RAHBAR MEDICAL & DENTAL COLLEGE

DEPARTMENT OF PATHOLOGY

Index

1. **Introduction to Study Guide**

This study guide is designed by a consolidated effort of all the faculty members throughout the year to provide MBBS students of RMDC a resource material that would highlight important aspects of the curriculum. The study guide aims to promote self-regulated lifelong learning among students. The curriculum aspects of undergraduate competencies, assessment policies and curriculum coordinators are mapped in this guidebook. The study guide gives an overview of intended course outcomes and objectives in relation to the course content. The assessment methodology tailored to institutional strategy is provided. This study guide has been carefully designed, keeping in view the PM&DC and UHS curriculum and guidelines. Dedicated effort by faculty has been made to make this guide tailored to student's needs.

2. Mission and Vision of RMDC

Mission OF RMDC

To produce competent physicians through quality health education research training and altruism. We prioritize lifelong learning, professional development , social accountability contextually and globally.

Vision Of RMDC

RMDC's vision will be to keep its medical graduates adept with emerging global health challenges, educational methodologies, and technological advances to maintain its position as a leading medical college of Pakistan.

3.Introduction to Pathology

Pathology is the foster understandings of the mechanisms of disease (pathogenesis) as a foundation for dealing with a vast amount of clinical information which will be encountered in later clinical years.

Pathology is a bridging discipline between basic and clinical sciences, devoted to the study of the structure and functional changes in cells, tissues and organs that underlie diseases.

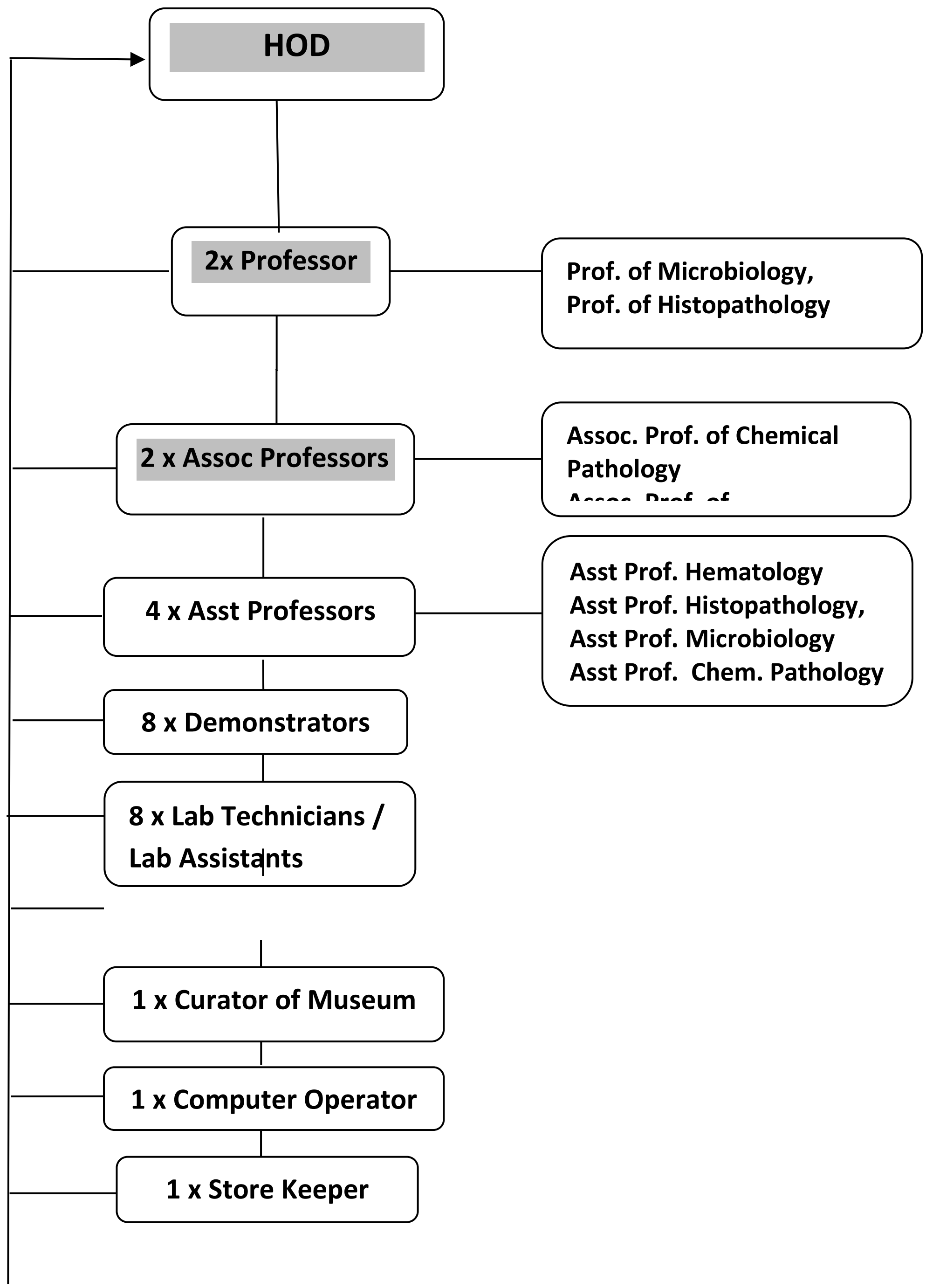
Pathology attempts to explore the WHYs and WHEREFOREs of the signs and symptoms of the diseases.

The department of pathology at RMDC has excellent infrastructure for teaching and diagnostic work. The department has four sub-specialties, i.e., Histopathology, Microbiology, Hematology & Chemical Pathology. Pathology department educate 3rd year and 4th year MBBS students the subject of General pathology & Microbiology; and Special Pathology, respectively. The departmental museum contains a large number of pathological specimens which helps the students for learning activity.

The department is managing a fully functional histopathology and cytopathological work in clinical pathology laboratory of RMDC.

The laboratory at PRTH is fully equipped for clinical lab work and well -functioning blood bank.

- **ORGANOGRAM OF PATHOLOGY DEPARMENT**



4.List Of Faculty Members

1. **HOD**
    - Prof Dr Rozina Jaffar

2. **PROF OF MICROBIOLOGY**
    - Prof Dr Mateen Izhar

3. **PROF OF HISTOPATHOLOGY**
    - Prof Dr Rozina Jaffar

4. **ASSOCIATE PROF OF CHEMICAL PATHOLOGY**
    - Dr Nusrat Alavi

5. **ASSOCIATE PROF OF HAEMATOLOGY**
    - Dr Maliha Asif

6. **ASSISSTANT PROFESSORS**
    - Dr Nidda Ayub
    - Dr Aneela Khawaja
    - Dr Rukhsana Sajjad
    - Dr Ayesha Qaisar

7. **DEMONSTRATORS**
    - Dr Sidra Shaukat
    - Dr Ayesha Bashir
    - Dr Maria Noor
    - Dr Asma
    - Dr Rufia Awais
    - Dr Umar

5. Rahbar Medical & Dental College, Lahore Institutional Curriculum Outcomes (MBBS Program)

1. **Knowledge**

1.1 Recognize and explain the scientific, including molecular basis of normal health and disease conditions affecting the human body.

1.2 Integrate the basic sciences knowledge to the clinical context in the diagnosis and management of diseases of the human systems.

1.3 Analyze the human psychosocial behavior in relation to health disorders in clinical decision-making.

1.4 Describe the strategies for lifelong learning and apply the same to make professional decisions.

2. **Skills**

2.1 Elicit accurate and focused medical histories of patients and perform relevant, comprehensive physical examinations.

2.2 Evaluate the use of laboratory tests & imaging studies, and interpret the results to arrive at clinical decision-making.

2.3 Perform the common medical and surgical techniques in clinical settings including the 'basic life support'.

2.4 Formulate and implement plans for the prevention and treatment of diseases and refer patients to experts, if needed.

3. **Attitudes and Behaviors**

3.1 Demonstrate professionalism and high ethical standards in all aspects of medical practice, specifically competence, honesty, integrity, compassion, respect for others, professional responsibility, and social responsibility.

3.2 Demonstrate the ability to communicate compassionately and effectively, both verbally and in writing, with patients, their families, colleagues, and others with whom physicians must exchange information in carrying out their responsibilities.

3.3 Exhibit appropriate value for the sensitive nature of the doctor-patient relationship and the importance of compassionate communication and active listening, with attention to the patient's familial, cultural, and spiritual circumstances.

3.4 Exhibit a capacity for self-evaluation, and ethical reasoning to form the basis for a self-directed, lifelong engagement in the responsible, committed, compassionate practice of medicine.

5. Learning objectives and outcomes of pathology

Year Wise Learning Objectives

Pathology teaching for medical students is a critical component of medical education, bridging basic science with clinical practice. The outcomes of pathology teaching are multifaceted and can be categorized into several key areas:

<table>
<tr><th colspan="2">1st Year MBBS</th></tr>
<tr><td>KNOWLEDGE</td><td>1. Foundation knowledge; To provide a foundation for 1st year medical students to understand the principles of pathology and its application in clinical practice.

a. General Pathology
Essential knowledge of general pathology including
A. Define and explain the concepts of homeostasis, adaptation, and pathological processes.
B. Describe the cellular responses to injury, including inflammation and repair.
C. Understand the principles of Neoplasia and carcinogenesis.
D. Identify the types of shock and their pathophysiological mechanisms.
b. Systemic Pathology.
- Identify common diseases and disorders affecting each organ system taught in the respective modules (MSK, CVS, RESP).
- Imparting in-depth knowledge on pathogenesis and clinical manifestations of diseases of the organ system included in their curriculum modules.
a. Cardiovascular: atherosclerosis, hypertension, heart failure
b. Respiratory: COPD, asthma, lung cancer.</td></tr>
<tr><td>SKILLS</td><td>2. Integration with Other Subjects
a. Correlate pathological concepts with other basic science subjects and clinical subjects taught together in the respective modules/blocks.
b. Understand the clinical relevance of pathological processes.
3. Research Skills:
Exposure to pathology can inspire interest in research, encouraging students to contribute to advancing medical knowledge through studies on disease mechanisms, diagnostics, and therapeutics.
4. Communication skills.
Students learn to communicate complex pathological findings effectively to patients, families, and colleagues, an essential skill for all medical practitioners, especially in the context of breaking bad news.</td></tr>
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<table>
<tr><td>ATTITUDE</td><td>
5. Ethical considerations
To consider the ethical aspects of disease diagnosis including issues related to laboratory testing, communicating disease diagnosis and confidentiality of patient’s lab results.
6. Interdisciplinary Collaboration:
To foster an attitude of collaboration in students and impart understanding of working with other healthcare professionals, including clinicians, radiologists, and surgeons, emphasizing the importance of a multidisciplinary approach in patient care.
</td></tr>
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<table>
<tr><th colspan="2">2nd Year MBBS</th></tr>
<tr><td>KNOWLEDGE</td><td>
1. Foundation knowledge.
a. To build upon the foundation established in the first year, with a focus on more advanced concepts, diagnostic skills, and clinical correlations.
b. In-depth understanding of specific organ system diseases, including:
- Gastrointestinal: inflammatory bowel disease, gastrointestinal cancer
- Renal: nephrotic syndrome, acute kidney injury
- Endo
- Reproductive system
- Nervous system
- inflammation
</td></tr>
<tr><td>SKILLS</td><td>
2. Integration with other Subjects
a. Correlate pathological concepts with other basic science subjects and clinical subjects taught together in the respective modules/blocks.
b. Understand the clinical relevance of pathological processes.
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ATTITUDE	**5. Ethical considerations** To consider the ethical aspects of disease diagnosis including issues related to laboratory testing, communicating disease diagnosis and confidentiality of patient's lab results. 6. **Interdisciplinary Collaboration**: To foster an attitude of collaboration in students and impart understanding of working with other healthcare professionals, including clinicians, radiologists, and surgeons, emphasizing the importance of a multidisciplinary approach in patient care.

3rd Year MBBS	
KNOWLEDGE	**1. In-depth Knowledge of pathology:** To impart a more detailed and in-depth knowledge of general pathology and microbiology building on the concepts imparted in 1st and 2nd year. 2. **Evidence-Based learnings.** Students learn to critically evaluate scientific literature, understanding how pathological findings contribute to the development of evidence-based clinical guidelines.
SKILLS	3. **Laboratory Skills and technique:** a. Develop skills in microscopic interpretation and diagnosis of diseases. b. Understand the principles of laboratory testing including basic tests like urinalysis, staining of slides, culture medias and biochemical reactions c. Interpreting laboratory results in the context of clinical scenarios. 4. **Integration with clinical rotations** a. Correlate pathological concepts with clinical findings and apply knowledge of pathology in interpretation of clinical finding. b. Understand the clinical relevance of pathological processes. 5. **Research Skills:** Exposure to pathology can inspire interest in research, encouraging students to contribute to advancing medical knowledge through studies on disease mechanisms, diagnostics, and therapeutics. **6. Communication skills**. Students learn to communicate complex pathological findings effectively to patients, families, and colleagues, an essential skill for all medical practitioners, especially in the context of breaking bad news.

ATTITUDE	7. **Ethical considerations** To consider the ethical aspects of disease diagnosis including issues related to laboratory testing, communicating disease diagnosis and confidentiality of patient's lab results. 8. **Interdisciplinary Collaboration**: To foster an attitude of collaboration in students and impart understanding of working with other healthcare professionals, including clinicians, radiologists, and surgeons, emphasizing the importance of a multidisciplinary approach in patient care.

4th Year MBBS	
KNOWLEDGE	1. **Knowledge of special pathology:** a. To understand the cores of pathology. b. To be aware of pathophysiology and laboratory findings of various diseases. c. To recognize and interpret the histological and gross pathological features of diseases. 2. **Integrate Knowledge**: Integrate pathological knowledge with clinical scenarios to enhance diagnostic accuracy and patient care.
SKILLS	3. **Laboratory Test and technique:** Students gain proficiency in understanding laboratory techniques and interpreting lab results, which is crucial for making informed clinical decisions, such as, a. Microscopic interpretation of normal and abnormal tissues. b. Grossing and sectioning of tissues. c. Basic laboratory tests and diagnostic procedures. 4. **Integration with clinical rotations** a. Correlate pathological concepts with clinical findings and apply knowledge of pathology in interpretation of clinical finding. b. Understand the clinical relevance of pathological processes. 5. **Communication skills** Demonstrate clear and efficient written and verbal communication skills

ATTITUDE	6. **Ethical considerations** To consider the ethical aspects of disease diagnosis including issues related to laboratory testing, communicating disease diagnosis and confidentiality of patient's lab results. 7. **Interdisciplinary Collaboration**: To foster an attitude of collaboration in students and impart understanding of working with other healthcare professionals, emphasizing the importance of a multidisciplinary approach in patient care.

In summary, pathology teaching for medical students leads to the development of essential knowledge, skills, and professional attitudes that are foundational for their future roles as clinicians, researchers, and health care workers.

6.Teaching Aids/Tools

Lectures

a) Text books

b) Reference books as per UHS recommendations

c) Regular and e-library RMDC

d) Power point by facilitators

e) Multimedia

f) Overhead projector

Practicals

a) Museum specimen

b) Microscopic slides for practicals and OSPE

c) Multihead microscope

d) Binocular microscope

Tutorials/SGDs

a) Small group discussions

b) Quiz

c) Presentations

7.Learning Methodology

A traditional method is being followed in RMDC for 3rd and 4th year MBBS which is aligned with UHS vision, institutional mission to address the local community and national needs with contextual relevance to meet the PM&DC standards. The college encourages active learning as well as flips class room activity. Our educational strategy include lectures, tutorials, small group discussion, clinical and laboratory work to achieve desired outcome at the end.Integrated system is being followed for 1st and 2nd year MBBS

1. **Facilitator Centered**
    a. Lectures
    b. Practicals
    c. Tutorials

2. **Student Centered**
    a. Inside The Class
        i. Laboratory Skills
        ii. Group Discussion
        iii. Assignments
        iv. Problem Based Learning
        v. Study Skills

    b. Outside The Class
        i. CPC
        ii. Seminars
        iii. Workshops
        iv. Self Study

8.Teaching Facilities Available On Campus

1. Lecture Hall:
The college has designated lecture halls with a seating capacity of 100-150, equipped with multimedia, a microphone, a computer system and UPS to provide an uninterrupted environment conducive to active learning.

2. Pathology Laboratory:
The pathology laboratory is fully equipped catering to the needs of our students.
The following facilities are available for the students in order to have a good hands-on experience.

- A multi-head **microscope** with a camera and screen facility.
- **Microscopes** for individual use.
- **Multiple stations** for practice of staining techniques.
- A **LED screen** is used to project slides when required by the facilitator.
- **Tissue processor, embedding station,water bath, microtome and automatic stainer** used for histopathology specimens.
- Miscellaneous instruments required for the smooth running of the laboratory.
- For students' safety and hygiene:
- An **Eyewash area.**
- Multiple areas designated for **hand washing** and alcohol-based **hand sanitizers** are
- provided in the laboratory.

3.Pathology Museum:
The pathology department is also equipped with a state-of-the-art museum, containing gross pathology specimens

9.Course Outline

Table Of Specification (UHS)

Educational Content Of 4th Year MBBS

S# 1	Topic/Chapter	No Of Seq	No Of Mcq	No Of Lectures Distributed In Weeks According To Time Table
1.	CARDIOVASCULAR SYSTEM	1	5	3 WEEKS
2.	HEMATOPOEITIC AND LYMPHOID SYSTEM	1	5	3 WEEKS
3.	RESPIRATORY SYSTEM	1	5	3 WEEKS
4.	ORAL CAVITY AND GIT	2	9	6 WEEKS
5.	HEPATOBILIARY	1	5	3 WEEKS
6.	URINARY SYSTEM	1	5	3 WEEKS
7.	MALE GENITAL SYSTEM	1	5	2 WEEKS
8.	FEMALE GENITAL SYSTEM	1	5	3 WEEKS
9.	DISEASES OF BREAST	1	5	2 WEEKS
10	ENDOCRINOLOGY	1	5	3 WEEKS
11	MUSKULOSKELETAL SYSTEM AND BONES & JOINTS	1	5	3 WEEKS
12	CNS	1	2	1 WEEKS
13	CLINICAL CHEMISTRY	1	3	1 WEEKS
14	SKIN	-	1	1 WEEKS
TOTAL		14	65	

EDUCATIONAL CONTENT OF 3rd YEAR MBBS

S# 1	Topic/Chapter	No Of Seq	No Of Mcq	No Of Lectures Distributed In Weeks According To Time Table
1.	CELL INJURY	1	4	3 WEEKS
2.	INFLAMMATION AND ITS MEDIATORS	1	6	3 WEEKS
3.	HEALING AND REPAIR	1	2	2 WEEKS
4.	DISORDERS OF CIRCULATION	1	4	2 WEEKS
5.	PARASITOLOGY	1	5	3 WEEKS
6.	VIROLOGY	1	6	3 WEEKS
7.	GENERAL BACTERIOLOGY	3	4	6 WEEKS
8.	SPECIAL BACTERIOLOGY	1	14	3 WEEKS
9.	MYCOLOGY	1	4	2 WEEKS
10.	GENETICS	1	2	3 WEEKS
11.	NEOPLASIA	1	9	4 WEEKS
12.	IMMUNOLOGY	1	5	2 WEEKS
TOTAL		14	65	

Pathology Hours in 2nd Year MBBS

Block 4:

Module 1: GIT and nutrition = 2 HRS

Module 2: Renal = 10 HRS

Total Hours = 12 HRS

Block 5:

Module 1: Endocrinology and reproduction = 9 HRS

Module 2: Head and Neck, Special Sevres = 3 hrs

Total Hours = 12 Hrs

Block 6:

Module 1: Neuro sciences = 12HRS

Module 2: Inflammation = 12 hrs

Total =14HRS

Total Hours in 2nd Year MBBS

Total Hours = 12+12+14

Grand Total Hours = 38 HRS

Pathology Hours in 1st Year MBBS

Block 1:

Module 1: Foundation Module = 12HRS

Module 2: Hematopoietic and Lymphatic Module = 5 HRS

Total Hours = 17 HRS

Block 2:

Module 1: Musculoskeletal and locomotion Module = 7HRS

Module 2: Total Hours = 7HRS

Block:3

Cardio vascular Module = 5 HRS

Respiratory Module = 6 HRS

Total Hours = 11 HRS

Total Hours in 1 year = 17+7+11

Grand Total = 35Hrs

UHS SYLLABUS WITH PLANNERS

3rd Year MBBS

CELL INJURY

1. Necrosis, Ischemia, Hypoxia, Infarction and Gangrene Oncosis and Autolysis.

2. Sequence of the ultrastructural and biochemical changes which occur in the cell in response to the following:
   - Ischemia
   - Immunological injury, e.g., Asthma / SLE / Anaphylactic reaction
   - Physical agents, e.g., Radiation
   - Genetic defects, e.g., Thalassemia / Hemophilia
   - Nutritional deficiency, e.g., Kwashiorkor
   - Infectious agents
   - Viruses, e.g., Hepatitis
   - Bacteria, e.g., Staphylococcus aureus
   - Fungi, e.g., Candida
   - Parasites, e.g., Malaria
   - Nutritional deficiency
3. Irreversible and reversible injury
4. Apoptosis and its significance.
5. Necrosis and its types
6. Exogenous and endogenous pigmentation.
7. Dystrophic and metastatic calcification along with clinical significance.
8. Metabolic disorders
   - Lipid disorders, Steatosis of liver, Hyperlipidemia
   - Protein disorders
   - Carbohydrate disorders

INFLAMMATION, MEDIATORS OF INFLAMMATION

1. Role of inflammation in the defense mechanisms of the body.
2. Vascular changes of acute inflammation and their relation to morphological and tissue effects.
3. Process of Chemotaxis, Opsonization and Phagocytosis.
4. Role of cellular components in inflammatory exudate.
5. Exudates and transudate.
6. Important chemical mediators of inflammation.
7. Pathway of Arachidonic Acid metabolism.
8. Role of products of Arachidonic acid metabolism in inflammation.
9. Mechanism for development of fever, with reference to exogenous and endogenous pyrogens.
10. Chronic inflammation including Granulomas.
11. Granuloma and its types along with causes.
12. Systemic effects of acute and chronic inflammation and their possible outcomes.
13. Significance of ESR.
14. Induced hypothermia in medicine.
15. Healing in specialized tissue.

WOUND HEALING

1. Repair and regeneration.
2. Wound healing by first and second intention.
3. Factors that influence the inflammatory reparative response.
4. Wound contraction and cicatrisation.
5. Formation of granulation tissue.
6. Complications of wound healing.

DISORDERS OF CIRCULATION

a. Thrombo-embolic disorders and their modalities

1. Etiology and pathogenesis of thrombosis.
2. Possible consequences of thrombosis
3. Difference between thrombi and clots
4. Classification of emboli according to their composition.
5. Difference between arterial and venous emboli.

b. Hemorrhage, Hyperemia and Congestion

1. Definitions of common types of Hemorrhage
2. Types of hyperemia
3. Difference between hyperemia and congestion

c. Infarction

1. Types of infarction
2. Difference between anemic and hemorrhagic infarct
3. Morphological picture of infraction in different organ systems

d. Disorders of the circulation and shock

1. Edema, ascites, hydrothorax and anasarca.
2. Pathophysiology of edema with special emphasis on CHF.
3. Pathogenesis of four major types of shock (Hypovolemic, cardiogenic, vasovagal & septic) and their causes.
4. Compensatory mechanisms involved in shock.

MICROBIOLOGY

1. Defense mechanisms of the body.

2. Microbial mechanisms of invasion and virulence.
3. Difference between sterilization and disinfection.
4. Methods of disinfection and sterilization of the following:
   a. Facility where the doctor practices,
   b. Examination table,
   c. Any spillage e.g. sputum, vomitus, stool, urine, blood,
   d. Examination tools, e.g., thermometer, nasal and ear specula and spatula,
5. Principles of aseptic techniques such as Venepuncture, urinary catheterization, bandaging, suturing and lumber puncture.
6. Universal precautions for infection control.
7. General principles of the following serological tests:
   a. ELISA – Hepatitis (A, B, C, D, E, G) Rubella, CMV and HIV
   b. PCR
   c. Hemagglutination – TPHA
   d. Western Blot –HIV Malaria.
8. Interpretation of :
   a. Culture reports
   b. Serological reports and
   c. Microscopic reports of gram stain and ZN stain.
9. Principles of proper collection and submission of specimens for laboratory investigations
9. General characteristics and taxonomy of Bacteria, Rickettsia, Chlamydia, Viruses and Fungi.
11. Communicable, Endemic, Epidemic, and Pandemic Diseases, Carriers Pathogens, Opportunists, Commensals and Colonizers.
12. Microorganisms responsible for infection of the following organ systems:
    1. Central Nervous System
    2. Respiratory System
    3. Gastrointestinal System
    4. Genital System
    5. Urinary System
    6. Infections of Bones and Joints
    7. Zoonosis
    8. Infection of the Skin
    9. Hepatic Infections

13 Pathogenesis, Treatment, Epidemiology, Prevention and Control of the following organisms:

(i) Bacteria

- Staphylococcus aureus
- Streptococcus pneumoniae
- Beta hemolytic streptococcus group a & b
- Diphtheria sp.
- Bordetella sp.
- Bacillus anthracis
- Clostridium perfrignes
- Clostridium botulinum,
- Clostridium difficile
- Clostridium tetani
- Actinomycies israelli
- Nocardia asteroides
- Neisseria meningitis
- Neisseria gonorrhoeae
- Gardenella vaginalis
- Haemophilus influenzae
- Mycobacterium tuberculosis
- Mycobacterium leprae
- coli
- Klebsiella
- Proteus
- Salmonella
- Shigella
- Yersinia pestis
- Pseudomonas
- Vibrio cholera
- Vibrio parahemolyticus
- Campylobacter jejuni
- Helicobacter pylori
- Legionella
- Mycoplasma pneumoniae
- Chlamydia
- Treponema pallidium
- Leptospira
- Rickettsia sp.

(ii) Viruses

- Mumps
- Herpes
- Measles
- Influenza,
- Para influenza
- RSV
- Hepatitis A, B, C, D, E
- Rota
- CMV
- EBV
- Rubella
- Chicken Pox
- HIV
- Rabies

(iii) Fungus

- Cryptococcus neoformans
- Candida albicans
- Tinea species

(iv) Protozoa

- Plasmodium species
- Giardia lamblia
- Entamoeba histolytica, Cryptosporidium
- Leishmania species
- Trichomonas vaginalis
- Toxoplasma gondii
- Pneumocyctis carinii

(v) Helminths

- Ascaris lumbricoides
- Ancylostoma duodenale
- Trichuris trichuria
- Enterobius vermicularis
- Filaria species
- Strongyloides stercoralis
- Schistosoma species
- Echinococcus species
- Taenia solium
- Taenia saginata
- Hymenolepis nana

PRINCIPLES OF ANTI MICROBIAL ACTION.

1. Antibiotics, selective toxicity, bacteriostatic and bactericidal.
2. Host determinants in relation to selection of an antimicrobial drug for therapy.
3. Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC)
4. Bacterial resistance and the mechanisms involved in acquiring bacterial resistance
5. Mechanisms involved in transfer of drug resistance to bacterial resistance.
6. Mode of action of various antimicrobial drug groups.
7. Superinfection and cross sensitivity.

GENETICS

1. Common sex linked, autosomal recessive and autosomal dominant disorders.
2. Common genetic mutations.
3. Diseases associated with consanguineous marriages.
4. Molecular biology techniques.

GROWTH DISORERS/NEOPLASIA

1. Atrophy and Hypertrophy, Agenesis, Dysgenic, Aplasia, Hypoplasia, Hyperplasia, Metaplasia, Dysplasia, Neoplasia, Anaplasia,.
2. Cell cycle and cell types (stable, labile, permanent) 3. Mechanisms controlling cell growth
4. Classification systems of tumors.
5. Characteristics of benign and malignant tumors
6. Difference between Carcinoma and Sarcoma.
7. Grading and staging system of tumors.
8. Biology of tumor growth
9. Process of carcinogenesis
10. Host defense against tumors.
11. Mechanism of local and distant spread.
12. Local and systemic effects of tumors.
13. Tumor markers used in the diagnosis and management of cancers.
14. Common chemical, physical agents and viruses related to human cancer.
15. Epidemiology of common cancers in Pakistan.
16. Radiation and its effects on tissues.
17. Cancer screening.

IMMUNOLOGY

1. Antigen, antibody, epitope, hapten and adhesion molecules.
2. Difference between innate and acquired immunity.
3. Structure and function of major histocompatibility complex (MHC).
4. Cytokines.
5. Mechanism of humoral and cell medicated immunity.
6. Hypersensitivity reactions, Type I, Type II, Type III and Type IV.
7. Autograft, homograft, allograft and xenograft.
8. Immunotolerance and immunoparalysis.
9. Mechanism involved in allograft rejection and steps that can be taken to combat rejection.
10. Classification of Immunodeficiency disorders
11. Basis of autoimmunity.
12. Tissue transplantation.
13. Pathology and pathogenesis of AIDS.
14. Lab diagnosis of immunological diseases.

4th Year MBBS

1. BLOOD VESSELS & HEART

- **Atherosclerosis**
- ➢ Etiology and pathogenesis
- ➢ Early lesion, Late and complicated lesion
- ➢ Vessels affected
- ➢ Complications → Monkeberg's medial calcific sclerosis & Arteriolosclerosis.
- **Hypertension**
- ➢ Classification
- ➢ Causes of secondary hypertension
- ➢ Vascular changes in hypertension.
- **Common pathogenetic mechanisms of vasculitis.**
  - **Aneurysm**
    - ➢ Classification
    - ➢ Etiology.
    - ➢ Atherosclerotic aneurysm
    - ➢ Pathogenesis → Morphological & clinical features.
    - ➢ Type of vessel involved.
  - **Varicose veins**
    - ➢ Common sites
    - ➢ Predisposing factors
    - ➢ Clinical features.
  - **Benign and malignant tumors of blood vessels.**
  - **Pathogenesis of ischemic heart disease.**
  - **Myocardial infarction**
    - ➢ Sequence of changes in myocardial infarction (M.I)
    - ➢ Pattern of elevation of biochemical markers used in the evaluation of M.I
    - ➢ Complications.
  - **Causes of sudden cardiac death**.

- **Cor-pulmonale** → Predisposing disorders.
- **Rheumatic Endocarditis**
- **Bacterial Endocarditis**
  - Etiology
  - Pathogenesis
  - Morphological & clinical features.
  - Complications
- **Myocarditis** → Morphological and clinical features of myocarditis.
- **Cardiomyopathy** → Dilated → Hypertrophic → Restrictive.
- **Pericarditis** → Clinical and morphological feature of pericarditis.
- **Primary & secondary cardiac tumours.**
- **Fallot's tetralogy**
- **Coarctation of aorta**

2. HEMATOPOIETIC AND LYMPHOID SYSTEMS

- **Stages in the formation of red blood cell and white blood cells.**
- **Normal values of red cell count**
- **Hemoglobin level**
- **Packed cell volume**
- **MCH**
- **MCV**
- **MCHC**
- **WBC Count**
- **Platelet count.**
- **Anemia**
  - Classification
  - Causes
  - Etiology, Blood picture, clinical features and Lab Diagnosis of;
    - **Iron deficiency anemia**

        - **Megaloblastic anemia.**
        - **Folate deficiency anemia.**
        - **Vit. B12 deficiency anemia.**
        - **Anemia of chronic disease**
        - **Nutritional deficiency anemia.**
    - **Hereditary spherocytosis**
        - Incidence
        - Etiology
        - Pathogenesis
        - Morphological and Clinical features
- **Thalassemia.**
    - Classification
    - Pathogenesis
    - Blood picture
    - Clinical and genetic features.
- **Hemolytic anemia**
- **Glucose-6-phosphate dehydrogenase deficiency.**
- **Immunohemolytic anemia**
- **Warm and cold antibodies immunohemolytic anemias**
- **Aplastic anemia**
    - Etiology
    - Pathogenesis
    - Clinical features
    - Lab. Diagnosis
- **Neutropenia**
- **Agranulocytosis.**
- **Leukocytosis.**
- **Infectious mononucleosis**
    - Epidemiology
    - Morphology

- ➢ Clinical features
- **Acute and chronic nonspecific lymphadenitis.**
- **Non-hodgkin's lymphoma →**
    - Classification (real and working formulations)
- **Hodgkin's disease**
    - ➢ Classification
    - ➢ Clinical stages
    - ➢ Etiology and pathogenesis
- **Leukemia**
    - Prognostic factors of acute lymphoblastic and acute myeloblastic leukemias.
    - Pathophysiology of chronic myeloid and chronic lymphocytic leukemias
- **Multiple myeloma**
    - Etiology
    - Pathogenesis
    - Morphology
    - Clinical features
- **Disseminated intravascular coagulation**
    - Etiology
    - Pathogenesis
    - Clinical features
    - Laboratory diagnosis
- **Causes of decreased production and decreased survival of platelets.**
- **Idiopathic & thrombotic thrombocytopenic purpura**
- **Value of following tests in the assessment of bleeding disorders**
    - ▪ Bleeding time
    - ▪ Clotting time
    - ▪ Platelets count
    - ▪ Platelet function test
    - ▪ Partial thromboplastin time
    - ▪ Prothrombin time

- Mixing test studies

- **Polycythemia**
  - Etiology
  - Pathogenesis
  - Clinical significance
  - Lab. Diagnosis
- **ABO and Rhesus blood groups**
- **Screening of Donors**
- **Hazards of blood transfusion and their prevention.**

3. RESPIRATORY SYSTEM

- **Micro-organisms causing upper respiratory tract infection.**
- **Etiology and clinical features of;**
  - **Rhinitis**
  - **Nasal polyps**
  - **Acute pharyngitis**
  - **Acute tonsillitis**
  - **Acute bacterial epiglottis**
  - **Acute laryngitis**
  - **Pleural effusion**
  - **Hemothorax,**
  - **Hydrothorax**
  - **Pleuritis,**
  - **Pneumothorax**
  - **Chylothorax**
- **Malignant & benign tumors of nasopharynx and larynx.**
- **Atelectasis**
  - Classification
  - Pathogenesis
- **Restrictive & obstructive lung disease**
  - **Etiology pathogenesis, morphology & clinical features of;**

- **Asthma.**
- **Various types of emphysema**
- **Chronic bronchitis.**
- **Bronchiectasis.**
- **Adult respiratory distress syndrome.**
- **Restrictive lung diseases.**
- **Sarcoidosis**
- **Hypersensitivity pneumonitis. ƒ Idiopathic pulmonary fibrosis.**
- **Goodpasture's syndrome.**
- **Thromboembolism.**
- **Pulmonary infarction.**
- **Pulmonary hypertension and vascular sclerosis.**

Etiology, pathogenesis & clinical features of;

- **Acute bacterial pneumonia.**
- **Micro-organisms causing atypical pneumonia.**
- **Tuberculosis of the lung.**
- **Pneumoconiosis**
- **Fungi (candida, pneumocystis carinii) causing lung infections.**
- **Bronchogenic carcinoma and mesothelioma**
  - Classification
  - Etiology
  - Pathogenesis
  - Clinical features

4. THE ORAL CAVITY AND GASTROINTESTINAL TRACT

- **Oral cavity**
  - **Leukoplakia.**
  - **Oral cancer**

        - Risk factors
        - Morphology
        - Clinical feature
    - **Benign and malignant tumors of salivary glands.**
    - **Pleomorphic adenoma**→ Clinical features & Morphology

- **Esophagus**
    - **Predisposing factors of esophagitis.**
    - **Carcinoma of the esophagus**
- **Stomach**

Etiology, pathogenesis, morphological and clinical features of ;

- **Acute gastritis**
- **Chronic gastritis.**
- **Peptic ulcer.**
- **Gastric carcinoma**
    - Risk factors
    - Pathogenesis
    - Morphology
    - Clinical features and diagnosis
    - Prognosis

- **Intestine**

    Etiology, pathogenesis, morphological and clinical features of;

    - **Hirschsprung's disease**
    - **Celiac sprue**
    - **Tropical sprue**
    - **Ischemic bowel disease. ƒ Crohn's disease**
    - **Ulcerative colitis.**
    - **Acute appendicitis**
- **Major causes of intestinal obstruction.**

- **Clinico-pathological features of following diseases of intestine**
    - **Amebiasis**
    - **Tuberculosis**
    - **Typhoid**
- **Non-neoplastic polyps of intestine**.
- **Adenomas**
    - Classification on the basis of epithelial architecture.
    - Clinical and morphological features
- **Colorectal carcinoma.**
    - Classification
    - Etiology
    - Pathogenesis
    - Morphological and clinical features
- **Aster-Coller classifications of carcinoma of the colon & rectum.**
- **Carcinoid tumour**
    - Peak incidence
    - Most prevalent sites in the gut
    - Morphological features
    - Clinical features of carcinoid syndrome.
- **tumors of appendix →** Etiology, pathogenesis, morphological and clinical features

- **Liver and Biliary Tract**
    - **Liver**
    - **Pathway of bilirubin metabolism and its elimination from the body**
    - **Jaundice**
        - Classification
        - Causes
        - Clinical features
        - Lab diagnosis

- **Intrahepatic and extrahepatic biliary obstruction**.

  Etiology, pathogenesis, morphology, clinical features and complication of;

  - **Hepatic failure**
  - **Cirrhosis**

- **Viral hepatitis A,B,C,D and E**
  - Route of transmission
  - Incubation period
  - Clinical features.
  - Potential outcome of acute infection.
  - Carrier state
  - Acute and chronic hepatitis.

- **Liver abscess**→ Etiology, morphological and clinical features
- **Drugs and toxins causing hepatic injury**
- **Alcohol liver disease** → Pathogenesis
- **Alcoholic hepatitis & cirrhosis** → Morphological and clinical features

  Classification, etiology, pathogenesis, morphological & clinical features of;

  - **Hemochromatosis.**
  - **Secondary hemochromatosis.**
  - **Wilson's disease.**
  - **Alpha-1 antitrypsin deficiency.**
  - **Neonatal hepatitis.**
  - **Primary and secondary biliary cirrhosis.**
- **Hepatocellular carcinoma**
  - Epidemiology
  - Pathogenesis
  - Morphology
  - Clinical features
- **Biliary tract**

- **Pathogenesis and risk factors of cholelithiasis.**
- **Morphological and clinical features of acute and chronic cholecystitis.**
- **Clinical and morphological features of gall bladder canc**er.

▪ **Pancreas**.

- **Acute and chronic pancreatitis**
  - Etiology
  - Pathogenesis
  - Morphology
  - Clinical features.
- **Clinical and morphological features of carcinoma of pancreas**.

5. THE URINARY SYSTEM

Etiology, pathogenesis, clinical features and complications of;

- **Azotemia**
- **Uremia**
- **Acute renal failure**
- **Chronic renal failure**
- **Polycystic kidney disease (its Classification)**
- **Glomerulonephritis (its Classification) ƒ Nephrotic and nephritic syndrome ƒ Acute pyelonephritis.**
- **Chronic pyelonephritis.**
- **Hydronephrosis**

- **Pathogenesis and clinical course of acute tubular necrosis**

- **Benign and malignant nephrosclerosis**
- **Renal stones →** Characteristics of various types of
- **Nephrolithiasis →** Pathogenesis, clinical features and lab diagnosis of
- **Wilm's tumor →** Epidemiology, morphology, clinical features & prognosis

- **Renal cell carcinoma →** Classification, Epidemiology, morphology, clinical features & prognosis
- **Cystitis →** Etiology, morphology & clinical features
- **Transitional cell carcinoma of the urinary bladder →** Clinical features, etiology & morphology

6. MALE GENITAL SYSTEM

- **Hypospadias**
- **Undescended testis**
- **Urethritis (Gonococcal, Non gonococcal)**
  - Etiology
  - Route of infection
  - Pathogenesis
  - Diagnosis

Etiology, pathogenesis and natural history of;

- **Prostatitis**
- **Prostatic hyperplasia**

- **Scrotal swelling→** Causes, pathogenesis and clinical features of
  - **Testicular adnexa**
  - **Varicocele**
  - **Hydrocele**
  - **Spermatocele**
  - **Testis and epididymis**
  - **Inflammation (Orchitis)**
  - **Epididymitis**
- **Male infertility →** Causes, pathogenesis and relevant investigations
- **Tumors of the male genital tract (Prostate,Testis) →** Classification, pathogenesis, morphology, clinical features and prognosis

7. FEMALE GENITAL SYSTEM

- **Sexually transmitted diseases →** Causes, routes of infection & methods of diagnosis
  Route of infection, pathogenesis and Lab diagnosis of;
  - **Gonorrhea**
  - **Syphilis**
  - **Chlamydia**
  - **HPV**
  - **Herpes simplex**
  - **Trichomonas vaginalis.**
- **Cervical intraepithelial neoplasia**
- **Neoplasms of cervix**
    - **Dysfunctional uterine bleeding →** Causes, pathogenesis and clinical features of with special reference to
      - **endometrial hyperplasia,**
      - **endometrial polyp**
      - **carcinoma.**

  Etiology, clinical features and pathogenesis of;
    - **Adenomyosis**
    - **Endometriosis**
    - **Ectopic pregnancy**
    - **Toxemia of pregnancy.**
- **Tumors of the female genital tract (uterus, ovary and Gestational trophoblastic tumours) →** Classification, pathogenesis, morphology, clinical features & prognosis

8. BREAST

- **Etiology and causes of lump in the breast**

Etiology, Pathogenesis, Morphology and clinical features;

  - **Mastitis**
  - **Fibrocystic disease of the breast**
  - **Intraductal papilloma**

- **Benign tumors of the breast (Fibroadenoma and Phyllodes tumor)**
- **Gynecomastia**
- **Carcinomas of the breast (Ductal and Lobular**

9. MUSCULOSKELETAL SYSTEM

Pathogenesis and clinical features of ;

- **Achondroplasia.**
- **Osteogenesis imperfecta.**
- **Osteoporosis.**

- **Acute and chronic osteomyelitis**
  - ➢ Common causative micro-organism
  - ➢ Common routes of spread
  - ➢ Complications.
- **Tuberculous osteomyelitis** → Common sites involved
- **Paget's disease (osteitis deformans)**→ Pathogenesis, morphological & clinical features
- **Benign and malignant bone forming tumors**.
- **Osteogenic sarcoma** → Common sites, morphological & clinical features
- **Benign & malignant cartilaginous tumors.**
- **Chondrosarcoma**
  - ➢ Peak incidence
  - ➢ Common sites of origin
  - ➢ Morphological and clinical features.
- **Giant cell tumors of bone**→ Most frequent sites, clinical & morphological features
- **Ewing's sarcoma**

➢ Peak incidence

➢ Common sites of origin

➢ Chromosomal abnormality

➢ Morphological and clinical features.

- **Osteoarthritis** → Pathogenesis, morphological & clinical features
- **Rheumatoid arthritis**
  - Pathogenesis
  - Morphological and clinical features
  - Lab Diagnosis

- **Gout**
  - Classification
  - Pathogenesis
  - Morphological and clinical features
  - Lab Diagnosis

Pathogenesis, morphological and clinical features of;

- **Duchenne muscular dystrophy**
- **Myotonic dystrophy**
- **Congenital myopathies**
- **Inflammatory myopathies**
- **Myasthenia gravis.**

- **Lipoma and lipasarcoma.**
- **Rhabdomyosarcoma**
  - Peak incidence
  - Histological variants
  - Frequent sites

10. ENDOCRINE SYSTEM

- **Pituitary**
- **Causes of hyperpituitarism.**

Morphology and clinical features of;

- Pituitary adenomas.
- Acromegaly
- Gigantism.

- Causes of hypopituitarism.

Etiology, pathogenesis and clinical features of;

- Sheehan's syndrome
- Dwarfism
- Inappropriate secretion of ADH → Etiology, clinical features, pathogenesis & lab findings
- Adrenal Cortex and Medulla
- Adrenal cortical hyperfunction. (CUSHNG'S SYNDROME)

Etiology, pathogenesis clinical features and lab diagnosis of;

- Conn's syndrome
- Adrenogenital syndrome.
- Hypofunction of adrenal cortex → Causes
- Addison's disease Etiology, pathogenesis and clinical features of.
- Tumors of adrenal medulla and cortex.
- Pheochromocytoma → Clinical features and diagnosis

- **Thyroid**
  - **Hyperthyroidism →** Etiology and clinical features
  - **Hypothyroidism →** Etiology and clinical features, including
    - **Cretinism and Myxedema**.
  - **Thyroid dysfunction →** Investigation / lab tests for diagnosis
  - **Goiter and its types**
  - **Diffuse & multinodular goiter→** Etiology, pathogenesis & clinical features
  - **Solitary thyroid nodule →** Causes of and its diagnostic approach.
  - **Thyroiditis**
    - Types
    - Pathogenesis
    - Morphology
    - Clinical features

  Etiology, pathogenesis, morphology and clinical features of;

  - **Follicular adenoma**
  - **Papillary carcinoma**
  - **Follicular carcinoma**
  - **Medullary carcinoma.**
  - **Undifferentiated.**
- **MEN syndromes →** Types
- **Parathyroid**

Etiology and clinical features of

- **Hyperparathyroidism**
- **Hypoparathyroidism**

- **Hyperparathyroidism → Primary, secondary and tertiary**
- **Calcium homeostasis**
- **Hyper and hypocalcemia.**

▪ **SKIN**

- **Macule, papule, nodule, plaque, vesicle, bulla, blister, pustule, scale, lichenification, excoriation, hyperkeratosis, parakeratosis, acanthosis, dyskeratosis, acantholysis, papillomatosis, lentiginous spongiosis.**
- **Urticaria →** Morphological and clinical features

Etiology, pathogenesis morphological and clinical features of;

- **Eczematous dermatitis.**
- **Contact dermatitis**
- **Atopic dermatitis**
- **Photoeczematus eruptions**
- **Primary irritant dermatitis**
- **Erythema multiforme**
- **Psoriasis.**
- **Pemphigus**
- **Bullous pemphigoid.**

- **Premalignant epithelial lesions**.

▪ **Warts →** Types & their most frequent locations.

Predisposing factors, morphology, clinical features and prognosis of;

- **Squamous cell carcinoma**
- **Basal cell carcinoma.**

Types, clinical and morphological features of;

- **Nevocellular Nevi**
- **Dysplastic nevi.**

- **Malignant melanoma**
  - Classification
  - Frequent site of origin
  - Clinical and morphological features.

11. NERVOUS SYSTEM

- **Hydrocephalus→** Clinico-pathological features
- **Cerebral edema (vasogenic & cytotoxic)**
- **Herniation of brain →** Types of and their clinical significance.
- **Intra-cranial hemorrhage**

Etiologic agents, clinical and morphological features of;

- **Acute purulent meningitis**
- **Acute lymphocytic meningitis**
- **Chronic meningitis**
- **Brain abscess**
- **Tuberculosis meningitis.**
- **Viral encephalitis**

- **Guillain Barre syndrome → Clinico-pathological features**
- **Polyneuropathies**
- **Toxic neuropathy**
- **Important intracranial tumors (astrocytoma, oligodendrogliomas, ependymoma, medulloblastoma and meningioma)**

- **Glial tumors →** Clinical significance
- **Frequent metastatic tumors to the brain**
- **Primary peripheral nerve sheath neoplasms**

SYLLABUS OF SECOND YEAR MBBS 2024

1.GIT AND NUTRITION:

- Describe the etiology, pathogenesis, morphology and clinical features of peptic ulcer disease
- Enumerate common infectious agents of diarrheal diseases
- Discuss pathogenesis and clinical features of common pathogens

2.RENAL:

- Discuss the etiology and pathogenesis of different types of stones.
- Identify the causes, morphological aspect & outcome of hydronephrosis.
- Enlist common causative agents of urinary tract infections and describe pathogenesis and clinical features of common causative agents of UTI.
- Define various presentations of glomerulonephritis.
- Define nephrotic and nephritic syndrome.
- List various risk factors and outline management of glomerulonephritis.
- Define AKI (acute kidney injury)
- Identify various risk factors and causes for AKI.
- Outline management strategies.
- Define UTI (Urinary Tract Infection) Urinary tract infection
- Identify various risk factors and causes of UTI.
- Describe signs and symptoms of UTI. Outline management strategies.

3.ENDOCRINOLOGY AND REPRODUCTION:

- Enumerate clinical manifestations along with hormone levels of anterior pituitary.
- Classification of pituitary adenomas.
- Enumerate and describe posterior pituitary syndromes (inappropriate ADH (Anti Diuretic Hormone) secretion, diabetes insipidus)
- Enumerate causes of hypo and hyperthyroidism along with levels of thyroid hormones
- Enumerate causes of hypercalcemia, hyper and hypoparathyroidism
- Give etiological Classification of DM (Diabetes Mellitus)
- Differentiating features of DM-I and DM-II on the basis of pathogenesis, clinical features, diagnosis and complications
- Enumerate causes of Cushing syndrome with lab investigations Causes and clinical features of adrenocortical insufficiency (Addison disease)

- Enumerate causes of lower genital tract infections and PIDs along with lab investigations
- Enumerate causes of infertility in females along with hormonal investigations
- Causes of dysfunctional uterine bleeding with histopathological features
- Pathophysiology and lab diagnosis of eclampsia and preeclampsia Causes of placental implantations (ectopic pregnancy)
- Enumerate causes of inflammation of male genital tract Causes of male infertility with semen analysis
- Describe pathological features of testicular torsion

4. HEAD & NECK, SPECIAL SENSES

- Enlist the common causative agents of Eye, Ear infections Pathology
- Eye/Ear infections. Discuss the pathogenesis and clinical features of common pathogens

5. NEUROSCIENCES-I

- Define cerebral vascular accident (CVA).
- Discuss the etiology and morphological changes of Cerebrovascular accidents.
- Define Meningitis. Identify types of meningitis

6. INFLAMMATION

- Define acute inflammation
- Enlist stimuli for Acute Inflammation Recognize microbes, necrotic cells, and foreign substances causing acute inflammation
- Identify different components of inflammation
- Define necrosis and explain its type with example
- Discuss the role of vascular and cellular events in acute inflammation
- Differentiate between transudate and exudate
- Classify chemical mediators
- Describe the different pathways of synthesis of chemical mediators and their role in clinical practice
- Discuss the role of different chemical mediators in acute inflammation
- Describe the different morphological patterns and outcomes of acute inflammation
- Define chronic inflammation
- Discuss the role of chronic inflammatory cells and mediators in chronic inflammation

- Discuss the causes, pathophysiology and morphology of granulomatous inflammation
- Classify mycobacteria Explain the pathogenesis, clinical manifestations and lab diagnosis of typical mycobacteria
- Explain the pathogenesis, clinical manifestations and lab diagnosis of atypical mycobacteria
- Discuss the concept of Cell Proliferation, the Cell Cycle and Stem Cells in tissue repair
- Discuss the role of Growth Factors, receptors, signal transduction and extracellular matrix Involved in Regeneration and Repair
- Explain the types of healing along with the steps in scar formation Identify the factors that influence the tissue repair
- Discuss the complication of wound healing :keloid, Hypertrophy, Scarring

FIRST YEAR MBBS SYLLABUS 2023-2024

CELL INJURY

- Discuss the significance of pathology.
- Discuss the causes of cell injury.
- Identify the types of cell injury.
- Describe the mechanism of cell injury.
- Identify the types of cell death.
- Define necrosis and apoptosis.
- Describe different types of necrosis. Compare apoptosis with necrosis.
- Identify different types and mechanism of cellular adaptations to stress
- Discuss the mechanism and types of intracellular accumulations and pathological calcifications

INTRODUCTION TO MICROBIOLOGY

- Enumerate the microbes causing infectious diseases.
- Describe the structure of bacterial cell
- Differentiate cell walls of gram positive and gram negative bacteria.
- Compare the structure of bacterial cell and virus
- Discuss the growth curve of bacteria.
- Enlist steps of viral replication
- Identify types of bacterial infections
- Enlist stages of bacterial pathogenesis
- Introduction to Microorganisms
- Discuss the determinants of bacterial pathogenesis
- Define sterilization and disinfection.
- Describe the principles of sterilization and disinfection.
- Describe clinical uses of common disinfectants and their mode of sterilization
- Discuss physical and chemical agents of sterilization

HEMATOPOIETIC & LYMPHATIC

- Define and classify anemias according to underlying mechanism and Mean Corpuscular Volume/ Mean Corpuscular Hemoglobin (MCV/MCH)
- Discuss the causes and investigations of iron deficiency anemia and megaloblastic anemia
- Classify the benign and malignant disorders of WBCs
- Discuss the causes leading to reactive leukocytosis
- Interpretation of anemias on the basis of peripheral blood smear and bone marrow findings
- Classify bleeding disorders
- Discuss first line laboratory investigations for bleeding disorders
- Describe the basic concept of blood grouping and acute hemolytic transfusion reaction

MUSCULOSKELETAL & LOCOMOTION-1

- Describe the hyperplasia, hypertrophy, and atrophy of muscle fiber.
- Explain the histopathological basis of leiomyoma
- Describe the histological basis of Duchenne Muscular Dystrophy and myopathy.
- Describe the clinical presentation and histological justification for osteoporosis, osteopetrosis
- Describe the histological basis for bone repair after Bone fractures
- Describe the histological basis for cartilage growth and repair

CARDIOVASCULAR-1

- Classify types of thrombosis, embolism, and infarction
- Atherosclerosis Discuss the pathophysiology of thrombosis, embolism, and infarction
- Identify the types and causes of hypertension.
- Discuss the clinical consequences of hypertension and atherosclerosis.
- Discuss the pathophysiology of shock.
- Classify the types of heart failure Cardiac Identify the causes leading to heart failure
- Discuss the pathophysiology of different types of ischemic heart disease.
- Explain the pathological causes of high & low cardiac output.

RESPIRATORY-1

- Describe the pathophysiology of acute respiratory distress syndrome.
- Acute Respiratory Distress Syndrome.
- Describe the pathophysiology of obstructive lung disease.
- Describe the pathophysiology of Restrictive Lung Disease

10. Marks Scheme

Format (Theory, Ospe & Viva)

Mbbs 3rd & 4th Professional Examination

General Pathology & Microbiology & And Special Pathology

THEORY

SR #	MCQs	SEQS	MARKS
1. 3rd PROFESSIONAL	65	14	70
2. 4th PROFESSIONAL	65	14	70
INTERNAL ASSESSMENT	15		
TOTAL	150		

OSPE AND VIVA OF 3rd PROFESSIONAL MBBS

Sr. No.	COMMENTS	MARKS
1.	OSPE	
	TOTAL 16 stations 12 unobserved station= 4 marks each 4 observed station= 6 marks each Time allowed : 04 mins	 48 24
2.	STRUCTURED VIVA VOCE(related to curriculum)	30+28=58 (external + internal)
3.	ANNUAL WORK BOOK	5 (internal)
4.	CONTINOUS INTERNAL ASSESSMENT	15 (internal)
	TOTAL	**150**

OSPE AND VIVA OF 4th PROFESSIONAL MBBS

SR #	COMMENTS	MARKS
1.	OSPE	
	TOTAL 20 NON-OBSERVED STATIONS RELATED TO PRACTICALS (EACH OF 04 MARKS) a) Histopathology (10 stations) b) Hematology (05 stations) c) Chemical pathology (05 stations) Time allowed : 04 mins for each station	 40 20 20
2.	STRUCTURED VIVA VOCE(related to curriculum)	25+25=50 (external + internal)
3.	ANNUAL WORK BOOK	5 (internal)
4.	CONTINOUS INTERNAL ASSESSMENT	15 (internal)
	Total	**150**

MBBS 1st

Professional Block-1

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (8 marks each observed)	OSVE (16 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	20	03	35	03	-	01	40
Normal Function	Physiology applied/clinical	22	02	32	02	-	01	32
	Biochemistry applied/clinical	22	02	32	02	-	01	32
Disease Burden & Prevention	Community Medicine & Public Health	05	-	05	-	-	-	-
	Behavioral Sciences	05	-	05	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	06	-	06	-	-	-	-
	Pharmacology	05	-	05	-	-	-	-
CFRC	CF-1-2	-	-	-	-	01	-	08
PERLs	PERLs-1-2	-	-	-	-	01	-	08
Total		**85**	**7x5=35**	**120**	**07 stations x 08 = 56**	**02 stations x 08 = 16**	**03 stations x 16=48**	**120**

MBBS 1st

Professional Block-2

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (8 marks each observed)	OSVE (16 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	35	04	55	05	-	01	56
Normal Function	Physiology applied/clinical	17	02	27	01	-	01	24
	Biochemistry applied/clinical	11	01	16	01	-	01	24
Disease Burden & Prevention	Community Medicine & Public Health	06	-	06	-	-	-	-
	Behavioral Sciences	04	-	04	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	07	-	07	-	-	-	-
	Pharmacology	05	-	05	-	-	-	-
CFRC	CF-1-2	-	-	-	-	01	-	08
PERLs	PERLs-1-2	-	-	-	-	01	-	08
Total		**85**	**7x5=35**	**120**	**07 stations x 08 = 56**	**02 stations x 08 = 16**	**03 stations x 16=48**	**120**

MBBS 1st Professional
Block-3

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (8 marks each observed)	OSVE (16 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	16	02	26	01	-	01	24
Normal Function	Physiology applied/clinical	31	04	51	04	-	01	48
	Biochemistry applied/clinical	18	01	23	02	-	01	32
Disease Burden & Prevention	Community Medicine & Public Health	06	-	06	-	-	-	-
	Behavioral Sciences	02	-	02	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	07	-	07	-	-	-	-
	Pharmacology	05	-	05	-	-	-	-
CFRC	CF-1-3	-	-	-	-	01	-	08
PERLs	PERLs-1-3	-	-	-	-	01	-	08
Total		**85**	**7x5=35**	**120**	**07 stations x 08 = 56**	**02 stations x 08 = 16**	**03 stations x 16=48**	**120**

MBBS 2nd Professional

Block-4

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (8 marks each observed)	OSVE (16 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	23	03	38	03	-	01	40
Normal Function	Physiology applied/clinical	16	02	26	02	-	01	32
	Biochemistry applied/clinical	20	02	30	02	-	01	32
Disease Burden & Prevention	Community Medicine & Public Health	07	-	07	-	-	-	-
	Behavioral Sciences	06	-	06	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	09	-	09	-	-	-	-
	Pharmacology	04	-	04	-	-	-	-
CFRC	CF-2-1	-	-	-	-	01	-	08
PERLs	PERLs-2-1	-	-	-	-	01	-	08
Total		**85**	**7x5=35**	**120**	**07 stations x 08 = 56**	**02 stations x 08 = 16**	**03 stations x 16=48**	**120**

MBBS 2nd Professional

Block-5

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (8 marks each observed)	OSVE (16 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	30	04	50	04	-	01	48
Normal Function	Physiology applied/clinical	18	02	28	02	-	01	32
	Biochemistry applied/clinical	11	01	16	01	-	01	24
Disease Burden & Prevention	Community Medicine & Public Health	08	-	08	-	-	-	-
	Behavioral Sciences	04	-	04	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	12	-	12	-	-	-	-
	Pharmacology	02	-	02	-	-	-	-
CFRC	CF-2-2	-	-	-	-	01	-	08
PERLs	PERLs-2-2	-	-	-	-	01	-	08
Total		**85**	**7x5=35**	**120**	**07 stations x 08 = 56**	**02 stations x 08 = 16**	**03 stations x 16=48**	**120**

MBBS 2nd Professional
Block-6

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (8 marks each observed)	OSVE (16 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	24	03	39	03	-	01	40
Normal Function	Physiology applied/clinical	26	03	41	03	-	01	40
	Biochemistry applied/clinical	09	01	14	01	-	01	24
Disease Burden & Prevention	Community Medicine & Public Health	04	-	04	-	-	-	-
	Behavioral Sciences	03	-	03	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	12	-	12	-	-	-	-
	Pharmacology	07	-	07	-	-	-	-
CFRC	CF-2-3	-	-	-	-	01	-	08
PERLs	PERLs-2-3	-	-	-	-	01	-	08
Total		**85**	**7x5=35**	**120**	**07 stations x 08 = 56**	**02 stations x 08 = 16**	**03 stations x 16=48**	**120**

10. Assessment Policy

Pathology Department

Student's Assessment Policy – 2024

- **<u>Purpose:</u>** In light of University of Health Sciences (UHS) rules for MBBS students assessments following SOP is formulated to carryout assessment of students.

  Assessment in medical education is an integrated process involving variety of procedures to obtain information about student's learning and development. Assessment is necessarily ingrained term in the curriculum. Assessment when properly planned and carried out has a powerful steering effect on learning outcomes and curriculum.
- **<u>Scope:</u>** Students of 1st, 2nd and 3rd year and 4th year MBBS of RMDC.
- **<u>Responsibilities:</u>** All faculty members of pathology department of RMDC under the supervision of Assessment Committee comprising of HODs of all depts.
- **<u>Procedures:</u>** Both traditional and modular pattern of assessment and examination is carried out in conducive environment under supervision of departmental and institutional Committees.

  Pathology department has a comprehensive assessment plan encompassing formative and summative method of teaching and learning

Traditional System

Follows the traditional pattern of internal and external assessments.

Internal Assesment

- <u>CONTINOUS ASSESMENT DURING ACEDAMIC YEAR</u>
  1. It will incorporate both formative and summative assesments for whole academic year.
  2. Class Presentations/ Assignments- Based on topics taught at the end of each system, assigned by respective teachers
  3. Throughout the academic year

- <u>FORMATIVE ASSESMENT</u>

  1. Written assessments

  In the form of assignments, DSL, class presentations and flip class model.

  During and at the end of each system or major topic area.

  2. Practical Examinations:

  In the form of slide-based identification, problem based learnings, and lab practical.

  During each practical training sessions or periodically throughout the course.

- <u>SUMMATIVE ASSESMENT</u>

  1. Written assessments

  In the form of Multiple-choice questions (MCQs), short answer questions (SAQs),.

  At the end of each term and academic year.

  2. **Sendup Exam:** A written and/or practical exam at the end of each module that includes multiple-choice questions, short-answer questions, and practical demonstrations to evaluate overall understanding and application of pathology.

  3. **Internal Assessment;** Calculated on the basis of each students performance throughout the academic year in the form of regular attendance, class tests, practical demonstration and class assignments

Modular System

Follows the pattern of internal and external assessments according to separate modules.

- CONTINOUS ASSESMENT DURING ACEDAMIC YEAR
  1. It will incorporate both formative and summative assessments for each block.
  2. Class Presentations/ Assignments- Based on topics taught at the end of each system, assigned by respective teachers
  3. Throughout the academic year

- FORMATIVE ASSESMENT

  1. Written assessments

  In the form of Multiple-choice questions (MCQs)

  At the end of each system or major topic area.

  2. **Quizzes:** Short quizzes are administered at the end of each module to assess understanding of key concepts and immediate feedback.
  3. **Group Discussions:** Facilitated discussions on pathology topics to evaluate collaborative learning and critical thinking skills.

- SUMMATIVE ASSESMENT

  1. Written assessments

  In the form of Multiple-choice questions (MCQs) at the end of each block.

  2. Send up Exam: A written exam at the end of academic year that includes multiple-choice questions.

EXTERNAL ASSESMENT

APPEAL SYSTEM AGAINST ASSESMENT;

An appeal system against module , class and term tests is already in place as defined by the RMDC policy.

Rahbar Medical & Dental College Lahore
Appeal Against the Examination / Module Test Result / Class Test

Name of Student: _______________ S/O D/O _______________

Roll No: _______________ Class: _______________

Date on which examination conducted _______________ Session: _______________

<table>
<tr><td rowspan="2">Test details</td><td>Class Test</td><td colspan="2">Module Test</td><td>Block Exam</td><td>Send Up</td></tr>
<tr><td colspan="2">Theory</td><td colspan="2">Practical</td><td>Ward</td></tr>
</table>

Brief account of Appeal: ____

____

____

____

Signature

Comments of HODs: ____

____

____

____

Approved
10/9/24

Signature

13. Academic Hours

4th YEAR MBBS PATHOLOGY

HOURS DISTRIBUTION

Academic Session = 36 weeks

Lectures	Practicals/ Tutorials	Assignments	Test Discussions	CPC	Test Day	SENDUP
114 hours	61 hours	10 hours	7 hours	14 hours	26 hours	5 hours
TOTAL= 237 hours						

3rd YEAR MBBS PATHOLOGY

HOURS DISTRIBUTION

Academic Session = 36 weeks

Lectures (hrs)	Practicals/ Tutorials (hrs)	Assign. & self- study (hrs)	Test Disc. (hrs)	Pre Test Day (hrs)	Test Day (hrs)	CPC (hrs)	SENDUP
93	116	12	6	25	35	10	5
TOTAL= 302 hours							

Pathology Hours In 2nd Year MBBS

Block 4:

Module 1: GIT and nutrition = 2 HRS

Module 2: Renal = 10 HRS

Total Hours = 12 HRS

Block 5:

Module 1: Endocrinology and reproduction = 9 HRS

Module 2: Head and Neck, Special Sevres = 3 hrs

Total Hours = 12 Hrs

Block 6:

Module 1: Neuro sciences = 12HRS

Module 2: Inflammation = 12 hrs

Total =14HRS

Total Hours in 2nd Year MBBS

Total Hours = 12+12+14

Grand Total Hours = 38 HRS

Pathology Hours in 1st Year MBBS

Block 1:

Module 1: Foundation Module = 12HRS

Module 2: Hematopoietic and Lymphatic Module = 5 HRS

Total Hours = 17 HRS

Block 2:

Module 1: Musculoskeletal and locomotion Module = 7HRS

Module 2: Total Hours = 7HRS

Block:3

Cardio vascular Module = 5 HRS

Respiratory Module = 6 HRS

Total Hours = 11 HRS

Total Hours in 1 year = 17+7+11

Grand Total = 35Hrs

13. Recommended books by UHS

1. Pathological Basis of Disease by Kumar, Cortan and Robbins, 7th Ed., W.B. Saunders.
2. Medical Microbiology and Immunology by Levinson and Jawetz, 9th Ed., Mc Graw-Hill.
3. Medical GeneticsbyJorde,3rdEd.,Mosby.
4. Clinical Pathology Interpretations by A. H. Nagi.
5. Ackerman's Surgical Pathology.
6. Clinical Pathology Interpretations by A.H.Nagi.
7. Theory and Practice Of Histololgical Techniques by John D Bancroft
8. District Laboratory Practice in Tropical Countries by Monica Cheesburgh, 2nd Ed. Part I & II.
9. Online Journals and Reading Materials through HEC Digital Library Facility.

“Education is the key to unlock the golden door of freedom.”- George Washington Carver