosplenomegaly
- To describe the difference Hematological malignancies.
- To describe the transplantation and graft rejection.
- To describe the blood parasites.
- Identify the role of pharmacology (drugs) in anemia and bleeding disorders.
- To describe the Immunosuppressants, immunomodulators related to transplantation
- Role of balanced diet in the prevention of blood disorders in community.
- Recognize the common causes of anemia prevalent in our community

## Psychomotor Domain

Description of the psychomotor skills to be developed and the level of performance required:

- Carry out practical work as instructed in an organized and safe manner.
- Make and record observations accurately.
- General physical examination of patient.
- Interpretation of diagnostic tests for cancer.
- Interpretation of laboratory tests for the diagnosis of Anemia.
- Interpretation of laboratory tests for the diagnosis of Anemia.
- Perform Manual blood grouping by tube method & compatibility testing.
- Interpretation of morphological features and immunohistochemical results of Hodgkin and non-Hodgkin lymphoma.
- Interpretation of laboratory tests for the diagnosis of Acute & Chronic Leukemia.

## Attitude & Behaviour

- To give and receive feedback, Respect for self and peers.
- To give sympathy and care to patients.
- Counseling of patients and family members for inherited anemias.
- Counseling of families for prenatal diagnosis of Thalassaemia.
- Counseling of patients and family members for Hematological malignancies.
- Develop communication skills with sense of Responsibility towards patients.
- Demonstrate good laboratory practices

## Themes

- Theme 1: Oncology
- Theme 2: Pallor (Anaemia)
- Theme 3: Hemostatic abnormalities
- Theme 4: Lymphadenopathy
- Theme 5: Hematological Malignancies
- Theme 6: Immunological disorders & Transplantation

# TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

## Theme 1: Oncology

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	<ul style="list-style-type: none"> <li>Describe the definition of neoplasia.</li> <li>Describe the nomenclature of neoplasia.</li> </ul>	<b>Hem-S2-Path-1</b> Neoplasia	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> <li>To describe the Characteristic of benign &amp; Malignant tumor</li> <li>To know Pathways of spread, seeding, lymphatic and Hematogenous spread</li> </ul>	<b>Hem-S2-Path-2</b> Characteristic Features of Tumor		
3	<ul style="list-style-type: none"> <li>Normal cell cycles and fundamental principal of cancer regarding cycle</li> <li>Essential alterations in malignant transformation</li> <li>Steps of cell proliferation Protooncogenes and growth factors and their receptors</li> </ul>	<b>Hem-S2-Path-3</b> Molecular Basis of Cancer –I		
4	<ul style="list-style-type: none"> <li>Two-hit hypothesis of Knudson</li> <li>Tumor suppressor genes</li> <li>Cellular changes in tumor cells</li> <li>DNA repair defects</li> <li>Homing of tumor cells</li> <li>Development of sustained angiogenesis</li> </ul>	<b>Hem-S2-Path-4</b> Molecular Basis of Cancer -II		
5	<ul style="list-style-type: none"> <li>To discuss Epidemiology of cancers</li> <li>To discuss different types of carcinogens</li> <li>To discuss the Mechanism of action of radiation carcinogen</li> </ul>	<b>Hem-S2-Path-5</b> Carcinogenic Agents (Radiation Carcinogenesis)		
6	To discuss the Mechanism of action of chemical & viral carcinogen.	<b>Hem-S2-Path-6</b> Carcinogenic Agents (Chemical & Viral Carcinogenesis)		
7	<ul style="list-style-type: none"> <li>To discuss Clinical features of cancer.</li> <li>To discuss Grading and staging of cancer.</li> <li>To discuss diagnostic methods used for Cancer.</li> </ul>	<b>Hem-S2-Path-7</b> Diagnostic approach of Neoplasia		
<b>Microbiology</b>				
8	<ul style="list-style-type: none"> <li>Classify the tumor Viruses</li> <li>Describe the role of tumor viruses in malignant transformation.</li> <li>Discuss the mechanism involved in carcinogenesis.</li> </ul>	<b>Hem-S2-Micb-1</b> Tumor Viruses	Interactive Lecture	SBQs & OSVE



<b>Pharmacology</b>				
9	<ul style="list-style-type: none"> <li>Classify the Anticancer Drugs.</li> <li>Describe the mechanism of action, indication, adverse effects, drug-drug interactions.</li> </ul>	<b>Hem2-S2-Pharm-1</b> Anti-cancer Drugs-I	Interactive Lecture	SBQs & OSVE
10	<ul style="list-style-type: none"> <li>Describe the mechanism of resistance of Anticancer Drugs.</li> <li>Describe the general principles of combination chemotherapy in treatment of cancer</li> </ul>	<b>Hem2-S2-Pharm-2</b> Anti-cancer Drugs-II		

## Theme 2: Palloriness (Anaemia)

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
11	<ul style="list-style-type: none"> <li>To enlist the causes, clinical features and laboratory diagnosis of iron deficiency &amp; Megaloblastic anemias.</li> </ul>	<b>Hem-S2-Path-8</b> Nutritional Anemias	Interactive Lecture	SBQs & OSVE
12	<ul style="list-style-type: none"> <li>To Enlist the causes, pathogenesis, clinical features and laboratory diagnosis of Aplastic anemia.</li> </ul>	<b>Hem-S2-Path-9</b> Aplastic anemia		
13	<ul style="list-style-type: none"> <li>To discuss the pathogenesis, clinical features and laboratory diagnosis of Hereditary spherocytosis &amp; G6P D deficiency</li> </ul>	<b>Hem-S2-Path-10</b> Hemolytic Anemia		
14	<ul style="list-style-type: none"> <li>To explain pathogenesis of Hemoglobinopathies.</li> <li>To identify morphological features on peripheral blood smear.</li> </ul>	<b>Hem-S2-Path-11</b> Hemoglobinopathies		
15	<ul style="list-style-type: none"> <li>Define Malaria and classify malarial parasites.</li> <li>Describe life cycle of malarial parasites.</li> <li>Differentiate between Benign and Malignant Tertian malaria.</li> <li>Discuss complications of Plasmodium Falciparum.</li> </ul>	<b>Hem-S2-Micb-2</b> Plasmodium		
16	<ul style="list-style-type: none"> <li>Interpretation of CBC.</li> <li>To discuss the Peripheral film findings of different types of anemia.</li> <li>To discuss the different tests used for the diagnosis of Anemia.</li> </ul>	<b>Hem-S2-Path-12</b> Laboratory diagnosis of Anemia	Practical	OSPE & OSVE
17	<ul style="list-style-type: none"> <li>Classify the drugs used in Iron Deficiency Anemia</li> </ul>	<b>Hem-S2-Pharm-3</b> Oral & injectable	Interactive Lecture	SBQs & OSVE

	<ul style="list-style-type: none"> <li>Describe the Mechanism Of Action, Indications, Contraindications, Adverse Effects And Drug Interactions Of Various Drugs used to treat the Iron Deficiency Anemia</li> </ul>	iron deficiency anemia		
18	<ul style="list-style-type: none"> <li>Classify the drugs used in Vitamin B12 and Folic Acid Deficiency Anemia.</li> <li>Describe the Mechanism of Action,</li> <li>Indications, Contraindications, Adverse Effects And Drug Interactions of Various Drugs used to treat the B12 and Folic Acid Deficiency Anemia</li> </ul>	<b>Hem-S2-Pharm-4</b> Vit. B12 & Folic acid in Macrocytic anemia	Interactive Lecture	SBQs & OSVE
19	<ul style="list-style-type: none"> <li>Classify anti-malarial drugs with their mechanism and side effects</li> </ul>	<b>Hem-S2-Pharm-5</b> Anti-malarial drugs		
<b>Clinical lecture</b>				
20	Assess, classify and manage child with anemia	<b>Hem-S2-Paeds-1</b> Anaemia in children	Interactive Lecture	SBQs & OSVE

### Theme 3: Hemostatic Abnormalities

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
21	<ul style="list-style-type: none"> <li>Overview of normal Hemostasis</li> <li>Discuss Quantitative &amp; Qualitative platelet disorders.</li> <li>To discuss ITP and diagnosis.</li> </ul>	<b>Hem-S2-Path-13</b> Platelet disorders	Interactive Lecture	SBQs & OSVE
22	<ul style="list-style-type: none"> <li>Define &amp; enlist the causes microangiopathic hemolytic anemias</li> <li>Define &amp; explain Thrombotic Thrombocytopenic Purpura (TTP) and Hemolytic Uremic Syndrome (HUS)</li> <li>Define and explain Disseminated Intravascular Coagulation (DIC)</li> </ul>	<b>Hem-S2-Path-14</b> MAHA (Microangiopathic hemolytic anemia)		
23	<ul style="list-style-type: none"> <li>Overview of inherited &amp; acquired coagulation disorders</li> <li>Discuss the pathogenesis and pathophysiology of hemophilia A &amp; B, VWD.</li> <li>Diagnose hemophilia based on clinical features and laboratory findings</li> </ul>	<b>Hem-S2-Path-15</b> Coagulation disorders (Hemophilia, vWD)		
24	<ul style="list-style-type: none"> <li>To discuss the thrombosis, pathogenesis, types and fate of thrombosis.</li> <li>To Define Embolism, its types and morphological features of Embolism.</li> </ul>	<b>Hem-S2-Path-16</b> Thromboembolism		
25	<ul style="list-style-type: none"> <li>Discuss and perform different laboratory tests for diagnosis of bleeding disorders</li> </ul>	<b>Hem-S2-Path-17</b> Laboratory diagnosis of	Practical	OSPE & OSVE

		Bleeding disorders		
26	<ul style="list-style-type: none"> <li>Classify the coagulants drugs.</li> <li>Describe the mechanism of action, clinical</li> <li>uses, adverse effects, drug interactions and contraindications of the coagulant drugs.</li> </ul>	<b>Hem-S2-Pharm-5</b> The Coagulants	Interactive Lecture	SBQs & OSVE
27	<ul style="list-style-type: none"> <li>Classify the Anticoagulants drugs.</li> <li>Describe the mechanism of action, clinical uses, adverse effects, drug interactions and contraindications of the Anticoagulant</li> <li>drugs.</li> </ul>	<b>Hem-S2-Pharm-6</b> Anti-Coagulants		
28	<ul style="list-style-type: none"> <li>Classify the thrombolytic drugs.</li> <li>Describe the mechanism of action, clinical uses, adverse effects, drug interactions and contraindications of the Thrombolytic drugs.</li> </ul>	<b>Hem-S2-Pharm-7</b> Thrombolytic drugs		
<b>Clinical Lectures</b>				
29	Discuss approach to a patient with Thrombotic disorders	<b>Hem-S2-Med-1</b> Approach to a patient with Thrombotic disorders	Interactive Lecture	SBQs & OSVE
30	Discuss approach to a patient with inherited bleeding disorders	<b>Hem-S2-Paeds-2</b> Bleeding disorders		
31	Discuss approach to a patient with deep vein thrombosis	<b>Hem-S2-Surg-1</b> Deep Venous Thrombosis		

## Theme 4: Lymphadenopathy

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
32	<ul style="list-style-type: none"> <li>Describe lymphoma, its etiology &amp; classification.</li> <li>Discuss the pathogenesis, types &amp; morphological features of Hodgkin lymphoma</li> </ul>	<b>Hem-S2-Path-18</b> Hodgkin Lymphoma	Interactive Lecture	SBQs & OSVE
33	<ul style="list-style-type: none"> <li>Describe Non-hodgkins lymphoma</li> <li>The classification and staging of non hodgkins lymphomas.</li> <li>Discuss the pathogenesis, clinical features and diagnosis of Chronic lymphocytic leukemia</li> </ul>	<b>Hem-S2-Path-19</b> Non-Hodgkin Lymphoma-I		
34	Brief Discussion of Burkitt, follicular and DLBCL lymphoma.	<b>Hem-S2-Path-20</b> Non-Hodgkin Lymphoma-II		
35	Discuss the pathogenesis, clinical features and laboratory diagnosis of Multiple Myeloma	<b>Hem-S2-Path-21</b> Multiple Myeloma		

36	<ul style="list-style-type: none"> <li>To see the Morphological features,</li> <li>Immunohistochemical findings of Lymphoma</li> </ul>	<b>Hem-S2-Path-22</b> Practical approach towards lymphoma	Practical	OSPE & OSVE
<b>Clinical lectures</b>				
37	Discuss approach to a patient with lymphadenopathy with or without Splenomegaly	<b>Hem-S2-Med-2</b> Approach to patient with lymphadenopathy with or without splenomegaly	Interactive Lecture	SBQs & OSVE
38	Discuss approach to Lymphedema	<b>Hem-S2-Med-3</b> Lymphedema		
39	Discuss approach to Disorders of Spleen & Splenectomy	<b>Hem-S2-Surg-2</b> Disorders of Spleen & Splenectomy		

## Theme 5: Hematological Malignancies

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	Assessment
<b>Pathology</b>				
40	<ul style="list-style-type: none"> <li>Overview &amp; classification of acute leukemias</li> <li>Describe the pathogenesis, clinical features and laboratory diagnosis of Acute Myeloid leukemia.</li> </ul>	<b>Hem-S2-Path-23</b> Acute Myeloid leukemia	Interactive Lecture	SBQs & OSVE
41	<ul style="list-style-type: none"> <li>Describe the pathogenesis, clinical features and laboratory diagnosis of Acute Lymphoblastic leukemia.</li> </ul>	<b>Hem-S2-Path-24</b> Acute Lymphoblastic Leukemia		
42	<ul style="list-style-type: none"> <li>The classification of Myeloproliferative disorders</li> <li>Discuss the pathogenesis, clinical features and laboratory diagnosis of Chronic myeloid Leukemia.</li> </ul>	<b>Hem-S2-Path-25</b> Myeloproliferative disorders		
43	<ul style="list-style-type: none"> <li>Morphological features of acute &amp; chronic leukemia.</li> </ul>	<b>Hem-S2-Path-26</b> Laboratory diagnosis of Acute & Chronic Leukemia	Practical	OSPE & OSVE
<b>Medicine</b>				
44	Describe the clinical features, laboratory investigations of acute & chronic leukemia.	<b>Hem-S2-Med-4</b> Approach to patient with Acute & chronic Leukemias	Interactive Lecture	SBQs & OSVE

## Theme 6: Immunological Disorders

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
45	<ul style="list-style-type: none"> <li>Define hypersensitivity reaction</li> <li>Describe Pathogenesis of four types of hypersensitivity reactions with examples.</li> </ul>	<b>Hem-S2-Path-27</b> Hypersensitivity Reactions	Interactive Lecture	SBQs & OSVE
46	<ul style="list-style-type: none"> <li>Discuss immunodeficiency and its causes and clinical features.</li> </ul>	<b>Hem-S2-Path-28</b> Immunodeficiency disorders		
47	<ul style="list-style-type: none"> <li>Discuss tolerance.</li> <li>Define Autoimmune disorders</li> <li>Describe the etiology, Pathogenesis and clinical features of autoimmune disorders.</li> </ul>	<b>Hem-S2-Path-29</b> Autoimmune Disorders		
48	<ul style="list-style-type: none"> <li>Definition of Transplantation</li> <li>Types of transplantation</li> <li>Sources of bone marrow transplantation.</li> <li>Define Rejection &amp; mechanism of different types of rejections.</li> </ul>	<b>Hem-S2-Path-30</b> Transplantation & Rejection		
49	<ul style="list-style-type: none"> <li>Define hemoflagellates.</li> <li>Enumerate the medically important species of Leishmania &amp; Trypanosoma.</li> <li>Describe vector, life cycle, pathogenesis clinical manifestation and lab diagnosis of Leishmaniasis &amp; Trypanosomiasis.</li> </ul>	<b>Hem-S2-Micb-3</b> Trypanosoma & Leishmania		
50	<ul style="list-style-type: none"> <li>Discuss the immunoassay techniques</li> </ul>	<b>Hem-S2-Path-31</b> Immunoassay technique	Practical	OSPE & OSVE
<b>Pharmacology</b>				
52	<ul style="list-style-type: none"> <li>Classify Antihistamine agents.</li> <li>Describe the Mechanism of Action, Indications, Adverse Effects And Drug Interactions of Antihistamines</li> </ul>	<b>Hem-S2-Pharm-7</b> Anti-Histamine	Interactive Lecture	SBQs & OSVE
	<ul style="list-style-type: none"> <li>Classify the Immunosuppressant and Immunomodulating drugs.</li> <li>Describe the mechanism of action, indications &amp; adverse effects of Immunosuppressant and Immunomodulating drugs.</li> </ul>	<b>Hem-S2-Pharm-8</b> Immuno modulating drugs		
<b>Clinical Lecture</b>				
53	Describe the clinical features, laboratory investigations of autoimmune disorders	<b>Hem-S2-Med-5</b> Approach to patient with Autoimmune disorders	Interactive Lecture	SBQs & OSVE

## Blueprint of Assessment

Purpose of Assessment: Summative Assessment First Professional MBBS  
 Curriculum: Integrated Modular Curriculum  
 Module: Haematology Module

Subject in Module	Proportion of subjects in module	Weightage	Test Instrument/tool/method				Explanation
What to assess?			How to assess?				
			MCQs (SBQs) Level 1 & 2	OSVE stations Level 1 & 2	OSPE/OSCE Level 3	Any Other	<b>Proportion of test instruments to be used:</b> Theory MCQs (SBQs)= 100 %; Practical OSVE=80% OSPE/OSCE= 20%  <b>Competency level &amp; Learning Domain at Miller's Pyramid:</b> <b>Cognition:</b> Know (Level-1)& How to know (Level-2) <b>Skills &amp; Attitude:</b> Show (Level-3) & Does (Level-4)
Pathology	31 (65.9%)	66	66				
Microbiology	03 (6.3%)	06	06				
Pharmacology	08 (17.0%)	17.0	17				
Community medicine	00	00	00				
Clinical Lecture	05(10.6%)	11	11				
	47	100%	100	80%	20%		

# 4 RESPIRATORY MODULE-II

## Introduction

This sensational module will be very necessary to your future work as doctors. This module is designed to make your learning both interesting and productive by including interactive activities. This module provides basic understanding by integrating the teaching of the basic pharmacology, pathology related to the disorders of the Respiratory system and their relevant clinical applications (Horizontal Integration). And Forensic Medicine, Community medicine (Vertical Integration). By adopting this approach, we are preparing you better for your future work as doctor, where patients will come to you with problems that are not categorized by discipline name. In order to help you learn in an integrated manner, we have updated the learning of basic sciences around a few key health-related situations (real life situations), which you are likely to encounter as third year medical students. You will be expected to think about the scenarios and participate in case based learning sessions for clearing your concepts and better learning. It will also help you focus your attention on what you need to achieve from the lectures, practical and tutorials that have been scheduled during this module.

## Rationale

Diseases of the Respiratory system are common all over the world. Timely diagnosis and management of acute Respiratory problems like Asthma, COPD prevents morbidity and mortality. Early diagnosis and prompt treatment of Asthma and COPD disease is important to reduce the occurrence of disability burden on community. Understanding the structure and function of Respiratory system and its relationship with pathophysiology of diseases is essential for diagnosis and management.

## Duration:

03 weeks

## Learning Outcomes

### Knowledge:

At the end of this module, the students will be able to:

- Explain obstructive and restrictive pathologies involving respiratory system
- Describe the management of the respiratory diseases
- Perform the respiratory system examination
- Take the history of the patients and co-relate the respiratory sign & symptoms to reach the differential diagnosis
- To counsel the people in community regarding the risk factors of the respiratory diseases.

### Skills

- Microscopic identification of the different diseases of the respiratory system.
- Perform the cardiopulmonary resuscitation(CPR)
- Interpretation of ABGs,PFT
- Perform clinical examination of the respiratorysystem

## Attitude

- Follow the basic laboratory protocols
- Participate in class and practical work professionally
- Communicate effectively in a team with peers, staff and teachers
- Demonstrate professionalism and ethical values in dealing with patients, peers, staff and teachers.
- Communicate effectively in a team with peers and teachers.
- Demonstrate the ability to reflect on the performance.

## Themes

- Theme 1: Lung Injury, Edema, Collapse & Obstructive Pulmonary diseases  
 Theme 2: Chronic diffuse Interstitial/Restrictive Lung diseases  
 Theme 3: Infectious & pleural diseases  
 Theme 4: Lung Tumors

## TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

### Theme 1: Lung Injury, Edema, Collapse & Obstructive Pulmonary Diseases

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	<ul style="list-style-type: none"> <li>• Types &amp; causes of Atelectasis</li> <li>• Types &amp; causes of pulmonary edema</li> <li>• Define acute lung injury</li> <li>• Describe the causes of ARDS</li> <li>• Discuss the characteristic features, morphology and pathogenesis of ARDS</li> <li>• Describe its consequences and clinical course</li> </ul>	<b>RESP-S2-Path-1</b> Pulmonary Edema, ARDS & Atelectasis	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> <li>• Define Obstructive lung disease (OPD)</li> <li>• Classify types of OPD</li> <li>• Describe etiology pathogenesis &amp; clinical features of chronic bronchitis + emphysema</li> </ul>	<b>RESP-S2-Path-2</b> Obstructive lung diseases-I		
3	<ul style="list-style-type: none"> <li>• Describe categories of ASTHMA</li> <li>• Explain pathogenesis</li> <li>• Discuss the immunological mechanisms of bronchial asthma and its triggering factors -Gross features &amp; morphological Features</li> <li>• Define BRONCHIECTASIS</li> <li>• Describe its causes,</li> </ul>	<b>RESP-S2-Path-3</b> Obstructive lung diseases-II		



	<ul style="list-style-type: none"> <li>Pathogenesis and Gross &amp; morphological features</li> </ul>			
4	<ul style="list-style-type: none"> <li>Describe major categories</li> <li>Explain the pathogenesis, morphology and clinical course of its important types</li> <li>Idiopathic pulmonary fibrosis</li> <li>Non-specific Interstitial Pneumonia</li> <li>Cryptogenic organizing Pneumonia</li> </ul>	<b>RESP-S2-Path-4</b> Restrictive lung diseases Chronic diffuse interstitial lung diseases		
5	<ul style="list-style-type: none"> <li>Describe the microscopic features</li> </ul>	<b>RESP-S2-Path-5</b> Pleural fluid for DR	Practical	OSPE & OSVE

## Theme 2: Chronic Diffuse Interstitial/ Restrictive Lung Diseases

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
6	<ul style="list-style-type: none"> <li>Describe major categories</li> <li>Explain the etiology, pathogenesis, gross, histological features of its important types like</li> <li>Coal worker Pneumoconiosis</li> <li>Silicosis</li> <li>Asbestos-related diseases</li> </ul>	<b>RESP-S2-Path-6</b> Chronic diffuse interstitial lung diseases II- Pneumoconiosis	Interactive Lecture	SBQs & OSVE
7	<ul style="list-style-type: none"> <li>Explain the etiology, pathogenesis, gross, histological features of</li> <li>Sarcoidosis</li> <li>Hypersensitivity Pneumonitis</li> <li>Pulmonary Eosinophilia</li> </ul>	<b>RESP-S2-Path-7</b> Chronic diffuse interstitial lung diseases III: Granulomatous Diseases		
8	<ul style="list-style-type: none"> <li>Smoking-related Desquamative Interstitial Pneumonia</li> <li>PAP (Pulmonary Alveolar Proteinosis)</li> <li>Respiratory bronchiolitis-associated ILD</li> </ul>	<b>RESP-S2-Path-8</b> Chronic diffuse interstitial lung diseases IV & smoking-related		
9	<ul style="list-style-type: none"> <li>Explain the etiology, Pathogenesis &amp; histological features of - Pulmonary Thromboembolism, HTN</li> <li>Goodpasture syndrome</li> </ul>	<b>RESP-S2-Path-9</b> Pulmonary Thromboembolism, HTN & important Hemorrhagic Syndromes		
10	<ul style="list-style-type: none"> <li>Explain the etiology, Pathogenesis and Clinical features of</li> <li>Pleural effusion</li> <li>Pneumothorax</li> <li>Explain the etiology, Pathogenesis and Microscopic</li> </ul>	<b>RESP-S2-Path-10</b> Pleural diseases		

	<ul style="list-style-type: none"> <li>• features of</li> <li>• Benign Tumors →Solitary fibrous tumor</li> <li>• Malignant Tumors →Mesothelioma</li> </ul>			
11	<ul style="list-style-type: none"> <li>• Describe histopathological features</li> </ul>	<b>RESP-S2-Path-11</b> Inflammatory diseases of lung	Practical	OSPE & OSVE

### Theme 3: Vascular, Infectious & Pleural Diseases

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
12	<ul style="list-style-type: none"> <li>• Explain the pathogenesis of granuloma formation</li> <li>• Describe the five different clinical patterns of tuberculosis</li> <li>• Define primary and secondary tuberculosis</li> <li>• Describe lab diagnosis and complications</li> </ul>	<b>RESP-S2-Path-12</b> Tuberculosis	Interactive Lecture	SBQs & OSVE
13	<ul style="list-style-type: none"> <li>• Explain the etiology, Pathogenesis and Clinical features of</li> <li>• Pleural effusion</li> <li>• Pneumothorax</li> <li>• Explain the etiology, Pathogenesis and Microscopic features of</li> <li>• Benign Tumors →Solitary fibrous tumor</li> <li>• Malignant Tumors →Mesothelioma</li> </ul>	<b>RESP-S2-Path-13</b> Pleural diseases		
<b>Microbiology</b>				
14	<ul style="list-style-type: none"> <li>• Classify the medically important mycobacteria.</li> <li>• Describe the important properties, virulence factors pathogenesis, clinical findings and lab diagnosis</li> </ul>	<b>RESP-S2-Micb-1</b> Mycobacterium tuberculosis & laprae (Microbiology)	Interactive Lecture	SBQs & OSVE
15	<ul style="list-style-type: none"> <li>• Classify the gram-negative rods related to the Respiratory tract.</li> <li>• Describe the important properties, pathogenesis, clinical findings and lab diagnosis of Hemophilus influenzae &amp; Bordetella pertussis</li> </ul>	<b>RESP-S2-Micb-2</b> Hemophilus influenzae & Bordetella pertussis (Microbiology)		
16	Describe the clinical & microscopic features.	<b>RESP-S2-Path-14</b> Obstructive diseases of lung	Practical	OSPE & OSVE

## Theme 4: Lung Tumors

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
17	<ul style="list-style-type: none"> <li>Explain histological features of - Squamous dysplasia &amp; Carcinoma in situ</li> <li>Atypical adenomatous hyperplasia</li> <li>Adenocarcinoma in situ</li> <li>Diffuse idiopathic pulmonary neuroendocrine cell hyperplasia (DIPNECH)</li> </ul>	<b>RESP-S2-Path-15</b> Tumors of Lung-I	Interactive Lecture	SBQs & OSVE
18	<ul style="list-style-type: none"> <li>Explain the etiology, pathogenesis, gross, histological features of</li> <li>Squamous cell carcinoma</li> <li>Adenocarcinoma</li> <li>Neuroendocrine carcinomas</li> </ul>	<b>RESP-S2-Path-16</b> Tumors of Lung-II		
19	<ul style="list-style-type: none"> <li>Morphological features &amp; immunohistochemistry</li> </ul>	<b>RESP-S2-Path-17</b> Tumors of lung	Practical	OSPE & OSVE
<b>Pharmacology</b>				
20	<ul style="list-style-type: none"> <li>Classify the drugs used in Asthma and COPD.</li> <li>Describe the mechanism of action, side effects of beta-2 receptor Agonists, Phosphodiesterase inhibitors Leukotrienes Pathway Inhibitors and Discuss the role of corticosteroids in asthma.</li> </ul>	<b>RESP-S2-Pharm-1</b> Drugs used in Asthma and COPD	Interactive Lecture	SBQs & OSVE
21	<ul style="list-style-type: none"> <li>Classify the drugs used as Anti-tussive.</li> <li>Describe the mechanism of action, side effects of Anti-tussive drugs</li> </ul>	<b>RESP-S2-Pharm-2</b> Drugs used as Anti-tussive		

## Blueprint of Assessment

Purpose of Assessment: Summative Assessment First Professional MBBS  
 Curriculum: Integrated Modular Curriculum  
 Module: Foundation Module

Subject in Module	Proportion of subjects in module	Weightage	Test Instrument/tool/method				Explanation
What to assess?			How to assess?				
			MCQs (SBQs) Level 1 & 2	OSVE stations Level 1 & 2	OSPE/OSCE Level 3	Any Other	<b>Proportion of test instruments to be used:</b> Theory MCQs (SBQs)= 100 %; Practical OSVE=80% OSPE/OSCE= 20%  <b>Competency level &amp; Learning Domain at Miller's Pyramid:</b> <b>Cognition:</b> Know (Level-1)& How to know (Level-2) <b>Skills &amp; Attitude:</b> Show (Level-3) & Does (Level-4)
Pathology	17	58	58				
Microbiology	02	07	07				
Pharmacology	02	07	07				
Community medicine	08	28	28				
Clinical Lecture							
	29	100%	100	80%	20%		

# 5 CARDIOVASCULAR MODULE-II

## Introduction

Cardiovascular diseases are commonest causes of morbidity and mortality all over the world, such as hypertension, ischemic heart disease, cardiac failure, and valvular disorders. Hence a medical graduate is expected to manage these problems in the community at large. This module is designed to learn pathology and pharmacology related to the cardiovascular system applying the background knowledge of anatomy, physiology, and biochemistry. An emphasis is put on clinical correlation and problem-solving so that the student will be able to build on the knowledge of clinical presentation, diagnostic investigations, and management of cardiovascular disorders.

Apart from that, the parallel-running yet related courses in Forensic Medicine and Toxicology, Community Medicine, and Behavioral Sciences are also part of this exciting new module.

## Rationale

The orientation of various medical subjects is the fundamental requirement of every medical student. Therefore, this module is designed to provide the integration of core concepts that underlie the foundation of basic sciences and their correlation and application in the clinical context. Students also learn clinical skills such as how to communicate effectively with patients and their relatives with compassion and understanding of their issues/problems and how to resolve them in coming years. Working in groups will enhance students' team working skills and capacity and management skills. Along with Lectures, practical's and demonstrations; through supplemented case-based learning they develop problem-solving skills to apply their basic medical knowledge and skills to practical situations.

## Duration:

04 weeks

## Learning Outcomes

### Knowledge:

At the end of this module, the students will be able to:

- Enlist pathologies involving cardiovascular system.
- Describe the management of the cardiovascular diseases.
- Perform the cardiovascular system examination.
- Take the history of the patients and co-relate the cardiovascular sign & symptoms to reach the differential diagnosis
- To counsel the people in community regarding the risk factors of the cardiac diseases.

### Clinical/ Practical skills

Placing electrodes and obtaining an electrocardiogram and interpretation of the basic ECG findings.

Perform clinical examination of the cardiovascular system.

## Attitude:

Follow the basic laboratory protocols.

Participate in class and practical work professionally.

Communicate effectively in a team with peers, staff and teachers.

Demonstrate professionalism and ethical values in dealing with patients, peers, staff and teachers.

Demonstrate the ability to reflect on the performance.

## Themes

Theme 1: Hypertension

Theme 2: Atherosclerosis

Theme 3: Myocardial diseases

Theme 4: Diseases of vessels

Theme 5: Pericardial and endocardial diseases, and cardiac tumors

## TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

### Theme 1: Hypertension

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	<ul style="list-style-type: none"> <li>Define hypertension and classify its causes.</li> <li>Discuss the pathogenesis of Hypertension</li> <li>Vascular Pathology in Hypertension.</li> </ul>	<b>CVS-S2-Path-1</b> Hypertensive Vascular Disease	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> <li>Define Hypertensive heart disease.</li> <li>Differentiate between systemic (Left-Sided) HHD and Pulmonary (Right-Sided) HHD (Cor Pulmonale).</li> <li>Describe the diagnostic features and morphology of Systemic and Pulmonary HHD.</li> <li>Describe various disorders predisposing to HHD.</li> </ul>	<b>CVS-S2-Path-2</b> Hypertensive heart disease (HHD)		
<b>Pharmacology</b>				
3	<ul style="list-style-type: none"> <li>Classify the antihypertensive agents based on mechanism of action.</li> <li>Describe the hemodynamic Responses, adverse effects, and drug interactions of antihypertensive agents.</li> </ul>	<b>CVS-S2-Pharm-1</b> Drugs used to treat Hypertension	Interactive Lecture	SBQs & OSVE
4	Identify the following in a given prescription:	<b>CVS-S2-Pharm-2</b> Drug-Drug interactions Flaws	Practical	OSPE & OSVE

## Theme 2: Atherosclerosis

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
5	<ul style="list-style-type: none"> <li>Describe the pathogenesis of Atherosclerosis.</li> <li>Discuss the morphological features of Atherosclerosis.</li> <li>Discuss the complications of Atherosclerosis.</li> </ul>	<b>CVS-S2-Path-3</b> Atherosclerosis	Interactive Lecture	SBQs & OSVE
6	<ul style="list-style-type: none"> <li>Define Ischemic Heart Disease with its types.</li> <li>Define Angina Pectoris with its pathogenesis, patterns, morphological changes, clinical features, and complications.</li> <li>Define Myocardial Infarction with its pathogenesis, patterns, morphological changes, clinical features, and complications.</li> </ul>	<b>CVS-S2-Path-4</b> Ischemic Heart Disease		
7	<ul style="list-style-type: none"> <li>Interpret the following on a given biochemical report:</li> </ul>	<b>CVS-S2-Path-5</b> Lipid Profile Cardiac Enzymes Pericardial Effusion	Practical	OSPE & OSVE
<b>Pharmacology</b>				
8	<ul style="list-style-type: none"> <li>Classify the Hypolipidemic drugs according to their mode of action.</li> <li>Describe the clinical uses, drug interactions, and adverse effects of hypolipidemic drugs.</li> </ul>	<b>CVS-S2-Pharm-3</b> Drugs to treat Hyperlipidemia	Interactive Lecture	SBQs & OSVE
9	<ul style="list-style-type: none"> <li>Classify anti-anginal drugs based on the mechanism of action.</li> <li>Describe adverse effects and drug interaction of antianginal drugs.</li> </ul>	<b>CVS-S2-Pharm-4</b> Drugs used to treat Ischemic Heart Disease		
10	Write down a prescription based on a given scenario.	<b>CVS-S2-Pharm-5</b> Dyslipidemia Hypertension	Practical	OSPE & OSVE

## Theme 3: Myocardial Diseases

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
11	<ul style="list-style-type: none"> <li>Define Cardiomyopathy and classify it.</li> <li>Describe the pathogenesis, patterns, morphological changes, clinical features, and complications of various cardiomyopathies.</li> </ul>	<b>CVS-S2-Path-6</b> Cardiomyopathies	Interactive Lecture	SBQs & OSVE
12	<ul style="list-style-type: none"> <li>Define valvular stenosis and insufficiency.</li> <li>Describe the causes of the major valvular lesions.</li> </ul>	<b>CVS-S2-Path-7</b> Valvular Heart Disease and		

	<ul style="list-style-type: none"> <li>Describe the natural history of Rheumatic Fever.</li> <li>Describe Calcific Valvular Degeneration and characterize it.</li> <li>Discuss the morphology and clinical features.</li> </ul>	Rheumatic Heart Disease		
<b>Pharmacology</b>				
13	<ul style="list-style-type: none"> <li>List the major classes of anti-arrhythmic drugs based on their mechanism of action.</li> <li>Describe the clinical use, drug interactions, and adverse effects of anti-arrhythmic drugs.</li> </ul>	<b>CVS-S2-Pharm-6</b> Drugs used to treat Cardiac Arrhythmias	Interactive Lecture	SBQs & OSVE
14	<ul style="list-style-type: none"> <li>Classify the major classes of drugs used to treat congestive cardiac failure based on their mechanism of action.</li> <li>Describe the pharmacokinetics, mechanism of action, indications, and adverse effects of drugs used in acute and chronic heart failure.</li> <li>Describe the clinical use, drug interactions, and adverse effects of drugs used in CCF.</li> </ul>	<b>CVS-S2-Pharm-7</b> Drugs used to treat Congestive Cardiac Failure		
<b>Clinical Lecture</b>				
15	<ul style="list-style-type: none"> <li>Describe the sign and symptoms of RF and RHD</li> <li>Describe the drugs used to treat RHD and their adverse effects</li> </ul>	<b>CVS-S2-Cardio-1</b> Rheumatic Fever and Rheumatic Heart Disease (RHD)	Interactive Lecture	SBQs & OSVE
16	<ul style="list-style-type: none"> <li>Describe the sign and symptoms of pericarditis, myocarditis, and infective endocarditis.</li> <li>Describe the treatment of pericarditis, myocarditis, and infective endocarditis.</li> </ul>	<b>CVS-S2-Cardio-2</b> Cardiac inflammation		

## Theme 4: Diseases of Vessels

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
17	<ul style="list-style-type: none"> <li>Define vasculitis and classify primary forms.</li> <li>Describe causes and mechanisms.</li> <li>Describe the typically involved vascular sites.</li> <li>Describe the following and characterize them: <ul style="list-style-type: none"> <li>Giant Cell (Temporal) Arteritis</li> <li>Thromboangiitis Obliterans (Buerger Disease)</li> </ul> </li> </ul>	<b>CVS-S2-Path-8</b> Vasculitis	Interactive Lecture	SBQs & OSVE
18	<ul style="list-style-type: none"> <li>Describe varicose veins and their clinical features.</li> </ul>	<b>CVS-S2-Path-9</b> Diseases of Veins and Lymphatics		



	<ul style="list-style-type: none"> <li>• Differentiate between Thrombophlebitis and Phlebothrombosis based on pathogenesis and clinical features.</li> <li>• Describe Lymphangitis and Lymphedema.</li> </ul>			
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## Theme 5: Pericardial and Endocardial Diseases, and Cardiac Tumors

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
20	<ul style="list-style-type: none"> <li>• Classify vascular tumors and tumor-like conditions.</li> <li>• Describe the pathogenesis, morphology, and clinical characteristics of the following: <ul style="list-style-type: none"> <li>• Hemangiomas</li> <li>• Lymphangiomas</li> <li>• Intermediate-Grade (Borderline) Tumors</li> <li>• Malignant Tumors</li> </ul> </li> </ul>	<b>CVS-S2-Path-10</b> Vascular Tumors	Interactive Lecture	SBQs & OSVE
21	<ul style="list-style-type: none"> <li>• Describe the pathogenesis, morphology, and clinical characteristics of IE, Pericarditis, and cardiac tumors.</li> </ul>	<b>CVS-S2-Path-11</b> Infective Endocarditis (IE), Pericarditis, and Tumors of the Heart	Interactive Lecture	SBQs & OSVE
22	<ul style="list-style-type: none"> <li>• Interpret the gross and microscopic features of the following on a given histopathology report:</li> </ul>	<b>CVS-S2-Path-12</b> Hemangiomas Cardiac Myxoma	Practical	OSPE & OSVE

## Blueprint of Assessment

Purpose of Assessment:

Summative Assessment First Professional MBBS

Curriculum:

Integrated Modular Curriculum

Module:

CVS 2 Module

Subject in Module	Proportion of subjects in module	Weightage	Test Instrument/tool/method				Explanation
What to assess?			How to assess?				
			MCQs (SBQs) Level 1 & 2	OSVE stations Level 1 & 2	OSPE/OSCE Level 3	Any Other	<b>Proportion of test instruments to be used:</b> Theory MCQs (SBQs)= 100 %; Practical OSVE=80% OSPE/OSCE= 20%  <b>Competency level &amp; Learning Domain at Miller's Pyramid:</b> <b>Cognition:</b> Know (Level-1)& How to know (Level-2) <b>Skills &amp; Attitude:</b> Show (Level-3) & Does (Level-4)
Pathology	12	48	48				
Microbiology							
Pharmacology	07	28	28				
Community medicine	04	16	16				
Clinical Lecture	02	08	08				
	25	100%	100	80%	20%		

# 6 GASTROINTESTINAL TRACT & LIVER MODULE II

## Introduction

Welcome to the GIT and Liver module. This exciting module will serve as building block and is very essential to your future work as doctors. This module is designed to make your learning both interesting and productive by including several inter active activities.

This module covers the topics which are Inflammatory and Neoplastic Diseases of Salivary Gland, Non-neoplastic and Tumor of Esophagus, Gastritis and Peptic Ulcer, Malignancies of Stomach, Diarrheal Diseases, Malabsorption Syndromes and Inflammatory Bowel Diseases, Benign and Malignant Lesions of Small and Large Intestine. Pathological conditions of Liver like Jaundice and cholestasis, Autoimmune liver diseases & Cholangiopathies, Metabolic Liver Diseases-1, Drug and Toxin Induced Liver Injury & Fatty Liver Disease, Cirrhosis of liver, Tumors of Liver, Inflammatory Diseases and Tumors of Gall Bladder. All these diseases are very common in clinical practice and will be helpful in understanding the GIT and Liver pathology. Real life scenarios have been added in the module which will be discussed in small groups to help students to develop them clinical approach to understand and solve the clinical problem by correlating their basic knowledge of anatomy, physiology, biochemistry and pathology with findings of a clinical case.

## Rationale

Diseases of the GIT are common all over our country. It is essential to make early diagnosis and treat the disease in order to reduce morbidity and mortality.

This module provides an integrative understanding and detailed and clinically relevant information of pathology related to the digestive and biliary system.

## Learning Outcomes

At the end of the module, the students will be able to relate understanding of the pathological processes related to the gastrointestinal tract & Liver.

## Duration:

04 weeks

## Themes

- Theme 1: Disease of oral cavity and esophagus
- Theme-2: Disease of stomach
- Theme-3: Diarrheal diseases and malabsorption syndromes
- Theme-4: Intestinal disorders
- Theme-5: Jaundice & cholestasis
- Theme-6: Metabolic & drug/toxin related liver diseases
- Theme-7: Cirrhosis
- Theme 8: Tumors of liver and gall bladder

# TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

## Theme 1: Disease of Oral Cavity and Esophagus

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	<ul style="list-style-type: none"> <li>Define leukoplakia and erythroplakia.</li> <li>Describe ulcer of oral cavity and define dental caries, fungal infection and inflammatory condition of oral cavity.</li> <li>Name the malignant tumors of oral mucosa &amp; describe their etiopathology, morphology and clinical features.</li> </ul>	<b>GIL-S2-Path-1</b> Ulcer/ inflammatory lesion and cancer of oral cavity	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> <li>Mention cause of sialadenitis, clinical features and morphology.</li> <li>Name benign and malignant tumors of salivary gland.</li> <li>Describe etiopathology, morphology and clinical features.</li> </ul>	<b>GIL-S2-Path-2</b> Disease of salivary gland inflammation and tumor		
3	<ul style="list-style-type: none"> <li>Define achalasia, mention its causes and morphology.</li> <li>Describe causes of Hematemesis.</li> <li>Describe pathogenesis, clinical features of GERD</li> <li>Mention causes of dysphagia.</li> </ul>	<b>GIL-S2-Path-3</b> Motor disorders. Esophageal varices, inflammatory condition and gastroesophageal reflux		
4	<ul style="list-style-type: none"> <li>Name benign and malignant tumors of esophagus.</li> <li>Describe etiopathology, clinical features and morphology of carcinoma esophagus.</li> </ul>	<b>GIL-S2-Path-4</b> Tumors of esophagus		
5	Demonstrate Gross and microscopic features of oral cavity carcinoma, salivary gland tumor and carcinoma esophagus.	<b>GIL-S2-Path-5</b> Gross and microscopic features of oral cavity carcinoma, salivary gland tumor and carcinoma esophagus.	Practical	OSPE & OSVE
<b>Pharmacology</b>				
6	Drugs used for dyspepsia (Antacids and prokinetic drugs)	<b>GIL-S2-Pharm-1</b>	Interactive Lecture	SBQs & OSVE
<b>Clinical Lectures</b>				
7	Discuss Gastroesophageal reflux, esophagitis, Barrett's esophagus and hiatal hernia	<b>GIL-S2-Med-1</b> Gastroesophageal reflux, esophagitis, Barrett's esophagus and hiatal hernia	Interactive Lecture	SBQs & OSVE
8	Discuss Surgical causes, presentation and management of	<b>GIL-S2-Surg-1</b> Surgical causes, presentation and	Interactive Lecture	SBQs & OSVE

	hematemesis, dysphagia and carcinoma esophagus	management of hematemesis, dysphagia and carcinoma esophagus		
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## Theme 2: Disease of Stomach

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
9	<ul style="list-style-type: none"> <li>Mention causes, pathogenesis of gastritis (Acute and chronic)</li> <li>Describe causes, etiopathology, complication and morphology of peptic ulcer disease.</li> <li>Mention role of H. Pylori in peptic ulcer disease, describe various methods of diagnosis of H. Pylori infection.</li> </ul>	<b>GIL-S2-Path-6</b> Gastritis and peptic ulcer disease	Interactive Lecture	SBQs & OSVE
10	Name benign and malignant tumors of stomach, describe etiopathology, clinical features and morphology of carcinoma stomach.	<b>GIL-S2-Path-7</b> Tumor of stomach		
11	Demonstrate Gross and microscopic features of peptic ulcer and carcinoma stomach	<b>GIL-S2-Path-8</b> Gross and microscopic features of peptic ulcer and carcinoma stomach	Practical	OSPE & OSVE
<b>Pharmacology</b>				
12	Describe drugs used for Acid peptic disorders including H. Pylori infection proton pump inhibitors	<b>GIL-S2-Pharm-2</b> Drugs used for Acid peptic disorders including H. Pylori infection proton pump inhibitors	Interactive Lecture	SBQs & OSVE
<b>Clinical Lectures</b>				
13	Discuss diagnosis and management of gastritis/Acid peptic disease and endoscopic management of bleeding peptic ulcer	<b>GIL-S2-Med-2</b> Diagnosis and management of gastritis/Acid peptic disease and endoscopic management of bleeding peptic ulcer	Interactive Lecture	SBQs & OSVE
14	Surgical management in Acid peptic disease and carcinoma of stomach.	<b>GIL-S2-Surg-2</b> Surgical management in Acid peptic disease & carcinoma of stomach.		

## Theme 3: Diarrheal Diseases and Malabsorption Syndromes

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
15	<ul style="list-style-type: none"> <li>Name various cases of enterocolitis.</li> <li>Mention various causes of diarrhea and dysentery (Microbiology).</li> <li>Describe clinical features.</li> <li>Mention etiopathogenesis and clinical features.</li> </ul>	<b>GIL-S2-Path-9</b> Enterocolitis and ischemic colitis, Hemorrhoids	Interactive Lecture	SBQs & OSVE
16	<ul style="list-style-type: none"> <li>Define malabsorption and name various causes.</li> <li>Describe clinical features, etiopathology, morphology and diagnosis of coeliac disease.</li> </ul>	<b>GIL-S2-Path-10</b> Malabsorption syndrome (Coeliac disease)		
17	<ul style="list-style-type: none"> <li>Name inflammatory bowel disease.</li> <li>Describe etiopathology, clinical features and morphological features of Crohn's disease and ulcerative colitis.</li> </ul>	<b>GIL-S2-Path-11</b> Inflammatory bowel diseases		
18	<ul style="list-style-type: none"> <li>Describe various microbial agents causing diarrhea and dysentery and mention their lab diagnosis.</li> </ul>	<b>GIL-S2-Path-12</b> various microbial agents causing diarrhea and dysentery and mention their lab diagnosis.	Practical	SBQs & OSVE
<b>Pharmacology</b>				
19	Describe Emetics and Antiemetic's	<b>GIL-S2-Pharm-3</b> Emetics and Antiemetic's	Interactive Lecture	SBQs & OSVE
<b>Clinical lecture</b>				
20	Explain Causes and clinical presentation and management of malabsorption syndrome / Coeliac disease. Irritable bowel syndrome.	<b>GIL-S2-Med-3</b> Causes and clinical presentation and management of malabsorption syndrome / Coeliac disease. Irritable bowel syndrome.	Interactive Lecture	SBQs & OSVE
21	Discuss Clinical presentation and surgical management of inflammatory bowel disease.	<b>GIL-S2-Surg-3</b> Clinical presentation and surgical management of inflammatory bowel disease.		
22	Discuss causes and clinical presentation and management of acute diarrhea.	<b>GIL-S2-Paeds-1</b> Causes and clinical presentation and management of acute diarrhea.		

## Theme 4: Intestinal Disorders

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
23	<ul style="list-style-type: none"> <li>Mention various causes of intestinal obstruction</li> <li>Define volvulus, intussusception, hernias and adhesions.</li> <li>Discuss etiopathogenesis, clinical features and morphology of Hirschsprung disease.</li> </ul>	<b>GIL-S2-Path-13</b> Intestinal obstruction	Interactive Lecture	SBQs & OSVE
24	<ul style="list-style-type: none"> <li>Define acute appendicitis.</li> <li>Describe causes, clinical features and morphology of acute appendicitis.</li> <li>Mention clinical features and morphology of Meckel's diverticulitis.</li> <li>Define diverticulosis, describe etiopathology and morphology.</li> </ul>	<b>GIL-S2-Path-14</b> Inflammatory condition of abdomen		
25	<ul style="list-style-type: none"> <li>Name benign polypoidal lesion of intestine.</li> <li>Describe etiopathology, clinical features and morphology of benign polyp.</li> <li>Define familial adenomatous polyposis syndrome.</li> <li>Describe etiopathology and morphology of FAP syndrome.</li> </ul>	<b>GIL-S2-Path-15</b> Benign tumors of small intestine and large intestine-1		
26	<ul style="list-style-type: none"> <li>Name malignant tumor of large intestine.</li> <li>Describe etiopathology, clinical features and morphological features.</li> </ul>	<b>GIL-S2-Path-16</b> Malignant tumors of small intestine and large intestine-2		
27	Describe gross and microscopic features of benign and malignant tumors of intestine.	<b>GIL-S2-Path-17</b> Benign and malignant tumors of intestine.	Practical	OSPE & OSVE
<b>Pharmacology</b>				
28	<ul style="list-style-type: none"> <li>Describe drugs used in constipation.</li> <li>Explain management of diarrhea and inflammatory bowel syndrome.</li> </ul>	<b>GIL-S2-Pharm-4</b> Drugs used in constipation. Management of diarrhea and inflammatory bowel syndrome.	Interactive Lecture	SBQs & OSVE
<b>Clinical Lecture</b>				
29	Discuss causes and management of intestinal obstruction	<b>GIL-S2-Surg-4</b> Causes and management of intestinal obstruction.	Interactive Lecture	SBQs & OSVE

## Theme 5: Jaundice & Cholestasis

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
30	Describe <ul style="list-style-type: none"> <li>Bile Formation and Secretion</li> <li>Pathophysiology of Hyperbilirubinemia</li> <li>Explain etiology &amp; clinical diagnosis of               <ul style="list-style-type: none"> <li>Pre-Hepatic Jaundice</li> <li>Hepatic Jaundice</li> <li>Post-Hepatic Jaundice</li> <li>Hereditary Hyperbilirubinemia</li> <li>Gilbert's syndrome</li> <li>Crigler–Najjar syndrome type I &amp; II</li> <li>Dubin-Johnson syndrome (DJS)</li> <li>Rotors syndrome (DJS)</li> </ul> </li> </ul>	<b>GIL-S2-Path-18</b> Jaundice and cholestasis	Interactive Lecture	SBQs & OSVE
31	Explain etiology, pathogenesis & clinical features & Diagnostic criteria of <ul style="list-style-type: none"> <li>Type I Autoimmune liver diseases</li> <li>Type II Autoimmune liver diseases</li> <li>Primary Biliary Cholangitis (PBC)</li> <li>Primary Sclerosing Cholangitis (PSC)</li> </ul>	<b>GIL-S2-Path-19</b> Autoimmune liver diseases & Cholangiopathies		

## Theme 6: Metabolic & Drug/Toxin Related Liver Diseases

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
32	Explain etiology, pathogenesis & clinical features & Diagnostic criteria of <ul style="list-style-type: none"> <li>Hemochromatosis</li> <li>Wilson Disease</li> <li><math>\alpha</math>1-Antitrypsin Deficiency</li> </ul>	<b>GIL-S2-Path-20</b> Metabolic Liver Diseases-1	Interactive Lecture	SBQs & OSVE
33	Explain etiology, pathogenesis & clinical features & Diagnostic criteria of <ul style="list-style-type: none"> <li>Alcoholic Liver Disease</li> <li>Nonalcoholic Fatty liver</li> </ul>	<b>GIL-S2-Path-21</b> Drug- and Toxin-Induced Liver Injury & Fatty Liver Disease		



## Theme 7: Cirrhosis

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
34	<ul style="list-style-type: none"> <li>Describe etiology, pathogenesis, symptoms and complications</li> </ul>	<b>GIL-S2-Path-22</b> Cirrhosis of liver	Interactive Lecture	SBQs & OSVE
35	<ul style="list-style-type: none"> <li>Demonstrate gross and microscopic features</li> </ul>	<b>GIL-S2-Path-23</b> Cirrhosis of liver	Practical	OSPE & OSVE
<b>Pharmacology</b>				
36	<b>Describe drugs used in Hepatitis</b>	<b>GIL-S2-Pharm-5</b> Drugs used in Hepatitis	Interactive Lecture	SBQs & OSVE
<b>Clinical Lecture</b>				
37	Discuss Clinical presentation and outline management of Hepatitis B&C	<b>GIL-S2-Med-4</b> Clinical presentation and outline management of Hepatitis B&C	Interactive Lecture	SBQs & OSVE
38	Discuss management of acute hepatitis and fulminant hepatic failure	<b>GIL-S2-Med-5</b> Management of acute hepatitis and fulminant hepatic failure		
39	Discuss clinical presentation and indication of surgery in liver cirrhosis.	<b>GIL-S2-Surg-5</b> Clinical presentation and indication of surgery in liver cirrhosis.		

## Theme 8: Tumors of Liver and Gall Bladder

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
40	Describe Etiology, pathogenesis, gross & histologic Features of <ul style="list-style-type: none"> <li>Focal Nodular Hyperplasia, cavernous Hemangioma</li> <li>Hepatocellular Adenoma</li> <li>Hepatoblastoma</li> <li>Hepatocellular Carcinoma</li> <li>Malignant Biliary Tumors</li> </ul>	<b>GIL-S2-Path-24</b> Tumors of liver	Interactive Lecture	SBQs & OSVE
41	State congenital anomalies etiology, pathogenesis, gross & histologic Features of <ul style="list-style-type: none"> <li>Cholelithiasis (Gall stones)</li> <li>Acute &amp; Chronic Cholecystitis</li> <li>Gall bladder Carcinoma</li> </ul>	<b>GIL-S2-Path-25</b> Diseases & Tumors of gall bladder		
42	<ul style="list-style-type: none"> <li>Demonstrate gross and microscopic feature of hepatocellular carcinoma and carcinoma gall bladder</li> </ul>	<b>GIL-S2-Path-26</b> Ca liver and Gall Bladder	Practical	SBQs & OSVE

Clinical Lecture				
43	Describe Cirrhosis, partial hypertension, variceal bleeding, medical and endoscopic management.	<b>GIL-S2-Med-6</b> Cirrhosis, partial hypertension, variceal bleeding, medical and endoscopic management.	Interactive Lecture	SBQs & OSVE
44	Describe Ascites, Hepatic encephalopathy and hepato renal syndrome	<b>GIL-S2-Med-7</b> Ascites, Hepatic encephalopathy and hepato renal syndrome		
45	Describe Clinical presentation and management of cholelithiasis	<b>GIL-S2-Surg-6</b> Clinical presentation and management of cholelithiasis		

## Blueprint of Assessment

Purpose of Assessment: Summative Assessment First Professional MBBS  
 Curriculum: Integrated Modular Curriculum  
 Module: GIL 2 Module

Subject in Module	Proportion of subjects in module	Weightage	Test Instrument/tool/method				Explanation
What to assess?			How to assess?				
			MCQs (SBQs) Level 1 & 2	OSVE stations Level 1 & 2	OSPE/OSCE Level 3	Any Other	<b>Proportion of test instruments to be used:</b> Theory MCQs (SBQs)= 100 %; Practical OSVE=80% OSPE/OSCE= 20%  <b>Competency level &amp; Learning Domain at Miller's Pyramid:</b> <b>Cognition:</b> Know (Level-1)& How to know (Level-2) <b>Skills &amp; Attitude:</b> Show (Level-3) & Does (Level-4)
Pathology	26	45	45				
Microbiology							
Pharmacology	05	09	09				
Community medicine	14	24	24				
Clinical Lecture	13	22	22				
	58	100%	100	80%	20%		

# 7 ENDOCRINOLOGY MODULE II

## Introduction

The Endocrine system is made up of ductless glands, which secrete chemical substances (hormones) directly into blood, relays information and maintains a constant internal environment of the body called homeostasis. The endocrine glands where hormones are produced, stored, and released. Once released into the bloodstream, they travel to their target organ or tissue, which has receptors that recognize and react to the hormone. Hormones of the endocrine system coordinate and control growth, metabolism, temperature regulation, the stress response, reproduction, and many other functions.

This module will help the students to develop knowledge and understanding the basic concepts of endocrine hormone their disorders relates to primary pathogenesis, and how this knowledge help in diagnosis and treatment.

This endocrine system module will facilitate to recognize the clinical presentations of common endocrinological and metabolic disorders and relate clinical manifestations to basic sciences.

## Rationale

Endocrine disorders like Diabetes Mellitus and Thyroid related diseases are very common in all parts of Pakistan. This module provides the basis on which 3<sup>rd</sup> year MBBS students will learn not only knowledge application to know the pathology but will be able to link abnormalities with treatment options in the 2nd spiral of the curriculum.

Common endocrinological disorders like Diabetes mellitus, thyrotoxicosis, hypothyroidism, Cushing syndrome, pituitary disorders are necessary to be understood for comprehensive management. These diseases are commonly encountered in medical practice. In this module with the integration of the basic knowledge obtained in the first spiral, a sound clinical base is developed by learning their pharmacotherapy in detail.

## Duration:

02 weeks

## Learning Outcomes

- Describe the clinical uses and adverse effects of growth hormone and adrenocorticotrophic (ACTH) hormones.
- Explain the therapeutic effects of thyroxine in the treatment of hypothyroidism.
- Explain the mechanism of action, therapeutic and adverse effects of anti-thyroid drugs.
- Explain the therapeutic and preventive role of iodine in thyroid disorders.
- Classify diabetes mellitus on the basis of WHO criteria.
- Describe the pathogenesis, clinical features, pathological changes, complications and prevention of diabetes mellitus.
- Describe the pharmacokinetics, mechanism of action and adverse effects of insulin and oral hypoglycemic agents.
- Classify mineralocorticoids & glucocorticoids on the basis of duration of action, anti-inflammatory and salt retaining properties.
- Describe the clinical uses and adverse effects of mineralocorticoids and glucocorticoids.
- To describe and discuss the roles of hormone receptors in hormone action including their location, type and signaling pathways.
- To apply endocrinological principles to determine the pathophysiological basis and consequences of specific endocrine disorders.
- Discuss the epidemiology and consequences of iodine deficiency and the salient features of iodine control program in Pakistan

- Describe the epidemiology of diabetes mellitus in terms of global perspectives in Pakistan
- Describe the levels of prevention of diabetes mellitus and its control.

## Themes

- Theme 1: Non-neoplastic & neoplastic diseases of Pituitary Gland  
 Theme 2: Non-neoplastic & neoplastic diseases of Thyroid & Parathyroid  
 Theme 3: Non-neoplastic & neoplastic diseases of Pancreas  
 Theme 4: Non-neoplastic & neoplastic diseases of Adrenal Gland  
 Theme 5: Multiple Endocrine Neoplasia Syndromes

## TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

### Theme 1: Non-Neoplastic & Neoplastic Diseases of Pituitary Gland

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	<ul style="list-style-type: none"> <li>• Describe clinical manifestations of Anterior Pituitary gland disorders &amp; Syndromes</li> <li>• Describe the pathophysiology and Histologic features of               <ol style="list-style-type: none"> <li>Lactotroph Adenoma</li> <li>Somatotroph Adenoma</li> <li>Corticotroph Adenoma</li> <li>Other Anterior Pituitary Tumors</li> </ol> </li> <li>• Explain histologic features of Hypothalamic Suprasellar Tumors</li> </ul>	<b>End-S2-Path-1</b> Disorders and neoplasms of Pituitary gland.	Interactive Lecture	SBQs & OSVE
<b>Pharmacology</b>				
2	Discuss the pharmacology of anterior pituitary growth hormone (Somatotropin)	<b>End-S2 Pharm-1</b> Anterior pituitary hormones	Interactive Lecture	SBQs & OSVE
<b>Clinical Lecture</b>				
3	Describe clinical manifestations of the anterior & posterior pituitary gland.	<b>End-S2 Med-1</b> Hypopituitarism/ Pan hypopituitarism, GHD, Sheehan Syndrome. Diabetes Insipidus	Interactive Lecture	SBQs & OSVE
4	<ul style="list-style-type: none"> <li>• Describe the clinical features of pituitary tumors + Hypothalamic suprasellar tumors.</li> <li>• Clinical features of Hyper function tumors + Mass effects</li> </ul>	<b>End-S2 Med-2</b> Pituitary tumors + Hypothalamic suprasellar tumors		
5	<ul style="list-style-type: none"> <li>• Identify the indications for trans sphenoidal Hypophysectomy</li> <li>• Describe the technique in regards to trans sphenoidal Hypophysectomy</li> </ul>	<b>Endo-S2-Surgery-1</b> Hypophysectomy		

	<ul style="list-style-type: none"> <li>Outline the appropriate evaluation of the potential complications of trans sphenoidal Hypophysectomy</li> <li>Review some interprofessional team strategies for improving care, coordination and communication to advance transsphenoidal Hypophysectomy and improve outcomes</li> </ul>			
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## Theme 2: Non-Neoplastic & Neoplastic Diseases of Thyroid & Parathyroid

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
6	<ul style="list-style-type: none"> <li>Describe the pathophysiology of               <ol style="list-style-type: none"> <li>Hyperparathyroidism</li> <li>Primary Hyperparathyroidism</li> <li>Secondary Hyperparathyroidism</li> <li>Hypoparathyroidism</li> <li>Pseudohypoparathyroidism</li> </ol> </li> </ul>	<b>End-S2-Path-2</b> Disorder of Parathyroid gland	Interactive Lecture	SBQs & OSVE
7	<ul style="list-style-type: none"> <li>Histology thyroid hormones T3 and T4 synthesis and functions.</li> <li>Pathophysiology, clinical features and laboratory diagnosis of simple and multinodular goiter.</li> <li>Toxic multinodular goiter</li> </ul>	<b>End-S2-Path-3</b> Diseases of Thyroid gland Introduction Simple goiter and Multinodular goiter		
8	<ul style="list-style-type: none"> <li>Hyperthyroidism and thyrotoxicosis.</li> <li>Primary and secondary hyperthyroidism.</li> <li>Pathophysiology causes, clinical features and laboratory diagnosis of Graves' disease</li> <li>Thyroid function and its</li> </ul>	<b>End-S2-Path-4</b> Hyperthyroidism. Graves' disease Thyroid storm Apathetic hyperthyroidism		
9	Hypothyroidism its causes clinical features and laboratory diagnosis	<b>End-S2-Path-5</b> Hypothyroidism Cretinism Myxedema		
10	Discuss Clinical and morphological features of: <ol style="list-style-type: none"> <li>Hashimoto Thyroiditis</li> <li>Subacute Lymphocytic Thyroiditis</li> <li>Granulomatous Thyroiditis</li> </ol>	<b>End-S2-Path-6</b> Inflammatory diseases of Thyroid gland		
11	Causes, pathogenesis, morphological features and laboratory diagnosis of thyroid adenoma and papillary carcinoma	<b>End-S2 Path-7</b> Thyroid Neoplasms-I		
12	Causes, pathogenesis, morphological features and	<b>End-S2-Path-8</b> Thyroid		

	laboratory diagnosis of follicular carcinoma, medullary carcinoma and anaplastic carcinoma.	Neoplasms-II		
13	Laboratory interpretation of parathyroid gland diseases	<b>End-S2-Path-9</b> Parathyroid gland Lab interpretation	Practical	OSPE & OSVE
14	Thyroid function test and its interpretation according to disease	<b>End-S2-Path-10</b> Thyroid function tests		
15	Neoplastic lesions of thyroid gland	<b>End-S2-Path-11</b> Benign and malignant tumors of thyroid gland		
<b>Pharmacology</b>				
16	<ul style="list-style-type: none"> <li>Classify the drugs used in Thyroid disorders</li> <li>Pharmacological effects of anti-thyroid drugs</li> <li>Discuss the drugs used for hypothyroidism</li> </ul>	<b>End-S2-Pharm-2</b> Introduction to Basic pharmacology of Thyroid drugs	Interactive Lecture	SBQs & OSVE
17	Drugs used in parathyroid disorders (Tetany)	<b>End-S2-Pharm-3</b> Parathyroid agents		
<b>Clinical Lecture</b>				
18	Describe the clinical features & management of & Hyperparathyroidism	<b>End-S2-Med-3</b> Primary+ Secondary+ tertiary. Hyperparathyroidism	Interactive Lecture	SBQs & OSVE
19	Describe the clinical features & management of hypoparathyroidism	<b>End-S2-Med-4</b> Primary+ Secondary+ tertiary. Hypoparathyroidism + Pseudo hypoparathyroidism		
20	Discuss Clinical features of inflammatory thyroid disorders	<b>End-S2-Med-5</b> Thyroiditis. Hypothyroidism (Hashimoto thyroid disease, Myxedema and cretinism)		
21	Discuss Clinical features of inflammatory thyroid disorders	<b>End-S2-Med-6</b> Hyperthyroidism (Graves' disease)		
22	<ul style="list-style-type: none"> <li>Discuss Toxic adenoma.</li> <li>Multinodular Goiter</li> <li>Simple Nontoxic goiter</li> <li>Types of thyroid carcinomas.</li> </ul>	<b>End-S2-Med-7</b> Goiter + Adenoma + Thyroid Malignancies.		
23	<ul style="list-style-type: none"> <li>Identify the indications of Para thyroidectomy</li> <li>Describe the technique of Para thyroidectomy.</li> <li>Review the clinical significance of Para thyroidectomy.</li> <li>Summarize the potential complications of Para thyroidectomy</li> </ul>	<b>End-S2-Surg-2</b> Para thyroidectomy.		

### Theme 3: Non-Neoplastic & Neoplastic Diseases of Pancreas

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
24	Glucose homeostasis, metabolic action of insulin and mechanism of insulin release. Classification of diabetes mellitus. Types of incretins. Impaired glucose tolerance test. Laboratory diagnosis of diabetes mellitus	<b>End-S2-Path-12</b> Disorder of Endocrine Pancreas Diabetes Mellitus-1	Interactive Lecture	SBQs & OSVE
25	Pathogenesis of type-I and type-II diabetes mellitus, clinical presentation and complications of diabetes mellitus.	<b>End-S2-Path-13</b> Disorder of Endocrine Pancreas Diabetes mellitus-II		
26	<ul style="list-style-type: none"> <li>Discuss clinical presentation, pathogenesis and histologic features of Common Pancreatic Endocrine Neoplasms Hyperinsulinism (Insulinoma) Zollinger-Ellison Syndrome</li> <li>(Gastrinoma) Pancreatic carcinoid tumors</li> </ul>	<b>End-S2-Path-14</b> Pancreatic tumors		
27	Diabetes mellitus its type and laboratory interpretation	<b>End-S2-Path-15</b> Diabetes mellitus Lab interpretation		
<b>Pharmacology</b>				
28	Describe the pharmacology of insulin and benefits of glycemic control in diabetes mellitus type-I	<b>End-S2-Pharm-4</b> Pancreas (Insulin)	Interactive Lecture	SBQs & OSVE
29	Describe the drugs used in type II diabetes mellitus.	<b>End-S2-Pharm-5</b> Non-Insulin antidiabetic agents		
<b>Clinical Lecture</b>				
30	<ul style="list-style-type: none"> <li>Describe Diabetes (Definition + WHO Classification).</li> <li>Management of diabetes.</li> </ul>	<b>End-S2-Med-8</b> Diabetes Mellitus-I	Interactive Lecture	SBQs & OSVE
31	<ul style="list-style-type: none"> <li>Discuss Acute &amp; chronic complications of diabetes.</li> </ul>	<b>End-S2-Med-9</b> Diabetes Mellitus-II		

### Theme 4: Non-Neoplastic & Neoplastic Diseases of Adrenal Gland

### Theme 5: Multiple Endocrine Neoplasia Syndromes

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
32	<ul style="list-style-type: none"> <li>Describe the hyper-secretory &amp; hypo-secretory disorders of adrenal cortex</li> <li>Adrenocortical Hyperfunction Hypercortisolism (Cushing Syndrome)</li> <li>Primary Hyperaldosteronism Adrenogenital Syndromes</li> <li>Adrenocortical Insufficiency</li> </ul>	<b>End-S2-Path-16</b> Non-neoplastic diseases of adrenal cortex Neoplastic diseases of adrenal cortex & Medulla MEN-I & MEN-II	Interactive Lecture	SBQs & OSVE



	<ul style="list-style-type: none"> <li>Primary Acute Adrenocortical Insufficiency</li> <li>Primary Chronic Adrenocortical Insufficiency (Addison Disease)</li> <li>Discuss clinical presentation, pathogenesis and histologic features of</li> <li>Adrenocortical Neoplasms Adrenocortical adenomas Pheochromocytoma.</li> </ul>			
<b>Pharmacology</b>				
<b>33</b>	Describe the pharmacokinetic pharmacodynamics clinical uses and toxicity of glucocorticoids	<b>End-S2-Pharma-6</b> Corticosteroids (Glucocorticoids).	Interactive Lecture	SBQs & OSVE
<b>34</b>	Discuss the pharmacology of mineralo corticoids.	<b>End-S2-Pharm-7</b> Mineralo corticoids		
<b>35</b>	Discuss the corticosteroid antagonists	<b>End-S2-Pharm-8</b> Corticosteroid antagonists		
<b>Medicine</b>				
<b>36</b>	<ul style="list-style-type: none"> <li>Describe Diabetes (Definition + WHO Classification).</li> <li>Management of diabetes.</li> </ul>	<b>End-S2-Med-8</b> Diabetes Mellitus-I	Interactive Lecture	SBQs & OSVE
<b>37</b>	Discuss Acute & chronic complications of diabetes.	<b>End-S2-Med-9</b> Diabetes Mellitus-II		
<b>38</b>	Describe the clinical manifestations of Hyper functioning of the Adrenal gland. (Cortex)	<b>End-S2-Med-10</b> Cushing Syndrome		
<b>39</b>	Describe the clinical manifestations of hypo functioning of the Adrenal gland. (Cortex)	<b>End-S2-Med-11</b> Adrenal insufficiencies (Addison disease)		
<b>40</b>	Describe the clinical features of. Corticotrophin adenoma.	<b>End-S2-Med-12</b> Corticotrophin adenoma. (Cushing Syndrome of pituitary origin)		
<b>41</b>	Discuss the Clinical manifestation of Adrenal Medullary tumors + paragangliomas	<b>End-S2-Med-13</b> Pheochromocytoma + paragangliomas		
<b>42</b>	Discuss the genetic mutation in Endocrinology	<b>End-S2-Med-14</b> MEN-I, MEN-II, A&B		
<b>Surgery</b>				
<b>43</b>	<ul style="list-style-type: none"> <li>Identify the indications of adrenalectomy</li> <li>Describe the management of adrenalectomy</li> <li>Outline the complications of adrenalectomy</li> </ul>	<b>End-S2-Surg-3</b> Adrenalectomy	Interactive Lecture	SBQs & OSVE

## Blueprint of Assessment

Purpose of Assessment:

Summative Assessment First Professional MBBS

Curriculum:

Integrated Modular Curriculum

Module:

Endocrine-2 Module

Subject in Module	Proportion of subjects in module	Weightage	Test Instrument/tool/method				Explanation
What to assess?			How to assess?				
			MCQs (SBQs) Level 1 & 2	OSVE stations Level 1 & 2	OSPE/OSCE Level 3	Any Other	<b>Proportion of test instruments to be used:</b> Theory MCQs (SBQs)= 100 %; Practical OSVE=80% OSPE/OSCE= 20%  <b>Competency level &amp; Learning Domain at Miller's Pyramid:</b> <b>Cognition:</b> Know (Level-1)& How to know (Level-2) <b>Skills &amp; Attitude:</b> Show (Level-3) & Does (Level-4)
Pathology	16	39	39				
Microbiology							
Pharmacology	08	19	19				
Community medicine	04	10	10				
Clinical Lecture	14	32	32				
	42	100%	100	80%	20%		

# 8 RENAL/ EXCRETORY SYSTEM MODULE-II

## Introduction

Welcome to the Renal & excretory module. This exciting module will serve as building block and is very essential to your future work as doctors. This module is designed to make your learning both interesting and productive by including several inter active activities.

This module covers the topics which are Pathogenesis of glomerular disease, Glomerular conditions associated with system disorders and Isolated glomerular abnormalities, Renal vascular disease, Obstructive uropathy (Urolithiasis, Hydronephrosis), Tumors of Renal and Lower Urinary System, Kidney function tests, Urine Analysis and Urine C/S. All these topics are interactive and helpful in understanding the renal pathology.

## Rationale

Renal system and excretory system is Responsible for the body to get rid of waste and toxic substances. In this module the renal and excretory system will be examined in detail with emphasis on Pathogenesis of glomerular disease, Glomerular conditions associated with system disorders and Isolated glomerular abnormalities, Renal vascular disease, Obstructive uropathy (Urolithiasis, Hydronephrosis), Tumors of Renal and Lower Urinary System, Kidney function tests, Urine Analysis and Urine C/S. This module will enable the students of third year to recognize the clinical presentations of common renal diseases and relate clinical manifestations to basic sciences.

## Duration:

03 weeks

## Learning Outcomes

At the end of this module, the students will be able to understand common clinical problems like kidney syndromes and to correlate with Pathogenesis of glomerular disease, Glomerular conditions associated with systemic disorders and Isolated glomerular abnormalities, Renal vascular disease, like benign and malignant nephrosclerosis, Obstructive uropathy (Urolithiasis, Hydronephrosis), Tumors of Renal and Lower Urinary System, Kidney function tests, Urine Analysis and Urine C/S.

## Themes

- Theme 1: Glomerular conditions including glomerular syndromes, conditions associated with systemic disorders and Isolated glomerular abnormalities.
- Theme 2: Kidney/ Excretory Infections and Renal Vascular Disorders
- Theme 3: Obstructive uropathy (Urolithiasis, Hydronephrosis)
- Theme 4: Tumors of Renal/ excretory System

## TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

### Theme 1: Glomerular Conditions Including Glomerular Syndromes, Conditions Associated with Systemic Disorders and Isolated Glomerular Abnormalities

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	<ul style="list-style-type: none"> <li>Classify glomerular disease.</li> <li>Define glomerular syndrome</li> <li>Discuss pathogenesis of glomerular injury and mediators of glomerular injury.</li> </ul>	<b>EXC-S2-Path-1</b> Glomerular diseases	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> <li>Describe various glomerular syndromes</li> <li>Define nephritic syndrome</li> <li>Describe pathophysiology and clinical features of nephritic syndrome</li> <li>Differentiate between nephritic and nephrotic syndrome.</li> </ul>	<b>EXC-S2-Path-2</b> Nephritic Syndrome		
3	<ul style="list-style-type: none"> <li>Define and describe causes:</li> <li>Pathophysiology and clinical features of nephrotic syndrome.</li> <li>Differentiate between nephritic and nephrotic syndrome.</li> </ul>	<b>EXC-S2-Path-3</b> Nephrotic Syndrome		
4	<ul style="list-style-type: none"> <li>Discuss the pathophysiology, morphology and clinical features in glomerular conditions associated with systemic disease e.g Diabetic nephropathy, Lupus nephritis, Henoch Schonlein purpura.</li> <li>Explain isolated glomerular abnormalities including IGA nephropathy, Hereditary nephritis, Alport syndrome.</li> </ul>	<b>EXC-S2-Path-4</b> Glomerular conditions associated with system disorders and Isolated glomerular abnormalities		
5	<ul style="list-style-type: none"> <li>Name kidney function test</li> <li>Mention clinical interpretation of serum urea, creatinine, BUN and creatinine clearance test.</li> </ul>	<b>EXC-S2-Path-5</b> Kidney function tests	Practical	OSPE & OSVE

## Theme 2: Kidney/ Excretory Infections and Renal Vascular Disorders

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
6	<ul style="list-style-type: none"> <li>Describe causes and pathogenic mechanism of tubulointerstitial injury</li> <li>Etiology, pathogenesis and morphology of acute tubular necrosis.</li> <li>Describe etiopathogenesis and morphology of tubulointerstitial nephritis.</li> </ul>	<b>EXC-S2-Path-6</b> Tubulo interstitial Injury	Interactive Lecture	SBQs & OSVE
7	<ul style="list-style-type: none"> <li>Identify predisposing factors of pyelonephritis</li> <li>Describe causes, pathogenic mechanisms and morphology of acute pyelonephritis.</li> <li>Describe clinical course and complications of acute pyelonephritis.</li> </ul>	<b>EXC-S2-Path-7</b> Pyelonephritis		
8	<ul style="list-style-type: none"> <li>Define chronic pyelonephritis</li> <li>Enumerate causes and morphological features of chronic pyelonephritis.</li> </ul>	<b>EXC-S2-Path-8</b> Chronic Pyelonephritis		
9	<ul style="list-style-type: none"> <li>Identify the causes of UTI.</li> <li>Describe predisposing factors and clinical presentation.</li> </ul>	<b>EXC-S2-Path-9</b> Urinary tract infections		
10	<ul style="list-style-type: none"> <li>Classify renal vascular disease.</li> <li>Discuss etiology, pathogenesis, morphology, clinical features of benign and malignant nephrosclerosis.</li> <li>Define renal artery stenosis mention its causes, clinical features. Describe thrombotic microangiopathy and other vascular disorders</li> </ul>	<b>EXC-S2-Path-10</b> Renal Vascular disease		
11	Describe urine detail report and different methods of urine culture	<b>EXC-S2-Path-11</b> Urine Analysis and Urine Culture	Practical	OSPE & OSVE

## Theme 3: Obstructive Uropathy (Urolithiasis, Hydronephrosis)

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
12	<ul style="list-style-type: none"> <li>Name various types of renal calculi.</li> <li>Describe etiopathology causes and complication.</li> </ul>	<b>EXC-S2-Path-12</b> Kidney stones	Interactive Lecture	SBQs & OSVE
13	Identify causes, pathophysiology, gross and microscopic features & clinical features of hydronephrosis.	<b>EXC-S2-Path-13</b> Hydronephrosis		

## Theme 4: Tumors of Renal/ excretory System

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
14	<ul style="list-style-type: none"> <li>Name benign and malignant tumor of kidney.</li> <li>Describe etiopathology, risk factor and morphology and clinical features of Renal Cell Carcinoma.</li> </ul>	<b>EXC-S2-Path-14</b> Tumors of Kidney-I	Interactive Lecture	SBQs & OSVE
15	<ul style="list-style-type: none"> <li>Classify urothelial tumor.</li> <li>Discuss etiology, pathogenesis, morphology, clinical features and diagnosis of urothelial tumors.</li> </ul>	<b>EXC-S2-Path-15</b> Tumor of Urinary System-II		
16	Describe gross and microscopic features of benign & malignant kidney and urinary bladder tumors	<b>EXC-S2-Path-16</b> Kidney and urinary bladder tumors	Practical	OSPE & OSVE
<b>Pharmacology</b>				
17	<ul style="list-style-type: none"> <li>Classify different types of Diuretics.</li> <li>Describe the mechanism of action of Diuretics,</li> <li>Identify the clinical uses and adverse effects of Diuretics</li> </ul>	<b>EXC-S2-Pharm-01</b>	Interactive Lecture	SBQs & OSVE

# 9 REPRODUCTIVE SYSTEM MODULE-II

## Introduction

Welcome to the Reproductive module. This exciting module will serve as building block and is very essential to your future work as doctors. This module is designed to make your learning both interesting and productive by including several inter active activities.

Reproductive health is a state of complete physical, mental and social well-being in all matters relating to the reproductive system. Reproductive Health is essential for peoples' overall well-being. Hence Reproductive health and specifically women's reproductive health is given prime importance at a global level.

This module will address inflammatory, neoplastic and non-neoplastic diseases of female genital organs, breast, sexually Transmitted Diseases and infertility. It will also address the inflammatory, non-neoplastic and neoplastic diseases of male reproductive system.

## Rationale

More than half of the population of Pakistan are females. Diseases related to female and male reproductive systems constitute a large segment of medical practice in all countries. These diseases together with pregnancy and its related disorders are the core teaching in this module. Reproductive module is expected to build students basic knowledge about normal structure, development and diseases of reproductive system. This will help the students to gain the knowledge about the etiology and pathogenesis of diseases of both male and female reproductive system and methods of diagnosis these diseases.

This module will enable the students of fourth year to recognize the clinical presentations of common reproductive diseases. The student will develop the understanding of the pathology, clinical presentation, and diagnosis of reproductive disorders, normal pregnancy and its disorders.

## Duration:

03 weeks

## Learning Outcomes

At the end of this module students should be able to:

- Recall the anatomy & physiology of male and female reproductive system.
- Discuss the etiology of early pregnancy disorders.
- Differentiate the non-neoplastic and neoplastic lesions of male and female genital tract.
- Differentiate between primary and secondary amenorrhea and discuss the management of infertility.
- Interpret the semen analysis report.
- Explain the clinical features diagnosis and management testicular tumors.
- Classify breast tumor and differentiate between non proliferative and proliferative breast lesions

## Themes

Theme 1: Lesions of Female Genital Tract  
Theme 4: Lesions of Male Genital Tract

# TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

## Theme 1: Lesions of Female Genital Tract

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
1	<ul style="list-style-type: none"> <li>Discuss congenital anomalies of female genital tract</li> <li>Define sexually transmitted infections</li> <li>Define Pelvic Inflammatory Disease</li> <li>List the organism causing genital tract infection</li> <li>Discuss complications of PID</li> </ul>	<b>Rep-S2-Path-1 Congenital anomalies &amp; Infections of female genital tract</b>		
2	<ul style="list-style-type: none"> <li>Discuss the morphology, pathogenesis and clinical presentation of non-neoplastic &amp; neoplastic vulvar conditions.</li> <li>Explain the pathogenesis and morphology of vaginal intraepithelial neoplasia and squamous cell carcinoma</li> </ul>	<b>Rep-S2-Path-2 Non-neoplastic and neoplastic conditions of vulva and vagina</b>		
3	<ul style="list-style-type: none"> <li>Explain the infections of cervix including acute &amp; chronic cervicitis and Endocervical Polyps</li> <li>Discuss risk factors, pathogenesis and morphology of cervical intraepithelial lesions and cervical carcinoma</li> </ul>	<b>Rep-S2-Path-3 Non-neoplastic and neoplastic conditions of cervix</b>	Interactive Lecture	SBQs & OSVE
4	<ul style="list-style-type: none"> <li>Discuss the etiology, pathogenesis, morphology and clinical features of Abnormal uterine bleeding and Anovulatory Cycle</li> <li>Explain the etiology, pathogenesis, morphology and clinical features of acute and chronic Endometritis, Endometriosis and Adenomyosis and Endometrial Polyps</li> <li>Define Endometrial hyperplasia and explain its etiology and morphology</li> </ul>	<b>Rep-S2-Path-4 Functional Endometrial Disorders &amp; Endometrial Hyperplasia</b>		
5	<ul style="list-style-type: none"> <li>Explain the procedure of pap smear</li> <li>Differentiate the normal and abnormal pap smear</li> </ul>	<b>Rep-S2-Path-5 Pap smear</b>	Practical	OSPE & OSVE
6	<ul style="list-style-type: none"> <li>Discuss the etiology, pathogenesis, morphology and clinical features of Carcinoma of the Endometrium</li> </ul>	<b>Rep-S2-Path-6 Tumors of Uterus</b>	Interactive Lecture	SBQs & OSVE



	<ul style="list-style-type: none"> <li>Describe benign and malignant tumors of myometrium</li> </ul>			
7	<ul style="list-style-type: none"> <li>Describe non neoplastic and functional cyst of ovary</li> <li>Explain etiology, morphology and clinical presentation of polycystic ovarian disease</li> </ul>	<b>Rep-S2-Path-7 Diseases of ovary</b>	Interactive Lecture	SBQs & OSVE
8	<ul style="list-style-type: none"> <li>Classify tumors of ovary</li> <li>Discuss the etiology, pathogenesis, morphology and clinical features of ovarian tumors</li> </ul>	<b>Rep-S2-Path-8 Tumors of ovary</b>		
9	<ul style="list-style-type: none"> <li>Discuss the etiology, pathogenesis and morphology of hydatiform mole including complete mole, partial mole and invasive mole</li> <li>Explain the pathogenesis and morphology of choriocarcinoma and placental site trophoblastic tumor</li> </ul>	<b>Rep-S2-Path-9 Gestational Trophoblastic Diseases</b>		
10	<ul style="list-style-type: none"> <li>Describe the morphology, gross and microscopic features of gestational tumors</li> </ul>	<b>Rep-S2-Path-10 Gestational Tumor</b>	Practical	OSPE & OSVE

## Theme 2: Lesions of Male Genital Tract

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
11	<ul style="list-style-type: none"> <li>Discuss congenital anomalies of male genital tract</li> <li>Describe inflammatory conditions of testis and epididymis</li> </ul>	<b>Rep-S2-Path-11 Congenital anomalies and inflammation of testis and epididymis</b>	Interactive Lecture	SBQs & OSVE
12	<ul style="list-style-type: none"> <li>Classify testicular tumors</li> <li>Discuss the etiology, pathogenesis, morphology and clinical features of various types of testicular tumors</li> </ul>	<b>Rep-S2-Path-12 Testicular Tumors</b>		
13	<ul style="list-style-type: none"> <li>Explain the etiology and morphology of prostatitis</li> <li>Describe gross and microscopic features and complications of BPH</li> </ul>	<b>Rep-S2-Path-13 Prostatitis &amp; benign prostatic hyperplasia</b>		
14	Describe etiology, morphology, type and staging of carcinoma of prostate	<b>Rep-S2-Path-14 Carcinoma of prostate</b>		
15	Explain the sample collection, gross, microscopic and chemical examination of semen	<b>Rep-S2-Path-15 Semen D/R</b>	Practical	OSPE & OSVE

**Pharmacology**

<b>16</b>	<ul style="list-style-type: none"> <li>• Enlist different estrogen and antiestrogen preparations</li> <li>• Describe the pharmacological effects, clinical uses and side effects of these agents</li> </ul>	<p><b>Rep-S2-Pharm-1</b> Estrogen And Antiestrogen</p>	Lecture	SBQs & OSVE
<b>17</b>	<ul style="list-style-type: none"> <li>• Enlist different types of hormonal contraceptives.</li> <li>• Describe the mechanism of action of hormonal contraceptives, their clinical uses and adverse effects of hormonal contraceptives.</li> </ul>	<p><b>Rep-S2-Pharm-2</b> Hormonal Contraceptives</p>		
<b>18</b>	<ul style="list-style-type: none"> <li>• Describe the role of endogenous oxytocin in labour</li> <li>• Describe the clinical conditions that may require the exogenous oxytocin</li> <li>• Discuss the unwanted effects of Oxytocin.</li> </ul>	<p><b>Rep-S2-Pharm-3</b> Oxytocin</p>		

# 10 MUSCULOSKELETAL MODULE-II

## Introduction

Welcome to the soft tissue and bone module. This exciting module will serve as building block and is very essential to your future work as doctors. This module is designed to make your learning both interesting and productive by including several inter active activities.

This module covers the topics which are basic structure and function of bone, developmental disorders of bone and cartilage, fractures, bone repair and osteomyelitis, arthritis, benign bone and cartilage forming tumors, malignant bone and cartilage forming tumors, tumors of unknown origin and soft tissue tumors. All these topics are interactive and helpful in understanding the soft tissue and bone pathology.

## Rationale

The soft tissue and bone module is designed with a compelling rationale, aiming to equip students with essential knowledge and skills for various disciplines:

## Duration:

02 weeks

## Learning Outcomes

At the end of this module, the students will be able to understand pathological conditions, etiology, diagnostic techniques, treatment planning, radiological interpretation, histopathology and clinical correlation.

## Themes

- Theme 1: Developmental Disorders of Bone & Cartilage, Basic Structure & Function of Bone.
- Theme 2: Fractures, Osteomyelitis and Arthritis.
- Theme 3: Benign Bone and Cartilage Forming Tumors, Malignant Bone and Cartilage Forming Tumors and Tumors of Unknown Origin
- Theme 4: Soft Tissue Tumors

## TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

### Theme 1: Developmental Disorders of Bone & Cartilage, Basic Structure & Function of Bone

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	<ul style="list-style-type: none"> <li>• Functions of Bone</li> <li>• Matrix</li> <li>• Cells</li> <li>• Development</li> <li>• Homeostasis and Remodeling</li> </ul>	<b>MSK-S2-Path-1</b> Basic Structure and Function of Bone	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> <li>• Diseases Associated with Defects in Nuclear Proteins and Transcription Factors</li> <li>• Diseases Associated with defects in Hormones and Signal Transduction Proteins</li> <li>• Diseases Associated with defects in Metabolic Pathways (Enzymes, Ion Channels, and Transporters)</li> <li>• Diseases Associated With Defects in Degradation of Macromolecules</li> </ul>	<b>MSK-S2-Path-2</b> Developmental Disorders Of Bone And Cartilage		

### Theme 2: Fracture, Osteomyelitis and Arthritis

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
3	<ul style="list-style-type: none"> <li>• Define terms related to fracture</li> <li>• Describe mechanism of bone healing</li> <li>• Complications of fracture</li> <li>• Pathophysiology of bone infection (osteomyelitis)</li> </ul>	<b>MSK-S2-Path-3</b> Fractures, bone repair and osteomyelitis	Interactive Lecture	SBQs & OSVE
4	<ul style="list-style-type: none"> <li>• What is arthritis</li> <li>• Define Osteoarthritis and Rheumatoid Arthritis</li> <li>• Explain pathophysiology of osteoarthritis and Rheumatoid Arthritis.</li> <li>• Describe the clinical features of osteoarthritis and Rheumatoid Arthritis</li> <li>• Treatment of osteoarthritis and Rheumatoid Arthritis</li> <li>• Crystal-Induced Arthritis.</li> </ul>	<b>MSK-S2-Path-4</b> Arthritis		

### Theme 3: Benign Bone and Cartilage Forming Tumors, Malignant Bone and Cartilage Forming Tumors and Tumors of Unknown Origin

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
5	<ul style="list-style-type: none"> <li>Osteoid Osteoma</li> <li>Osteoblastoma</li> <li>Osteochondroma</li> <li>Chondroma</li> </ul>	<b>MSK-S2-Path-5</b> Benign Bone and cartilage Forming Tumors	Interactive Lecture	SBQs & OSVE
6	Gross and Microscopic Features	<b>MSK-S2-Path-6</b> Cartilage And Bone Forming Tumors		
7	<ul style="list-style-type: none"> <li>Osteosarcoma</li> <li>Chondrosarcoma</li> <li>Tumors of Unknown Origin</li> <li>Ewing Sarcoma</li> <li>Giant Cell Tumor</li> <li>Aneurysmal Bone Cyst</li> </ul>	<b>MSK-S2-Path-7</b> Malignant Bone and cartilage Forming Tumors Tumors of Unknown Origin	Practical	OSPE & OSVE

### Theme 4: Soft Tissue Tumors

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
8	<ul style="list-style-type: none"> <li>Tumors of Adipose Tissue</li> <li>Lipoma</li> <li>Liposarcoma</li> <li>Fibrous Tumors</li> <li>Nodular Fasciitis</li> <li>Fibromatoses</li> <li>Superficial Fibromatosis</li> <li>Deep Fibromatosis (Desmoid Tumors)</li> <li>Skeletal Muscle Tumors</li> <li>Rhabdomyosarcoma</li> <li>Smooth Muscle Tumors</li> <li>Leiomyoma</li> <li>Leiomyosarcoma</li> </ul>	<b>MSK-S2-Path-8</b> Soft Tissue Tumors	Interactive Lecture	SBQs & OSVE
9	Gross and Microscopic Features	<b>MSK-S2-Path-9</b> Soft Tissue Tumors	Practical	OSPE & OSVE

# 11 NEUROSCIENCE II

## Introduction

Welcome to the Neuroscience module-II. This exciting module will serve as building block and is very essential to your future work as doctors. This module is designed to make your learning both interesting and productive by including several inter active activities.

This module covers the topics which are Pathogenesis of infective and tumorous conditions of nervous system like meningitis including bacterial, viral, tuberculous and fungal meningitis CSF findings to differentiate various types of meningitis and brain tumors including both central and peripheral nervous system tumors like gliomas, neuronal tumors, meningiomas, peripheral nerve sheath tumors and others. All these topics are interactive and helpful in understanding the renal pathology.

## Rationale

Diseases of the nervous system are common all over the world. Timely diagnosis and management of acute CNS problems like cerebrovascular accidents and infections prevents morbidity and mortality. Early diagnosis and prompt treatment of ischemic, infective and tumorous conditions like meningitis, cerebrovascular accident and brain tumors is important to reduce the occurrence of disability burden on community. After Understanding the structure and function of nervous system and its relationship with pathophysiology of diseases in neuroscience module-I, the students will be able to understand various infective and tumorous conditions of nervous system the neuropathology module-II by integrating the teachings of basic and clinical pathology, clinical medicine and surgery related to the disorders of the central and peripheral nervous system.

## Duration:

02 weeks

## Learning Outcomes

At the end of this module, the students will be able to understand common clinical problems like meningitis and brain tumors and to correlate with Pathogenesis of diseases of meninges and brain parenchymal disease, related investigations like CSF examination and biopsies

## Themes

- Theme 1: Meningitis Including Bacterial, Viral, Fungal and T.B Meningitis
- Theme 2: Tumors of Central Nervous System

# TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

## Theme 1: Inflammatory and Infective Diseases of CNS

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
1	<ul style="list-style-type: none"> <li>Define meningitis and encephalitis</li> <li>Discuss common Central Nervous System infections including acute (pyogenic) bacterial infections, acute aseptic viral infections, chronic bacterial meningo-encephalitis, and fungal meningo-encephalitis</li> </ul> Viral pathogens causing meningitis, Enteroviruses, HSV-2, Arboviruses Discuss pathogenesis of cerebral malaria, Naegleria fowleri and Cysticercosis Infection of Brain & Meninges & CSF interpretation List the most common organisms that cause CNS infection in different age groups Discuss CSF findings of bacterial, tuberculous, viral and fungal meningitis	<b>NS-S2-Path-1</b> Inflammation and infections of CNS	Interactive Lecture	SBQs & OSVE

## Theme 2: Tumors of Central Nervous System

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
<b>Pathology</b>				
2	<ul style="list-style-type: none"> <li>Classify CNS tumors according to WHO classification</li> <li>List genetic mutations, pathogenesis, morphology and clinical features of brain tumors</li> <li>Including all types of Glioma, Ependymoma, Medulloblastoma and Meningioma</li> <li>Discuss the metastatic tumors to brain</li> </ul>	<b>NS-S2-Path-7</b> <b>Brain tumors</b>	Interactive Lecture	SBQs & OSVE
<b>Pharmacology</b>				
3	<ul style="list-style-type: none"> <li>Classify different types of antiepileptic agents.</li> </ul>	<b>NS-S2-Pharm-1</b> Antiepiletics		

	<ul style="list-style-type: none"> <li>• Describe the mechanism of action, and adverse effects.</li> </ul>			
5	<ul style="list-style-type: none"> <li>• Classify different types of antipsychotic agents.</li> <li>• Describe the mechanism of action, and adverse effects.</li> </ul>	<b>NS-S2-Pharm-2</b> Antipsychotics		
6	<ul style="list-style-type: none"> <li>• Enlist different drugs that are used for the treatment of Parkinson disease.</li> <li>• Describe their mechanism of action and adverse effects.</li> </ul>	<b>NS-S2-Pharm-3</b> Treatment of Parkinson Disease		
7	<ul style="list-style-type: none"> <li>• Discuss the pathophysiology of migraine headaches</li> <li>• Discuss both pharmacologic and non-pharmacologic treatment strategies for migraine.</li> </ul>	<b>NS-S2-Pharm-4</b> Treatment of Migraine		



# 11 EXAMINATION ASSESSMENT

ASSESSMENT PLAN FOR EACH PAPER	END OF YEAR ASSESSMENT	INTERNAL EVALUATION	TOTAL %AGE
THEORY (SBQS)	80%	20%	100%
PRACTICAL EXAM (OSVE; OSPE)	80%		

ALLOCATION OF INTERNAL ASSESSMENT MARKS		
COMPONENT	SCORING MATRIX	PERCENTAGE
THEORY	ATTENDANCE (>90%=03; 89-80%=02; 79-70%=01;<70%=00)	3%
	Module tests	3%
	Block tests	4%
		10%
PRACTICAL	ATTENDANCE (>90%=03; 89-80%=02; 79-70%=01;<70%=00)	3%
	Module tests including ethics, conduct, practicals, assignments)	3%
	Block tests	4%
		10%
<b>TOTAL</b>		<b>20%</b>

# 11 LEARNING RESOURCES

## Pathology:

### ❖ TEXT BOOKS

- Robbins & Cotran, Pathologic Basis of Disease, 9th edition.
- Rapid Review Pathology, 4th edition by Edward F. Goljan MD

## Pharmacology:

### ❖ TEXT BOOKS

- Lippincot Illustrated Pharmacology
- Basic and Clinical Pharmacology by Katzung

## MicroBiology:

### ❖ TEXT BOOKS

- Review of Medical Microbiology and Immunology, Seventeenth Edition 17th Edition by by Warren Levinson (Author), Peter Chin-Hong (Author), Elizabeth A. Joyce (Author), Jesse Nussbaum (Author), Brian Schwartz (Author)
- Jawetz Melnick & Adelbergs Medical Microbiology 28 Edition

## PARASITOLOGY:

### ❖ TEXT BOOKS

- Parasitology (Protozoology and Helminthology) by KD Chatterjee. 13th Edition
- A Guide to Human Parasitology by Blacklock and Southwell Hardcover 10th edition