



**CONSOLIDATED
INTEGRATED CURRICULUM DOCUMENT
MBBS PROGRAM
2024-2025**

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| ABBREVIATIONS | |
|---------------|--|
| BCQs | Best Choice Questions |
| BST | Bedside Teaching |
| CBL | Case-Based Learning |
| CC | Curriculum Committee |
| CR | Clinical Rotation |
| C-FRC | Clinical Skills Foundation Rotations |
| CPC | Clinical Pathological Conference |
| CQ | Class Quiz |
| CR | Class Representation |
| CME | Continuous Medical Education |
| DSE | Directed Self-Learning |
| HO | House Officers |
| HOD | Head of Department |
| HEC | Higher Education Commission |
| LGIT | Large Group Integrated Teaching |
| MIT | Modes of Information Transfer |
| OSPE | Objective Structured Practical Examination |
| OSCE | Objective Structured Clinical Examination |
| OSVE | Objective Structured Viva Examination |
| PBL | Problem-Based Learning |
| PERLs | Professionalism, Ethics, Research, Leadership Skills |
| PMP | Patient Management Problem |
| PSIL | Problem Solving Integrated Learning |
| PM&DC | Pakistan Medical & Dental Council |
| PW/Lab | Practical work |
| QEC | Quality Enhancement Cell |
| SS | Self Study |
| SL | Skills Lab |
| SGD | Small Group Discussion |
| SIM | Simulation |
| SEQs | Short Essay Questions |
| UHS | University of Health Sciences |
| TBL | Team-Based Learning |
| WBT | Ward-Based Teaching |
| WPBA | Work Placed Based Assessment |

PREAMBLE

Muhammad Medical College is located just outside Mirpurkhas (6 km from Zero point) on Hyderabad Road. This is opposite Ratanabad Railway Station near the main bus stand. It spreads over 40 acres owned by the Muhammad Foundation Trust for its projects. All necessary facilities, including building, gas, electricity, telephone, and e-mail. Internet, transport, accommodation, food and drink spots are available. Public transport operating along the Hyderabad Road provides frequent and regular access to the college. The college building is more than sufficient to the requirements and has all the necessary departments. Each department has its own museum, laboratory, and tutorial room, which are well-equipped and fascinating. All facilities are modern and up-to-the-mark. Students will get clinical training at 540-bedded hospital at Muhammad Medical College Hospital, Mirpurkhas in campus, and the facility of 120 beds at Muhammad Medical College Hospital, Mirpurkhas City campus. There are hostels for boys and girls on-site and in the city. A new, large state-of-the-art 3-story girls' hostel has just been established on-site

The word curriculum comes from the Latin word *curare*, which means "racecourse." It is, to put it simply, the study path. "Planned educational experience or activity" is the definition of it in medical education.

The idea of a curriculum is as fluid as societal transformations. Curriculum is understood narrowly to be nothing more than a list of subjects that need to be taught in a classroom. Broadly speaking, it encompasses people's whole educational journeys, both inside and outside of institutions. Numerous curriculum approaches exist, including competency based, problem-based, outcome-based, discipline-based, integrated, and apprenticeship programs.

Globally, the idea of the Integrated Medical Curriculum is gaining traction. With an integrated medical curriculum, students will receive clinical experience in addition to scientific information, allowing them to study the subject matter by theme rather than by specialty.

Dismantling the existing boundaries that exist between the clinical and basic sciences in the context of the Traditional Medical Curriculum is the aim of integration. Through the iterative and progressive development of concepts and their application, integration should support the retention of knowledge and the learning of skills.

In order to provide a more comprehensive understanding of how to teach and learn medicine, vertical integration should incorporate not only the basic and clinical sciences but also the socio-humanistic and population health sciences. "Education that is organized so that it cuts across subject matter lines, bringing various aspects of the curriculum into meaningful association to focus upon broad areas of study" is what is meant to be understood by an integrated curriculum.

The conventional medical curriculum suggests that before moving on to clinical sciences, students should first study basic and paraclinical/biomedical sciences; however, this is not how patients present in real-world situations. This approach is frequently criticized for failing to show students how basic and biological sciences relate to clinical practice; instead, it is thought that students should be encouraged to think like doctors from the moment they enroll in medical school. Because basic science education is placed in the context of clinical and professional practice, students view it as being more meaningful and relevant. For this reason, integration is crucial to medical education.

Parts of both integrated and traditional curricula are applied in a learning environment in a hybrid medical curriculum.

More than 90% of schools and medical universities took part in a recent poll sponsored by PM&DC, and the majority (65%) still follows traditional or subject-based curricula with little to no horizontal or vertical integration. 25% of schools use an integrated curriculum, while the remaining 75% use a hybrid. The majority of proponents of the traditional, subject-based curriculum are open to switching to an integrated modular curriculum; however, they would want a grace period and university support.

Based on data from multiple meta-analyses (1-4), senior medical educators' opinions from every province, and feedback from AJK, CAC is agreed that integrated curricula are more beneficial than traditional ones and are well-liked by faculty and students. The teaching innovation has been well-received by both faculty and students. Consequently, it is now appropriate to formally introduce integrated medical curriculum. It is suggested that medical and dental schools and universities transition to integrated curriculum, finishing the process by 2025 to ensure full implementation for the 2026 class.

Integration is now acknowledged as a crucial teaching tactic in the education of medical students. PMDC & LUMHS support ongoing curriculum revision by routinely reviewing and gathering input from stakeholders. A minimum level of integration in MBBS, known as correlation, has been included to this new curriculum. This curriculum improves health and avoids disease and is outcome-based, patient-centered, and relevant to the community. In cooperation with the MMC Department of Medical Education and the LUMHS Academic Directorate, the faculty of fundamental and clinical medical sciences has amended it.

Prof Dr Syed Razi Muhammad

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OPERATIONAL DEFINITIONS

1. **TRADITIONAL CURRICULUM:** Pakistan is among the countries where certain medical schools still use the old discipline-based curriculum. It is not until the third year of their medical degree that students are introduced to clinical instruction or patients. The curriculum for the first two years of medical school is entirely devoted to basic sciences. It is common practice to teach the first two years in a didactic, discipline-based manner.
The earliest form of education is a discipline-based curriculum that does not attempt to teach the fundamental sciences in a clinical setting.
2. **INTEGRATED CURRICULUM:** It is described as combining and arranging the various components to create a brand-new curriculum. When learning is provided within a framework and is organized into blocks or units that correspond to body systems, individual departments, or subject areas make meaningful, holistic contributions to the development and delivery of learning. This is known as horizontal integration.
Information from all of the curriculum phases is taught simultaneously in vertical integration, with an emphasis on major ideas or themes that are covered year-round and require knowledge to be revisited. Alongside the fundamental sciences, therapeutic skills are introduced early and developed.
3. **HYBRID CURRICULUM:** The program blends didactic coursework with clinical rotations to provide students with the skills they need to become competent and good doctors. It includes both conventional teaching methods and some integration. It seems more practical for underdeveloped nations.
4. **COMPETENCY-BASED MEDICAL EDUCATION (CBME):** CBME is a physician training approach that focuses on achieving specific, measurable skills and abilities rather than simply completing a set amount of time in training.
 - It emphasizes the continuous development of competencies, often using frequent, low-stakes assessments and feedback, and a learner-centered model where progression is based on demonstrated competence rather than time spent.

Key principles of CBME

- **Focus on outcomes:** CBME is an outcomes-based approach that designs curricula around the abilities physicians need to have, derived from the needs of society.
- **Shifts from time-based to competency-based progression:** In a traditional model, learners progress after a fixed period. In CBME, learners progress at their own pace based on their demonstrated abilities, making training more flexible and tailored to individual needs.
- **Emphasis on coaching and feedback:** CBME integrates frequent, real-time feedback and coaching into daily clinical work, providing more timely and task-specific guidance compared to traditional, time-based assessments.
- **Use of Entrustable Professional Activities (EPAs):** EPAs are work-based assessments that allow for the explicit documentation of a resident's completed tasks and provide more data points for understanding a learner's abilities.
- **Promotes learner-centeredness:** The curriculum provides clear goals and milestones, allowing learners to manage their own development and engagement actively.

Benefits of CBME

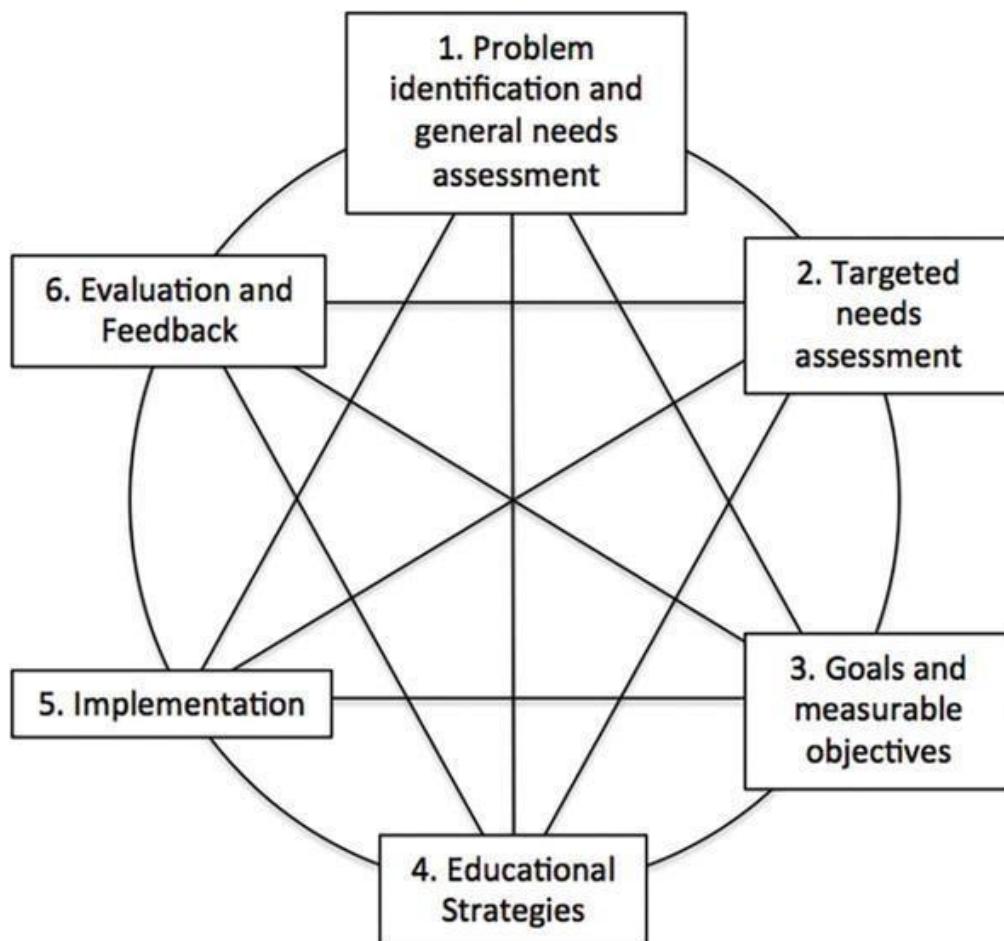
- **More visible and measurable training:** It makes the process and outcomes of training more transparent and easier to assess.

- **Clearer expectations:** EPAs clearly communicate the expectations for each task, helping to improve understanding of a resident's abilities.
- **More data points for assessment:** The frequent, low-stakes assessments provide more data points for each rotation, allowing for a more comprehensive view of a learner's progress.

5. **Greater efficiency:** Tailoring the training to the individual's needs can make the overall educational process more efficient and engaging

GUIDELINES FOR CURRICULUM DEVELOPMENT

The guidelines for the development of the Comprehensive Curriculum framework at Ibn-E-Sina University Mirpurkhas, are based on the following six headings as depicted below.



The Sina University is introducing a modular integrated undergraduate curriculum for its constituent and affiliated medical colleges in order to fulfill its mission of producing a seven-star physician with the generic competencies of "Skillful, Knowledgeable, Community Health Promoter, Critical Thinker, Professional, Scholar, Leader, and Role Model." These competences are further defined by a variety of enabling attributes that include attitude, knowledge, and abilities. The Kern's approach for developing medical curriculum serves as the foundation for both our curriculum development process and concept.

Encouraging students to think like doctors from the moment they enroll in medical school is the goal of the integrated modular curriculum. The vertical integration strategy broadens the idea of how to teach and study medicine by situating behavioral sciences and basic scientific education within the framework of clinical and professional practice. Content overlap across multiple subjects slows down the formation of concepts and makes people less eager to study. This needs to be reduced via an integrated strategy. An additional element that promotes the importance of information acquisition in formal undergraduate settings is the availability of knowledge. Core ideas and the "must know" principles for a student are given priority in these calibrations and refinements made possible by an integrated approach.

STEP 1: PROBLEM IDENTIFICATION AND GENERAL NEED ASSESSMENT

Muhammad Medical College (MMC) is a vibrant Institute that strives to meet all international health standards and is always developing to incorporate new and cutting-edge approaches. The practice of incorporating both local demands and international standards into the curriculum is known as contextualization. It guarantees that the curriculum satisfies both international standards and the needs of the local community.

Contextualization is crucial for health professionals because it makes students more ready for the real world, where they will be offering healthcare services to a variety of people.

When making a curriculum, leaders and experts must think about what people need locally and also what the global standards are. They must do this at the same time. Muhammad Medical College engaged medical educators and subject matter professionals to accomplish this. The university intends to solicit feedback from all relevant local parties. This will assist in making sure the program satisfies the requirements as they stand right now.



Contextualization is necessary in Pakistan, where the curriculum is still based on an antiquated discipline, to make sure that it meets the needs of the community. Due to the nation's particular healthcare issues, including the high prevalence of infectious diseases, malnutrition, and maternal and child mortality, in addition to socioeconomic concerns, contextualization is clearly needed while developing curricula in Pakistan. A customized approach to medical education is necessary due to the high burden of both communicable and non-communicable diseases, the scarcity of healthcare resources, and the diversity of cultures and languages. Graduate students' performance is probably going to improve with the curriculum contextualization. Through the integration of foundational and clinical disciplines, early clinical orientation, and the development of a contextual understanding of learning through a practical approach, graduates will be more equipped to handle health issues in their local communities. This will raise their level of proficiency, self-assurance, and capacity to offer varied populations high-quality healthcare services.

In the past, the curriculum was constantly increased to cover more ground and develop more skills. But today's social consciousness, legal obligations, growing responsibility, and community relations demanded that the young learners receive categorically structured instruction in the "affective" domain. When creating a special "spiral" for emotional training, this viewpoint was also maintained. In order to guarantee the training of this field and establish its objective nature, the spiral of "PERLs" will also undergo evaluation.

Ultimately, the most important foundation for any curriculum's success is "student centeredness," which was ingrained in the delivery method. Students will have more control over their education with the introduction of problem-based learning and its components, such as "Electives," self-directed learning sessions, and portfolio construction.

Learning is a lifelong process for Tomorrow's Doctor. Learning and training in Medicine have different periods as formal/undergraduate/foundation education is articulated in the Curriculum.

STEP 2: TARGETED NEED ASSESSMENT

The Curriculum Document of Muhammad Medical College (MMC) Program is addressing the content provided by the accreditation/regulator bodies, such as Pakistan Medical & Dental Council (PM&DC) & Higher Education Commission (HEC). This document is developed to guide dental undergraduates who are capable to provide quality and competent healthcare to the patients by addressing the needs of society.

The graduate program of MBBS was initiated in 1999 and the curriculum is merged in the study guides of every year, which is provided to every student and the teaching faculty of the respective year. The study guide will be revised every year according to need. The curriculum highlighted integration of the disciplines in a horizontal & vertical manner. Integration is what is needed by the graduate to function competently in real-world practice settings.

The curriculum document of MBBS graduate program addresses the elements mentioned in the document of the Pakistan Medical & Dental Council (National Accreditation Framework for Medical and Dental Schools in Pakistan 2019) & standards/framework/Guideline for the development of Competency-Based Medical education. This document expressed the quality standards for accreditation of Medical and Dental Colleges in Pakistan such as vision and mission statement of the Institute which should be reflected in the outcome of the extended MBBS Program, Curricular Organization, Educational Content, Curriculum Management, Assessment Plan, Student Awards, Faculty Development, Program Evaluation and Continuous Renewal, Governance Services and Resources and Research and Scholarship.

The syllabus/educational content that needed to be covered during the five years of the MBBS program was provided by PMDC as well as the number of hours each subject needed to be taught. Guidance was sought from the Pakistan Medical & Dental Council & LUMHS in this regard and the University's proposal of curricular review was endorsed by both bodies.

The curriculum document of Muhammad Medical College (MMC) is developed according to the syllabus provided by the Liaquat University of Medical and Health Sciences (LUMHS) which was initially traditional based. LUMHS has introduced integrated Modular Curriculum for the first time in 2021 for First Year MBBS & BDS. This was the start of the needs assessment process as per PMDC standards. The curriculum of MMC & MDC is hybrid curriculum which is the combination of traditional and integrated curricula implemented as modular in the learning environment of MDC. Hopefully, with the passage of time, this document will prove to be the step ahead in continuing curricular reforms in medical and dental colleges of our country as it is an imperative step which is needed to be taken to produce graduates who can accomplish what society demands from them, that is quality patient care.

STEP 3: GOALS AND OBJECTIVES: COMPETENCIES REQUIRED OF A DOCTOR TO BE ACHIEVED AT THE UNDERGRADUATE LEVEL

| A. PATIENT ASSESSMENT | | | | |
|------------------------------|--|--|---|---|
| S. No. | Procedure | Description | Level of Competence | Carried out at |
| 1. | Take baseline physiological observation and record appropriately (all wards) | Measure temperature, respiratory rate, pulse rate, blood pressure, oxygen saturations, NG output and urine output. | Safe to practice under indirect supervision | ICU/HDU, Wards |
| 2. | Carry out general and systemic examination abdominal, chest, nervous system, CVS, vascular, breast lump, neck, and thyroid (all wards) | Systemic approach in clinical examination. Complete All steps of the examination and document appropriately | Safe to practice under indirect supervision | Ward, OPD |
| 3. | Ophthalmoscopy- Eye ward rotation | Perform basic ophthalmoscopy and identify common abnormalities | Safe to practice under indirect supervision | Ophthalmology Ward, OPD |
| 4. | Otoscopy- ENT Ward | Perform basic otoscopy and identify common abnormalities | Safe to practice under indirect supervision | ENT Ward, OPD |
| 5. | Obstetric & Gynecological Wards | Perform Obstetric & Gynecological examination | Safe to practice under indirect supervision | Obstetric & Gynecological Wards, OPD |
| 6. | Taking informed consent | | Safe to practice under indirect supervision | Surgery ward, OPDS, ER |
| 7. | Preoperative counselling | | Safe to practice under indirect supervision | Obstetrics & Gynecological Surgery, Wards |
| B. PROCEDURAL SKILLS | | | | |
| 8. | Blood sampling | Take samples of venous blood tests for the growth of infectious organisms in proper culture bottles | Safe to practice under direct supervision | Any ward, Skills Lab |
| 9. | Carry out arterial blood gas and acid-base sampling from the radial artery in adults | Insert a needle into a patient's radial artery (in the wrist) to take a sample of arterial blood and interpret the results. Use appropriate measures to prevent hematoma formation at the site | Safe to practice under direct supervision | ICU |
| 10. | Carry out venipuncture | Insert a needle into a patient's vein to take a sample of blood for | Safe to practice under indirect | Any ward, Skills Lab |

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|-----|--|---|---|----------------------------|
| | | testing. Make sure that blood samples are taken in the correct order, placed in the correct containers, that these are labelled correctly and sent to the laboratory promptly | supervision | |
| 11. | Measure capillary blood glucose | Measure the patient's blood glucose concentration at the bedside using appropriate equipment. Record and interpret the results. | Safe to practice under indirect supervision | Medicine, Surgical ward |
| 12. | Carry out a urine multi-dipstick test | Explain to patients how to collect a midstream urine sample. Test a urine sample to detect abnormalities. Perform a pregnancy test where appropriate. | Safe to practice under indirect supervision | Medicine, Gynea ward |
| 13 | Carry out a 3- and 12-lead electrocardiogram | Set up a continuous recording of the electrical activity of the heart, ensuring that all leads are correctly placed. | Safe to practice under indirect supervision | Cardiology/Medicine Ward |
| 14. | Take and/or instruct patients how to take a swab | Use the correct technique to apply sterile swabs to the nose, throat, skin and wounds. Make sure that samples are placed in the correct containers, that they are labelled correctly, and sent to the laboratory promptly and in the correct way | Safe to practice under indirect supervision for nose, throat, skin or wound swabs | ENT/Dermatology, OPD, Ward |
| 15. | Carry out Urinary Bladder Catheterization | Insertion of a catheter tube through the urethra and into the bladder to drain urine. | Safe to practice under indirect supervision | Medicine, Surgical ward |
| 16. | Nebulization | Follow the directions for the specific brand of the Nebulizer machine and cup | Safe to practice under indirect supervision | Medicine, HDU |
| 17. | Carry out the removal of surgical drains | Firmly grasp the drainage tube close to the skin with the dominant hand, and with a swift and steady motion, withdraw the drain and place it on the waterproof drape/pad (the other hand should stabilize the skin with 4 x 4 sterile gauze around the drain site). | Safe to practice under direct supervision | Surgical ward |

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|-----|--------------------|---|---|--------------------|
| 18. | Removal of sutures | Remove sutures by following aseptic techniques | Safe to practice under direct supervision | Gyne/Surgical ward |
| 19. | Application of POP | Apply the POP on top of the cotton wool padding from distal to proximal, without applying tension to the roll, overlapping each layer by 50%. | Safe to practice under direct supervision | ER/Orthopedic |
| 20. | Take HVS | To test vaginal discharge for the presence of vaginal thrush, bacterial vaginosis and Trichomonas vaginalis. Carried out in clean conditions, using a speculum to look at the cervix and vagina. | Safe to practice under direct supervision | Gyne OPD ward |

C. PATIENT CARE

| S. No. | Procedure | Description | Level of Competence | Carried out at |
|--------|--|---|---|----------------------|
| 20. | Perform surgical scrubbing up | Follow approved processes for cleaning hands and wearing appropriate personal protective equipment before procedures or surgical operations | Safe to practice under direct supervision | OT |
| 21. | Set up an infusion | Set up a run-through of an intravenous infusion. Have awareness of the different equipment and devices used. | Safe to practice under direct supervision | Any ward |
| 22. | Use correct techniques for moving and handling, including frail patients | Use, and/ or direct other team members to use, approved methods for moving, lifting, and handling people or objects, in the context of clinical care, using methods that avoid injury to patients, colleagues, or oneself | Safe to practice under indirect supervision | Skills Lab, Any Ward |
| 23. | Positioning for breastfeeding | Should be able to direct the patient on the positioning of breastfeeding | Safe to practice under indirect supervision | Medicine Ward |
| 24. | Performing CTG and its interpretation | | Safe to practice under direct supervision | Neurology |

D. PRESCRIBING

| S. No. | Procedure | Description | Level of Competence | Carried out at |
|--------|--|--|---|----------------------------|
| 25. | Instruct patients in the use of devices for inhaled medication | Explain to a patient how to use an inhaler correctly, including spacers, and check that their technique is correct. Should | Safe to practice under direct supervision | Medicine/ Pulmonology ward |

| | | | | |
|-----|--|---|---|-------------------------|
| | | know about various types of Inhalers | | |
| 26. | Prescribe and administer oxygen | Prescribe and administer oxygen safely using a delivery method appropriate for the patient's needs and monitor and adjust oxygen as needed. Knows the exact volume given per Minute | Safe to practice under direct supervision | Pulmonology ward |
| 27. | Prepare and administer injectable (intramuscular, subcutaneous, intravenous) drugs | Prepare and administer injectable drugs and prefilled syringes Knows about various channels of CVP | Safe to practice under direct supervision | ER/Any Ward |
| 28. | Interpretation of X-rays of the upper and lower limbs | should be able to identify gross musculoskeletal pathology on X-rays | safe to practice under indirect supervision | ER/Orthopedic |
| 29. | Interpretation of X-rays of the chest, abdomen and pelvis | should be able to identify rib fractures, hemothorax, pneumothorax, free air under diaphragm, pelvic fractures | safe to practice under direct Supervision | Medicine, Surgical ward |

E. THERAPEUTIC PROCEDURES

| S. No. | Procedure | Description | Level of Competence | Carried out at |
|--------|---|--|---|---------------------|
| 30. | Carry out intravenous cannulation | Insert a cannula into a patient's vein and apply appropriate dressing. | Safe to practice under direct supervision | ER/Skills/Any Ward |
| 31. | Carry out safe and appropriate blood transfusion | Following the correct procedures, give a transfusion of blood (including correct identification of the patient and checking blood groups). Observe the patient for possible reactions, do the transfusion and take action if they occur. | Experienced in a simulated setting; further training required before direct Supervision | Any Ward |
| 32. | Carry out male and female urinary catheterization | Insert a urethral catheter in both male and female patients. Should know its complications and Management | Safe to practice under direct supervision | Skills/Any Ward |
| 33. | Carry out wound care and basic wound closure and dressing | Provide basic care for surgical or traumatic wounds and apply dressing appropriately. | Safe to practice under direct supervision | Surgery Ward/OT |
| 34. | Carry out nasogastric tube placement | Pass a tube into the stomach through the nose and throat for feeding and administering drugs or draining the stomach's contents. Should know | Safe to practice simulation | Skills Lab/Wards/OT |

| | | | | |
|-----|---|--|---|-------------------------------|
| | | how to ensure correct placement | | |
| 35. | Use local anesthetics | Inject or topically apply a local anesthetic. Understand maximum doses of local anesthetic agents. | Safe to practice under direct supervision | OT before surgical procedures |
| 36. | Apply a splint for fractures | Can apply routine splints for fractures like Thomas, - Neck of femur | Safe to practice under direct supervision | ER/Orthopaedics |
| 37. | Measure CVP (central venous pressure) | should be able to measure, interpret and monitor central venous pressure readings | safe to practice under direct supervision | ICU |
| 38. | Should be able to perform essential lifesaving procedures (BLS) | (Tracheostomy, endotracheal intubation and chest intubation. Should be competent at Basic Life Support) | safe to practice under direct supervision | Skills lab/OT |
| 39. | Digital rectal examination and Proctoscopy | Should know common causes of bleeding per rectum and common perianal diseases and be able to diagnose them by means of digital rectal examination and proctoscopy. | safe to practice under direct supervision | Surgical OPD |
| 40. | Nutritional assessment | Calculate BMI, carry out nutritional assessment of patients, and guide them according to their caloric requirements | safe to practice under direct supervision | Gynae OPD/Community Visits |

SEVEN STAR COMPETENCIES STANDARDS OF SEVEN STARS DOCTOR

The goal of creating a medical curriculum is to create skilled, compassionate, and effective medical professionals who can offer patients high-quality care. A modular integrated curriculum that synchronizes the MBBS program results with the nationally designated seven-star doctor competences has been developed in order to accomplish this goal.

The following are the anticipated general competencies for a medical graduate:

1. Skillful
2. Knowledgeable
3. Community Health Promoter
4. Critical Thinker
5. Professional
6. Scholar
7. Leader and Role Model

"A seven-star physician" A Pakistani medical graduate ought to exhibit the different qualities listed under each competency. These qualities are the absolute necessities. The program's results are comparable to those that the country's regulatory bodies have processed for MBBS graduates up to this point. These seven-star competencies are translated into the session-specific learning objectives by the curriculum outcomes.



A Pakistani medical graduate who has become a "seven-star doctor" is supposed to exhibit a range of qualities within each competency, according to the national regulating authorities. These characteristics are deemed necessary and need to be demonstrated by the person both personally and professionally.

1. SKILLFUL (CLINICAL, COGNITIVE AND PATIENT CARE SKILLS)

Strong clinical abilities based in an understanding of patient-centered care are necessary for competent medical graduates. It should be possible for them to prove that they can:

- a. Conduct a focused history and use the bio psychosocial model to identify the patient's risk factors. This should take into account the patient's environment, ethnicity, race, religion, gender, age, sexual orientation, occupation, and cultural customs.
- b. Conduct physical and psychological testing to detect specific issues, distinguish them from others, and look for deviations from physiological or anatomical norms.
- c. Create a tentative diagnosis together with a rationale, along with two to three most plausible differential diagnoses.
- d. To confirm the diagnosis or set yourself apart from others, order the necessary investigations and evaluate the results.
- e. Provide first aid, basic life support (including cardiopulmonary resuscitation), nebulization, wound care and dressings, oxygen therapy, taking swabs and smears, recording ECG, peak flow spirometry, blood

sugar testing by glucometer, proctoscopy, urinary catheterization, urinalysis, and simple skin suturing are among the common procedures that ensure infection control when giving injections (I/M, I/V, S/C, and I/D).

- f. Discuss the benefits, drawbacks, indications, contraindications, restrictions, and complications of the available treatment methods, providing the best available evidence to support each one's use.
- g. Create management plans in collaboration with patients, guaranteeing their security through autonomous diagnosis and treatment of common health issues.
- h. Reporting drug interactions and adverse events, and using patient-safe, cost-effective, best-evidence ways.
- i. Understanding alternative medicine's impact on health and its availability as a choice.
- j. Taking into account the expectations, worries, and comprehension of the patients; figuring out how much the patients want to be involved in the decision-making process; and honoring their choices and rights.
- k. Identifying the patient, assisting with stabilization (first aid and basic life support), looking into the matter, and taking appropriate action (transport, triage, neglect, abuse).
- l. Being reachable while performing duties.
- m. Relieving suffering, including care provided at the end of life.
- n. Acknowledging and operating within one's own area of expertise, using the resources at hand, and, when necessary, seeking advice from colleagues while adhering to the consultation process.
- o. Using straightforward language, provide the patient and their family with advice and counsel regarding appropriate health promotion, rehabilitation, and support; prevention of risk factors for family members, including genetic counseling; immediate treatment and medications; complications; and prognosis.
- p. Inform the patient on the medical condition, the treatment options, the management strategy, self-care, and how to take prescribed medications and equipment.
- q. Acknowledge and consider diversity, equity, and equality issues, and that opportunities are lost if people don't think they're useful.
- r. Discuss and explain why different strategies to improve preventive and lessen social injustices have succeeded or failed.
- s. Prioritize work, manage time, and make efficient use of resources.
- t. Consistently monitor patient safety while implementing stringent infection control procedures.

2. KNOWLEDGEABLE (SCIENTIFIC KNOWLEDGE FOR GOOD MEDICAL PRACTICE)

This embodies the fundamental clinical and medical scientific knowledge needed to perform medicine. A graduate in medicine ought to be qualified to:

A. DIFFERENTIATE BETWEEN:

- The body's normal and aberrant functioning and structure, as well as how to spot structural abnormalities in relation to certain illnesses.
- Homeostasis is maintained and disrupted in health and disease by normal and aberrant molecular, cellular, biochemical, physiological, and pathophysiological systems and processes (physical and mental).
- Distinguish between normal and abnormal human behavior, as well as the pathophysiological and psychopathological underpinnings of each disorder.
effects of aging, development, and growth on the family, community, and individual throughout the life cycle of a person,
- Biological, social, and health-related risk factors,

- Differential etiological cause(s) and causative agents for certain accidents, illnesses, and diseases Therapeutic choices available to choose the best drug or treatment method for common diseases based on efficacy and pharmacodynamics.
- Recognizing the role of religious and cultural interventions in such settings, as well as other pertinent biochemical, pharmaceutical, surgical, psychological, and social therapies in acute and chronic disease, rehabilitation, and end-of-life care.

B. RELATE:

- The impact and interplay of social, emotional, and physical environments on human health and illness.
- The course of acute and chronic, communicable and non-communicable diseases, their corresponding etiologic agents, and the impact of suitable interventions on the disease's progression

C. APPLY:

- Elements from evidence-based medicine to deliver the best care at the lowest possible cost.

D. ENSURE:

- Adherence to the law as it relates to rules and health care.
- Guidelines for patient safety.

3. COMMUNITY HEALTH PROMOTER (KNOWLEDGE OF POPULATION HEALTH AND HEALTHCARE SYSTEMS)

Medical graduates need to understand population health and healthcare systems in order to address issues related to population-based primary health care, which includes illness prevention and promotion with a focus on vulnerable groups. The graduates ought to be aware of their responsibilities and capable of acting appropriately to safeguard and advance public health. They ought to be capable of:

- a. Recognize their responsibility and be capable of acting appropriately to safeguard and advance the community's health.
- b. Discuss the relationship between the community's health and the impacts of lifestyle choices, genetic, demographic, environmental, social, cultural, economic, and psychological determinants of health.
- c. Take the necessary steps to avoid infectious diseases, non-communicable injuries, and health problems, as well as to safeguard, preserve, and improve the health of people individually, in families, and in communities.
- d. Assess national and international trends in the morbidity and mortality of socially significant diseases and injuries, the influence of environmental variables and migration on health, and the contribution of national and international health organizations to health status.
- e. Contribute effectively to the healthcare team and show that you understand and accept the duties of other medical professionals in the delivery of care to patients, groups, and communities.
- f. Use a multidisciplinary approach to health-promoting interventions, which call for inter-sectoral cooperation, shared accountability, and partnerships between the medical community and the population they serve.
- g. Apply the fundamentals of health systems, such as organizations, finance, policies, and cost-containment strategies to address the escalating expenses of healthcare, to the treatment of individuals, families, and populations.
- h. Encourage and put into place policies that support fairness in the availability and caliber of healthcare.

4. CRITICAL THINKER (PROBLEM SOLVING AND REFLECTIVE PRACTICE)

Problem solving requires the capacity to critically assess the knowledge, technology, and information currently in use as well as the ability to reflect on it. Graduates in medicine and dentistry ought to be able to show:

- a. Utilizing data that has been gathered and correlated from many sources.
- b. Critical data evaluation (decipher, examine, combine, assess, and decide)
- c. Making informed medical decisions by considering the most recent research and how it relates to various health conditions, while also effectively managing complexity, uncertainty, and likelihood.
- d. Consistently considering their work and the standards of medical practice.
- e. Starting, taking part in, or adjusting to change as needed to guarantee the benefit of the patients and the profession.
- f. Adaptability and an approach to problem-solving
- g. A dedication to quality control and oversight by involvement in chart audits and reporting of significant events in order to enhance medical practice and lower risk to oneself, patients, and the general public.
- h. Bringing up issues with patient safety and public risk.

5. PROFESSIONAL (BEHAVIOR AND PROFESSIONALISM)

Professional values, attitudes, and behaviors that reflect effective medical practice—such as a commitment to lifelong learning, empathy, cultural and religious sensitivity, accountability, probity, ethics, communication skills, and teamwork—are necessary for competent medical graduates. Graduates in medicine ought to be aware of the PMDC competencies. In order to uphold the public's trust, graduates should lead by example and serve as role models for their code of conduct, professionalism, and ideals both on and off the job. Their actions need to increase the public's confidence in the industry.

A. LIFE-LONG SELF-DIRECTED LEARNER:

To be competent and apply new scientific information and skills to their daily medical practice, medical graduates must constantly learn new ones. Through personal development activities and a constant pursuit of new knowledge and technological advancements, they should exhibit a drive for lifelong learning and a commitment to continuing their medical education throughout their professional lives. A medical graduate ought to be qualified to:

- a. Show that you are always growing through consistent self-evaluation.
- b. Ask for input from peers. Up until re-licensure and recertification, this also entails a continual program of accredited, self-directed study and continuous medical education activities.
- c. Effectively manage information to use for decision-making, self-learning, and medical problem-solving:
 - Accurately record and keep track of their practice activities for analysis, improvement, and better patient care.
 - Get data particular to a patient out of a clinical data system.
 - Making use of information and communication technology in accordance with its advantages and disadvantages.
 - Look up, gather, arrange, and evaluate biological and health data from reliable sources and databases.
 - Compare patient data with information found in the literature to make decisions about diagnosis, treatment, prevention, or prognosis, as well as surveillance and status monitoring.
- d. Present proof of ongoing professional development (CPD) by participating in CPD programs in their major discipline or as a professional, or by seeking further training in subjects. Keeping up professional development portfolios can help gather this evidence.

- e. Perform competently in the roles of trainer and mentor in order to evaluate, instruct, and give feedback to students, peers, and coworkers.
- f. React favorably to evaluations and comments.

B. ALTRUISTIC AND EMPATHIC:

When planning or coordinating the best care, medical graduates should be able to exhibit the professional values of empathy, altruism, and cultural sensitivity by adhering to the following guidelines:

- Appropriate manners and attire.
- Accountability, kindness, understanding, truthfulness, and moral rectitude.
- Acceptance of differences.
- A compassionate approach to patients and medical issues.
- Prioritize the needs of the patient over your own.
- Put the safety of your patients first.
- Culturally aware and considerate of all religions.
- Special sensitivity towards vulnerable populations.

C. ETHICAL:

Medical graduates should be able to demonstrate professional values of self and professional accountability, honesty, probity, and ethics.

- a. Without discriminating against anyone based on their age, gender, sexual orientation, color, race, ethnicity, national origin, culture, disability, illness, way of life, marital status, parenting status, religion, or beliefs.
- b. Make an ongoing effort to better both yourself and the healthcare delivery systems.
- c. Honor the patient's and the patient's family's opinions and concerns.
- d. Respect the values of informed consent, patient autonomy, beneficence, non-maleficence, fairness, and secrecy.
- e. When faced with ethical, legal, and professional dilemmas, such as those brought up by financial restrictions, the commercialization of healthcare, and scientific advancements, use moral reasoning to guide your decisions.
- f. Being responsible for maintaining professional and personal standards via audits and performance evaluations, as well as for establishing one's practice and interacting with pharmaceutical companies and other businesses.

D. COLLABORATOR:

To effectively serve the interests of the patient, profession, and institution, the medical graduate should be able to demonstrate collaborative abilities by:

As an efficient team player, must recognize the significance of every role in the group.

Acting with respect and camaraderie among classmates, seniors, juniors, and the medical staff.

Constantly evaluating oneself and other people in light of their roles and acting appropriately.

Disseminating information and transferring responsibility correctly.

Stressing the importance of a cooperative yet analytical approach.

E. COMMUNICATOR:

The medical graduates should be able to demonstrate:

- a. **Nonverbal communication abilities**, such as attentive listening, empathy, and a compassionate demeanor; also, exhibiting thoughtful and tactful conduct when interacting with patients and their families, nurses, other healthcare providers, the community, the public at large, and the media.
- b. **Clear and concise verbal communication**; counseling patients in a sensitive and effective manner; ensuring that patients and families have understood all information so that they can make informed decisions when consenting to any procedure or therapy; providing bad news in a sensitive, effective, and clear manner; handling angry or violent patients; handling difficult situations; and presenting information to patients.
- c. **Proficiency in written and electronic communication**, along with neat, readable, precise, comprehensive, and succinct documentation of prescriptions, medical records, procedural and progress notes, discharge summaries, and referral letters that satisfies all pertinent legal requirements.
- d. **Maintaining confidentiality** while weighing the risk to the public.
- e. **Sharing knowledge and research results** to enhance medical treatment.

6. SCHOLAR AND RESEARCHER

The expectations for medical graduates are to exhibit an open-minded, creative, and research-focused mindset, as well as constructive criticism. The graduates ought to be qualified for:

- a. Determine a researchable issue and conduct a critical literature evaluation.
- b. Condense research topics and develop hypotheses.
- c. Determine which epidemiological study design and which biostatistics analytical tests are best suited to address the research topic.
- d. Gather, examine, and assess data; provide findings.
- e. Exhibit ethical behavior when carrying out research and when possessing intellectual property.

7. LEADER AND ROLE MODEL:

It is required of the medical graduates to have leadership potential and exemplary behavior in:

- Improving medical care.
- Improving instruction in medicine.
- Using methods and evidence from science to initiate, engage in, and adapt to change.
- Building the public's confidence in the medical and dental fields by serving as outstanding role models both at work and on the weekends.
- Taking on leadership positions when necessary.
- Acting as a leader in matters pertaining to society.

STEP 4: EDUCATIONAL ROADMAP FOR PRODUCING A SEVEN-STAR DOCTOR

These guidelines are meant to facilitate the development of educational plans to accomplish desired competencies as defined by PM&DC:

- Medical universities shall preferably implement a hybrid or integrated curriculum, at least at the level 7 (correlation) of Harden's Integration ladder.
- The curricular document should outline principles of curricular organization to clarify how different subjects will combine to promote comprehensive learning.
- Distribution of curricular hours among different subjects of basic and clinical sciences will be as per PM&DC recommendations. Curricular plan will span over minimum 6200 hours of teaching medical subjects.
- Instructional tools for information transfer should be student-centered to groom the student to be a self-directed learner.
- Joint sessions of basic and clinical subjects should be integral component of timetable where facilitators from different specialties will combine to exhibit clinical problem solving through contributions from different learning domains.
- Early Clinical Exposure (ECE) from the first year of professional education should be included to facilitate understanding of basic sciences through applied and practical information transfer. Suggested plan for ECE is as under:
 - **Year I;** Integrated sessions and relevant patient exposure on campus
 - **Year II;** Hands-on training in a controlled environment, such as a skill lab/simulation, Bench to bedside teaching
 - **Year III;** Clinical environment in-patient, outpatient clinics, Accident & Emergency
- Humanities and elective rotations outside the parent institution and affiliated hospital may be incorporated in the curricular plan for the development of a visionary professional.

1. Cognitive Domain:

- Instructional strategies employed for knowledge transfer should be student centered focusing on principles of active learning e.g., Problem-Based Learning, Case-Based Learning, Team-Based Learning, and Directed Self Learning. Teaching should promote group activities in the form of small group discussion, assignments to encourage teamwork, collaboration and peer-assisted learning among students.

2. Psychomotor Domain:

- Skills training will be carried out in laboratories, skill labs, and bedside/chairside. Curriculum will have clearly defined learning outcomes for skill acquisition. It will ensure opportunities for students to first observe, then do hands-on training under supervision, with provision of corrective feedback during practice, followed by supervised, independent performance with due care for patient safety.
- Sufficient opportunities for practice, feedback, and remediation should be provided to students for skill development.
- During clinical training, students should actively participate in ward rounds, patient care in the outpatient department, and in Accident and Emergency under the close supervision of clinical teachers to allow real-life experience and contextual learning.
- Log of clinical activities and procedures shall be maintained (clerkship portfolios)

3. Affective Domain:

- Training in affective domain should get its due share in curriculum. Institutions should have dress codes, clearly conveyed rules and regulations, and policies in handling misbehavior, bad conduct and negligence.
- Institutions will maintain a proper record of student attendance, participation in academic activities, performance in term and annual assessments. This record will be used for student appraisal. Students will be counselled in case of unsatisfactory performance with feedback and identification of corrective measures.
- Longitudinal themes like Behavioral Science, Professionalism, Ethics, Leadership, and patient safety will be an essential component of curriculum to develop a competent professional.
- Behavioral sciences will be taught using tools like role play, incident reporting and reflective exercises to produce a well-behaved professional.

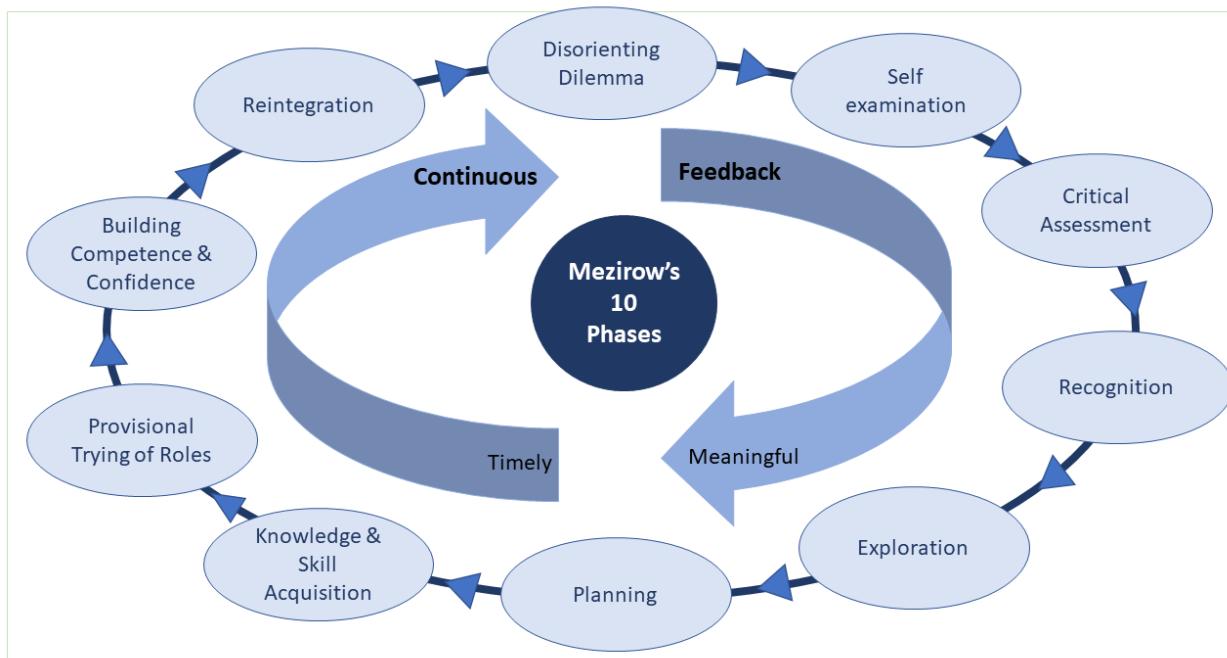
4. Assessment Domain:

- Curriculum must have clearly outlined assessment plan. Both formative and summative assessments should be part of the curriculum.
- Summative assessments at the end of the session in form of a professional examination should include assessment of knowledge, skill, and attitude in accordance with their weightage in the curriculum. Diverse assessment tools should be used to ensure high validity and reliability. Assessment must reflect the achievement of each outcome.
- As assessment drives learning, the distribution of questions should be in line with table of specifications.
- Transparency, security and secrecy of examination are responsibility of examining body. Institutions should have clearly documented policies to avoid leakage of paper, cheating, and fraud during examinations.
- Summative examination papers should be ready at least one month before the examination date. It should be finalized by senior faculty members of the subject, including members(s) from outside the institution. At least two papers should be prepared for the subject to be examined, and the controller of examinations should decide which paper will be put up for examination.
- Pre & Post hoc analysis should be conducted to improve the validity & reliability of an exam
- Examination department along with the Medical Educationist, will utilize this analysis for continuous improvement of their examination. The examination department will use post-exam analysis for continuous improvement of the process, by seeking guidance from subject specialists. The result should be declared after critical analysis
- Institutions should develop their own question bank for each subject being taught. Faculty members should regularly contribute questions throughout the academic year to this bank. Committee of subject specialists should regularly scrutinize these questions for quality before selection for examination.
- In addition to summative assessments, term/ end of block / end of rotation assessments should be planned in curriculum during the year to promote learning. Results of these term/ end of block / end of rotation assessments should get 20% weightage in result. Curriculum should clearly define timing of assessments, content to be examined and assessment tools to be used for it.

SCOPE OF INTEGRATION

Curricular reforms and program assessments are essential for maintaining learning, implementing innovations, contextualizing educational processes with societal needs, and keeping pace with technological and healthcare advancements. Muhammad Medical College wholeheartedly supports these change-inducing factors, and the university's goal is consistent with such dynamic maintenance.

These days, a century-old idea—which was based on Flexner's study and divided the field into pre-clinical and clinical stages—is giving rise to emerging paradigms of integration across disciplines and years. Another foundation for curriculum revisions is Mezirow's notion of "transformative learning," which is based on developing dynamic interactions between teachers and students as well as a common body of knowledge to support student learning and personal development.



The nationally mandated competencies of seven-star physicians are aligned with the outcomes of the MBBS program through the use of a modular, integrated curriculum. The program's results are comparable to those that the country's regulatory bodies have received from MBBS graduates thus far. The seven-star competencies are translated into the session-specific learning results by the curriculum outcomes. The objectives are broken down into smaller goals that represent the three learning domains. These goals are then graduated in spirals and horizontally integrated to foster higher-order thinking, professional approach acquisition, practical knowledge with a broad base, and learner curiosity.

Integrating a component of individual learning into larger practices and group learning scenarios is another facet of curriculum design that has been maintained.

MITs that encourage the growth of individual learning inclinations include PBL and small-group discussions.

Early clinical exposure is necessary for practicality and applied knowledge, and this has been the main consideration in developing the spiral of Clinical Skills Foundation, Rotation, and Clerkships. Even with its limitations, an early clinical exposure over the first two years fosters interest and creates clinical learning contexts.

TEACHING HOURS FOR UNDERGRADUATE MEDICAL EDUCATION (MBBS) CURRICULUM

Preclinical and Para-clinical Sciences = 2875 Clinical Sciences (Medicine and allied) = 1700

Clinical Sciences (Surgery and allied) = 1625 Grand

Total: 2875+1700+1625 = 6200 Hours

| Subject | Hours |
|--|--------------|
| Anatomy | 500 |
| Physiology | 450 |
| Medical Biochemistry | 250 |
| Pharmacology & Therapeutics | 300 |
| Pathology | 500 |
| Community Medicine and Public Health | 200 |
| Basics of Radiology | 25 |
| Research and EBM | 100 |
| Pakistan Studies/ Ideology and Pakistan Constitution | 25 |
| Islamiyat /Ethics for Non-Muslim | 25 |
| Quran Kareem Introduction | 50 |
| to Computer Expository | 25 |
| Writing Leadership | 25 |
| Professionalism | 25 |
| Arts & Humanities (one course) Communication | 25 |
| Skills | 25 |
| Co-curricular activities | 25 |
| | 200 |
| Forensic medicine and toxicology | 100 |
| Total | 2875 |

SURGERY & ALLIED

| Subject | Hours |
|--|-------------------|
| General Surgery | 600 |
| Anesthesia | 50 |
| Critical care | 50 |
| Orthopedics & Trauma | 100 |
| Any three of the sub-specialties: | |
| • Urology, Neurosurgery, Thoracic Surgery, Paediatric Surgery, Plastic Surgery, Vascular Surgery | 225 (75 hrs each) |
| Ophthalmology | 150 |
| Otorhinolaryngology | 150 |
| Gynaecology and Obstetrics | 300 |
| Total | 1625 |

| MEDICINE & ALLIED | |
|--|------------------|
| Subject | Hours |
| General Medicine | 600 |
| Psychiatry & Behavioral Sciences | 150 |
| Emergency Medicine & Critical Care | 25 |
| Dermatology | 50 |
| Cardiology | 50 |
| Pulmonology | 50 |
| Nephrology | 50 |
| Gastroenterology | 50 |
| Medical Oncology | 25 |
| Patient Safety Infection Control | 25 |
| Family Medicine | 75 |
| Any three of the sub-specialties: (For clinical rotations) Neurology, Endocrinology, Rheumatology, Geriatrics, Paediatric Cardiology | 225 (75 each) |
| Paediatrics and Neonatology | 300 |
| Total | 1700 |

Total = 6200 Contact hours

STANDARD 1 & 2: MISSION STATEMENT OF MMC & VISION OF ISUM/MMC & LUMHS

MISSION STATEMENT OF MOHAMMAD MEDICAL COLLEGE (MMC)

Nurturing students' potential by providing them the highest quality education, thereby producing individuals with strong values, compassion, **inclusiveness, leadership** and professionalism, emphasizing community engagement, particularly with marginalized segments of the rural population, encouraging students to become empathetic and socially responsible professionals by training them in the best evidence- based practice, capable of contributing to advancements through research and innovation.

VISION OF MOHAMMAD MEDICAL COLLEGE (MMC)-ISUM

To be an internationally recognized institution, famous for its ethical work, emphasizing the importance of integrity, honesty and moral principles, highlighting the University's commitment to serving the community and producing unbiased and empathetic educated people, **who are inclusive and have leadership skills**, encouraging them to engage in research, critical thinking, innovation and evidence-based best practices.

VISION OF LIAQUAT UNIVERSITY OF MEDICAL AND HEALTH SCIENCES (LUMHS)

Liaquat University of Medical and Health Sciences (LUMHS) seeks to be a top-tier healthcare Institution, producing ingenious academic leaders, medical researchers, and health care advocates to serve the global community.

MBBS PROGRAM OUTCOME

By the end of the Five years of MBBS program at MUHAMMAD MEDICAL COLLEGE, aims to produce Medical graduates who are able to:

1. Recognize signs and symptoms of common illnesses in the population of different ages from different settings, and provide cost effective treatment to alleviate suffering
2. Construct an integrated knowledge of organ, structure, function and its regulatory mechanism through integrated learning.
3. Generate competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
4. Exhibit ethical patient-centred care based on Integrity, humility, social accountability and high ethical values of this sacred profession
5. Become an exemplary citizen by observing medical ethics and fulfilling social and professional obligations, responding to national aspirations.
6. Formulate a management plan by taking a focused history, performing physical examination, derive clinical decision making and evaluating laboratory tests, imaging investigations to interpret the results of common health ailments.
7. Counsel on health promotion to improve the health of individuals, and families including marginalized population.
8. Demonstrating professional behaviors that embody lifelong learning, altruism, empathy and cultural sensitivity in the provision of healthcare services.
9. Engage in research activity aimed at improvement of quality of health care including behavior modification of individual and community for quality life.
10. Developing a scientific temper by acquiring continuous educational experience for proficiency in profession and promoting healthy living of the individual and population at large by critically analyzing the situation.
11. Commit to lifelong learning to keep up to date with developments in clinical practice and trends in disease at the population level by strong leadership and management skills.
12. Applying evidence-based practices for protecting, maintaining and promoting the health of individuals, families, and community.

MISSION STATEMENT OF MMC & VISION OF ISU/MMC & LUMHS

One of the difficulties that any medical/dental college faces in the transition period while switching from one University to another, is aligning the vision and mission of the two universities with the program outcome & Bloom's taxonomy. As Muhammad Medical & Dental Colleges' programs are well aligned with the LUMHS' vision and mission, and in near future, they have to be aligned with the ISU's vision and mission, we expect that a fair amount of work will be needed. However, there are striking similarities in the contents and directions of the vision and mission of the two universities. These may be due to the following facts

- Both are offering the same programmes of MBBS & BDS.
- Both are working in lines and directions given by the same regulatory bodies (PMDC).
- Both are working to produce a Global Five Star Doctor award, first described by Dr Charles Boelen, then of WHO, in 2000, and is judged on the following five criteria:
 1. A CARE PROVIDER, who considers the patient holistically as an individual and as an integral part of a family and the community, and provides high- quality, comprehensive, continuous, and personalized care within a long- term, trusting relationship.
 2. A DECISION MAKER, who makes scientifically sound judgments about investigations, treatments and use of technologies that take into account the person's wishes, ethical values, cost-effective considerations, and the best possible care for the patient.
 3. A COMMUNICATOR, who is able to promote healthy lifestyles by effective explanation and advocacy, thereby empowering individuals and groups to enhance and protect their health,
 4. A COMMUNITY LEADER, who, having won the trust of the people among whom he or she works, can reconcile individual and community health requirements, advise citizen groups, and initiate action on behalf of the community.
 5. A MANAGER, who can work harmoniously with individuals and organizations both within and outside the health system to meet the needs of individual patients and communities

EXPECTED COMPETENCIES IN MEDICAL GRADUATES

Pakistan Medical and Dental Council is the main governing and statutory body that ensures the ethical and standardized medical teaching, learning, and practice all over the country. One of the major achievements of this council is to establish seven core competencies that a Pakistani doctor should achieve upon graduation, and it is named as PMDC's Seven Star Doctor. These include all 7 attributes of a 5-star doctor and add it to include researcher and lifelong learner. These attributes are meant to warrant the standardization and uniformity among the medical graduates.

1. Care Provider.
2. Decision Maker.
3. Communicator.
4. Community Leader.
5. Manager.
6. Researcher
7. Lifelong learner.

| ALIGNMENT OF MMC MISSION WITH PMDC SEVEN-STAR COMPETENCIES AND CURRICULUM IMPLEMENTATION PILLARS OF SRMLG | | | | | | | |
|---|--------------------------------------|--|--|-----------------------------------|---|--------------------------------------|--|
| MUHAMMAD MEDICAL COLLEGE, MIRPURKHAS | | | | | | | |
| ALIGNMENT OF MMC MISSION STATEMENT WITH LUMHS VISION WITH ISUM VISION | | | | | | | |
| ALIGNMENT OF MMC MISSION AND MBBS PROGRAM OUTCOME WITH ISUM VISION | | | | | | | |
| ALIGNMENT OF MBBS PROGRAM OUTCOME WITH KNOWLEDGE, ATTITUDES, AND SKILLS | | | | | | | |
| LUMHS VISION | ISUM/MMC VISION | MMC MISSION | MBBS PROGRAM OUTCOMES | BLOOMS TAXONOMY | PMDC COMPETENCIES | SRMLG | YEAR OF IMPLEMENTING |
| Top-tier Healthcare Institution | Internationally Recognized Institute | Highest quality education | <p>1. Recognize signs and symptoms of common illnesses in populations of different ages from different settings, and provide cost-effective treatment to alleviate suffering</p> <p>2. Construct an integrated knowledge of organ structure, function, and its regulatory mechanisms through integrated learning</p> <p>3. Generate competence in the practice of holistic medicine, encompassing promotive, preventive, curative, and rehabilitative aspects of common diseases</p> | Cognitive, Affective, Psychomotor | <p>Lifelong Learner, Care Provider, Decision Maker, Community Leader, Communicator, Manager, Researcher</p> | SURVIVE, Daily Mobile Health Clinics | First Year, Second Year, Third Year, Fourth Year, Final Year |
| Producing Ingenious Leaders | Famous for Ethical Work | Producing individuals with strong values | <p>4. Exhibit ethical patient-centered care based on Integrity, humility, social accountability, and high ethical values of this sacred profession</p> | Cognitive, Affective, Psychomotor | <p>Leader, Manager, Decision Maker</p> | SURVIVE, Daily Mobile Health Clinics | First Year, Second Year, Third Year, Fourth Year, Final Year |
| | Importance of Integrity, | Compassion Professionalism | 5. Become exemplary citizens by observing medical ethics and | Cognitive, Affective, | | SURVIVE, Mentoring, Daily | |

| | | | | | | | | |
|-------------------------------|---|---|---------------------------------|---|-----------------------------------|--|---|--|
| | Honesty, and Moral Principles | | | fulfilling social and professional obligations, responding to national aspirations | Psychomotor | Communicator, Community Leader, Decision Maker | Mobile Health Clinics, Annual Symposium, Annual Gastroenterology Conference | First Year, Second Year, Third Year, Fourth Year, Final Year |
| To serve the global Community | Commitment to Serving the Community | Emphasizing community engagement | segment of the rural population | <p>6. Formulate a management plan by taking a focused history, performing a physical examination, derive clinical decision-making by evaluating laboratory tests and imaging investigations to interpret the results of common health ailments.</p> <p>7. Counsel on health promotion to improve the health of individuals and families, including the marginalized population.</p> | Cognitive, Affective, Psychomotor | Community Leader, Researcher, Communicator | Daily Mobile Health Clinics, Annual Symposium | First Year, Second Year, Third Year, Fourth Year, Final Year |
| | Producing Unbiased and Empathetic Educated People | Become Empathetic | | 8. Demonstrating professional behaviors that embody lifelong learning, altruism, empathy, and cultural sensitivity in the provision of health care services. | Cognitive, Affective, Psychomotor | Lifelong Learner, Care Provider, Decision Maker, Community Leader, Communicator, Manager, Researcher | Mentoring, Daily Mobile Health Clinics, Annual Symposium | First Year, Second Year, Third Year, Fourth Year, Final Year |
| Medical Researchers | Engaged in Research | Contributing to advancements through research | | 9. Engage in research activity aimed at improving the quality of health care, including behavior modification of individuals and communities for a quality life. | Cognitive, Affective, Psychomotor | Researcher | Daily Mobile Health Clinics, Annual Symposium | First Year, Second Year, Third Year, Fourth Year, Final Year |
| | Critical | | | 10. Developing a scientific temper by acquiring continuous educational experience for proficiency in the profession and promoting healthy living of the individual and population at | | Community Leader, Researcher, Communicator, Decision Maker | SURVIVE, Mentoring, Daily Mobile Health Clinics, Annual | First Year, |

| | | | | | | | | |
|----------------------|-------------------------------|------------------------------------|------------|---|-----------------------------------|------------------------------|---|--|
| Healthcare Advocates | Thinking | Socially responsible professionals | | large by critically analyzing the situation. | Cognitive, Affective, Psychomotor | | Symposium, Annual Gastroenterology Conference | Second Year, Third Year, Fourth Year, Final Year |
| | Innovation | Training | Innovation | 11. Commit to lifelong learning to keep up to date with developments in clinical practice and trends in disease at the population level by strong leadership and management skills. | Cognitive, Affective, Psychomotor | Lifelong Learner Researcher, | SURVIVE, Mentoring, Daily Mobile Health Clinics, Annual Symposium, Annual Gastroenterology Conference | First Year, Second Year, Third Year, Fourth Year, Final Year |
| | Evidence-Based Best Practices | Best Evidence-Based Practice | | 12. Applying evidence-based practices for protecting, maintaining, and promoting the health of individuals, families, and communities. | Cognitive, Affective, Psychomotor | Lifelong Learner Researcher, | Daily Mobile Health Clinics, Annual Symposium | First Year, Second Year, Third Year, Fourth Year, Final Year |

Hence, once we have aligned the vision and mission of the one university with the program outcome & Bloom's taxonomy, we find that it is in line with the vision and mission of the other university too.

| ISU VISION | ISU MISSION |
|---|--|
| To be an internationally recognized institution, famous for its ethical work, emphasizing the importance of integrity, honesty and moral principles, highlighting the University's commitment to serving the community and producing unbiased and empathetic educated people, who are inclusive and have leadership skills, encouraging them to engage in research, critical thinking, innovation, and evidence-based best practices. | Nurturing students' potential by providing them with the highest quality education, thereby producing individuals with strong values, compassion, and inclusiveness, leadership and professionalism, emphasizing community engagement particularly with marginalized segments of rural population, encouraging students to become empathetic and socially responsible professionals by training them in the best evidence-based practice, capable of contributing to advancements through research and innovation. |

STEP 5: CURRICULUM IMPLEMENTATION

For Curriculum Implementation, a curricular committee was developed and comprised of the principal of Muhammad Medical College (MMC), all subject specialists, and Medical Educationists to suggest methodologies to cultivate a curriculum. Various learning strategies were incorporated, such as interactive lectures, tutorials, case-based learning, PBLs, self-directed learning, and directed self-learning. All teaching strategies are interactive & small group format. In addition, non-formal experiential learning for students is promoted by CME. All this has been structured taking into account the Best Evidence-Based Medical Education literature and our local culture and context.

Moreover, the Electives are not part of the curriculum. Students can avail electives whenever he/she has completed the Academic Contact Session and during vacations. PERLs (Professionalism, Ethics, Research, and Leadership Skills) are part of the Curriculum and will be taught every year. Formative and summative evaluations are used to evaluate the students; internal exams receive 20% of the total weight, while university-conducted professional exams receive 80% of the weight.

No transformation is possible without the involvement of a dedicated faculty and staff, who took on the task with unfathomable zeal and through their efforts, the outcomes that initially were thought to be a dream took on the shape of reality.

CURRICULAR COMMITTEE STRUCTURE

INTRODUCTION:

Muhammad Medical College strives to create a supportive learning environment that supports student learning, encourages professionalism, and prepares students for lifelong self-directed learning in accordance with the Pakistan Medical & Dental Council requirements.

PURPOSE:

The Muhammad Medical College Curriculum Committee's goals are to:

1. Create, administer, and assess curriculum that meets PMDC criteria, reflects current medical knowledge and practice, and both.

2. To guarantee that the five-year MBBS program's learning objectives are met and are based on PMDC's seven-star doctor's ideology

RESPONSIBILITIES:

The Curriculum Committee is in charge of three things. The PMDC's accreditation requirements and the Muhammad Medical College's overarching goal are followed in carrying out these duties.

- 1) Organizing and creating the curriculum.
- 2) Management and implementation of curricula
- 3) Reviewing and revising the curriculum.

To achieve these goals, the curriculum committee has to:

- Participate in curriculum meetings and work in tandem with the medical education and research department
- Establish the general goals, the substance of the curriculum, and the pedagogical framework for the MBBS curriculum.
- Provide enough time (i.e., teaching hours) to meet the learning objectives in accordance with PMDC criteria
- Suggest allocating resources appropriately to guarantee that teaching and learning approaches adhere to national and international standards.
- Create evaluation procedures that adhere to the fundamentals of medical education.
- The Curriculum Committee will routinely evaluate the curriculum and its components to ensure ongoing quality improvement.
- Evaluations and results of board performance, courses, clerkships, and teachers are taken into account by the Curriculum Committee while assessing the caliber of the curriculum.
- To make sure that learning objectives are appropriate and clearly stated, course content is relevant, methods are matched to the level of learning, appropriate reinforcement is included, and needless redundancy is eliminated, there are multi-source, periodic, systematic reviews of the design, content, and instruction in each course
- Faculty development programs, coaching and feedback, and systematic faculty assessments are among the resources and tools that are given to them so they can become successful educators

The Curriculum Committee has the authority to organize subcommittees comprising of teachers, staff, and students who possess particular knowledge or abilities to aid in the committee's work in creating, overseeing, and enhancing the curriculum.

SRMLG SYSTEM IN ISUM FOR CURRICULUM IMPLEMENTATION

The Medical Education department of ISUM & MMC has worked hard to achieve the following goals:

- A. To develop a curriculum that fulfils the directions of PM&DC as well as LUMHS & ISU vision and mission simultaneously.
- B. To develop a plan and system to execute and monitor the curriculum that achieves the core competencies described by the WHO & PM&DC, and yet take into account local dynamics, resources, limitations, strengths, and weaknesses.
- C. SRMLG System was developed to fulfill the guidelines of PMDC, LUMHS and ISUM Vision and Mission and to smoothly implement the curriculum.

| IMPLEMENTATION OF CURRICULUM THROUGH SRMLG | | | |
|---|--------------|-----------|------------|
| S. N | FIVE PILLARS | PMDC Core | MBBS-Class |

| | | Competencies | |
|---|--|---|--|
| 1 | Survive | Lifelong Learner | First Year, Second Year, Third Year, Fourth Year, Final Year |
| 2 | Weekly mentoring program | Care Provider, Communicator | First Year, Second Year, Third Year, Fourth Year, Final Year |
| 3 | Daily Mobile Clinics by Students | Care Provider Decision Maker Community Leader Communicator | Fourth Year, Final Year |
| 4 | LBAS, or “Learner Based Annual Symposia | Decision Maker Community Leader Communicator Researcher Manager | First Year, Second Year, Third Year, Fourth Year, Final Year |
| 5 | GSAT” Annual “Gastroenterology session with Students as Teachers. Conducted by Prof. Dr. Syed Zafar Abbas. | Communicator, Researcher, Care Provider Manager, | Fourth Year, Final Year |

A. FULFILLING THE DIRECTIONS OF PM&DC AS WELL AS LUMHS & ISUM VISION AND MISSION:

One of the difficulties that any medical/dental college faces in the transition period while switching from one University to another is aligning the vision and mission of the two universities with the program outcome & Bloom’s taxonomy. As Muhammad Medical & Dental Colleges’ programs are well aligned with the LUMHS’ vision and mission, and in the near future, they have to be aligned with the ISU’s vision and mission, we expect that a fair amount of work will be needed. However, there are striking similarities in the contents and directions of the vision and mission of the two universities. These may be due to the following facts

- Both are offering the same programmes of MBBS & BDS.
- Both are working in lines and directions given by the same regulatory bodies (PMDC).
- Both are working to produce a Global Five Star Doctor award, first described by Dr Charles Boelen, then of WHO, in 2000, and is judged on the following five criteria:
 1. A **CARE PROVIDER**, who considers the patient holistically as an individual and as an integral part of a family and the community, and provides high-quality, comprehensive, continuous, and personalized care within a long-term, trusting relationship.
 2. A **DECISION MAKER**, who makes scientifically sound judgments about investigations, treatments and use of technologies that take into account the person’s wishes, ethical values, cost- effective considerations, and the best possible care for the patient.
 3. A **COMMUNICATOR**, who is able to promote healthy lifestyles by effective explanation and advocacy, thereby empowering individuals and groups to enhance and protect their health.
 4. A **COMMUNITY LEADER**, who, having won the trust of the people among whom he or she works, can reconcile individual and community health requirements, advise citizen groups, and initiate action on behalf of the community.
 5. A **MANAGER**, who can work harmoniously with individuals and organizations both within and outside the health system to meet the needs of individual patients and communities

Pakistan Medical and Dental Council (PMDC) is the main governing and statutory body that ensures the ethical and standardized medical and dental teaching, learning, training, and practice all over the country. One of the major achievements of this council is to establish 7 core competencies that a Pakistani doctor should achieve at the time of his/her graduation and named it as PMDC's seven-star doctor. These include all 7 attributes of a 5-star doctor and add it to include researcher and lifelong learner. These attributes are meant to warrant the standardization and uniformity among the medical graduates.

1. Care Provider.
2. Decision Maker.
3. Communicator.
4. Community Leader.
5. Manager.
6. Researcher.
7. Lifelong learner.

Hence, once we have aligned the vision and mission of the one university with the program outcome & Bloom's taxonomy, we find that it is in line with the vision and mission of the other university too.

| LUMHS'S VISION | ISU VISION | LUMHS'S MISSION | ISU MISSION |
|---|---|--|--|
| Liaquat University of Medical & Health Sciences seeks to be a top-tier healthcare institution, producing ingenious academic leaders, medical researchers, and healthcare advocates to serve global community. | To be an internationally recognized institution, famous for its ethical work, emphasizing the importance of integrity, honesty and moral principles, highlighting the University's commitment to serving the community and producing unbiased and empathetic educated people, who are inclusive and have leadership skills , encouraging them to engage in research, critical thinking, innovation and evidence- based best practices. | Fostering ideal learning environment to ensure modern scientific evidence-based practices by imparting critical knowledge, analytical and psychomotor skills, and professional dedication among healthcare students, under the umbrella of virtuous professional, moral and ethical standards. | Nurturing students' potential by providing them highest quality education thereby producing individuals with strong values, compassion, inclusiveness, leadership and professionalism, emphasizing community engagement particularly with marginalized segments of rural population, encouraging students to become empathetic and socially responsible professionals by training them in the best evidence- based practice, capable of contributing to advancements through research and innovation. |

B. DEVELOPING A PLAN AND SYSTEM TO EXECUTE AND MONITOR THE CURRICULUM:

Some people like to fondly remember these pillars by "Syed Razi Muhammad's Learning Group" (SRMLG). Ibn e Sina University, Mirpurkhas (ISUM) is a newly formed University, which is the first university of Mirpurkhas Division. It follows a vertically integrated modular system. There are 37 modules divided in 5

years of MBBS Curriculum and 16 modules in four years of BDS program. Each year has an average of 36 to 40 weeks of studies. Weekly plan is organized as a “theme”.

Regular classes, practicals, clinics, and hospital duties are amply supported by 5 pillars that contribute to the high standards of this first-ever university of Mirpurkhas division. These pillars include:

1. “**Survive**” a three-pronged system of weekly tests, assignments and post-test discussions.
2. “**RLSE**” or “Running Lives by Sharing Experiences”, a weekly mentoring program.
3. “**MCS**” or daily “Mobile Clinics by Students”.
4. “**LBAS**”, or “Learner Based Annual Symposia”.
5. “**GSAT**” Annual “Gastroenterology session with Students as Teachers”. Conducted by Prof. Dr. Syed Zafar Abbas.

Some people like to fondly remember these pillars by “Syed Razi Muhammad’s Learning Group” (SRMLG).

After doing my fellowships and training in Surgery, I have spent the last 3 decades reading, studying and attending seminars, workshops and courses in medical education. This involves completing my courses of certificate, diploma, and master's in medical education from the University of Dundee. Currently, I am engaged in doing PhD in Medical Education from the University of Cyberjaya, Malaysia.

While we continue to learn and benefit from the research and innovation of others (no need to reinvent the wheel or rediscover the laws of motion), we must remember our own situations, culture, and values and not neglect our strengths and weaknesses while developing our systems. This is exactly what we have done in developing our vision, mission and goals. If you go through them, you will appreciate that the above pillars are the powerful tools to achieve them. In a day and society, where copy & paste practices, plagiarism, and recently letting the artificial intelligence replace the original and critical thinking, ISUM can take some pride in SRMLG. I am proud of my team to understand, participate and take forward this unique system which has raised the standard of learning, improved the results (Muhammad Medical College received the first prize in Sindh this year in innovation, by the Pakistan Association of private Medical & Dental Institutions or PAMI and empowered the learners of ISUM.

1. “SURVIVE”, A THREE-PRONGED SYSTEM OF WEEKLY TESTS, ASSIGNMENTS AND POST-TEST DISCUSSIONS

The University of Dundee uses Moodle which is a learning management system (LMS). At Dundee, all communications, announcements, submission of assignments and dissertations, their assessments and grading and academic chats between teachers and students take place within Moodle. While using this model, in ISUM, Moodle is used for all 3 strategies (weekly tests, assignments and post-test discussions).

Survive is a weekly test (assessment) framework and is a time-tested tool that has been implementing in MBBS & BDS Program since March 2020. In different times, it has used the components of F2F, Hybrid and Online methods. It started at the time of COVID and has continued since then in various forms. Each year is divided into 40 weeks, and hence it has seen 215 weeks at the time of writing.

Like any new thing, this idea of turning to massive online learning through “Survive” was also looked at with suspicion. There was resistance from some of the faculty members and students. They thought that online learning was probably some inferior sort of learning.

آئین نو سے ڈرنا، طریز کہن پے اڑنا
منزل یہی کٹھن پے، قوموں کی زندگی میں

I had to assert that the reality was quite the opposite. I presented the following studies to prove my point of view.

- a. **Brandon-Hall Study**- This study showed that online learning saves 40-60% of learner's time than learning the same material in a F2F setting. The quality of learning is also improved by online learning.
- b. **The Research Institute of America**- Online learning enhances the rate of **retention by 25% to 60%** while retention rates of F2F learning is only 8% to 10%. It may be due to the fact that an online learner can refer back to the learning material again and again at his/her convenience.
- c. IBM has recently discovered that online learners learned almost **five times more content during the same time as F2F learners**.
- d. Britain's Open University's study has discovered online courses consume 90% less energy and releases 85% less CO2 emissions per student than F2F learning. (Knowledge Direct Web).

At the beginning, during the COVID Pandemic, we had no time to formally train our faculty or students. However, our WhatsApp groups and Facebook pages came in handy and we (Me and Mr. Zubair) started writing posts and interacting with the faculty and students on a daily basis (actually hourly basis), answering their queries, writing guidelines and recording short videos to illustrate our points and train our students and faculty.

In the initial days, I had to check assignments and make MCQs for many subjects. Slowly and gradually students started joining in. This was a very busy time. I trained two of my junior doctors (Dr. Saba and Dr. Hyder) and they proved a wonderful support. Still, I had to submit assignments of individual students (who emailed or Whatsapped them to me), guided them how to reduce the size of assignments and adopted techniques to avoid plagiarism. The dates of submission had to be extended many times. Few frustrated students got aggressive and had to be controlled with a carrot and stick approach. Some students wanted to avoid assignments as it consumed lots of time. However, I made it clear that:

- Assignments will continue in the current mode and will have to be submitted by everyone.
- We will discuss the problems and difficulties, but we will remain positive and boost each other's morale like a true family does. Students can share their frustration and depression by personally messaging me or a teacher. But on the general forum, only positive and morale-boosting posts should be shared.

The schedule of assignments and tests on the portal will be strictly followed in spirit and order. No teacher, senior or junior, will change anything (in fact, only the Principal and the head of IT department have comprehensive administrative rights to edit anything on the portal). If some change is necessary, the teacher will discuss with the principal and that too much before the assignment is due, and then the Principal will make the necessary amendment.

- Only standard textbooks will be followed. Students should not follow the substandard books which largely discourage the concepts and promote rote learning. This goes much beyond destroying the understanding of a subject. It adversely affects one's mindset, thinking, character and personality too.
- Plagiarism will not be accepted. Copy and paste culture will be discouraged. Hence students must make assignments in their own handwriting and then make a pdf of the entire assignment and submit it in one piece. The size of the file may have to be reduced by using the proper software.

- Students & faculty have been strongly advised to get a good internet connection. They have been encouraged to discuss within the family and peers to improve their IT skills. No professional, including doctors, can progress in today's world without good IT skills.

Unfortunately, our educational system does not promote higher levels of cognition and affective domains. It merely promotes passive learning and rote memorization. As a result, most of the teachers and students rely on passive lectures and on substandard books which merely stress on remembering and recalling the facts until the examinations are over. Imagine how useless the information that the student memorizes with endless effort is, that:

1. Is easily accessible on google
2. Students are going to forget it soon anyway.
3. Is of no use in data interpretation and problem solving.

Our system is riddled with the old and outdated ideas. This can produce the followers and not the leaders. These results in producing the graduates who remember the long lists and facts but cannot think, inquire, create or lead. Examination system also favors people who are good in rote memorization. This has flooded the shops with substandard books from the poorly qualified people who have not mastered the subject but worked to find tricks to rote memorize the facts, so these facts can be spilled on the examination papers. Teachers enjoy the role of the sage who cannot be questioned and is the epitome of the entire system.

The world of education has gone through a paradigm shift with Benjamin Bloom (1956) publishing his work 64 years ago suggesting three domains of learning, i.e.: The cognitive domain (6 sub domain), the affective domain (5 sub domain) and the psychomotor domain (7 sub domain).

1. The cognitive domain (knowledge-based)

- b. Knowledge (Remember)
- c. Comprehension (Understand)
- d. Application (Apply)
- e. Analysis (Analyze)
- f. Synthesis (Create)
- g. Evaluation (Evaluate)

2. The affective domain (emotion-based)

- a. Receiving
- b. Responding
- c. Valuing
- d. Organizing
- e. Characterizing (Internalizing)

3. The psychomotor domain (action-based)

- a. Perception
- b. Set
- c. Guided response
- d. Mechanism
- e. Complex overt response
- f. Adaptation
- g. Origination

Our educational system still favors only knowledge and sometimes comprehension subdomains. Higher levels of cognition and affective domains are largely ignored and resisted.

Internationally, the passive learning is seen as a waste of time, and the center of learning has shifted from the teacher (facilitator) to the student (active learner). Alison King (1993) has given it a name in her work **“From Sage on the Stage to Guide on the Side”**. She writes:

“In most college classrooms, the professor lectures and the students listen and take notes. The professor is the central figure, the “sage on the stage,” the one who has the knowledge and transmits that knowledge to the students, who simply memorize the information and later reproduce it on an exam—often without even thinking about it—assuming that the student’s brain is like an empty container into which the professor pours knowledge. Students are passive learners rather than the active ones. Such a view is outdated and will not be effective in the twenty-first century, when individuals will need to think for themselves, pose and solve complex problems, and generally produce knowledge rather than reproduce it.”

She further writes:

“Active learning simply means getting involved with the information presented—really thinking about it (analyzing, synthesizing, evaluating) rather than just passively receiving it and memorizing it. Active learning usually results in the generation of something new, such as a cause-effect relationship between two ideas, an inference, or an elaboration, and it always leads to deeper understanding.”

Daniel H Pink (2005) has endorsed King’s point by saying that the world has now moved from the “Information Age” or the “Industrial Age”, and we now live in “The Conceptual Age”. Erica McWilliam’s (2009) has produced her famous work “The 21st Century Teacher: From Sage- to Guide- to Meddler.” While she accepts that learning should be active and learner (student) based, she remains very critical of the idea of a teacher withdrawing from learning process to allow the students to be more active. She writes:

“Many of the teachers who see themselves as Guide are as unlikely to be “fascinating” as they are to be “challenging”. In reality, we have seen the high ground of “guiding” too easily collapse into passive child-minding and worksheet distribution. When this occurs, Guide-on-the-Side becomes a high moral-ethical excuse for the teacher to “step out” of the main game of teaching and to sit at the margins of the physical, mental and emotional activity that is so vital to learning”.

She suggests a third meta-category “geared up for creative capacity building—that of Meddler-in-the-Middle. This meta-category is descriptive of active interventionist pedagogy in which teachers are mutually involved with students in assembling and/or dis-assembling knowledge and cultural products. Meddling is a re-positioning of teacher and student as co-directors and co-editors of their social world. As a learning partnership, meddling has powerful implications for what “content” is considered worthy of engagement, how the value of the learning product is to be assessed, and who the rightful assessor is to be”.

Unfortunately, many teachers are still stuck on old and discarded “Sage on the Stage role”. The forced lockdown will force them to unlearn and become first “Guide on the Side” allowing the student to take the active role and later become a “Meddler-in-the middle” where he co-creates with the student. This is why I have stressed that the interactive discussion on the challenging concepts is far more important than the traditional lectures. Frequent critical discussions are far more important than long traditional lectures that the students and teachers are so used to. Jess Gifkins (2020), a Research Fellow at the Asia-Pacific Centre for the Responsibility to Protect, compares active discussion on important conceptual issues with lectures (passive learning):

"Active learning promotes recall and deeper understanding of material, as students are engaging with the content rather than simply listening to it. The education literature commonly quotes studies showing that when Students are passively listening their concentration limit is between 10 and 20 minutes, a small fraction of a lecture. Passively listening is not as good at promoting higher-level skills like 'apply', 'analyze' and 'evaluate'."

One thing that this pandemic has made very clear is that everyone shows his/her true colors in crisis. Whereas those who truly love their institution have come out with courage and hard work, and have joined hand to support the institution. Some have shown their negative color and tried to make small groups and promote despair, discontent and chaos. Some others have seen it as a long holiday where they can turn their back to their institution and their students/teachers. I see this as an opportunity to find people's true colors and carefully choose and strengthen the team with sincere and honest people. Alhamdolillah some of the staff and students have come forward who have further strengthened our team and countered the trouble makers. There are many other problems that we have faced. The accounts department comes and warned that the balance of expenses and income is getting out of hand, with the salary expenses pending and the income being halted (since the fees are unlikely to come until the college reopens). One of the colleagues says that many colleges are deferring the salary of the staff, who are not working during lockdown. But I have taken the option of taking loans from the banks, and Alhamdolillah, every employee's salary is being paid on time.

In this world of marketing and propaganda, we have seen people who run a few online lectures and claim to have promoted online learning. Most of the students of MMDC can see through them. However, few immature students, especially those who get carried away easily with negative comments, fall to the trap and make suggestions which if accepted, would promote passive learning. "Survive" is a phenomenon which is hard to match in any developing country. Started without any trained staff, establishing the entire system of daily assignments with the support material and textbooks, within 48 hours of the beginning of lockdown has been a real achievement. The continuous active discussion on the topic with the dedicated faculty and fellow students, the checking of each and every assignment with grading and comments (a total of half a million assignments during first two phases and will reach one million by the end of July), the weekly tests to challenge and grade the 550 students and a unique post-test self-assessment by each student, ensuring that whatever deficiency has resulted in wrong answer, gets corrected and the student never repeats the same mistake. With as many recorded lectures on WhatsApp and online lectures on zoom as possible, "Survive" will be remembered by the generations to come.



Online Moodle Test Schedule for 2024

| S. No | Days | Time | Year/Class |
|-------|-----------|--------------------|----------------------|
| 1 | Monday | 01:00pm to 02:00pm | Third Year BDS |
| 2 | | 02:30pm to 03:30pm | Final Year MBBS |
| 3 | Tuesday | 10:00am to 11:00am | Third Year DPT |
| 4 | | 01:00am to 02:00PM | Fourth Year MBBS |
| 5 | | 02:30pm to 03:30pm | Final Year BDS |
| 6 | Wednesday | 02:30pm to 03:30pm | Third Year MBBS |
| 7 | Thursday | 10:00am to 11:00am | Second Year BDS |
| 8 | | 11:00am to 12:00pm | CHPE Morning Program |
| 9 | | 12:00am to 01:00am | Second Year DPT |
| 10 | | 02:30pm to 03:30pm | Second Year MBBS |
| 11 | Friday | 11:30am to 12:30pm | First Year DPT |
| 12 | | 12:30pm to 01:30pm | First Year BDS |
| 13 | | 02:30pm to 03:30pm | First Year MBBS |

IT DEPARTMENT

2. “RLSE” or “Running Lives by Sharing Experiences”, a weekly Mentoring Program.

Significance of Mentoring at MMC:

Mentoring in higher education or medical education plays a vital role. It helps students or young professionals develop skills, gain insights, and build confidence. A good mentor provides guidance, support, and valuable feedback, which can lead to better academic or professional outcomes. In medical education, mentoring is particularly crucial as it helps shape future healthcare professionals. Some benefits include:

- Personalized guidance and support
- Improved critical thinking and problem-solving skills

- Enhanced professional development and networking
- Increased confidence and self-awareness
- Strengthening the teacher and student relationship.
- Better academic or professional performance

In ISUM, like weekly “Survive” and other tests, assignments include posttest Discussion (PTD) and attendance. One contact hour is reserved for students’ character building and development during regular mentoring activities.

Time: Meeting time will be reserved for one hour per week (Wednesday 1-2 pm between mentees & mentors, schedule is mentioned in the timetables of all respective years and programs.

Chief Mentoring meeting time: Thursday, 1-2 pm with mentors and chief mentor.

Mentoring process:

1. Mentee
2. Mentor (5-10 mentees). Will submit a weekly report. If he fails to fill out the B & C forms or report about the shortcomings of a mentee, he will be held responsible.
3. Class Coordinator (For a whole class). Will closely liaise with the mentors of his/her class and report to the Chief Mentor regularly. If a mentor is not performing his mentoring duties or not filling the form, and the Class Coordinator fails to report to the Chief Mentor, he will be held responsible.
4. Chief Mentor
5. Program Supervisor. Prof. Syed Razi Muhammad, assisted by Dr. Kiran Fatima and Mr. Mehmood-ul-Hassan, will liaise with the mentors, class coordinators, and the chief mentors and prepare reports.

Mentors will have weekly meetings with 5-10 students every week at the mentoring hour (Wednesday 1-2pm). In a class of 100 about 12 and in a class of 50 about 8 mentors have assigned the role of mentor. Hence number of mentors will be about:

- 48 in class 1-4 of MBBS
- 12 in final year MBBS.
- 30-32 in BDS
- 15 in DPT.

Senior students may be involved as mentors after the recommendation of senior teachers if the Chief Mentor considers it appropriate. Paper form will be brought by the mentees and online form will be filled by the mentors.

The Chief mentors will check and review the online forms regularly. They will have a meeting with the mentors every month and see their performance with the mentees. If a mentor is found lacking in performing his duty like holding the meetings regularly or filling the form, or if he cannot bring any positive change in mentee, the chief mentor can replace him and report to the Chancellor.

A mentor will be observed for

1. Filling the form on paper and online regularly
2. Improvement in his mentees’ performance.
3. Mentor of the month and Mentor of the year award will be given at the end of each month and year in each college.

| What a Mentor DOES | What a Mentor DOES NOT do |
|--|---|
| Regularly holds meetings, fill the forms and report to chief mentor and involve parents where appropriate. | Skips meetings, fails to fill forms or report to chief mentor and involve parents where needed. |

| | |
|--|---|
| Listen: function as a sounding board for problems and ideas | Protect from experience: do not assume the role of spoon feeder for the mentees |
| Criticize constructively: point out areas that need improvement, always focusing on the mentee's behavior, never his/her character. | Take over: do not do what the mentees should be doing themselves |
| Support and facilitate provide networking experience; share knowledge of the system; offer assistance where needed | Force: do not attempt to force a mentee in one direction |
| Teach by example: serve as a model for adhering to the highest values in every area of life | Use undue influence: do not use a sense of obligation to influence the mentee's professional decisions |
| Encourage and motivate help mentees to consistently move beyond their comfort zone | Lose critical oversight: do not allow friendship to shade over into favouritism |
| Promote independence: give their mentees every opportunity to learn by experience | Condemn: do not convey to the mentees that honest mistakes are career-altering disasters |
| Take pride in the success of their mentees | Indulges in anger issues or getting into conflicts. |
| recognize that students may rise to greater levels than those who trained them | |

3. MOBILE CLINICS BY THE STUDENTS (MCS)

“MCS” or daily “Mobile Clinics by Students” is a part of the unique 5-pillars system, which supports the vertically integrated modular system of Ibne Sina University, Mirpurkhas (ISUM). This was started in 2018 in collaboration with APPNA, when the President of APPNA supplied 4 mobile health systems to MMC/ ISUM to run this unique system.

While we continue to learn and benefit from the research and innovation of others (no need to reinvent the wheel or rediscover the laws of motion), we must remember our own situations, culture and values and not neglect our strengths and weaknesses while developing our systems. This is exactly what we have done in developing our vision, mission, and goals. If you go through them, you will appreciate that the above pillars are the powerful tools to achieve them. In a day and society, where copy & paste practices, plagiarism, and recently letting the artificial intelligence replace the original and critical thinking, ISUM can take some pride in SRMLG. I am proud of my team to understand, participate and take forward this unique system, which has raised the standard of learning, improved the results (Muhammad Medical College received the first prize in Sindh this year in innovation- by the Pakistan Association of private Medical & Dental Institutions or PAMI) and empowered the learners of ISUM.

As on 22ND February 2018, President APPNA_US, Dr. Zafar Iqbal, along with his Team, visited Muhammad Medical College (MMC) and Ibne Sina University, Mirpurkhas (ISUM) and provided 02 Mobile Clinics that resulted in creation of 02 Health Units.

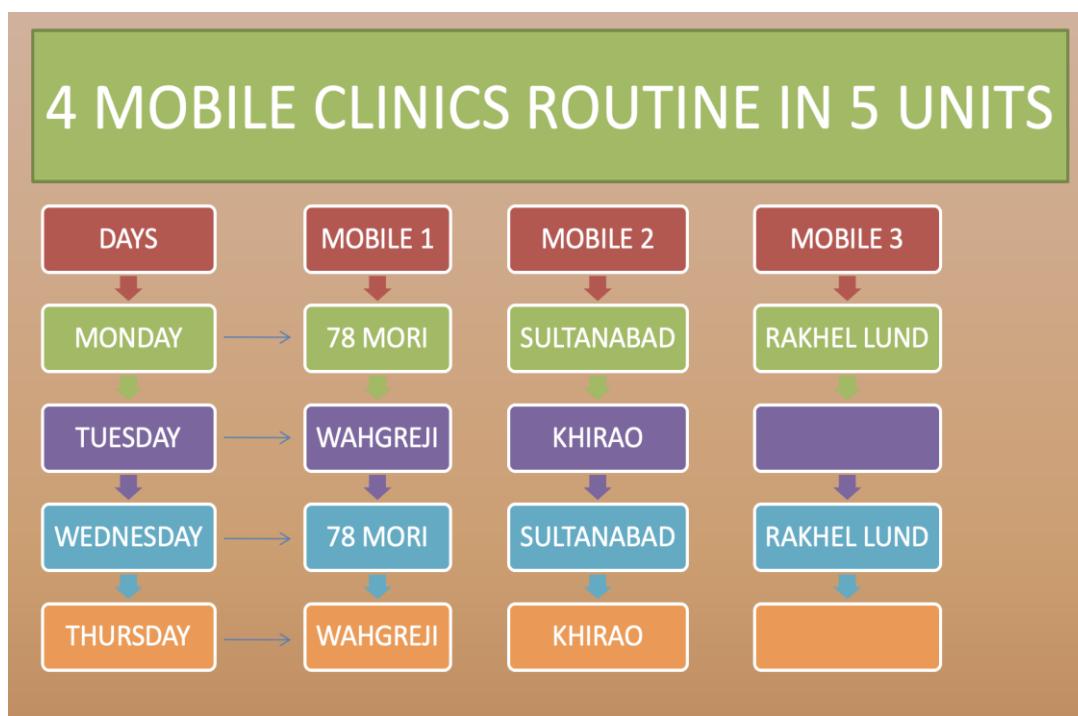
In 1st Health Unit 78 Mori village 680 patients have seen & in 2nd health Unit Wahgreji Village where 617 patients have seen on Inauguration Day that were being covered by Health Staff (Doctors, Nursing Staff & Helping Staff).

Later on, at 8TH March 2018 another 3rd Health Unit was created in Village Khirao where 1039 patients have seen on Inauguration Camp.

On 9TH March 2018 4th Health Unit in Village Sultanabad was created where 1282 patients have seen on Inauguration camp and on very next day all the Operational Activities were started. These 02 Mobile Clinics alongwith all the concerned Staff & Medicines kept working in all 04 Health Units on a well planned cycle (Monday – Thursday) that included Free Camps (Check Ups) & Medicines and not only this but if any of the patient found in need, he/she used to be referred to MMCH for free Care & Cure.

Afterward, In November 2018 APPNA_US provided one another mobile clinic that resulted in creation of 5th Health Unit on 15 November 2018 in Village Rakhel Lund where 450 patients have seen on Inauguration day and very next all 5 Health Units being covered by 3 Mobile Clinics.

Unit wise schedule of mobile clinics



Now, apart from the students of MBBS, students of BDS and DPT have also joined the mobile clinics by the students (MCS).

Following is the report of each year of MCS.



MMCH MOBILE HEALTH CLINICS SUMMARY YEARS

2018 TO 2024

| YEARS | MEDICINE | PATIENTS | STUDENTS | PETROL | SALARIES | FURNITURE | STAATIONARY & OFFICE ITEM | SURGICAL ITEMS | MEDICAL & OTHER EQUIPMENTS |
|--------------|-----------------|---------------|-------------|----------------|-----------------|---------------|---------------------------|----------------|----------------------------|
| 2018 | 752802 | 17128 | 1420 | 188000 | 1023000 | 30300 | 21294 | 35051 | 7960 |
| 2019 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 |
| 2020 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 | COVID-19 |
| 2021 | 8076862 | 20239 | 1425 | 325094 | 2160000 | 193500 | 34600 | 94025 | 64200 |
| 2022 | 6524986 | 23329 | 1440 | 708657 | 2592000 | 193500 | 34600 | 74085 | 61500 |
| 2023 | 3842136 | 21662 | 1431 | 1153639 | 2592000 | 28500 | 26750 | 97945 | 85000 |
| 2024 | 3842136 | 19894 | 1400 | 1268633 | 2592000 | 28500 | 26200 | 88795 | 73300 |
| TOTAL | 23038922 | 102252 | 7116 | 3644023 | 10959000 | 474300 | 143444 | 389901 | 291960 |

4. LEARNER BASED ANNUAL SYMPOSIUM (LBAS) 26TH SYMPOSIUM:

Introduction:

Rigorous reverberation on scientific symposium started from October 1 to 11, 2024, encompassing pre-symposium workshops, research papers from faculty, students and invited speakers from Karachi, Hyderabad, Nawabshah, Sukkur, Gambat & other cities of interior Sindh. Muhammad Medical College, Mirpurkhas, Sindh, successfully organized pre-symposium workshops, a symposium, and a conference on the theme as

Role of Universities In Promoting Higher Education in Underprivileged Areas of Pakistan

The events aimed at providing a platform for medical professionals, researchers, and students to share knowledge, exchange ideas, and discuss cutting-edge advancements in the field.

5. “GSAT” ANNUAL “GASTROENTEROLOGY SESSION WITH STUDENTS AS TEACHERS”.

Muhammad Medical College (MMC), a constituent college of Ibn-e-Sina University, Mirpurkhas (ISUM), has become an icon in the field of medical education and healthcare services in Pakistan. Not only it provides quality formal medical education, but as part of its innovative activities, it keeps holding several nontraditional activities to stimulate and provoke scientific curiosity among its students and teachers throughout the year. It therefore came as no surprise that under the leadership of its Chancellor Professor Syed Razi Muhammad, ISU received the prestigious National Healthcare Excellence Award 2025 recently at Lahore from Federal Minister of Health early April this year.

As part of these activities, for which ISUM is now well known throughout its history on National level and in particular throughout the existence of MMC since its inception in 1998, it held its 15th Annual Mirpurkhas Seminar in Medical Sciences on 30th April 2025. It is its mission to provide excellent medical educational activities to the medical students and doctors belonging to it in particular but to all doctors in the city of Mirpurkhas via open invitation, completely free of cost. The seminar was attended by Final year students along with junior and senior doctors of all clinical departments. ISU strongly believes that

participating in such seminars plays an essential role in the intellectual growth of future doctors, seeing high quality advanced talks coming from experts in a variety of medical specialties.

The programme started with a recitation of verses from the Holy Quran. A Final year student Mr Talha had the honour of doing the recitation. A relatively recent addition to the Department of Diabetes and Endocrinology, Assistant Professor **Dr Sarwat Anjum** then took charge and invited Visiting Professor **Dr Syed Zafar Abbas** to give an introduction of the programme ahead. Professor Zafar Abbas gave a brief history of these seminars which started 15 years ago, and have been working its way through GI Medical Seminar, General Medical Seminar, and have now evolved into Seminar on broader Medical Sciences, involving experts from all specialities. Dr Sarwat Anjum then invited Professor **Dr Qamar Habib**, Head of the Department of Gynaecology and Obstetrics to the stage. Dr Qamar Habib gave an overview and update on “Management of New Onset Hypertension in Pregnancy”. Her talk included the pathophysiology of this condition, the difference between Hypertension in general and when it happens in pregnancy, and how the management guidelines are different in these two scenarios with their rationale. She answered the questions from the audience after her talk. Head of Department of Medicine, Professor **Dr Abdul Qadir Khan** delivered a talk on “Current Management Guidelines on MASLD/MASH”. With the help of various studies and figures, he explained the relatively new and updated nomenclature of this condition, and the new advances including those in its treatment. He also indicated that there was an important clinical difference in the interpretation of Body Mass Index (BMI) and waist circumference measurements of Asians and Caucasians. Head of Surgical Department and Pro Vice Chancellor of ISU Professor **Dr Aijaz Memon** gave a talk on “Enhanced Recovery after Surgery” (ERAF). He discussed various pre operative, operative and post operative measures to mitigate the chances of complications and tips on promotion of rapid and improved recovery following various surgical procedures. He also discussed the difficulties faced by surgeons in Pakistan to fully implement such changes due to lack of required resources, but more importantly because of long established surgical culture. However, he was quick to point out the practical advances at MMC Hospital (MMCH) in this respect. Head of the Department of Paediatrics, Professor **Dr Hasan Memon**, then gave an interesting update and comparison of present and past medical practice on the management of Meningitis with title of his presentation “Septic Meningitis in Children: Management in mid 70s and now”. He described various treatment improvements and prevention with the help of various vaccinations. Students and doctors at MMCH are lucky to have not only the newly qualified consultants as their teachers, but also very experienced clinicians who have the advantage of their own time in the field of medicine to be able to see and in fact participate in the practice improvements spanning decades.

STEP 6: CURRICULUM EVALUATION

ISUM has an active curriculum evaluation committee comprising medical educationists who are entrusted with the responsibility to evaluate the curriculum throughout the year to determine whether the curriculum has succeeded in producing professionals with desired attributes with the support of the Institutional Quality Assurance Cell.

QAC will take regular feedback from all stakeholders, including students, teachers, and administration, regarding learning activities, difficulties being faced and suggestions for improvement. adopted by the University/ Institution in accordance with the HEC guidelines. Program must be evaluated by institutional quality assurance cell in coordination with University QEC who should be entrusted with responsibility to evaluate curriculum throughout the year to determine whether curriculum has succeeded in producing professionals with desired attributes.

- They will arrange focus group discussions with teachers and students periodically to discuss issues being faced during learning.

All this information will be used to modify and improve the curriculum to enhance and encourage the process of learning.

To ensure the optimum delivery of curriculum, robust quality assurance mechanisms should be in place. A policy framework for quality assurance of the curriculum should be

The Program Monitoring and Review Policy are an integral component of the Ibn-e-Sina University for Undergraduate and Postgraduate Studies system of Institutional Effectiveness and Quality Assurance (IEQA). It provides a systemic approach that allows programs to maintain their academic standards, assure the quality of their academic provision, ensure alignment with the institute's mission and strategic goals, and guide their own development continuously. It is a mechanism of continuous improvement that provides programs with the opportunity to evaluate their current status and achieved progress, and set direction for the future, including the needs and priorities for those programs.

All degree programs at Ibn-e-Sina University are subject to this policy and are required to conduct ongoing monitoring, annual assessments, and periodic reviews. Heads of Programs are responsible for the implementation of this policy within their program in collaboration with their program members and in coordination with relevant units such as the Office of Institutional Effectiveness and Quality Assurance (IQAE). This is the responsibility of the deans to oversee the implementation of this Policy.

- a. The subsequent stage of designing and developing curricula involved identifying themes, organizing syllabi elements into corresponding modular patterns based on the themes, specifying the subjects to be taught for each learning objective, and allocating hours for various components. This was carried out as an ongoing, hands-on development and design workshop. Medical educators and subject matter specialists conducted it. Most of the subject advisory panels were represented by the subject specialists. All the subject matter specialists, however, had notable educational backgrounds for their subjects and were leaders in their own fields.
- b. To finish the modules, a working committee consisting of Lead Medical Educationists and the Department of Medical Education determined on the modules' structure, themes, hourly allotment, syllabi material, and suggested clinical relevance.
- c. The completed modules, evaluation guidelines, and structure have undergone the required procedures of the Academic Council and Board of Studies.
- d. Since the curriculum is a work in progress, any suggestions for changes, additions, or deletions made during the statutory approval process were included in the curriculum guidelines.
- e. Additionally, it has been ensured that a routine for feedback and curriculum assessments is integrated throughout the entire implementation process, allowing for periodic additions and revamps. This last action is required to ensure that any educational component is included and that there is no duplication in the delivery content.
- f. The entire approach includes stakeholders, disciplinary perspectives, medical educationists, monitoring and leadership involvement for curriculum development.

CURRICULUM EVALUATION VIA QEC

1. INTRODUCTION

The Quality Enhancement Cell (QEC) of Muhammad Medical College was officially established in 2019. Improving the quality of instruction across all Muhammad Medical College programs is the primary objective of QEC. In order to ensure the caliber of academic programs and support teachers and administration in establishing high standards for education, self-evaluation is a crucial tool. In order to maintain and improve the standard of higher education, QEC needs to ensure that procedures for quality assurance are

established. Gaining insights from comments and applying information from program assessments is an ongoing activity that improves student learning.

In order to improve student learning, assessment is a methodical process for gathering, evaluating, and applying important quantitative and qualitative data and information regarding educational programs from a wide range of sources. This is to assess and track whether learning and academic standards are being reached or whether more work needs to be done to meet them. When evaluation data are applied to enhance student learning, the process comes to a close. The following elements must be present for the program assessment to be successful:

2. OBJECTIVES

- Facilitating the adoption of Quality Assurance methods and policies is the responsibility of QEC.
- Ensuring that educational programs meet national and international standards in terms of quality, relevance, and alignment.
- Working together with the faculty to examine, modernize, and adapt the curriculum to the ever-evolving needs of the healthcare industry.
- Developing reliable evaluation techniques to precisely gauge program results and student accomplishment.
- Working together with the faculty to review, modernize, and adapt the curriculum to the ever-evolving needs of the healthcare industry.
- MMC should implement quality-focused methods to raise stakeholder satisfaction and institutional performance.
- QEC is in charge of getting input from staff members, instructors, recent graduates, and students.
- Gathering and evaluating input from students in order to pinpoint areas that require development and enhance the fit between learning opportunities and student requirements.
- Ensuring adherence to rules, policies, and directives concerning healthcare and medical education.

3. CURRICULAR EVALUATION PROCESS

The following steps are involved in the curriculum evaluation process that a medical college's Quality Enhancement Cell (QEC) oversees:

A. PLANNING AND PREPARATION: This stage entails establishing the evaluation's goals and scope, creating a thorough plan that outlines the procedure, schedule, and responsible parties, and gathering pertinent documents such as learning outcomes, curriculum materials, and assessments.

B. DATA COLLECTION: Utilizing a variety of techniques, such as document analysis, interviews, and surveys, is the second phase. To evaluate how well learning objectives, instructional strategies, and assessments line up, information is collected from a variety of sources, including employers, educators, alumni, and students.

C. ANALYSIS AND ASSESSMENT: In the third step, the data is analyzed to determine the curriculum's strengths, weaknesses, and areas for improvement. Teaching methods, assessment techniques, and curriculum content are assessed, and the curriculum's applicability in addressing current healthcare requirements and industry trends is determined. The curriculum violates best practices for medical education as well as national and international standards.

D. RECOMMENDATIONS AND ACTION PLANS: Creating well-founded recommendations based on evaluation findings is what this stage entails. To create a thorough action plan that outlines how to handle problems that have been identified for improvement based on analysis, evaluations, and suggestions.

E. IMPLEMENTATION AND MONITORING: All of the processes are valuable when they are put into practice. This step entails implementing suggested curriculum modifications, regularly assessing the implementation's progress, and making any necessary improvements.

MBBS CURRICULUM FRAMEWORK

| Month S | Feb - March | April | May | June | July | August | Sept – Oct | Nov | Dec |
|---------|---|--|-----|--|--|----------------------|--|--|-----|
| Year 5 | Medicine | Medicine & Allied | | Pediatrics | Surgery | | Gynae/Obs | Surgery & Allied | |
| | Mid-module formative Assessment BCQs=25-50, SEQS=10-15, OSCE = 15 End-Module Theory Paper MCQS=25-50, SEQs=10-15 OSCE=15 stations | Mid-module formative Assessment BCQs =25-50 SEQS=10-15 OSCE = 15 End-Module Theory Paper MCQS=25-50, SEQs=10-15 OSCE=15 stations | | Mid-module formative Assessment BCQs =25-50 SEQS=10-15 OSCE = 15 End-Module Theory Paper MCQS=25-50, SEQs=10-15 OSCE=15 stations | Mid-module formative Assessment BCQs =25-50 SEQS=10-15 OSCE = 15 End-Module Theory Paper MCQS=25-50, SEQs=10-15 OSCE=15 stations | | Mid-module formative Assessment BCQs =25-50 SEQS=10-15 OSCE = 15 End-Module Theory Paper MCQS=25-50, SEQs=10-15 OSCE=15 stations | Mid-module formative Assessment BCQs =25-50 SEQS=10-15 OSCE = 15 End-Module Theory Paper MCQS=25-50, SEQs=10-15 OSCE=15 stations | |
| | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station, Mini-CEX | Block 13 Exam Theory | | Block 14 Exam Theory | | Block 15 Exam Theory | | | |
| | Clinical Rotation | Clinical Rotation | | Clinical Rotation | Clinical Rotation | | Clinical Rotation | Clinical Rotation | |
| | End of ward rotation Assessment Logbook & Mini-CEX | End of ward rotation Assessment Logbook & Mini-CEX | | End of ward rotation Assessment Logbook & Mini-CEX | End of ward rotation Assessment Logbook & Mini-CEX | | End of ward rotation Assessment Logbook & Mini-CEX | End of ward rotation Assessment Logbook & Mini-CEX | |
| | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | |
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| Year 4 | GIL, Hepatobiliary & Metabolism | Renal, Endocrine & Reproduction | | Neuroscience | ENT | | EYE | Clinical Subjects (Medicine, Surgery, Psychiatry Gynae) | |
| | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | |
| | Block 10 Exam Theory | Block 11 Exam Theory | | Block 12 Exam Theory | | Block 13 Exam Theory | | Fourth Professional Exam Theory, MCQS = 100, SEQs = 10 Clinical OSCE = 10 Station, Mini-CEX (EYE,ENT) | |
| | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | |
| | Clinical Rotation | Clinical Rotation | | Clinical Rotation | Clinical Rotation | | Clinical Rotation | Clinical Rotation | |
| | End of ward rotation | End of ward | | End of ward rotation | End of ward | | End of ward | End of ward rotation | |
| | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | MCQs = 100, SEQs = 10, Clinical OSCE = 15 station | |
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| | Assessment Logbook & Mini-CEX | rotation Assessment Logbook & Mini-CEX | | Assessment Logbook & Mini-CEX | rotation Assessment Logbook & Mini-CEX | | rotation Assessment Logbook & Mini-CEX | Assessment Logbook & Mini-CEX | | | | | | | | | |
| Year 3 Assessment Clinical Assessment | Infectious Diseases Module | Blood – II Module | | Respiratory – II Module | CVS – II Module | | GIT & Hepatobiliary-II Module | Endocrine Module | | | | | | | | | |
| | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | | | | | | | | |
| | Clinical Rotation | Clinical Rotation | | Clinical Rotation | Clinical Rotation | | Clinical Rotation | Clinical Rotation | | | | | | | | | |
| | End of ward rotation Assessment Logbook & Mini-CEX | End of ward rotation Assessment Logbook & Mini-CEX | | End of ward rotation Assessment Logbook & Mini-CEX | End of ward rotation Assessment Logbook & Mini-CEX | | End of ward rotation Assessment Logbook & Mini-CEX | End of ward rotation Assessment Logbook & Mini-CEX | | | | | | | | | |
| Year 2 Year 2 Assessment | Neurosciences Module | Head & Neck Module | | GIT, Hepatobiliary & Metabolism | Renal Module | | Reproduction Module | Endocrine Module | | | | | | | | | |
| | Clinical Rotation | Clinical Rotation | | Clinical Rotation | Clinical Rotation | | Clinical Rotation | Clinical Rotation | | | | | | | | | |
| | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | | | | | | | | |
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| Year 1 Year 1 Assessment | Foundation Module | Blood Module | | Musculoskeletal Module | | Block 1 Exam Theory MCQs = 100, SEQs = 10, Practical OSPE | Block 2 Exam Theory MCQs = 100, SEQs = 10, Practical OSPE | Block 3 Exam Theory MCQs = 100, SEQs = 10, Practical OSPE | Second Professional Exam Theory, MCQs = 100, SEQs = 10 Practical OSPE = 10 Station | First Professional Exam Theory, MCQs = 100, SEQs = 10 Practical OSPE = 10 Station | Third Professional Exam Theory, MCQs = 100, SEQs = 10 Practical OSPE = 10 Station | | | | | | |
| | Clinical Rotation | Clinical Rotation | | Clinical Rotation | | | | | | | | | | | | | |
| | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | Mid-module formative Assessment BCQs= 25-50 SEQS= 5-10, OSPE= 5-10 | | | | | | | | | | | | | |
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| | | 10, OSPE= 5- 10 | | | | | | | | | |
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CURRICULUM MAP

COMPETENCIES REQUIRED IN A DOCTOR TO BE ACHIEVED AT THE UNDERGRADUATE LEVEL

Students should graduate from a five-year MBBS program with the following competencies—a combination of knowledge, skills, and attitude.

| KNOWLEDGE | SKILLS | ATTITUDE |
|--|---|---|
| <ul style="list-style-type: none"> Understand the diagnostic processes, clinical and analytical techniques used to treat prevalent health conditions in society. | <ul style="list-style-type: none"> Conduct comprehensive physical examinations, request and interpret diagnostic testing, create appropriate treatment plans, and deliver follow-up care. | <ul style="list-style-type: none"> Demonstrating compassion for patients, honoring their individuality and autonomy, and being committed to providing excellent, patient-centered care that is grounded in the best available evidence. |
| <ul style="list-style-type: none"> Knowledge of the ethical and legal guidelines, including as those pertaining to informed consent, patient rights, and confidentiality, that control the practice of medicine. | <ul style="list-style-type: none"> To apply these concepts in clinical settings, appropriately record patient care, and handle any possible medicolegal issues. | <ul style="list-style-type: none"> To uphold ethical standards and respect patient autonomy in order to maintain the respect and confidence of both patients and the general public. |
| <ul style="list-style-type: none"> Comprehending the anatomy, physiology, and pathophysiology of common illnesses, together with the principles of evidence-based medicine and clinical decision-making. | <ul style="list-style-type: none"> To evaluate patient information from multiple sources, including imaging scans, laboratory testing, physical examinations, and clinical histories, and use this information to create a treatment plan and differential diagnosis. | <ul style="list-style-type: none"> Committed to provide patient-centered care that is based on the best available evidence and customized to meet each patient's needs and preferences. |
| <ul style="list-style-type: none"> Recognizing the concepts of disease prevention and promotion, as well as epidemiology, environmental health, social determinants of health, and behavioral and lifestyle factors impacting illness and injury. | <ul style="list-style-type: none"> To design and implement efficient preventive and management strategies, such as patient education, behavior modification interventions, and community-based therapies, as well as to conduct a full assessment of the health hazards to the individual and the community. | <ul style="list-style-type: none"> Committed to advancing health equity and addressing the social and environmental determinants of health, as well as an appreciation of the role that prevention plays in improving health outcomes and reducing healthcare costs. |
| <ul style="list-style-type: none"> Comprehend the principles behind surgical techniques, infection prevention, sterile technique, and patient safety. | <ul style="list-style-type: none"> To perform both standard and emergency surgeries, including CPR, births, and other life-saving procedures, using the appropriate equipment and | <ul style="list-style-type: none"> Committed to provide high standards of care and patient safety as well as an awareness of the need to act quickly and effectively in |

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| | <p>methods, and to deal with challenges as they arise.</p> | <p>emergency situations.</p> |
| <ul style="list-style-type: none"> Having a solid understanding of anatomy, physiology, and pathophysiology as well as principles of patient evaluation, diagnosis, and treatment planning. | <ul style="list-style-type: none"> To perform a complete and accurate physical examination, including a system review and a mental state evaluation, and to use the information gathered to develop and implement successful treatment plans for patients. | <ul style="list-style-type: none"> Committed to providing patient-centered care delivery and recognition of the significance of conducting a thorough assessment to inform efficient treatment planning. |
| <ul style="list-style-type: none"> Comprehend the principles of patient-centered care and evidence-based practice, as well as the pathophysiology, epidemiology, and current treatments for a range of acute and chronic health conditions. | <ul style="list-style-type: none"> To design and carry out suitable patient-centered care plans for patients with common diseases | <ul style="list-style-type: none"> Committed to provide patient-centered care and recognition of the significance of evidence-based practice in enhancing patient outcomes. |
| <ul style="list-style-type: none"> Awareness of the fundamentals of good communication, including appropriate language use, nonverbal clues, and active listening strategies. | <ul style="list-style-type: none"> To establish rapport and build trust through efficient communication with patients and other medical professionals by utilizing suitable language and nonverbal clues | <ul style="list-style-type: none"> Committed to provide patient-centered care and recognition of the importance of good communication in fostering trust and promoting positive patient outcomes. |
| <ul style="list-style-type: none"> Recognize the basic principles of medicine, such as the physical, emotional, social, and spiritual dimensions of health and wellbeing as well as the promotion, prevention, treatment, and rehabilitation of common diseases. | <ul style="list-style-type: none"> To implement a holistic approach to patient care, encompassing the ability to recognize and address patients' physical, emotional, social, and spiritual requirements; developing and implementing patient-centered treatment plans incorporating preventive, promotional, curative, and rehabilitative components of care; and collaborating with interdisciplinary healthcare teams to provide comprehensive and integrated care. | <ul style="list-style-type: none"> Committed to provide patient-centered care and knowledge of the need of attending to patients' physical, emotional, social, and spiritual needs in order to support the best possible outcomes for their health. |
| <ul style="list-style-type: none"> Knowing pharmacology, including the side effects, mechanism of action, and contraindications of | <ul style="list-style-type: none"> To prescribe medications that are both safe and effective while taking into account factors specific to the patient, including | <ul style="list-style-type: none"> To patient safety and a recognition of the need of offering safe and affordable medications. An |

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| <p>commonly prescribed drugs, and safe and effective prescribing techniques.</p> | <p>as age, gender, comorbidities, past medication history, cost-effectiveness, and potential side effects. being able to follow dosage, interaction, and contraindication guidelines as directed</p> | <p>understanding of the possible impact of medications on patient outcomes, as well as the ability to track and manage medication-related interactions and adverse effects.</p> |
| <ul style="list-style-type: none"> Understanding of human psychology, encompassing the principles of psychological assessment and intervention as well as the impact of social and psychological factors on health outcomes. | <ul style="list-style-type: none"> To recognize and assess psychosocial factors that may impact a patient's health results, to develop and implement effective management plans incorporating social and psychological therapies, and to collaborate with mental health professionals to provide holistic care. | <ul style="list-style-type: none"> Committed to provide evidence-based care that takes these elements into account as well as knowledge of how social and psychological factors affect health outcomes. |

POLICY FOR ELECTIVES

- a. Electives are not mandatory nor are they a part of the curriculum. Electives are considered add on extra-curricular activities with benefits for selection for jobs or postgraduate training after MBBS.
- b. The Electives Rotation will be of four weeks' duration.
- c. It will be planned at least six months in advance during the 4rd or 5th Year.
- d. The Elective will be planned during the **SUMMER HOLIDAYS**, preferably.
- e. The institution or department will be of the student's choice.
- f. During the elective, the student will not get credit for attending lectures at MDC.
- g. **It is the student's responsibility to ensure that his/her overall attendance record is not affected adversely by the elective.**
- h. The student will not proceed on an elective without informing the Vice Principal or the Concerned HOD designated for this purpose, who will get permission from the Principal.
- i. The student will sign a waiver to the effect that any shortfall in attendance is his /her own responsibility and will be dealt with as per the rules of Liaquat University of Medical & Health Sciences (LUMHS).
- j. The adequacy of education during the elective is the student's own responsibility.
- k. Permission to attend an elective is given by the Associate Dean designated for this purpose. This simply implies that the college authorities are aware that the student is away for this period so that admission is not cancelled.
- l. The student will ensure that the Elective Supervisor completes an evaluation report at the end of the elective.
- m. MDC will not provide any financial assistance for the elective.

INSTRUCTIONAL STRATEGIES FOR INTEGRATED CURRICULUM

According to educational scholars, active learning is predicated on the idea that learning is an active process and that individuals learn differently. In order to encourage active student participation, our college makes sure that a variety of instructional methodologies are applied. We use several techniques to deliver adequate clinical resources in accordance with World Federation for Medical Education norm 6.2 (Federation & Medical, 2020, p. 24).

The following teaching/learning methods are used to promote better understanding

- a. Interactive Lectures
- b. Small Group Discussion
- c. Case- Based Learning (CBL)
- d. Skills session
- e. Practicals
- f. Self-Directed Study
- g. Bedside Teaching
- h. Ward Rounds
- i. Online LMS Assignments
- j. Community-based teaching via Daily Mobile Health Clinics by Students of Fourth Year and Final Year MBBS

a. INTERACTIVE LECTURES: Large group discussions are not the same as traditional lecture formats. When a teacher or instructor uses images, radiographs, patient interaction recordings, etc. to discuss a topic or typical clinical scenario, the lecture becomes interactive. When they are given tiny activities to do that allow them to apply the knowledge they have learned throughout the session and are asked questions, students actively participate in the learning process.

b. SMALL GROUP DISCUSSIONS (SGDS): With the use of SGD, students can take an active role in their education, clarify ideas, develop psychomotor skills, and develop a positive attitude. Discussion themes, patient interviews, and clinical cases are used to design sessions in an organized manner. Pupils are inspired to express their ideas, apply the fundamental knowledge they have learned from lectures and independent study, and are encouraged to share their notions. In small groups, role play is a useful technique for acquainting pupils with real-world scenarios. Probing questions, rephrasing, and summarizing are used by the teacher to assist make the concepts obvious.

c. CASE-BASED LEARNING (CBL): Learning is centered around a sequence of questions based on a clinical scenario in this small group discussion format. Students create new information by discussing and responding to the questions using pertinent prior knowledge from the clinical and fundamental health sciences modules. The relevant department will give the CBL.

d. SKILL SESSIONS: A skills lab is a learning resource center that offers a safe, non-threatening setting for trainees to practice clinical skills without endangering patient care or having unfavorable impacts. Under the supervision of academic members, students hone both basic and advanced nursing abilities in the skills lab. Videos and fictitious patients are used to practice a variety of skills. Some of the instructional strategies include interactive lectures, group discussions, skill demonstrations, practise on manikins, case studies, presentations, and films.

e. PRACTICALS: The Practical lab is a structured learning exercise that uses original or raw data to solve problems. It is a process that involves first-hand knowledge of items or information obtained through research or experimentation. Basic science practicals

related to Anatomy, Physiology, Biochemistry, pharmacology and Pathology have been scheduled for student learning.

f. SELF STUDY: Self-directed learning is a process in which students take charge, either on their own or with assistance from others. Students chart their learning objectives and determine their areas of need for learning. They select and employ their own learning methodologies, and they independently assess the learning objectives.

g. BEDSIDE TEACHING: One of the best methods to acquire clinical and communication skills is through bedside teaching, which is an essential part of medical school. Teaching in a patient's presence is known as "bedside" teaching. This will significantly affect both the clinical and communicative skills.

f. WARD ROUNDS: Ward rounds, which are the primary means by which patients in the hospital are methodically examined by the multidisciplinary team, which includes students who review each patient under the supervision of their consultant and hospital trainees, are essential to the seamless operation of the patient journey. Each patient's present state and the following steps in their care plan are determined during the ward round.

g. ONLINE LMS ASSIGNMENTS: An online assignment on the Ibn-e-Sina University Moodle is uploaded according to the topic of the week. All assignments are checked by the teacher who has taken the lecture on the topic during the same week. The assignment covers enough material to include the requirement of the curriculum and syllabus, so the student is able to answer the annual examination questions by revising these notes (assignments) only. The assignments are checked and graded also with comment to guide, motivate and encourage the students to work wholeheartedly. Frequent guidance and motivation go a long way in improving the students' performance.

h. PTD (Post Test Discussion) Assignments:

- a. Every student prepares a special assignment where he/she selects all the questions he/she got wrong. Then he/she makes 3 boxes. In box A he/she writes the questions he/she got wrong in his/her own words, highlighting and underlining the keywords. In box B the student explains why he/she has chosen this answer. In box C the student mentions what he/she has learnt after reading the explanation and how the concept has become clear now.
- b. The concerned year moderator checks, assesses and grades PTD Assignment.
- c. Next day, the class moderator of the class conducts a class where he/she discusses the mistakes committed and the post-test assignments submitted in detail with the class.

i. Community-Based Learning: MMC-ISUM is committed to providing the environment and training that would enable professionals to successfully contribute to the improvement of the health sector, particularly in less privileged communities, under the Community-Oriented Medical Education Program. Community-based Learning is provided to students with the collaboration of the Community Dentistry and Community Medicine Department.

The university involves its students in research and development work in these designated communities. Students are encouraged to participate in the preventive and curative care and management of patients and their families in Primary Health Care field settings from the very first year of the BDS program.

“MCS” or daily “Mobile Clinics by Students” is a part of the unique 5-pillars system, which supports the vertically integrated modular system of Ibne Sina University, Mirpurkhas (ISUM). This was started in 2018 in collaboration with APPNA, when the President of APPNA supplied 4 mobile health systems to MMC/ ISUM to run this unique system. Through this MCS, students of BDS and MBBS will be involved in community-based

learning with senior faculty members once a week Tuesday or any other day as decided by the administration ISUM. This is an excellent platform to involve students in community-based research projects.

Teaching in an integrated curriculum is based on themes that unite different disciplines by blurring their boundaries. These themes allow teachers of different disciplines to meaningfully link the content of their respective disciplines to enable students to see the big picture and appreciate the relevance of their learning to their future practical life. The selection of tools for information transfer should ensure simultaneous input of different disciplines to enhance understanding and implementation of knowledge being taught. Different disciplines may need to have joint teaching sessions to help students develop links between information coming from different subjects. While tools and methods mentioned in the traditional curricula above may continue to be used, the following tools are commonly used for module or theme-based teaching:

| COGNITION: | PSYCHOMOTOR TRAINING | ATTITUDE OR BEHAVIOR |
|---|--|---|
| <ul style="list-style-type: none"> Joint or paired lectures by different disciplines Problem based learning sessions Case base learning sessions Group work by students Seminars Tutorials Videos Clinical-pathological conferences Symposiums Webinars Self-learning Assignments | <ul style="list-style-type: none"> Workshops <u>Skill</u> labs Cadaveric dissection Models Laboratory work Bedside teaching Emergency or casualty department Operation theatres Ward rounds Community work | <ul style="list-style-type: none"> Training Videos Role plays Role modeling Workshops Group assignments |

PROPOSED ASSESSMENT METHODOLOGIES FOR INTEGRATED MBBS CURRICULUM

OVERVIEW:

“Lack of assessment and feedback, based on observation of performance in the workplace, is one of the most serious deficiencies in current medical education practice”.

John Norcini and Vanessa Burch 2007

- Assessing the learner is the most important and difficult task for the tutor as students may be able compensate for sub-optimal teaching, but misaligned/poor assessment of their abilities can have longlasting effects on their personal and professional goals.
- Assessment is important not only for students but also for tutors, course/syllabi organizers, and the accrediting body (affiliated university/PM&DC).
- Assessment data informs important decisions related to whether learning outcomes have been achieved to allow progression to the next level of the course.
- More importantly, holistic assessment determines whether the potential graduate is competent and can practice as a safe doctor.
- In curricula which are theme or module based, each module needs to be followed by assessment to determine achievement of learning outcomes defined for that module.

- Assessment can be both summative and formative, thereby using it for grading of students as well as for providing students with feedback to enhance and improve their learning respectively. Knowledge, skills and attitude learned during the modules will need separate tools for assessment.

INTEGRATED ASSESSMENT

- Integrated curriculum must be aligned with integrated assessment policies as it is an instrumental and integral part of curricular development.

ASSESSMENT PROCESS

- Integrated assessment requires an in-depth analysis and understanding of the process. A good starting point for this is seeking to answer important questions, the answers of which will help form the basis of these assessments.

1. Why assess the students?

The purpose of assessment has to be clear and must include assessment for learning (as a learning strategy) and assessment of learning (summative assessment) for progression, remediation or promotion.

2. Who should assess the students?

The stakeholders should include program advisors/organizers, accrediting body, affiliated university, enrolled college, tutors, other health care professionals and students themselves, as well as standardized patients. PM&DC will oversee the assessment process to be implemented by medical universities in their affiliated colleges.

3. What should be assessed?

All the competencies must be assessed. The integrated curricular objectives must be aligned with the content to be assessed according to the context in which it is taught to students. The chosen assessing material will demonstrate what is valued for example knowledge of higher order thinking, clinical skills, behavior/attitudes and professionalism among other requirements.

2. How the students should be assessed?

Integrative assessment fosters a wide variety of tools which can be incorporated to assess students. The methods to be used should be:

- a. Reliable and consistent
- b. Valid in measuring what it is to measure
- c. Feasibility according to the resources available
- d. Assessment must have an impact on student learning
- e. Amenable to appropriate standard setting method

3. When should the students be assessed?

The enrolled colleges can devise their own strategy of number of internal assessments to be carried out within the prescribed timelines of the affiliated universities. The University may provide a template of the **“Course, Module or Rotation Objective Assessment Map”** in the assessment procedure document. E

Each course will develop an examination blueprint, which will include all competencies and information on the methods, timing, and relative contribution to the final mark of all summative assessments, criteria for passing and remediation must be specified by the university. The final assessment by universities must be within timelines by the accrediting body.

4. Where should the students be assessed?

Internal and external assessments must conduct theory examination/practical in appropriate examination venues

ASSESSMENT TOOLS

These tools should assess higher level of cognition like understanding, application, interpretation, analysis and decision making rather than simple recall. Different disciplines will need to develop these assessments together to judge holistic comprehension and ability to practice what is learnt by student. Tools of assessment which can be used for integrated curriculum are as following.

| COGNITIVE DOMAIN | PSYCHOMOTOR DOMAIN | AFFECTIVE DOMAIN |
|--|--|---|
| 1. MCQs 2. Extended matching questions (EMQs) 3. Short Answer Questions (SAQs) 4. Short Essay questions (SEQs) 5. Oral Examination | Formative Assessment: a. OSPE b. Mini-Clinical Evaluation Exercise (Mini-CEX) c. Surgical DOPS (Directly Observed Procedural Skills) Case Based Discussion Summative Exam: (OSCE) Practical Examination Direct Observation of clinical skills Long case Short case | The following tools can assess behaviour, communication skills, ethics and professionalism. a. Interviews b. Direct observation of communication skill and behaviour c. OSPE/OSCE d. Portfolios e. Reflections (only for formative assessment) |

ASSESSMENT

Muhammad Medical College adheres to the constructive alignment model, whereby the teaching methodologies and learning objectives are matched with the assessment. For the purpose of evaluating the formative tests for the MBBS program, our college has a clear assessment policy and an Exam Cell. However, LUMHS administers the Summative Professional Examinations.

ASSESSMENT POLICY

PURPOSE:

The purpose of this Assessment Policy is to outline assessment practices within the MMC MBBS program. The policy has been developed by the Department of Medical Education (DME) and it documents a clear format for all types of assessments. This document is intended to complement the LUMHS assessment policy that outlines the structure for conducting annual summative assessments and certification of MBBS degree.

GUIDING PRINCIPLES OF ASSESSMENT POLICY IN MUHAMMAD MEDICAL COLLEGE

- j. MMC has the responsibility to ensure to all stakeholders that students have achieved the identified outcomes of our MBBS program.
- k. Good assessment requires a variety of methods; no single method is enough to assess learning outcomes across all domains.
- l. Feedback should be provided to students following all assessments to ensure that students identify gaps in their learning and faculty can review future curricular and assessment content.
- m. Each assessment instrument/method must be selected based on scientific evidence
- n. All assessment decisions must be made on rational arguments and scientific underpinnings. The faculty must be trained/ show competence in use of various assessment strategies.
- o. The quality of the entire assessment process must be ensured.
- p. The assessment process should be clear and transparent so that students know in advance the expectations (from students) and Consequences of the assessment.
- q. The Timing and Mode of each College & University Assessment must be explicitly defined in the assessment plan.
- r. Details of LUMHS exams are available in the assessment Policy 2021 document

ROLES OF VARIOUS DEPARTMENTS IN ASSESSMENT:

Each department is responsible for student assessment within its domain. Students must be continuously assessed for the required knowledge, skills and attitudes through various examination procedures. Records of the conduct of these procedures should be maintained in the departments in the form of documented assessment plans.

There are two forms of Assessment:

- 1. Formative Assessment
- 2. Summative Assessment

1. FORMATIVE ASSESSMENT

Formative assessment has been defined as “activities undertaken by teachers and by their students in assessing themselves that provide information to be used as feedback to modify teaching and learning

activities. Formative assessment is a systematic process to continuously gather evidence about learning. Student performance in these assessments is used to identify a student's current level of learning and to adapt lessons to help the student reach the desired learning goal. The data are used to identify a student's current level of learning and to adapt further teaching to help the student reach the desired learning goals. These assessments which do not necessarily carry Weightage in the final examination. Formative Assessment should be carried out throughout the blocks and clinical rotations using various strategies at the discretion of departments. Formative assessments must be accompanied by feedback to the students.

Formative assessments also inform students

- About what the learning goal is,
- Where the students are in relation to that learning goal,
- What can be done to improve subsequent performance

Formative assessment has two further types

- I. **Informal Formative Assessments:** Taken during or at the end of a teaching session to ensure student learning. Informal formative assessments do not need to be planned and can be taken spontaneously.
- II. **Formal Formative Assessments.** These are planned in the form of planned quizzes, assignments, class tests etc. The results of formal formative assessments must be shared with students. Formal formative assessments can be used to inform internal assessments if required.

2. SUMMATIVE ASSESSMENT

Summative tests are usually given at the conclusion of instructional units and are nearly always graded. The governing body for the Muhammad Medical College MBBS program's summative examinations at the end of the session is LUMHS.

After a summative assessment, if a student performs adequately, there is usually no additional formal learning on the examined subject—unless there is a cumulative final examination. Summative assessments serve the purpose of evaluating a student's performance or proficiency at a given moment as well as determining their eligibility for special programs (like gifted and talented education), if they should move on to the next grade, if they should receive career guidance, and if they meet the requirements for awards.

These are the assessments which are used to inform decisions about students' progress, promotion and graduation from the Muhammad Medical College MBBS program. Summative assessment decisions are made on the basis of both internal assessments scores and end of year assessment scores. Internal assessments will contribute 20%, each for theory and practical. Internal assessments include module exams, End of the block (EOB) exams, ward tests, OSCE/ OSPE, pre annual exams. Assessment strategies used in End of the block (EOB) exams & pre annual exams and professional assessments shall remain the same. The details of examinations for each professional exam are present in the LUMHS assessment policy.

The methods for summative assessment are as follows:

A. Multiple Choice Questions

- Single best type MCQs having five options with one correct answer and four distractors are part of assessment.
- Total 100 MCQs are included, which are formulated through the table of specification from learning objectives of Module interactive lectures.
- Time duration for Modules MCQs is 1 and half hour.
- MCQs are used to assess objectives covered in each module.
- Students after reading the statement / scenarios, select one appropriate response from

the given options.

- Correct answers carry one mark, and incorrect will be marked zero. Rule of negative marking is not applicable.
- Students attempt the MCQs exam on Computer screen on Moodle / LMS program in IT Lab.

B. Short Essay Questions (SEQs):

- Short-answer questions are structured way of asking open-ended questions that require students to create their answers based on their knowledge.
- Commonly used in examinations to assess the depth of knowledge and understanding.
- Modular exams include 10 questions each carrying 10 marks.
- Time Duration for Essay type Modular exam is 2 hours.
- Questions are selected from the specific learning objectives of the specific ongoing module.

C. OSPE / OSCE

- Each student is assessed on the same content and have same time to complete the task.
- Time allocated for each station is five minutes as per Examination rules of Ibn e Sina University, Mirpurkhas.
- All students are rotated through the same stations.
- OSPE / OSCE comprises 15 - 20 stations.
- Each station may assess a variety of diagrammatic identifications and clinical tasks. These tasks may include history taking, physical examination, skills and application of skills and knowledge
- Stations are Interactive, observed, unobserved (static) and rest stations.
 - Interactive Stations:
 - In this station, examiner ask questions related to the task within the allocated time.
 - Observed Stations:
 - In observed stations, internal or external examiner don't interact with the candidate and just observe the performance of the skills or procedures.
 - Unobserved (static) Stations:
 - It will be static stations in which there may be models, specimens, multiple identification points, X-ray, Labs reports, flowcharts, pictures, or clinical scenarios (to assess cognitive domain) with related questions for students will be used to answer on the provided answer copy.
 - Rest station
 - It is a station where there is no task given, and in this time student can organize his/her thoughts

D. WEEKLY ONLINE TESTS

The weekly tests are conducted for all classes. The tests are conducted online and are on topics displayed on the portal (Moodle). It consists of 35 MCQs. 5 MCQs will be from the previous weeks (slightly altered to change the answer or the right option). Everyone taking lectures, submits two MCQs to the Chairperson of the department who will check and pass them to the class moderator. MCQs can also be sent directly to the class moderator, who submits the MCQs to IT department for final placement on the moodle.

- The MCQs are not merely simple recall but test higher level of cognition. As far as possible, they test an important concept related to one of the topics of the week.
- It is somewhat different from the Annual or Semester Examinations in that the goal of summative assessment is to evaluate student's learning at the end of an instructional unit by comparing it against some standard or benchmark, to decide if the student can be

promoted or not, whereas the goal of these weekly tests is to check the understanding of the students on the important concepts related to the topics that have been displayed on the portal for the week, the teachers have taught them and the students have made assignments on them.

E. LONG CASES

As part of a lengthy case, a kind of clinical examination, a junior professional, trainee, or undergraduate student discusses a specific case with a senior professional. Each scenario in a lengthy case typically lasts at least 20 minutes, as the name suggests, though it may last longer depending on the circumstances.

F. SHORT CASES

Every brief case starts with a stem, and you have seven minutes to complete the assessment. to establish a reliable diagnosis or aetiology for the issue the patient is presenting with.

INTERNAL ASSESSMENT

Following are the policies for Internal Assessment for MBBS in Muhammad Medical College:

- All subjects will have internal assessments using the format specified.
- Ongoing internal evaluations will include assessments at the conclusion of every task, such as class exams, stages and sub-stages, and workbooks, as well as attitudinal evaluations from clinical and educational supervisors and assessments of clinical expertise.
- Knowledge, skill, and attitude assessments will be used to inform internal evaluations. Multiple Choice Questions, Short Essay Questions, Oral/Viva, and Practical/Clinical Exams are the methods that will be utilized to evaluate these domains.
- Admission forms for the annual examination and awards of internal assessment in each candidate's subject must be turned in to the Controller of Examinations. Internal evaluations submitted after the final exam has started won't be accepted.
- The results of the internal assessment must be turned in just once a year before the annual exam; the results will be taken into account for both the annual and supplemental exams. It is further highlighted that it is not acceptable to submit a revised or fresh assessment for a supplemental examination.
- The Department of Medical Education & Research and the relevant departments must keep accurate records of ongoing internal assessments. It will be sent to the Controller of Examinations in accordance with Ibn E Sina University specifications.

| SCHEME OF INTERNAL ASSESSMENT/EVALUATION-2025 | | | |
|---|----|----------------------------|---------|
| Overall attendance | | | 7% |
| M-Modular Test/Ward test/OPD Test | | | 2% (6%) |
| SURVIVE | | | 7% |
| SURVIVE 7% | | | |
| Final Year | | Remaining Years | |
| Test | 3% | Test | 3% |
| Assignment | 2% | Assignment | 2% |
| Post Test Discussion | 2% | PTD/Practical Book/Logbook | 2% |
| Total | 7% | Total | 7% |

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| ACADEMIC CALENDAR ACADEMIC SESSION 2024-2025 | | |
|---|--|----------------------------------|
| ACTIVITY | CLASS YEAR | DATES |
| Classes starts | First Prof MBBS | February 18, 2025 |
| Eid-ul-Fitr | Holiday | March 31 to April 06, 2025 |
| Classes Resumes | All Batches of MBBS | April 07, 2025 |
| Summer Vacation | 1 st to 4 th Year MBBS | June 07 to July 06, 2025 |
| Classes Resumes | All Batches of MBBS | July 07, 2025 |
| Classes Ends | First Year MBBS | November 14, 2025 |
| Exam Preparation | First Year MBBS | November 15 to December 07, 2026 |
| Annual Examination | First Year MBBS | December 08 to January 04, 2026 |

FIRST YEAR MBBS PROGRAM

**MODULES, THEMES, CONTACT HOURS, CREDIT HOURS
OF FIRST YEAR OF MBBS PROGRAM-2025**

| THEME NAME | DURATION | CONTACT HOURS | CREDIT HOURS | |
|--|----------|------------------|----------------|---------------------------|
| FIRST YEAR MBBS | | | | |
| Total 28 Themes | | 40 weeks | 1300 | 81.25 |
| Introductory Week | 1 week | 32.5 | 2.03 | |
| Cell Structure, Chemistry and Functions | 1 week | 32.5 | 2.03 | |
| Cellular Interactions, Cell Injuries, Cellular Response and Adaptation | 1 week | 32.5 | 2.03 | |
| Body Fluids: Composition, Function, Homeostasis | 1 week | 32.5 | 2.03 | |
| Macromolecules: Fundamental Tissue/System of the Human Body | 1 week | 32.5 | 2.03 | |
| Fundamental Tissue/System of the Human Body | 1 week | 32.5 | 2.03 | |
| Development, Differentiation and Growth | 1 week | 32.5 | 2.03 | |
| Genetics and Developmental Anomalies | 1 week | 32.5 | 2.03 | |
| Assessment | 1 week | 32.5 | 2.03 | |
| Total Contact Hours for 9 Weeks | | | 9-Weeks | 292 Hours |
| Red Cell Disorders (Anemia, Polycythemia) | 2 weeks | 32.5*2= 65 Hours | 4.06 | |
| Infections and Inflammation | 1 week | 32.5 | 2.03 | |
| Bleeding and Thromboembolic Disorders | 1 week | 32.5 | 2.03 | |
| ABO and Rh-Incompatibility | 2 weeks | 32.5*2= 65 Hours | 4.06 | |
| Immunological Disorders | 1 weeks | 32.5 | 2.03 | |
| Assessment | 1 week | 32.5 | 2.03 | |
| Total Contact Hours for 8-Weeks | | | 8-Weeks | 260 Hours |
| | | | | 16.25 Credit Hours |

| | | | | |
|--|---------|------------------|-----------------|------------------|
| Pectoral Region And Breast | 1 week | 32.5 | 2.03 | |
| Back, Axilla And Shoulder Joint | 1 week | 32.5 | 2.03 | |
| Brachial Plexus And Arm | 2 weeks | 32.5*2= 65 Hours | 4.06 | |
| Forearm, Hand, Carpal Tunnel Syndrome | 1 week | 32.5 | 2.03 | |
| Anterior Thigh and Femoral Hernia | 1 week | 32.5 | 2.03 | |
| Gluteal Region, Hip Joint and Sciatic Nerve | 2 weeks | 32.5*2= 65 Hours | 4.06 | |
| Anterior Compartment of Leg and Compartment Syndrome | 1 week | 32.5 | 2.03 | |
| Posterior Compartment of Leg and Foot | 1 week | 32.5 | 2.03 | |
| Assessment | 1 week | 32.5 | 2.03 | |
| Total Contact Hours for 11-Weeks | | | 11-Weeks | 357 Hours |
| Arrhythmias and Myocardial Infarction | 1 week | 32.5 | 2.03 | |
| Congenital Anomalies of the Cardiovascular System | 1 week | 32.5 | 2.03 | |
| Hypertension | 2 weeks | 32.5*2= 65 Hours | 4.06 | |
| Heart Failure | 1 week | 32.5 | 2.03 | |
| Assessment | 1 week | 32.5 | 2.03 | |
| Total Contact Hours for 06-Weeks | | | 06-Weeks | 195 Hours |
| The Chest/Thoracic Wall And Trauma | 1 week | 32.5 | 2.03 | |
| Airways And Their Conditions Or Disease | 2 weeks | 32.5*2= 65 Hours | 4.06 | |

| | | | | |
|---|---------|------------------|------------------|---------------------------|
| Lung Parenchyma and Interstitium and their Conditions or Diseases | 2 weeks | 32.5*2= 65 Hours | 4.06 | |
| Assessment | 1 week | 32.5 | 2.03 | |
| Total Contact Hours for 06-Weeks | | 06-Weeks | 195 Hours | 12.18 Credit Hours |

FIRST YEAR MBBS
LIST OF SKILLS WORKSHOPS ACCORDING TO MODULES
MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS

Competence-based medical education is being promoted by the World Federation of Medical Education and PM&DC. In its quest to be a national/international leader in producing quality doctors, Muhammad Medical College has a state-of-the-art Skills Lab/ Simulation Centre and a unique Program of teaching and training the 64 Clinical skills required by a doctor. Each skill will be taught at the skill/ simulation lab and will be strengthened in the wards. Following is the schedule of the program. Each session may be preceded by a brief introduction/video. A printed as well as the electronic logbook will be maintained by each student. This record will be automatically updated and kept in the student's e-file, and some marks will be awarded in each modular/ annual examination to the student. Here, the skills have been divided according to

| MODULE NAME | COMPETENCIES | LUMHS LEARNING OBJECTIVES | NAME OF WORKSHOP | VENUE |
|----------------------------|---------------------------------------|--|---------------------------------------|---------------------|
| MOD-I Foundation module | Demonstrate the use of the Microscope | Describe the basic laboratory techniques and demonstrate the use of a microscope to identify basic laboratory skills | Microscope handling | Physiology Lab |
| | Demonstrate hand washing technique | Demonstrate hand washing technique | Hand Washing | Physiology Lab |
| | Demonstrate the use of Microscope | Techniques of using glassware and handling Biochemical instruments during laboratory work. | Handling of Biochemical instruments | Biochemistry Lab |
| | Power Lab handling | Introduction to Power Lab | Handling of Power lab | Physiology Lab |
| | Biochemical analysis of carbohydrates | Perform Biochemical analysis of carbohydrates | Biochemical analysis of carbohydrates | Biochemistry Lab |
| | Preparation of different solutions | Prepare different solutions used in laboratory for tests | Preparation of different solutions | Biochemistry Lab |
| | Sterilization Protocol | Basics of sterile techniques and disinfection. | Sterilization Protocol | Skills Lab/Surgical |

| | | | | |
|-------------------------------------|--|--|---|----------------|
| MOD-2 Hematology-I | Perform blood sampling | Collect blood sample by various methods i.e. pricking method & venipuncture on dummies | Methods of blood sampling | Physiology Lab |
| | Prepare Peripheral Blood film | Prepare blood film & Identify and quantify different types of white blood cells on blood film | Peripheral Blood film | Physiology Lab |
| | Blood grouping | Identify different blood groups | Blood grouping | Physiology Lab |
| | Sahli's method for Hb determination | Determine hemoglobin concentration (Sahli's method) | Sahli's method for Hb determination | Physiology Lab |
| | Interpretation of Normal and abnormal Hb | Laboratory diagnosis of Anemia | Interpretation of Normal and abnormal Hb | Physiology Lab |
| | Bleeding and clotting time | Estimate bleeding time, clotting time (BT & CT) | Bleeding and clotting time | Physiology Lab |
| | Diagnosis of Bleeding Disorders | Laboratory diagnosis of Bleeding Disorders | Diagnosis of Bleeding Disorders | Physiology Lab |
| | Estimation of ESR | Estimate erythrocyte sedimentation rate (ESR by Wester green method) | ESR Estimation | Physiology Lab |
| | History taking Skills | Practice history taking: patients with anemia and bleeding disorders on simulated lab <ul style="list-style-type: none"> • Understand patients' stance while taking a comprehensive history or in any other scenario like breaking bad news, conflict resolution, disaster management, information care, etc. • Communicate well his/her own understanding and strategy in interpersonal relationships. • Use cognitive and behavioral theories while communicating with others and in any clinical or non-clinical activity. • Believe in the implication of socio-cultural factors such as | History taking Skills, Communication Skills, Breaking bad news Conflict resolution | Skills Lab |

| | | | | |
|----------------|---|---|---|-----------------------|
| | | <p>gender, race, social class, family, and occupations in health and disease.</p> <ul style="list-style-type: none"> • Be able to correlate the psychosocial aspects with the common clinical conditions (DM, Coronary Artery Disease, AIDS, etc.) • Identify the social and anthropological factors that influence detection, management, compliance, and clinical outcome (stigma, myths, cultural taboo, somatization, etc.) • Demonstrate stress management skills towards self, patients, and colleagues. • Be highly concerned about the psychosocial factors in important clinical settings like hospitalization, emergency, ICU, cancer wards, etc. <p>Early Clinical Exposure (ECE): observe patient examination and basic surgical procedures</p> | | |
| | Orientation to the operating theatre (OT) | <ul style="list-style-type: none"> • Orientation to the operating theatre (OT) and surgical instruments (introductory). | Orientation to the operation theatre (OT) | Skills Lab/OT Complex |
| MOD-3 MSK-I | The muscular twitch response | To develop skills in recording, analyzing, and interpreting phases of muscular twitch response experimentally. | Muscular twitch response | Histology Lab |
| | EMG | Perform EMG | Electromyogram | Physiology Lab |
| | Interpretation of Calcium and Phosphorus | To acquire skills in interpreting calcium and phosphorus levels for assessing bone and metabolic disorders | Interpretation of Calcium and Phosphorus | Physiology Lab |
| | Action potential | To develop skills in recording, analyzing, and interpreting neuronal action potentials for understanding excitable cell physiology. | Action potential | Physiology Lab |
| | Muscle Fatigue | To develop skills in inducing, recording, and interpreting muscle fatigue for understanding neuromuscular physiology mechanisms. | Muscle Fatigue | Physiology Lab |

| | Breast Examination | Perform Breast examination | Breast Examination | Skills Lab |
|------------------------|--|--|---|----------------|
| MOD-4 CVS-I | Identification of cardiac tissues and blood vessels | Identification of cardiac tissues and blood vessels under the microscope with points of Identification. | Identification of cardiac tissues and blood vessels | Histology lab |
| | Measuring blood pressure | To measure blood pressure using a Sphygmomanometer with correct technique and interpretation of its values and calculation of mean arterial pressure Recording of arterial blood pressure. Effects of exercise and posture on blood pressure | Measuring blood pressure | Physiology Lab |
| | Examination of pericardium | Examination of heart sound Apex beat and normal heart sounds. | Examination of pericardium | Physiology Lab |
| | Examination of heart sounds, Apex beat and normal heart sounds | Identification of areas on the chest for auscultation of the heart sounds. | Examination of heart | Skills Lab |
| | ECG | Placing electrodes and obtaining an electrocardiogram and interpretation of the basic ECG findings. ECG recording and interpretation of normal ECG Pulse rate, blood pressure, ECG recording on power lab and ECG machine | ECG | Physiology Lab |
| | Examination of arterial pulses | Examination of arterial pulses | Examination of arterial pulses | Skills Lab |
| MOD-5 Respiratory-I | Cardiopulmonary Resuscitation (CPR) | Perform CPR on Mannequins | Cardiopulmonary Resuscitation (CPR) | Skills Lab |
| | Triple response | Demonstrate and explain the mechanism of Lewis's Triple Response (red reaction, flare, and wheal) and correlate it with underlying physiological processes involving local vascular and neural mechanisms. | Triple response | Physiology Lab |

| | | | | |
|--|--|--|-----------------------------|--|
| | Microscopic identification of the respiratory system | Microscopic identification of the different parts of the respiratory system. | | Histology Lab |
| | Interpretation of ABGs, PFT | Interpretation of ABGs, PFT | Interpretation of ABGs, PFT | Biochemistry Lab |
| | Application of a pH meter | Application of pH meter | Application of pH meter | Biochemistry Lab |
| | Clinical examination of the respiratory system | Perform a clinical examination of the respiratory system | | Skills Lab, Hospital rotation |
| | Pulmonary volumes, capacities and their clinical interpretation. | Perform the spirometry & plot a graph of lung volume Recording of respiratory movements using a stethoscope Respiratory adaptations during standing, sitting, and swallowing | | Physiology Lab Skills Lab, Hospital rotation |

FOUNDATION MODULE-1

Introduction Welcome to the foundation 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 interactive activities.

During this module, students will be encouraged to learn basic organization of human body in terms of structure, function and Biochemical properties in an integrated manner **i.e.** Basic subjects including Anatomy, Physiology, Biochemistry, Pharmacology and Pathology will be learned and assessed together. You will also learn to integrate basic knowledge with clinical relevance. By adopting this approach, you will be prepared 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 house officers. 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 Interactive Lectures, practical and tutorials that have been scheduled during this module.

Rational Orientation of medical sciences in respect to health and disease 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 clinical sciences. Students also learn clinical skills such as how to communicate effectively with patients and their relatives with compassion and understanding their issues/problems and how to resolve in coming years. Working in groups will enhance students' team working skills and capacity and management skills. Along with LGT/Interactive Lectures, practical and demonstrations; through supplemented case-based learning they develop problem solving skills to apply their basic medical knowledge and skills to practical situations under supervision and subsequently in real life practice.

Duration 8 weeks

Learning Outcomes

by the end of this foundation module, the students should be able to: Knowledge

- Describe the cell division, its types and genetic material along with its clinical correlation.
- Describe the basic organization of the human body.
- Describe the basic tissues of the human body
- Explain the maintenance of homeostatic mechanism.
- Describe the various malformations.
- Describe the Biochemistry of carbohydrates, nucleic acids and enzymes
- Describe various cellular adaptations during cell growth, differentiation and cell injury
- Describe the basic concepts of medical ethics, professionalism, clinical research, behavioral sciences, communication skills, information technology skills

Skills

- Describe the basic laboratory techniques and demonstrate the use of microscope
- Identify basic tissues under the microscope
- Learn and follow the basic laboratory protocols
- Perform Biochemical analysis of carbohydrates
- Prepare different solutions used in laboratory for tests

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, cadavers, peers, staff and teachers.
- Communicate effectively in a team with peers and teachers.
- Demonstrate the ability to reflect on the performance.

Themes

Theme 1: Cell structure, Chemistry and Function

Theme 2: Cellular interactions, Cell injuries, Cellular responses and Adaptations

Theme 3: Body fluids: Composition, Function & Homeostasis

Theme 4: Macromolecules: Fundamental tissues/systems of the human body

Theme 5: Fundamental tissues/systems of the human body

Theme 6: Development, Differentiation and Growth

Theme 7: Genetics and Developmental anomalies

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

INTRODUCTORY WEEK

| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
|---------------------|--|--|---------------------|-------------|
| Anatomy | | | | |
| 1 | State the history of the subject Anatomy, including its various branches and practical applications of Anatomy as a foundation in different fields of medicine | Fnd-S1-Ana-G1 Introduction to the subject of Anatomy and its subdivisions | Interactive Lecture | |
| 2 | Comprehend the exact location of dissected/ prosecuted part /organ of human body with respect to various terms of positions, direction, and body planes | Fnd-S1-Ana-G2 Anatomical Position, Anatomical planes & terms of position | | SBQs & OSVE |
| 3 | Interpret the movements of different parts of the human body the knowledge of various terms of movement. | Fnd-S1-Ana-G3 Terms of movements | | |
| 4 | Explain the appendicular and axial skeleton | Fnd-S1-Ana-G4 Introduction to the parts of axial and appendicular skeleton | | |
| Physiology | | | | |
| 5 | Define Physiology and Enumerate the branches of Physiology | Fnd-S1-Phy-1 Introduction to Physiology | Interactive Lecture | SBQs & OSVE |
| Biochemistry | | | | |

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|---|--|---|---------------------|-------------|
| 6 | Define Biochemistry & Discuss the role of Biochemistry in medicine | Fnd-S1-Bio-1 Introduction to Biochemistry and its implication in medicine | Interactive Lecture | SBQs & OSVE |
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|---------------------------|--|---|---------------------|-------------|
| 7 | Describe the significance of Protection protocols to keep yourself safe during Biochemistry laboratory work. | Fnd-S1-Bio-2 Laboratory Hazards & Protection Protocols | Practical | OSPE & OSVE |
| 8 | Demonstrate the importance of chemicals and reagents in the different reactions of Biomolecules | Fnd-S1-Bio-3 Chemicals and reagents | | |
| 9 | Illustrate techniques of using glassware and handling of Biochemical instruments during laboratory work. | Fnd-S1-Bio-4 Use of glassware & Instruments for laboratory work | | |
| Pathology | | | | |
| 10 | Define the pathology Enumerate the different branches of pathology Describe the terminologies used in Pathology | Fnd-S1-Path-1 Introduction to Pathology | Interactive Lecture | SBQs & OSVE |
| Pharmacology | | | | |
| 11 | Define the Pharmacology and role of Pharmacology in medicine Discuss Pharmacodynamics and Pharmacokinetics | Fnd-S1-Pharm-1 Introduction to Pharmacology | Interactive Lecture | SBQs & OSVE |
| Community Medicine | | | | |
| 12 | Define different definitions of public health/Community Medicine Discuss basic functions of Public health/community Medicine Define the difference between clinical and community medicine Discuss Non-Governmental organizations, international agencies and National Programs of Pakistan. | Fnd-S1-CM-1 Introduction to Community Medicine & Public Health | Interactive Lecture | SBQs & OSVE |
| Forensic Medicine | | | | |
| 13 | Define Forensic Medicine, Forensic Pathology and state Medicine Know the branches and the history of Forensic Medicine briefly Discuss the scope of Forensic Medicine in practice Identify the essential facilities for medico legal investigation. Define medical jurisprudence and differentiate it from Forensic medicine | Fnd-S1-FM-1 Introduction to Forensic Medicine and Toxicology | Interactive Lecture | SBQs & OSVE |

Medical Education

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|-----------|---|--|---------------------|-------------|
| 14 | Describe the curriculum and modules under implementation Describe the use of study guides (not to be assessed) Differentiate between various teaching & learning strategies Enlist various assessment tools, and assessment policy | Fnd-S1-ME-1 Curriculum structure, teaching learning strategies | Interactive Lecture | SBQs & OSVE |
| 15 | Describe various study skills strategies | Fnd-S1-ME-2 Study skills strategies | | |

Information Technology

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|-----------|--|---|---------------------|-------------|
| 16 | Define IT and its importance in Medicine | Fnd-S1-IT-1 Importance of IT skills | Interactive Lecture | SBQs & OSVE |
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Library Sciences

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|-----------|--------------------------------|--|---------------------|-------------|
| 17 | Learn literature search skills | Fnd-S1-LIB-1 Literature search and library resources | Interactive Lecture | SBQs & OSVE |
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Behavioral Sciences

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|-----------|--|---|---------------------|-------------|
| 18 | Learn the significance of communication skills in Medical Sciences | Fnd-S1-BS-1 Introduction to Behavioral Sciences | Interactive Lecture | SBQs & OSVE |
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Communication Skills

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| 19 | Learn the significance of communication skills in Medical Sciences | Fnd-S1-CS-1 Introduction to communication skills | Interactive Lecture | SBQs & OSVE |
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Biomedical Ethics

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| 20 | Learn the significance of ethics in Medical Sciences | Fnd-S1-BE-1 Introduction to Bio-Medical Ethics | Interactive Lecture | SBQs & OSVE |
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Research Methodology

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| 21 | Learn the significance of ethics in Medical Sciences | Fnd-S1-RM-1 Introduction to research methodology | Interactive Lecture | SBQs & OSVE |
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Theme 1: Cell Structure, Chemistry & Functions

| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|---------|---------------------|-------|-------------------|------------|
| Anatomy | | | | |

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|---------------------|---|--|---------------------|-------------|
| 22 | Describe the basic structure and functions of cell membrane. Describe the basic structure and functions of the Nucleus. | Fnd-S1-Ana-H1 Cell structure and function (Membrane structure and the Nucleus) | Interactive Lecture | SBQs & OSVE |
| 23 | Describe the structural Organization of different organelles of a cell. (Endoplasmic Reticulum, Golgi Apparatus, Ribosomes, Centrioles, Mitochondria, Lysosomes, Peroxisomes) | Fnd-S1-Ana-H2 Cell Organelles | | |
| 24 | Operate the different parts of the light microscope. Explain how to use the light microscope to visualize a slide. | Fnd-S1-Ana-H3 Parts of the Light microscope | Practical | OSPE & OSVE |
| Physiology | | | | |
| 25 | Describe the Functional arrangement of different levels of organization and the General structure, Physiology, and composition of cell, tissues, organs, organ systems, cell nutrition, capillaries, and venules. | Fnd-S1-Phy-2 Functional arrangement of different levels of organization and the General structure and composition of the Cell. | Interactive Lecture | SBQs & OSVE |
| 26 | Define the Functional organization of different components of a cell and its organelles. Describe the functions of lysosomes & peroxisomes, Endoplasmic Reticulum. | Fnd-S1-Phy-3 Cell organelles-I (Lysosomes, Peroxisomes, Endoplasmic Reticulum, Golgi complex) | | |
| 27 | Describe the functions of mitochondria, their special features & their role in the generation of ATP Describe the functions of the ER, Golgi apparatus, and the Ribosomes and cytoskeleton. | Fnd-S1-Phy-4 Cell organelles-II Mitochondria, Microtubules & Microfilaments, Ribosomes, Vaults, Centromere. | | |
| 28 | Recognize the structure & Functions of the Nucleus | Fnd-S1-Phy-5 Nucleus & its functions | | |
| 29 | Show the Parts and Functions of the Microscope | Fnd-S1-Phy-6 Introduction to Microscope | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 30 | Describe the chemical structure and significance of mitochondria, functions and location of enzymes for metabolic pathways & chemical reactions that occur in mitochondria. | Fnd-S1-Bio-5 Mitochondria: Structure, functions & location of enzymes for metabolic pathways | Interactive Lecture | SBQs & OSVE |

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| 31 | Prepare all types of solutions and their quantities for different chemical reactions. | Fnd-S1-Bio-6 Solutions, concentration expression (Percent solutions, Molarity, Molality, Normality) | Practical | OSPE & OSVE |
| Pathology | | | | |
| 32 | Define Hypertrophy, Hyperplasia, Atrophy and Metaplasia. Enlist the Physiological and pathological mechanisms of cellular adaptation | Fnd-S1-Path-2 Cellular adaptations | Interactive Lecture | SBQs & OSVE |

| Theme 2: Cellular Interactions, Cell Injuries, Cellular Responses, and Adaptations | | | | |
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| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 33 | Describe the components of cell surface modifications and the junction complex | Fnd-S1-Ana-H-4 Cell surface modifications and cell Junctions | Interactive Lecture | SBQs & OSVE |
| 34 | Differentiate between normal and abnormal cell division and their consequences | Fnd-S1-Ana-E-1 Cell cycle: Mitosis and Meiosis cell divisions | | |
| 35 | Enlist steps of tissue processing. Define the artifacts. Know the basic histological stains. Define H&E Staining. | Fnd-S1-Ana-H-5 Slide preparation and the H&E Staining | Practical | OSPE & OSVE |
| Physiology | | | | |
| 36 | Explain the composition and basic structure of the cell membrane, its functional importance, and adaptation | Fnd-S1-Phy-7 Plasma membrane & its structure and function | Interactive Lecture | SBQs & OSVE |
| 37 | Describe the types and processes of transport across the membrane and their effects. | Fnd-S1-Phy-8 Types of transport, Simple Diffusion | | |
| 38 | Describe the Transport across the cell membrane via a mediated method. Describe the process of osmosis | Fnd-S1-Phy-9 Protein-mediated transport: Facilitated diffusion Osmosis | | |
| 39 | Explain the Physiological mechanism and types of transport. (Passive & Active) | Fnd-S1-Phy-10 Active transport, Primary active transport, Secondary active transport Bulk transport | | |

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| 40 | Describe the membrane potential its development & maintenance of resting membrane potential. Explain Permeability of cell membrane Explain the Propagation of action potential and its ionic basis | Fnd-S1-Phy-11 Resting membrane Potential Graded potential, Factors affecting membrane potential | | |
| 41 | Discuss action potential Give mechanism of propagation of action potential & its ionic changes | Fnd-S1-Phy-12 Action potential | | |
| 42 | Employ types and methods of sterilization | Fnd-S1-Phy-13 Sterilization | Practical | OSPE & OSVE |
| Pathology | | | | |
| 43 | Demonstrate gross and microscopic features of cellular adaptations and Necrosis | Fnd-S1-Path-3 Cell Pathology | Interactive Lecture | SBQs & OSVE |
| Pharmacology | | | | |
| 44 | | Fnd-S1-Pharm-2 Introduction to Pharmacokinetics | Interactive Lecture | SBQs & OSVE |
| 45 | | Fnd-S1-Pharm-3 Introduction to Pharmacodynamics | Interactive Lecture | SBQs & OSVE |

| Theme 3: Body Fluids: Composition, Function & Homeostasis | | | | |
|--|---|--|---------------------|------------|
| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Physiology | | | | |
| 46 | Describe the divisions of body fluids into intracellular, extracellular, and intravascular compartments. | Fnd-S1-Phy-14 Body fluids | | |
| 47 | Recognize the Physiological aspects for the maintenance of homeostasis, ECF, Internal environment, and the role of various body systems in homeostasis. | Fnd-S1-Phy-15 Homeostasis | Interactive Lecture | SBQs& OSVE |
| 48 | Explain the concepts of homeostasis and its regulation through the feedback mechanism. Negative feedback, Positive Feedback, Feed-forward Stress & disease | Fnd-S1-Phy-16 Mechanisms of Homeostasis | | |
| Pharmacology | | | | |

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| 44 | Enlist different routes of drug administration Describe the merits & demerits of the different routes of drug administration | Fnd-S1-Pharm-4 Routes of drug administration | Interactive Lecture | SBQs & OSVE |
| Pathology | | | | |
| 51 | Define cell aging Discuss events in Cellular Aging | Fnd-S1-Path-4 Cell Aging | Interactive Lecture | SBQs & OSVE |

| Theme 4: Macromolecules/ Fundamental tissues/systems of the Human Body | | | | |
|---|---|--|-------------------|-------------------|
| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
| Anatomy | | | | |
| | Define the divisions & functions | | | |
| | of skeletal system. | | | |
| 52 | Classify bones on the basis of shape, development, region, structure and microscopic features, gross structure of adult long bone and parts of young long bone. | Fnd-S1-Ana-G5 The skeletal system (classification of bones.) | Demonstration | SBQs, OSPE & OSVE |
| 53 | Describe general concepts of development, ossification, and blood supply of bones | Fnd-S1-Ana-G6 Bone development (ossification), Blood supply of long bones | | |

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| 54 | Define the joints. Classify joints based on structure, regions and functions Discuss the characteristics of synovial joints and classify on basis of structure & movement | Fnd-S1-Ana-G7 The joints and its types. The synovial joints. | Interactive Lecture | SBQs & OSVE |
| 55 | Define dislocation, sprain and inflammation of joints | Fnd-S1-Orth-1 Fractures | Clinical Interactive Lecture | SBQs & OSVE |
| 56 | Describe the microscopic features of epithelial tissues Explain their functional importance and their surface modifications | Fnd-S1-Ana-H-06 The Epithelium | Interactive Lecture | SBQs & OSVE |
| 57 | Discuss gross and microscopic features of exocrine glands | Fnd-S1-Ana-H-07 Exocrine glands | | |
| 58 | Define the composition of the connective tissue. Describe and differentiate the microscopic features of the different types of the connective tissues | Fnd-S1-Ana-H-08 Histology of Connective tissue | Interactive Lecture | SBQs & OSVE |

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| 59 | Demonstrate histological features of cartilage. Describe the types of the cartilage. | Fnd-S1-Ana-H-09 The cartilage and its types | | |
| 60 | Identify different types of the epithelia on the light microscope | Fnd-S1-Ana-H-10 Epithelium | Practical | OSPE & OSVE |
| Physiology | | | | |
| 61 | Explain the Physiology experiments and an introduction to Power Lab. | Fnd-S1-Phy-17 Power lab | Practical | OSPE & OSVE |
| 62 | Identify the indications of hand washing Demonstrate the protocols and steps of hand washing in sequential manner | Fnd-S1-Phy-18 Hand washing | | |
| Biochemistry | | | | |
| 63 | Apply the basic knowledge of carbohydrates in chemistry for health | Fnd-S1-Bio-07 carbohydrates: introduction, classification, and its Biochemical significance | Interactive Lecture | SBQs & OSVE |
| 64 | Describe the Biochemical structure of polysaccharides with their clinical importance | Fnd-S1-Bio-08 Monosaccharides: Classification, Structure, Functions | | |
| 65 | Discuss the functions of carbohydrates in the cell membrane, energy provision and nutrition supply to different parts of the body | Fnd-S1-Bio-09 Chemical Properties & Derivatives of Monosaccharides & their Biochemical Significance in Biological systems | | |

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| 66 | Describe different isomers of monosaccharides e.g. Glactose, Mannose, Fructose, Dextrose. | Fnd-S1-Bio-10 Isomerism: Structural & Optical Isomerism in carbohydrates & their Biochemical significance. | | |
| 67 | Explain the Structure of disaccharides and oligosaccharides | Fnd-S1-Bio-11 Glycosidic Linkage, Biologically important disaccharides and oligosaccharides | | |
| 68 | Describe the classification of polysaccharides and their functions. | Fnd-S1-Bio-12 Polysaccharides: Classification, Structure & Functions of Homopolysaccharides | | |
| 69 | Perform Molisch's Test, Iodine Test, and Benedict's Test to identify an unknown carbohydrate in a given fluid | Fnd-S1-Bio-13 Molisch's Test, Iodine Test, Benedict's Test | | OSPE & |

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|----|--|---|---------------------|-------------|
| 70 | Detect carbohydrates by different tests | Fnd-S1-Bio-14 Selivanoff's Test, Barfoed's Test, Osazone Test | Practical | OSVE |
| 71 | Classify amino acids on the basis of their polarity, charge & nutritional significance. | Fnd-S1-Bio-15 Classification of Amino Acids based on structure, Properties, Nutrition & their role in human metabolism | | |
| 72 | Describe the physicochemical classification of proteins. Enumerate the functional classification of proteins. Classify proteins on the basis of their axial ratio. | Fnd-S1-Bio-16 Classification of Proteins based on their structures, functions & chemical reactions. | Interactive Lecture | SBQs & OSVE |
| 73 | Describe the structural levels of proteins and their important Biochemical features. | Fnd-S1-Bio-17 Structural Organization of Proteins | | |
| 74 | Able to detect unknown amino acid/protein in a given fluid | Fnd-S1-Bio-18 General Tests for Proteins & Amino acids | Practical | OSPE & OSVE |
| 75 | Discuss the significance of Lipids for a balanced diet and Health | Fnd-S1-Bio-22 Lipids: Classification & Biochemical significance. | Interactive Lecture | SBQs & OSVE |
| 76 | Able to detect proteins by colour reaction tests | Fnd-S1-Bio-19 Color Reaction Tests of Proteins. | Practical | OSPE & OSVE |

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| 77 | Able to detect proteins by Separation tests | Fnd-S1-Bio-20 Separation Tests | | |
| 78 | Able to detect proteins by precipitation tests | Fnd-S1-Bio-21 Precipitation Tests | | |
| 79 | Able to detect solubility, oily nature, emulsification, saponification tests | Fnd-S1-Bio-23 Tests for Lipids | | |

Theme 5: Fundamental Tissues/Systems of the Human Body

| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
|----------------|---|------------------------|-------------------|-------------|
| Anatomy | | | | |
| | Define the parts of the skin | Fnd-S1-Ana-G-08 | | |
| | Define the appendages of the skin. | Introduction | | |
| 82 | Recognize the role of the Component Tissues of the Skin and Fascia in Support | Integumentary | | |
| | | system (Skin | | |
| | | fascia) | | |

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|----|--|--|---------------------|-------------|
| 83 | Explain the types and functions of blood vessels. (Arteries, veins, capillaries, and Anastomosis) | Fnd-S1-Ana-G-09 Blood vascular system | | |
| 84 | Integrate the function of the Defense with the structure of the lymph nodes | Fnd-S1-Ana-G-10 Introduction to lymphatic system | | |
| | Define the types of muscles | Fnd-S1-Ana-G-11 Definition and Classification of muscles | | |
| 85 | Describe the internal structure of a muscle action, nerve supply, and naming of skeletal muscles | | | |
| | Define smooth and cardiac muscles. | | | |
| 86 | Describe the Nervous system and classification of the NS Define the central and peripheral nervous system | Fnd-S1-Ana-G-12 Introduction to the Nervous System | Interactive Lecture | SBQs & OSVE |
| 87 | Describe the structure and the structure of the typical spinal nerve. | Fnd-S1-Ana-G-13 Formation and Spinal | | |
| 88 | Define the autonomic nervous Describe the types and functions of Autonomic Nervous System. | Fnd-S1-Ana-G-14 General Concepts of Autonomic nervous system | | |
| 89 | Describe the process of Gametogenesis | Fnd-S1-Ana-E-2 Gametogenesis | | |
| 90 | Discuss ovulation and phases and outcomes of fertilization | Fnd-S1-Ana-E-3 Ovulation Fertilization | | |
| 91 | Enumerate the events of the first week of development (cleavage and blastocyst formation, and implantation) | Fnd-S1-Ana-E-4 The First week of development | | |
| 92 | Enumerate the events of the Second | Fnd-S1-Ana-E-5 The second week of | | |

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|-------------------|---|---|--|--|
| | amniotic cavity, amniotic membrane, bilaminar embryonic disc, yolk sac, chorionic sac, and primary chorionic villi) | development | | |
| 93 | Recognize male & female genitalia. Describe the process of fertilization (conception). | Fnd-S1-Cli-G&O-1 Fertilization (The conception) | | |
| Physiology | | | | |
| 94 | Describe the Physiological Concepts and organization of the nervous system. State general physiological concepts and the organization of the Autonomic Nervous System | Fnd-S1-Phy-19 Introduction Organization of the Nervous System | | |

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|----|--|--|---------------------|-------------|
| 95 | Describe the basic Structure and function of neurons & neuroglia Describe the Excitable cells and their types (Synapse) | Fnd-S1-Phy-20 Neuron and neuroglia synaptic transmission | Interactive Lecture | SBQs & OSVE |
| 96 | Definition, structure, functions, and types of synapses, Properties of synapse | Fnd-S1-Phy-21 Synapses and neural integration | | |

| Theme 6: Development, Differentiation, and Growth | | | | |
|--|---|---|--------------------------|-------------------|
| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 98 | Explain the main events of third week of development State formation of the primitive streak, Gastrulation and notochord | Fnd-S1-Ana-E-6 Third week of development (Trilaminar germ disc) | Interactive Lecture | SBQs & OSVE |
| 99 | Explain the formation of neural tube and somite Recognize external appearance of embryo during second month | Fnd-S1-Ana-E-7 Third week to eighth week of development (Embryonic period) | | |
| 100 | Enlist the derivatives of the Ectoderm and neural crest cells | Fnd-S1-Ana-E-08 Derivatives of ectodermal germ layer and neural crest cells | | |
| 101 | Enlist the derivatives of mesodermal and endodermal germ layers | Fnd-S1-Ana-E-09 Derivatives of Mesodermal and Endodermal germ layers | | |
| 102 | Describe the development of the fetus & parturition | Fnd-S1-Ana-E-10 3 rd month to birth (Fetal Period) | | |
| 103 | Explain the interchange of substances between maternal and fetal blood by applying the knowledge of structure and functions of placenta and fetal Membranes & clinicals | Fnd-S1-Ana-E-11 Placenta and fetal membranes | | |
| 104 | Describe the Ectopic pregnancy & its consequences. | Fnd-S1-CL-O&G-2 Ectopic pregnancy | | |

| Theme 7: Genetics and Developmental Anomalies | | | | |
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| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |

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|---------------------|---|--|---------------------|-------------|
| 105 | Define teratogenesis and the basic principles of teratogenesis. Categorize the common teratogens | Fnd-S1-Ana-E-12 Teratogenesis | Interactive Lecture | SBQs & OSVE |
| 106 | Explain the types of twin/ multiple pregnancies and their clinical significance | Fnd-S1-Ana-E-13 Twin pregnancy | | |
| 107 | Calculate the expected date of delivery (EDD) Describe various methods used to Assess fetal well-being | Fnd-S1-Gyn & Obs-3 The Fetal wellbeing & EDD | | |
| Biochemistry | | | | |
| 108 | Enlist different types of nucleotides and their basis in genetics. | Fnd-S1-Bio-24 Structure and types of nucleotides. | Interactive Lecture | SBQs & OSVE |
| 109 | Enlist different types of nucleotides and their basis in genetics | Fnd-S1-Bio-25 Structure of DNA & RNA | Interactive Lecture | SBQs & OSVE |
| Physiology | | | | |
| 110 | Describe the Physiological basis of genes and functions of DNA and RNA | Fnd-S1-Phy-22 DNA, Gene, Genetic code RNA, Types, Codan, anti Codan Fnd-S1-Phy-23 Control of gene functions | Interactive Lecture | SBQs & OSVE |
| Pathology | | | | |
| 114 | Define Mutation and its types. Classification of genetic disorders Define Mendelian Disorders | Fnd-S1-Path-5 Introduction to genetic disorder | Interactive Lecture | SBQs & OSVE |
| 115 | Describe the normal Karyotype Discuss various numerical and structural abnormalities of chromosomes | Fnd-S1-Path-6 Chromosomal aberration. | | |
| 116 | Describe the causes and pathogenesis of congenital fetal abnormalities | Fnd-S1-Path-7 Congenital fetal abnormalities | | |

HAEMATOLOGY MODULE-1

Introduction welcome to the hematology module. this module aims to provide the basic understanding of hematopoiesis and hemostasis at the molecular level. this module is designed to learn and integrate basic knowledge of blood cells, with clinical relevance. this module is designed to make your learning both interesting and productive by including more practical activities. it will deal with the basic patho-physiological and pharmacological aspects of infections and chemo therapeutic agents and integrate it with clinical sciences.

The module will give the 1st year medical students an opportunity to know the presentations and principles of management of common hematological, immunological, inflammatory and neoplastic disorders. 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 Interactive Lectures, practical and tutorials that have been scheduled in this module.

DURATION: 8 weeks Learning

outcomes

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

COGNITIVE DOMAIN: By the end of this module, first year MBBS students shall be able to:

- Identify & describe the various cellular and non-cellular components of blood in relation to its Anatomy, Physiology & Biochemistry
- Describe structure, synthesis and degradation of Hemoglobin
- Describe the regulatory mechanisms of normal hemostasis and coagulation
- Describe the conditions associated with dysfunction of cellular and non-cellular components of blood
- Describe the basic characteristics of immune system.
- Discuss the structure, functions and Biochemical aspects of the Lympho-reticular system.
- Explain the principles and clinical significance of ABO/RH blood grouping system
- Explain the Patho-Physiology of various bleeding disorders
- Identify the role of Pharmacology in inflammation, anemia and bleeding disorders.

PSYCHOMOTOR DOMAIN

Description of the psychomotor skills to be developed and the level of performance required: By the end of this Module, the student should be able to:

- Carry out practical work as instructed in an organized and safe manner
- Make and record observations accurately.
- Determine percentage of formed blood elements (Hematocrit).
- Identify RBC and should be able to do its counting-on-counting chamber and to know normal values. And also classify Anemia morphologically.
- Determine the Hemoglobin with the apparatus and have knowledge of normal and abnormal value.
- Identify WBC morphology and its different types, should be able to count them on counting chamber and to know the normal values. Diagnostic importance of each WBC.
- Identify Platelets and should be able to know normal values. Its diagnostic importance in relation to bleeding disorders
- Perform bleeding time and clotting time and to know normal values and its diagnostic importance in relation to bleeding disorders.
- Perform Blood groups typing and Rh factor.
- Perform ESR and to know its normal value and prognostic importance.

ATTITUDE AND BEHAVIOUR:

By the end of Module, the student shall gain the ability and carry responsibility to:

- Demonstrate ability to give and receive feedback, respect for self and peers.
- Demonstrate sympathy and care to patients.
- Having respect for patients, colleagues and other health professionals
- Organize & distribute tasks
- Exchange opinion & knowledge
- Develop communication skills with sense of responsibility.
- Regularly attend the classes
- Demonstrate good laboratory practices

Laboratory Skills (Physiology & Pathology):

By the end of Module, the students should be able to:

- Describe types & methods of sterilization
- Collect blood sample by various methods i.e. pricking method & venipuncture on dummies
- Prepare blood film & Identify and quantify different types of white blood cells on blood film
- Identify different blood groups
- Antigen-Antibody reactions in the Laboratory
- Determine hemoglobin concentration (Sahli's method)
- Laboratory diagnosis of Anemias
- Estimate bleeding time, clotting time (BT & CT)
- Laboratory diagnosis of Bleeding Disorders
- Estimate erythrocyte sedimentation rate (ESR by wester green method)
- Non. Neoplastic WBC Disorders
- Acute Inflammation/ Chronic inflammation
- Repair: Wound Healing
- Isolation of micro-organism/Lab diagnosis of infectious disease
- Culture Media-I & Culture Media-II

Clinical Skills: By the end of Module, the students should be able to:

1. Practice history taking: patients with anemia and bleeding disorders
2. Define and classify polycythemia
3. Define and describe the different types of anemia
4. Describe various types of blood indices

Themes

Theme 1: Red cell disorders (Anemia, Polycythemia)
Theme 2: Infections & Inflammation
Theme 3: Bleeding & thromboembolic disorders
Theme 4: ABO & Rh-Incompatibility
Theme 5: Immunological disorders

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

Theme 1: Red cell disorders (Anemia, Polycythemia)

| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
|---------------------|---|--|--------------------------------|--------------------|
| Anatomy | | | | |
| 1 | <ul style="list-style-type: none"> Illustrate the organization of hematopoietic tissue Enlist the sites and sources of hematopoiesis before and after the birth. | Hem-S1-E1-Ana- Development of blood | Interactive Lecture | SBQs & OSVE |
| 2 | <ul style="list-style-type: none"> Examine the structure of RBC, WBC & platelets. Illustrate methods used to study blood and bone marrow cells. | Hem-S1-H1-Ana- Morphology of blood cells | Interactive Lecture/ Practical | SBQs & OSPE & OSVE |
| Physiology | | | | |
| 3 | <ul style="list-style-type: none"> Discuss the cellular components of blood Define hematocrit, normal values & factors affecting hematocrit | Hem-S1-Phy-1 Composition of blood & its cellular components | Interactive Lecture | SBQs & OSVE |
| 4 | <ul style="list-style-type: none"> Discuss the various stages of RBC'S formation. Discuss various sites of erythropoiesis Enlist the factors necessary for erythropoiesis. Discuss the significance of Reticulocyte count | Hem-S1-Phy-2 Development of RBCs (Erythropoiesis) | | |
| 5 | <ul style="list-style-type: none"> Examine concentration by Sahli's method | Hem-S1-Phy-3 hemoglobin concentration (Sahli's method) | Practical | OSPE & OSVE |
| 6 | <ul style="list-style-type: none"> Estimate erythrocyte sedimentation rate (ESR by wester green method) | Hem-S1-Phy-4 Estimation of erythrocyte sedimentation rate (ESR by the wester green method) | | |
| Biochemistry | | | | |
| 7 | <ul style="list-style-type: none"> Explain the Biochemical basis for the difference in plasma & serum. Describe composition of blood & plasma protein. | Hem-S1-Bio-1 Composition of blood & plasma proteins (Specialized body fluid) | Interactive Lecture | SBQs & OSVE |
| 8 | <ul style="list-style-type: none"> Describe Chemistry& synthesis of Heme Explain structure, types & forms of Hb. | Hem-S1-Bio-2 Normal Hemoglobin | | |
| 9 | <ul style="list-style-type: none"> Identify abnormalities of Heme Synthesis (PorPhyrins & its types). | Hem-S1-Bio-3 Abnormal Heme | | |

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|---------------------|--|--|---------------------|-------------|
| 10 | <ul style="list-style-type: none"> Explain the Biochemical aspects of hemoglobinopathies. (Thalassemia, sickle cell anemia) | Hem-S1-Bio-4 Abnormal Hemoglobin (Hemoglobinopathies) | | |
| 11 | <ul style="list-style-type: none"> Describe degradation of heme. Explain bile pigments, formation, types,, transport & Excretion of bile. | Hem-S1-Bio-5 Degradation of Heme | | |
| 12 | <ul style="list-style-type: none"> Discuss Iron Metabolism & identify its abnormalities. | Hem-S1-Bio-6 Iron Metabolism | | |
| 13 | <ul style="list-style-type: none"> Explain the Biochemical importance of Vitamin B12 & Folic acid & their associated diseases. | Hem-S1-Bio-7 Vitamin B12 & Folic acid | | |
| 14 | <ul style="list-style-type: none"> Describe importance of Vitamin K & E & their associated diseases. | Hem-S1-Bio-8 Vitamin K & E | | |
| Pathology | | | | |
| 15 | <ul style="list-style-type: none"> Describe classification of Anemia Differentiate the different types of anemias on the basis of Morphology & Pathophysiology. | Hem-S1-Path-1 Introduction of Anemia | | |
| 16 | <ul style="list-style-type: none"> Identify the types of nutritional Anemias Enlist causes of iron deficiency, Anemia & clinical features and Laboratory diagnosis | Hem-S1-Path-2 Iron deficiency Anemia | Interactive Lecture | SBQs & OSVE |
| 17 | <ul style="list-style-type: none"> Enlist causes of vitamin D-12 and folate deficiency Explain the Pathophysiology, clinical features and laboratory diagnosis. | Hem-S1-Path-3 Megaloblastic Anemia | | |
| Pharmacology | | | | |
| 18 | Describe role of oral & injectable iron in iron deficiency anemia | Hem1-S1-Pharm-1 Drugs for iron deficiency anemia | Interactive Lecture | SBQs & OSVE |
| 19 | Describe role of Vit. B12 & Folic acid in Macrocytic anemia | Hem1-S1-Pharm-2 Drugs for Megaloblastic anemia | | |

Theme 2: Infections & Inflammation

| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|-------------------|---|--|--|-------------------|
| Anatomy | | | | |
| 21 | • Discuss the embryological source of lymphoid organs | Hem-S1-E2-Ana- Development of lymphoid organs | Interactive Lecture | SBQs & OSVE |
| 22 | • Discuss the components, location & structure of lymphoid issue. | Hem-S1-G1-Ana- Gross features of lymphoid organs | Demonstration | SBQs, |
| | • Describe parts, surfaces and relations of Lymphoid organs | organs | | OSPE & OSVE |
| 23 | • Discuss the histological classification & microscopic features of lymphoid organs. | Hem-S1-H3-Ana Microscopic anatomy of lymphoid organs | Interactive Lecture | SBQs & OSVE |
| 24 | • Define histological features of spleen & lymph node. | Hem-S1-H4-Ana- Spleen & Lymph node | Practical | OSPE & OSVE |
| 25 | • Define histological features of Thymus gland & Tonsil. | Hem-S1-H5-Ana- Thymus & Tonsil | | |
| Physiology | | | | |
| 26 | • Describe the process of leukocyte genesis, enlist various types of granulocytes and agranulocytes, their functions & normal values • Explain the significance of Reticuloendothelial system • Discuss the functions of T and B lymphocytes. | Hem-S1-Phy-5 Genesis and general characteristics, and functions of white blood cells | Interactive Lectures/ Small Group Discussion | SBQs, OSPE & OSVE |
| Pathology | | | | |
| 27 | • Define acute inflammation. • Describe the changes systemic effects & occurring in acute inflammation. | Hem-S1-Path-4 Overview of acute and chronic inflammation | Interactive Lecture | SBQs & OSVE |
| 28 | • Describe causes of Neutrophilia and Neutropenia, Eosinophilia Lymphocytosis, Monocytosis | Hem-S1-Path-5 Non-Neoplastic WBC Disorders | | |

| Theme 3: Bleeding & thromboembolic disorders | | | | |
|---|--|--|-------------------|------------|
| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Physiology | | | | |
| 42 | • Describe the four basic mechanism of Hemostasis, • Explain the mechanism of formation of platelet plug. | Hem-S1-Phy-6 Hemostasis & role of Thrombocytes | Interactive | |

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|---------------------|---|---|---------------------------------|-------------------|
| 43 | <ul style="list-style-type: none"> Explain steps involved in intrinsic and extrinsic pathway for coagulation, Enlist the clotting factors, to describe the role of clotting factors in coagulation. | Hem-S1-Phy-7 Clotting cascade & | Lectures/Small Group Discussion | SBQs, OSPE & OSVE |
| Biochemistry | | | | |
| 44 | <ul style="list-style-type: none"> Describe importance of Vitamin K & E & their associated diseases. | Hem-S1-Bio-9 Vitamin K & E | Interactive Lecture | SBQs & OSVE |
| Pathology | | | | |
| 45 | <ul style="list-style-type: none"> Discuss the different types of bleeding disorders. | Hem-S1-Path-6 Platelet and Bleeding | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Discuss Quantitative & Qualitative platelets disorders Describe classification & Lab. diagnosis of hemophilia and Von Willebrand disease. | disorder | | |
| 46 | <ul style="list-style-type: none"> Discuss thrombosis, pathogenesis, types and fate of thrombosis. | Hem-S1-Path-7 Thrombosis | | |
| 47 | <ul style="list-style-type: none"> Define embolism, its types and morphological features of embolism. | Hem-S1-Path-8 Embolism | | |

Theme 4: ABO & Rh-Incompatibility

| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
|-------------------|---|---|--|-------------------|
| Physiology | | | | |
| 49 | <ul style="list-style-type: none"> Describe the antigens & antibodies for A,B,AB & O blood groups Define Agglutinogen, agglutinin, and agglutination & what takes place when incompatible blood types are mixed. Identify universal donor & recipient & explain why? Enlist various Rh antigens & Rh immune response. What is erythroblastosis fetalis & how it can be prevented | Hem-S1-Phy-8 Blood groups ABO/RH system | Interactive Lectures/Small Group Discussion/ Practical | SBQs, OSPE & OSVE |
| Pathology | | | | |

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|----|--|------------------------------------|---------------------|-------------|
| 50 | Recognize different types of blood transfusion reaction. | Hem-S1-Path-9 Blood Transfusion | Interactive Lecture | SBQs & OSVE |
|----|--|------------------------------------|---------------------|-------------|

| Theme 5: Immunological Disorders | | | | |
|---|---|---|---|-------------------------|
| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
| Physiology | | | | |
| 51 | <ul style="list-style-type: none"> Discuss the overall organization of the immune system Differentiate between innate & acquired immunity, Discuss cell-mediated immunity and humoral immunity, active and passive immunity. | Hem-S1-Phy-9 Immunity. | Interactive Lectures/ Small Group Discussion | SBQs, OSPE & OSVE |
| Biochemistry | | | | |
| 52 | <ul style="list-style-type: none"> Define Immunoglobulins. Describe chemistry, structure & their classification. | Hem-S1-Bio-10 Immunoglobulins | Interactive Lecture | SBQs & OSVE |
| Pathology | | | | |
| 55 | <ul style="list-style-type: none"> Define hypersensitivity Describe the Pathogenesis of Type-I & II hypersensitivity reactions with examples | Hem-S1-Path-10 Hypersensitivity reaction Type I & II | Interactive Lecture | SBQs & OSVE |

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|---------------------|--|---|---------------------|----------------|
| 56 | <ul style="list-style-type: none"> Describe type III & IV hypersensitivity reactions with examples. | Hem-S1-Path-11 Hypersensitivity reaction Type III & IV | | |
| 58 | <ul style="list-style-type: none"> Discuss primary immunodeficiency and its causes Discuss secondary immunodeficiency and its causes | Hem-S1-Path-12 Immunodeficiency | | |
| Pharmacology | | | | |
| 59 | <ul style="list-style-type: none"> Associate role immune immune-modulating drugs in autoimmune disorders | Hem-S1-Pharm-4 | Interactive Lecture | SBQs & OSVE |

MUSCULOSKELETAL MODULE - 1

Introduction 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 interactive activities. Motility is the most important feature of life. Every living being shows locomotion in one or other form. Human locomotor system is very beautiful and well organized. Man is the only mammal that walks on two feet. So, our musculoskeletal system is well oriented to counter the effect of gravity. God Himself has said in Holly Quran that He has made man in the best of its form. Cerebral cortex, the highest center of brain causes controls various body movements by coordination of the muscles, bones, & joints.

Rationale This module is designed to build a solid foundation regarding knowledge of the structure and function of various muscles, bones and joints. This also provides information regarding its clinical applications. It has been estimated that one in four consultations in primary care is caused by problems of the musculoskeletal system.

It is likely that individuals at some time suffer from a problem related to the musculoskeletal system, ranging from a very common problem such as osteoarthritis or back pain to severely disabling limb trauma or rheumatoid arthritis. Many musculoskeletal problems are chronic conditions as well. The most common symptoms are pain and disability, with an impact not only on individuals' quality of life but also, importantly, on people's ability to earn a living and be independent.

Throughout this module, students will have the opportunity to link basic science knowledge to clinical problems. Teaching relevant basic sciences with clinical examples will help you make connections among concepts and retain the information for later clinical education.

Duration 10 weeks of

Learning Outcomes

By the end of this module, the students should be able to describe, demonstrate & explain **Knowledge**

- Muscles, bones, joints, fascia, fossa, compartments, nerves and blood vessels of upper limb
- Muscles, bones, joints, fascia, fossa, compartments, nerves and blood vessels of Lower limb
- Microscopic features of muscles, bones, cartilages, and skin.
- Collagen metabolism and collagen disorders.
- Development of muscles and bones & their congenital anomalies
- Fractures & their healing, bone remodeling, osteoporosis & its management.
- Nerve palsies and disability
- Pain Physiology and pain management including analgesics.
- Scheme & control of motor activity, motor cortical areas, motor pathways, and role of cerebellum and basal ganglia in motor activity.
- Mechanism of contraction of skeletal muscle & its molecular basis
- Muscle glycogen metabolism and glycogen storage diseases
- Neuromuscular junction, abnormalities of transmission across it, and drugs affecting this transmission
- Calcium homeostasis, role of hormones and their abnormalities
- Nutrition & adaptation of muscles in exercise
- Epidemiology of road accidents, their prevention, disability and rehabilitation
- Functions of skin, its common disorders and their treatment

Skills

- Histology of Cartilage
- Introduction to power lab
- Histology of Muscles
- Simple muscle twitch & summation

- The muscular twitch response and recruitment
- Physiological properties of skeletal muscle
- EMG
- Estimation of calcium
- Estimation of Phosphorus
- Fractures

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, cadavers, pears, staff and teachers.
- Communicate effectively in a team with peers and teachers.
- Demonstrate the ability to reflect on the performance.

Themes

Theme 1: Pectoral region and Breast
 Theme 2: Back, Axilla and Shoulder joint
 Theme 3: Brachial Plexus and Arm
 Theme 4: Forearm, hand, and carpal tunnel syndrome
 Theme 5: Anterior thigh and femoral hernia
 Theme 6: Gluteal region, hip joint and Sciatic nerve
 Theme 7: Anterior compartment of leg and compartment syndrome
 Theme 8: Posterior compartment of leg and foot

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

Theme 1: Pectoral region and Breast

| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|----------------|--|--|-------------------|-------------------|
| Anatomy | | | | |
| 1 | <ul style="list-style-type: none"> • Define different regions of the upper limb • Identify various compartments of arm, forearm & hand. • Define the axial and appendicular skeleton and define the girdle bones. • Identify joints of the upper limb. | MSK-S1-Ana-G-1 Introduction to locomotor system & Organization of upper limb | Demonstration | SBQs, OSPE & OSVE |
| 2 | <ul style="list-style-type: none"> • Define the pectoral region. • Describe its muscles. • Identify the general features and different landmarks for side determination and the attachments of various muscles on the clavicle. | MSK-S1-Ana-G-2 Pectoral region & the clavicle | | |
| 3 | <ul style="list-style-type: none"> • Discuss the development of Bone | MSK-S1-Ana-E-1 | Interactive | SBQs & OSVE |

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|-------------------|--|---|---------------------|-------------------|
| | <ul style="list-style-type: none"> Describe Intramembranous ossification Describe endochondral ossification Describe ossification of the limb bones Describe the development of the joints Describe the development of the cartilage | Development of the skeletal system | Lecture | |
| 4 | <ul style="list-style-type: none"> Identify general features and different landmarks for side determination and the attachments of various muscles on the Scapula. Define arrangement, attachments, neurovascular bundle, and actions of the muscles of the back | MSK-S1-Ana-G-3 Scapular region (scapula bone, muscles & Neurovascular bundle of back) | Demonstration | SBQs, OSPE & OSVE |
| 5 | <ul style="list-style-type: none"> Identify the bony components, type & variety & movements of sternoclavicular, acromioclavicular joints | MSK-S1-Ana-G-4 Sternoclavicular Acromioclavicular Joints | | |
| 6 | <ul style="list-style-type: none"> Define the extent and quadrants of the breast Describe the blood supply and lymphatic drainage of the breast in the female with its clinical significance. | MSK-Ana-G-5 Anatomy of the breast | Interactive Lecture | SBQs & OSVE |
| 7 | <ul style="list-style-type: none"> Identify histology of mammary gland in non-lactating, lactating & during pregnancy under the microscope. Identify and describe histological features of the nipple and areola. | MSK-S1-Ana-H-1 Histology of the breast | Practical | OSPE & OSVE |
| Physiology | | | | |
| 8 | <ul style="list-style-type: none"> Describe the Physiology of the mammary gland. Describe the Hormone responsible for milk production & ejection. Describe the let-down reflex (milk ejection reflex) | MSK-S1-Phy-1 Physiology of the breast and lactation | Interactive Lecture | SBQs & OSVE |
| 9 | <ul style="list-style-type: none"> Discuss the basic relationship between vitamin D, PTH, calcium, and Phosphate in relation to bone formation Describe the various cells of the bones and their function in Calcium homeostasis | MSK-S1-Phy-2 Hormones regulating calcium homeostasis | | |

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|-------------------------|---|---|---------------------|-------------|
| 10 | <ul style="list-style-type: none"> Identify and name various parts of power lab Illustrate the functions of various parts of the power lab | MSK-S1-Phy-P1 Introduction to Power Lab | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 11 | <ul style="list-style-type: none"> Enlist classification, functions and Biochemical significance of Hetero polysaccharides in formation of Extracellular Matrix. | MSK-S1-Bio-01 Role of Hetero polysaccharides (Glycosaminoglycans) | Interactive Lecture | SBQs & OSVE |
| 12 | <ul style="list-style-type: none"> Explain Muco-polysaccharidoses: Classification, Deficient Enzymes Clinical Manifestation | MSK-S1-Bio-02 Muco- polysaccharidoses | | |
| 13 | <ul style="list-style-type: none"> Discuss the general introduction and classification of Minerals. | MSK-S1-Bio-03 Classification of Minerals | | |
| Clinical Lecture | | | | |
| 14 | <ul style="list-style-type: none"> Define bone density and factors that are responsible for maintaining bone density Define Pathogenesis and clinical course of change in bone density and conditions associated with lactation. Discuss its complications and management. | MSK-S1-Gyn & Obs-1 Changes in bone density with lactation | Interactive Lecture | SBQs & OSVE |
| 15 | <ul style="list-style-type: none"> Describe the Pathophysiology of mammary gland disorders Describe the lactation reflex Describe weaning Describe the hormonal effect Student guide for complete protocol of lactation and weaning | MSK-S1-Paeds-1 Breastfeeding guide for medical professionals | | |

| Theme 2: Back, Axilla and Shoulder joint | | | | |
|---|---|--|-------------------|--------------|
| S. # | LEANING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 16 | <ul style="list-style-type: none"> Describe the attachments, nerve supply and the actions of the back muscles. Define the effects of paralysis of these muscles | MSK-S1-Ana-G-6 Muscles of back | | SBQs, OSPE & |

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|----|--|--|---------------------|-------------|
| 17 | <ul style="list-style-type: none"> Discuss the arterial anastomosis around the scapula. Explain the neurovascular bundle of scapula. | MSK-S1-Ana-G-7 Anastomosis around scapula & Neurovascular bundle of scapula | Demonstration | OSVE |
| 18 | <ul style="list-style-type: none"> Enumerate bony components, type & variety, attachment of | MSK-S1-Ana-G-8 The Shoulder Joint | Interactive Lecture | SBQs & OSVE |

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| | capsule and ligaments of this joint. <ul style="list-style-type: none"> Demonstrate various muscles & movements at the joint. Identify the factors stabilizing or weakening the shoulder joint. | | | |
| 19 | <ul style="list-style-type: none"> Discuss the developmental stages of skull and its clinicals | MSK-S1-Ana-E-2 Development of skull | | |
| 20 | <ul style="list-style-type: none"> Define the shape, location, boundaries, and contents of the Axilla. Discuss the formation, course, and relations of axillary vessels Describe the arrangement of axillary lymph nodes and their area of drainage. | MSK-S1-Ana-G-9 Axilla: Boundaries & Contents | Demonstration | SBQs, OSPE & OSVE |
| 21 | <ul style="list-style-type: none"> Describe and draw formation of the brachial plexus. Mention different parts of brachial plexus and their location. Identify different nerves with their root values. Discuss the effects of injury to different sites of the brachial plexus. | MSK-S1-Ana-G-10 Brachial Plexus | Interactive Lecture | SBQs & OSVE |
| 22 | <ul style="list-style-type: none"> Identify the skeletal muscle under a light microscope Describe the structural basis of muscle striations. Recognize the structural elements that produce muscle contraction and brings the movement of a body part. | MSK-S1-Ana-H-2 Histology of skeletal muscle | Practical | OSPE & OSVE |

Physiology

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|---------------------|--|---|---------------------|-------------|
| 23 | <ul style="list-style-type: none"> Describe the distribution of calcium in the bones. Describe the mechanism by which Ca is released in blood from the bone | MSK-S1-Phy-3 Role of Calcium in bones | Interactive Lecture | SBQs & OSVE |
| 24 | <ul style="list-style-type: none"> Describe and classify properties of various types of muscle. Describe the structure, functions, and arrangements of Myosin, Actin, Troponin & Tropomyosin filaments | MSK-S1-PHY-4 Properties of muscles & structure of skeletal muscles. | | |
| Biochemistry | | | | |

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|------------------|--|---|---------------------|-------------|
| 25 | <ul style="list-style-type: none"> Describe sources, RDA, Absorption, transport, Functions, Clinical Aspects | MSK-S1-Bio-4 Calcium metabolism. | Interactive Lecture | SBQs & OSVE |
| 26 | <ul style="list-style-type: none"> Describe sources, RDA, Absorption, transport, Functions, Clinical Aspects | MSK-S1-Bio-5 Magnesium & Phosphorus Metabolism | | |
| 27 | <ul style="list-style-type: none"> Describe sources, RDA, Absorption, Transport, Functions, Clinical Aspects | MSK-S1-Bio-6 Vitamin D metabolism. | | |
| 28 | <ul style="list-style-type: none"> Describe miscellaneous minerals: Iodine, Fluoride, Selenium, Cobalt, Zinc, Copper | MSK-S1-Bio-7 Miscellaneous Minerals | | |
| 29 | <ul style="list-style-type: none"> Discuss role of Parathyroid, Calcitonin & Vitamin D | MSK-S1-Bio-8 Regulation of Calcium & PO ₄ Metabolism | | |
| 30 | <ul style="list-style-type: none"> Discuss chemical composition of bone, remodeling and normal composition of synovial fluid. | MSK-S1-Bio-9 Chemical composition of bone | | |
| 31 | <ul style="list-style-type: none"> Demonstrate importance of calcium as macro-mineral. RDA, Absorption, factors influencing absorption. clinical manifestation of excess and deficiency states. | MSK-S1-Bio-10 Estimation of serum calcium | Practical | OSPE & OSVE |
| Pathology | | | | |
| 32 | <ul style="list-style-type: none"> Define Vitamin D Explain significance of vitamin D in the body Describe the different deficiency states related to vitamin D Discuss the prevention of Vitamin D Deficiency | MSK-S1-Path-1 Vitamin D deficiency | Interactive Lecture | SBQs & OSVE |

| Pharmacology | | | | |
|--------------|---|---|---------------------|-------------|
| 33 | • | MSK-S1-Pharm-1 Introduction to Cholinergic | Interactive Lecture | SBQs & OSVE |

Theme 3: Brachial Plexus and Arm

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|----------------|--|--|---------------------|-------------------|
| Anatomy | | | | |
| 34 | <ul style="list-style-type: none"> Explain the arrangement of different functional groups of muscles in the anterior compartment of the arm & their attachment Demonstrate the actions of the above muscles Describe the neurovascular structures and their important relations | MSK-S1-Ana-G-11 Humerus bone Anterior compartment of the arm | Demonstration | SBQs, OSPE & OSVE |
| 35 | <ul style="list-style-type: none"> Define cubital fossa. Discuss its boundaries Clinical correlates | MSK-S1-Ana-G-12 Cubital fossa | Interactive Lecture | SBQs & OSVE |
| 36 | <ul style="list-style-type: none"> Explain the arrangement of different functional groups of muscles in the post-compartment arm & their attachment Demonstrate the actions of muscles Describe neurovascular structures and their important relations | MSK-S1-Ana-G-13 Posterior compartment of the arm & the Elbow joint | Demonstration | SBQs, OSPE & OSVE |
| 37 | <ul style="list-style-type: none"> Identify general features of the radius & ulna. Discuss attachments of various muscles on the radius & ulna. Discuss the radioulnar joints. | MSK-S1-Ana-G-14 Radius & Ulna (radioulnar joints) | | |
| 38 | <ul style="list-style-type: none"> Explain the arrangement of different functional groups of muscles in the anterior compartment of the fore-arm & their attachment. Describe neurovascular structures and their important relations | MSK-S1-Ana-G-15 Anterior compartment of the forearm | Demonstration | SBQs, OSPE & OSVE |

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| 39 | <ul style="list-style-type: none"> Explain the arrangement of different functional groups of muscles in the posterior compartment of forearm & their attachment. Describe neurovascular structures and their important relations | MSK-S1-ANA-G- 16 Posterior compartment of forearm | | |
| 40 | <ul style="list-style-type: none"> Describe ossification of vertebra, ribs & sternum, and its clinicals | MSK-S1-Ana-E-3 Development of vertebra, ribs, & sternum. | Interactive Lecture | SBQs & OSVE |

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|----|--|--|-----------|-------------|
| 41 | <ul style="list-style-type: none"> Identify smooth and cardiac muscles under light microscope Describe the structural basis of muscle striations & differentiate between the two muscles. Recognize function and organization of the connective tissue in muscle. | MSK-S1-Ana-H-3 Histology of smooth and cardiac muscles | Practical | OSPE & OSVE |
|----|--|--|-----------|-------------|

| Physiology | | | | |
|-------------------|---|--|---------------------|-------------|
| 42 | <ul style="list-style-type: none"> Describe general mechanism of skeletal muscle contraction. Describe molecular mechanism (sliding filament theory) of skeletal muscle contraction. Describe walk along theory— power stroke. Define motor unit, isotonnic & isometric contraction | MSK-S1-Phy-5 Mechanism & different theories of muscle contraction Types of muscle contraction | Interactive Lecture | SBQs & OSVE |
| 43 | <ul style="list-style-type: none"> Define neuromuscular junction (NMJ) & list the components of NMJ Explain sequence of events of neuromuscular transmission | MSK-S1-Phy-6 Neuromuscular Junction & transmission | | |
| 44 | <ul style="list-style-type: none"> Define end plate potential Describe excitation contraction coupling Explain myasthenia gravis | MSK-S1-Phy-7 Excitation contraction coupling | | |
| 45 | <ul style="list-style-type: none"> Demonstrate Nerve conduction velocity Explain how electrical events are converted to mechanical events | MSK-S1-Phy-P2 Action potential | Practical | OSPE & OSVE |

Biochemistry

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|-------------------------|--|---|---------------------|-------------|
| 46 | <ul style="list-style-type: none"> Demonstrate sources, daily requirements, intestinal absorption, transport and Biochemical role and regulation of Vit-D3 | MSK-S1-Bio-11 Estimation of Serum Vit.D3 | Practical | OSPE & OSVE |
| Clinical Lecture | | | | |
| 48 | <ul style="list-style-type: none"> Enlist disorders of skeletal muscle disorders and the factors that are responsible for it Define Pathogenesis and clinical course of conditions associated with skeletal muscle disorders Discuss its complications and management | MSK-S1-Ortho-1 Disorders of voluntary muscles | Interactive Lecture | SBQs & OSVE |

Theme 4: Forearm, Hand, and Carpal Tunnel Syndrome

| S # | LEANING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|----------------|--|---|---------------------|-------------------|
| Anatomy | | | | |
| 53 | <ul style="list-style-type: none"> Describe the location, destination, course & relations of arteries & their branches in upper limb. Identify and discuss the deep veins of the upper limb. Describe the location, destination, course & relations of nerves & their branches in upper limb. | MSK-S1-Ana-G-17 Neuromuscular bundle of the upper limb | Demonstration | SBQs, OSPE & OSVE |
| 54 | <ul style="list-style-type: none"> Describe the type, variety, and attachment of capsule and ligaments of this joint. demonstrate various movements at this joint. Describe the structural organization of the Flexor & Extensor Retinaculum. Discuss carpal tunnel syndrome. | MSK-S1-Ana-G-18 Wrist joint | Interactive Lecture | SBQs & OSVE |
| 55 | <ul style="list-style-type: none"> Describe the bony arrangement of the hand. Describe the joints of the hand. | MSK-S1-Ana-G-19 Osteology of the hand and the joints of the hand. | | |

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| 56 | <ul style="list-style-type: none"> Discuss the cutaneous supply, arteries & veins of the palm of the hand. define fibrous flexor sheath. Define the palmar aponeurosis, facial spaces. Describe small muscles of the hand. | MSK-S1-Ana-G-20 Palm | Demonstration | SBQs, OSPE & OSVE |
| 57 | <ul style="list-style-type: none"> Discuss the dorsal venous arch. Describe the insertion of the long extensor tendons. | MSK-S1-Ana-G-21 Dorsum of the hand | | |
| 58 | <ul style="list-style-type: none"> Describe different regions of lower limb. Identify the various bones forming skeleton of lower limb. Describe general arrangement of superficial & deep fasciae of lower limb Demonstrate the bones of pelvic girdle. Identify different landmarks in different regions of lower limb | MSK-S1-Ana-G-22 Introduction to lower limb / Organization of skeleton of lower limb | Interactive Lecture | SBQs & OSVE |
| 59 | <ul style="list-style-type: none"> Identify the superficial arteries of | MSK-S1-Ana-G-23 | Demonstration | SBQs, OSPE & |
| | lower limb <ul style="list-style-type: none"> Name and discuss superficial veins of lower limb Highlight the course of great and small saphenous vein Describe the superficial lymphatic vessels & lymph nodes of lower limb Discuss clinical correlates. | Superficial veins, arteries , lymph nodes & cutaneous supply of the lower limbs | | OSVE |
| 60 | <ul style="list-style-type: none"> Describe the development of skeletal muscle. Discuss the development of Myotomes List derivatives of Ebaxial and Primaxial divisions of myotomes | MSK-S1-ANA-E-4 Development of skeletal muscles | Interactive Lecture | SBQs & OSVE |
| 61 | <ul style="list-style-type: none"> Classify bone on developmental and structural basis. Differentiate between woven bone and lamellar bone under microscope. Differentiate between compact bone and spongy bone under microscope. | MSK-S1-Ana-H-4 Histology of bones | Practical | OSPE & OSVE |

Physiology

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|---------------------|--|--|---------------------|-------------|
| 62 | <ul style="list-style-type: none"> • Demonstrate SMT on power lab • What are the different periods of SMT & their duration? • Demonstrate the phenomenon of fatigue & Tetanus | MSK-S1-Phy-P3 Muscular twitch response | Practical | OSPE & OSVE |
| 63 | <ul style="list-style-type: none"> • Describe types of muscle fibers (type I and II) • Determine effect of exercise on muscle blood flow • State effect of training, stamina and resistance on muscle fibers • State Hypoxia, muscle Fatigue during exercise and, its Biochemical reasons. | MSK-S1-Phy-8 Muscle adaptation to exercise | Interactive Lecture | SBQs & OSVE |
| 64 | <ul style="list-style-type: none"> • Explain aerobics and anaerobic exercise and effect of exercise on muscles. | MSK-S1-Phy-9 Role of muscle in exercise | | |
| Biochemistry | | | | |
| 65 | <ul style="list-style-type: none"> • Describe the Collagen Structure and synthesis, Types, Role of vitamin C in synthesis of Collagen | MSK-S1-Bio-12 Collagen Structure and synthesis | Interactive Lecture | SBQs & OSVE |
| 66 | <ul style="list-style-type: none"> • Brief overview of inherited Collagen Disorders and their clinical manifestation | MSK-S1-Bio-13 Overview of inherited Collagen disorders | | |

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| 67 | <ul style="list-style-type: none"> Estimation, RDA, Effects, regulation and clinical manifestation of excess and deficiencies. | MSK-S1-Bio-14 Estimation of serum phosphorus | Practical | OSPE & OSVE |
| 69 | <ul style="list-style-type: none"> Classify different muscle relaxants. Discuss mechanism of their action Explain clinical uses and their diverse effects | MSK-S1-Pharm-2 Drugs used as Skeletal muscle relaxant | | |

Clinical Lecture

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| 70 | <ul style="list-style-type: none"> Define of osteoporosis Describe generalized and localized osteoporosis Enlist primary & secondary causes of generalized osteoporosis Define Pathogenesis and clinical course Discuss it's complications and management | MSK-S1-Ortho-2 Clinical manifestation of Osteoporosis | Interactive Lecture | SBQs & OSVE |
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Theme 5: Anterior thigh and femoral hernia

Theme 6: Gluteal region, hip joint, and Sciatic nerve

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|----------------|---|---|-------------------|-------------------|
| Anatomy | | | | |
| 71 | <ul style="list-style-type: none"> Identify parts of the hip bone. Determine side of the bone. Describe the general features of each part of the hip bone. Identify the bone. Determine the side of the bone. Describe the anatomical position of the bone. | MSK-S1-Ana-G-24 Hip bone + Femur | Demonstration | SBQs, OSPE & OSVE |
| 72 | <ul style="list-style-type: none"> Discuss the division of the thigh into compartments Enumerate muscles of the anterior compartment of the thigh and their respective actions. Describe the innervation and blood supply of the muscles of the anterior compartment. | MSK-S1-Ana-G-25 Anterior compartment of the thigh | | |

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| 73 | <ul style="list-style-type: none"> Describe the Femoral triangle, its boundaries, and contents. Discuss the femoral sheath and its contents, and the clinical conditions associated. | MSK-S1-Ana-G-26 Femoral triangle | Interactive Lecture | SBQs & OSVE |
| 74 | <ul style="list-style-type: none"> Describe the development of smooth and cardiac muscle. Discuss the development of Myotomes Enlist derivatives of epaxial and hypaxial divisions of myotomes | MSK-S1-Ana-E-5 Development of smooth & cardiac muscles | | |
| 75 | <ul style="list-style-type: none"> Discuss muscles of the medial compartment of the thigh. Discuss the blood & nerve supply of these muscles. Describe actions of the muscles of medial compartment of thigh. | MSK-S1-Ana-G-27 Medial compartment of thigh | Demonstration | SBQs, OSPE & OSVE |
| 76 | <ul style="list-style-type: none"> Describe location of gluteal region. Discuss about bones and ligaments of the gluteal region. Discuss muscles of the gluteal region & their respective actions. Discuss nerves and blood vessels of the gluteal region. | MSK-S1-Ana-G-28 The Gluteal region | Demonstration | SBQs, OSPE & OSVE |
| 77 | <ul style="list-style-type: none"> Describe the articular surfaces of the hip joint along with the capsular attachment Enumerate ligaments of the hip joint & describe their attachments. Discuss clinical correlates | MSK-S1-Ana-G-29 Hip joint | Interactive Lecture | SBQs & OSVE |
| 78 | <ul style="list-style-type: none"> Identify different types of cartilage under a light Microscope. Define distinctive microscopic features of each type. | MSK-S1-Ana-H-5 Histology of Hyaline Cartilage | Practical | OSPE & OSVE |
| Physiology | | | | |
| 79 | <ul style="list-style-type: none"> Describe role of skin in homeostasis Describe the function of skin Describe medico-legal importance of the skin | MSK-S1-Phy-12 Physiology of Skin | Interactive Lecture | SBQs & OSVE |
| Biochemistry | | | | |
| 80 | <ul style="list-style-type: none"> Describe the metabolic pathway for the synthesis of purines and pyrimidines | MSK-S1-Bio-15 Metabolic pathway for the synthesis of purines and pyrimidines | | |

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| 81 | <ul style="list-style-type: none"> Discuss in detail the metabolic pathways for nucleic acid degradation. Inherited associated disorders. Uric acid metabolic disorders. | MSK-S1-Bio-16 Metabolic pathways for nucleic acid degradation and related disorders. | Interactive Lecture | SBQs & OSVE |
| 82 | <ul style="list-style-type: none"> Demonstrate the methods | MSK-S1-Bio-17 Estimation of serum uric acid | Practical | OSPE & OSVE |
| Pathology | | | | |
| 83 | <ul style="list-style-type: none"> Mention types of arthritis | MSK-S1-Path-2 Arthritis | Interactive Lecture | SBQs & OSVE |
| 84 | <ul style="list-style-type: none"> Define Osteoarthritis& Rheumatoid arthritis Describe their clinical features | | | |
| Clinical Lecture | | | | |
| 85 | Explain clinical manifestations of arthritis | MSK-S1-Ortho-3 Clinical manifestation of Arthritis | Interactive Lecture | SBQs & OSVE |

Theme 7: Anterior Compartment of Leg and Compartment Syndrome

| S # | LEANING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|----------------|---|--|---------------------|-------------------|
| Anatomy | | | | |
| 86 | <ul style="list-style-type: none"> Describe the muscles of posterior compartment of the thigh. Describe the arterial supply of the posterior compartment of thigh. Discuss trochanteric and cruciate anastomosis at back of the thigh. Describe venous drainage of this region. | MSK-S1-Ana-G-30 Post: compartment of thigh + popliteal fossa | Demonstration | SBQs, OSPE & OSVE |
| 87 | <ul style="list-style-type: none"> Describe anatomical position of the bone. Identify the bone and its side determination. Mark attachment of muscles and ligaments. Describe the nerve injuries related to it. | MSK-S1-Ana-G-31 Tibia & fibula | | |
| 88 | <ul style="list-style-type: none"> Discuss site and time of appearance of upper and lower limb buds. Define source of mesoderm forming the limb muscles | MSK-S1-Ana-E-6 Development of Limbs & its clinical 1 | Interactive Lecture | SBQs & OSVE |

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| 89 | <ul style="list-style-type: none"> Discuss the formation of different compartments of leg. Explain the arrangement of the muscles in the anterior compartments of leg and their actions. Describe the neurovasculature of these compartments of leg. Identify bones forming the architecture of the foot. Discuss joints formed by these bones. | MSK-S1-Ana-G-32 Anterior compartment of leg & dorsum of foot | Demonstration | SBQs, OSPE & OSVE |
| 90 | <ul style="list-style-type: none"> Explain the arrangement of the muscles in the lateral compartments of the leg and their actions. Describe the microvasculature of these compartments of the leg Clinical correlates like compartment syndrome of the leg. | MSK-S1-Ana-G-33 Lateral compartment of the leg & tibiofibular joint | | |
| 91 | <ul style="list-style-type: none"> Describe the articular surfaces of the knee joint along with the capsular attachment. Describe ligaments & bursa of the knee joint and discuss their attachments. Describe movements of the knee joint. (locking & unlocking mechanism) | MSK-S1-Ana-G-34 Knee joint | Interactive Lecture | SBQs & OSVE |
| 92 | <ul style="list-style-type: none"> Identify different types of cartilage under a light Microscope. Define distinctive microscopic features of each type. | MSK-S1-Histo-6 Histology of elastic and fibrous cartilage | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 93 | <ul style="list-style-type: none"> Demonstrate principals and types of chromatography. Interpretation of clinical conditions and investigations related to use in chromatography. | MSK-S1-Bio-18 Chromatography | Practical | OSPE & OSVE |

Theme 8: Posterior compartment of leg and foot

| S # | LEANING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|---------|--------------------|-------|-------------------|------------|
| Anatomy | | | | |

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| 96 | <ul style="list-style-type: none"> Explain the arrangement of the muscles in the posterior compartment of the leg. Describe the nerve supply of these muscles. Explain the actions of the muscles of the posterior compartment. Discuss clinical correlates. | MSK-S1-Ana-G-35 Posterior compartment of the leg | Demonstration | SBQs, OSPE & OSVE |
| 97 | <ul style="list-style-type: none"> Describe the architecture of the arches of the foot and the factors responsible for their maintenance. Identify the bones forming these arches. Describe the function of the arches of foot. | MSK-S1-Ana-G-36 Skeleton of foot & arches of foot | | |
| 98 | <ul style="list-style-type: none"> Discuss the hand plate and formation of digital rays resulting into digits | MSK-S1-Ana-E-7 Development of Limbs & its clinical 2 | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Describe the muscles involved in and process of rotation of the limb Explain the congenital anomalies of the limbs | | | |
| 99 | <ul style="list-style-type: none"> Describe the Ankle Joint. Describe Superior and Inferior Tibiofibular Joints. | MSK-S1-Ana-G-37 Ankle, subtalar & small joints of foot | | |
| 100 | <ul style="list-style-type: none"> Identify the bones forming the architecture of the sole. Discuss the joints formed by these bones. Describe clinical correlates like flat foot and club foot. | MSK-S1-Ana-G-38 Sole | | |
| 101 | <ul style="list-style-type: none"> Explain the different nerves of the lower limb and their root value. Discuss causes of injuries. Enumerate common sites of these nerve injuries Discuss symptoms caused by these nerve injuries. | MSK-S1-Ana-G-39 Neurovascular bundle of the lower limb | Demonstration | SBQs, OSPE & OSVE |
| 102 | <ul style="list-style-type: none"> Discuss the blood supply and nerve supply of the sole. Describe the vascular and nervous supply of the dorsum of foot. | MSK-S1-Ana-G-40 Neurovascular bundle of the foot | | |

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| 103 | <ul style="list-style-type: none"> Describe the development of the musculoskeletal system. Discuss the development of Myotomes List derivatives of epaxial and hypaxial divisions of myotomes Describe the development of bones, joints & cartilage | MSK-S1-Ana-E-8 Overview of Embryological development of the musculoskeletal system | Interactive Lecture | SBQs & OSVE |
| 104 | <ul style="list-style-type: none"> Describe layers of the skin. Discuss layers of the Epidermis. Describe appendages of skin. Discuss the functions of the skin. | MSK-S1-Ana-H-7 Microscopic Anatomy of the Skin | | |
| 105 | <ul style="list-style-type: none"> Identify three layers of skin under the light microscope Describe structural basis & elements of skin. Recognize the function and organization of connective tissue in skin | MSK-S1-Ana-H-8 Histology of skin | Practical | OSPE & OSVE |
| 106 | <ul style="list-style-type: none"> Identify three layers of skin under the light microscope Describe structural basis & elements of skin. Recognize the function and organization of connective tissue in skin | MSK-S1-Ana-H-9 Histology of skin appendages | | |
| Clinical Interactive Lecture | | | | |
| 109 | <ul style="list-style-type: none"> Define terms related to fracture: Stress Fracture, Incomplete fracture, Closed (simple fracture), Open (complicated) fracture, multi-fragmented fractures, complex fracture, Pathologic fractures Describe the mechanism of bone healing Enlist complications of fracture Describe etiology & Pathogenesis of pathological fractures. | MSK-S1-Ortho-4 Fractures/Dislocations | Interactive Lecture | SBQs & OSVE |
| Pathology | | | | |

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| 110 | <ul style="list-style-type: none"> Classify different types of osteomyelitis List factors leading to their etiology Explain its pathogenesis | MSK-S1-Path-3 Osteomyelitis | Interactive Lecture | SBQs & OSVE |
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CARDIOVASCULAR MODULE-1

Introduction Welcome to the cardiovascular abnormalities' module. This exciting 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.

During this module, students will be encouraged to learn the structure and function of the cardiovascular system in an integrated manner, i.e. subjects such as Anatomy, Physiology and Biochemistry, will be learned and assessed together (Horizontal Integration). We will also help you learn the basic sciences in a way that is relevant to their clinical applications (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 first 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 Interactive Lectures, practical and tutorials that have been scheduled during this module.

Rationale An overall aim of this module is to help you form a cognitive base for understanding pathogenesis of cardiovascular diseases as they are major cause of morbidity and mortality. (Cardiovascular diseases module – Third year) & practice of cardiovascular medicine (final-year clinical rotation). The module will prepare you for your future work in the medical course that will include learning in relation to the assessment and promotion of cardiovascular health and management of range of cardiovascular diseases.

Duration 5 weeks

Learning Outcomes **By the end of this foundation module, the students should be able to:** **Knowledge:** At the end of this module, the students will be able to:

- Describe the components of the cardiovascular system by learning and applying the relevant basic sciences.
- Apply the above knowledge to a few common real-life situations (Hypertension, Myocardial Infarction and Shock) to explain how the anatomy, Physiology and Biochemistry are altered in the given situation.
- Describe the anatomy of the different parts of the cardiovascular system in detail.
- Describe the development and anomalies of the cardiovascular system.
- Define and identify the microscopic features of the cardiovascular system.
- Describe the functions of the cardiovascular system.
- Interpret the Biochemical changes in the body related to the cardiovascular system.
- Enlist pathologies involving cardiovascular system.
- Describe the management of cardiovascular diseases.
- Perform the cardiovascular system examination.
- Take the history of the patients and correlate the cardiovascular signs & symptoms to reach the differential diagnosis
- To counsel the people in the community regarding the risk factors of cardiac diseases.

Clinical/ Practical skills

Measuring blood pressure using a Sphygmomanometer with correct technique and interpretation of its values,

and calculation of mean arterial pressure. Identification of areas on the chest for auscultation of the heart sounds.

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

Identification of cardiac tissues and blood vessels under the microscope with points of identification. (Students are required to draw and label microscopic sections of cardiovascular components in a histology journal. The journal will be assessed during the end-module examination. 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: Arrhythmias and Myocardial Infarction

Theme 2: Congenital Anomalies of the Cardiovascular System

Theme 3: Hypertension

Theme 4: Heart Failure

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

Theme 1: Arrhythmias, Myocardial Infarction

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
|----------------|---|---|---------------------|-------------------|
| Anatomy | | | | |
| 1 | <ul style="list-style-type: none">Define the middle mediastinum.Explain the location and contents of the middle mediastinum.Discuss fibrous and serous parts of the pericardium.Define pericardial sinuses and nerve supply of the pericardium.Discuss related clinical conditions. | CVS-S1-Ana-G-1 Middle Mediastinum and The Pericardium | Interactive Lecture | SBQs & OSVE |
| 2 | <ul style="list-style-type: none">Define the Anatomical position of the heart.Identify and name structures constituting the borders and surfaces of the heart.Define the external features of the Chambers of the heart. | CVS-S1-Ana-G-2 Anatomy of the Heart-1 | | |
| 3 | <ul style="list-style-type: none">Describe the Internal features of each chamber of the heart.Discuss the related clinical conditions. | CVS-S1-Ana-G-3 Anatomy of the Heart-2 | Demonstration | SBQs, OSPE & OSVE |

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| 4 | <ul style="list-style-type: none"> Describe composition of the walls and the skeleton of the heart. Describe conducting system of the heart. Discuss related clinical conditions. | CVS-S1-Ana-G-4 Structure of the heart and The Conducting system of the Heart | | |
| 5 | Identify the histological features of the heart: endocardium, myocardium, and epicardium on the light microscope. | CVS-S1-Ana-H-1 Histology of the Heart | Practical | OSPE & OSVE |

Physiology

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| 6 | <ul style="list-style-type: none"> Describe components/parts of CVS and their functions Define systemic and pulmonary circulation Mention the distribution of blood (in percentage of total blood) in different parts of the circulatory system Mention pressures in various portions of the circulatory system | CVS-S1-Phy-1 Overview of CVS | Interactive Lecture | SBQs & OSVE |
| 7 | <ul style="list-style-type: none"> Mention three major types of muscle Describe properties of cardiac muscle (Functional syncytium, Automaticity, Rhythmicity, Conductivity, Long refractory period) Describe cardiac muscle action potential Discuss the mechanism of excitation-contraction coupling in cardiac muscle | CVS-S1-Phy-2 Properties of cardiac muscle | Interactive Lecture | SBQs & OSVE |
| 08 | <ul style="list-style-type: none"> Describe various parts/components of the conducting system of the heart and their functions Explain the action potential and the rhythmicity of sinus nodal fibers Describe the origin and spread of the cardiac impulse Mention AV nodal delay and its significance Describe the effect of the ANS on the functioning of the conducting system of the heart | CVS-S1-Phy-3 Excitatory and Conducting system of the heart | Interactive Lecture | SBQs & OSVE |
| 09 | <ul style="list-style-type: none"> Define electrocardiogram and electrocardiography Describe the waves, intervals and segments of a normal electrocardiogram (ECG) Mention the uses/indications of ECG | CVS-S1-Phy-4 Electrocardiogram (ECG) | | |

Biochemistry

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| 10 | <ul style="list-style-type: none"> Mention the introduction of isoenzymes Discuss the diagnostic significance of isoenzymes | CVS-S1-Bio-1 Diagnostic significance of Isoenzymes in cardiovascular disorders | Interactive Lecture | SBQs & OSVE |
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Pathology

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| 11 | <ul style="list-style-type: none"> Define ischemic heart disease? Classify different types of ischemic heart diseases. Discuss causes and clinical manifestations of ischemic heart diseases. | CVS-S1-Path-1 Ischemic heart disease | Interactive Lecture | SBQs & OSVE |
| Medicine (Cardiology) | | | | |
| 12 | <ul style="list-style-type: none"> Define Arrhythmias Recognize the common abnormalities in rate and rhythm of the heart (tachycardia, bradycardia, flutter, fibrillation, heart blocks and extra systole) failure. Describe the hemodynamic, neuroendocrine and cellular changes that occur in heart failure. Describe the Physiological basis of the treatment principles in heart failure. | CVS-S1-Cardio-1 Arrhythmias | Interactive Lecture | SBQs & OSVE |

| Theme 2: Congenital Anomalies of the Cardiovascular System | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 13 | <ul style="list-style-type: none"> Describe the development of the cardiogenic field and heart tube. Enumerate the derivatives of the heart tube. Define the formation of cardiac looping and dextrocardia, and how the sinus venosus and cardiac septa formed. | CVS-S1-Ana-E-1 Development of the heart tube | Interactive Lecture | SBQs & OSVE |
| 14 | <ul style="list-style-type: none"> Explain atrial and interatrial septum development. Explain ventricles and Inter-ventricular septum development. Enlist common congenital anomalies of heart chambers. | CVS-S1-Ana-E-2 Development of the heart chambers and their septa -1 | | |
| 15 | <ul style="list-style-type: none"> Explain How atria and interatrial septum develops? How ventricles and the interventricular septum develop? What are the common congenital anomalies of heart chambers? | CVS-S1-Ana-E-3 Development of the heart chambers and their septa -2 | | |
| 16 | <ul style="list-style-type: none"> Describe septa formation in bulbus cordis and the truncus arteriosus. Enlist congenital heart defects: transposition of great vessels, PDA, PTA | CVS-S1-Ana-E-4 Development of septa in the truncus arteriosus, valves, and conducting system | | |

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| 17 | <ul style="list-style-type: none"> Describe the microscopic features of the arteries Identify the different types of arteries | CVS-S1-Ana-H-2 Histology of the Arteries | Practical | OSPE & OSVE |
| Physiology | | | | |
| 18 | <ul style="list-style-type: none"> Define cardiac cycle Mention duration of cardiac cycle and its relation with heart rate Describe sequence of events of cardiac cycle Mention pressure changes that occur during each cardiac cycle | CVS-S1-Phy-5 Cardiac cycle and its mechanical Events-I | Interactive Lecture | SBQs & OSVE |
| 19 | <ul style="list-style-type: none"> Describe the relationship of the electrocardiogram to mechanical events of cardiac cycle Mention pressure changes in atria Define JVP and mention its clinical importance | CVS-S1-Phy-6 Cardiac cycle and its mechanical events-II | | |
| | <ul style="list-style-type: none"> Define EDV, ESV and Stroke volume Define ejection fraction and mention its clinical importance Define preload and afterload | | | |
| 20 | <ul style="list-style-type: none"> Describe functions of heart valves Mention normal heart sounds and explain their production Define heart murmur Mention the timing of the murmur produced by valvular defects and congenital heart diseases Explain the hemodynamic changes in various valvular heart diseases | CVS-S1-Phy-7 Heart valves, heart sounds and murmurs | | |
| 21 | <ul style="list-style-type: none"> Define Ohm's law of circulation Describe main factors that determine vascular resistance Define total peripheral vascular resistance and total pulmonary vascular resistance Mention Poiseuille's law | CVS-S1-Phy-8 Interrelationship among blood flow, pressure and resistance | | |
| Biochemistry | | | | |
| 22 | <ul style="list-style-type: none"> Describe different aspects related to fatty acids and their clinical significance in the CVS diseases. | CVS-S1-Bio-2 Fatty acids | Interactive Lecture | SBQs & OSVE |
| Pathology | | | | |
| 23 | <ul style="list-style-type: none"> Define aneurysm Classification of aneurysm What are the true and false aneurysms with their examples Pathogenesis of aneurysm | CVS-S1-Path-2 Congenital anomalies of blood vessels | Interactive Lecture | SBQs & OSVE |
| 24 | <ul style="list-style-type: none"> Define congenital heart disease. Describe etiopathogenesis. Discuss clinical features | CVS-S1-Path-3 Congenital heart disease. | | |

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| 25 | <ul style="list-style-type: none"> Describe the Hemodynamic changes in various congenital heart diseases including; Mitral Stenosis Mitral Regurgitation Stenosis Aortic regurgitation | CVS-S1-Paeds-I Congenital heart diseases | Interactive Lecture | SBQs & OSVE |
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Theme 3: Hypertension

| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
|-------------------|--|---|---------------------|-------------|
| Anatomy | | | | |
| 26 | <ul style="list-style-type: none"> Describe the arterial supply and venous drainage of heart. Describe the branches of major arteries and their distribution. Define the nerve supply of the heart. Describe the cardiac plexus. | CVS-S1-Ana-G-5 Blood and nerve supply of the Heart | Interactive Lecture | SBQs & OSVE |
| 27 | <ul style="list-style-type: none"> Discuss development of arterial system; aortic arches, umbilical, vitelline and coronary arteries Name the common congenital anomalies of arteries? | CVS-S1-Ana-E-5 Development of arterial system of heart | | |
| 28 | <ul style="list-style-type: none"> Discuss the development of the venous system, cardinal veins, umbilical, and vitelline. Name the common congenital anomalies of the venous system? | CVS-S1-Ana-E-6 Development of the venous system of heart | | |
| 29 | Describe the microscopic structure of the veins | CVS-S1-Ana-H-3 Histology of veins | Practical | OSPE & OSVE |
| Physiology | | | | |
| 30 | <ul style="list-style-type: none"> Mention the specific needs of the tissues for blood flow Define local blood flow Describe acute/short-term control of local blood flow Describe long-term control of local blood flow Explain the autoregulation of blood flow | CVS-S1-Phy-9 Control of local blood flow | Practical | OSPE & OSVE |
| 31 | <ul style="list-style-type: none"> Describe the structure of microcirculation and capillary wall Explain flow of blood in capillaries Define vasomotion Define Starling forces and give their approximate values Describe role of Starling forces in fluid exchange across the capillary wall List the functions of lymphatics Define edema and explain the pathophysiological basis for edema (i.e. increased capillary hydrostatic pressure, hypoalbuminemia, increased capillary permeability and lymphatic obstruction) | CVS-S1-Phy-10 Capillary fluid exchange | | |

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| 32 | <ul style="list-style-type: none"> Describe the vasomotor center, its important areas, and functions Define vasomotor tone Describe the role of the sympathetic nervous system in the regulation of circulation Describe the role of the parasympathetic nervous system in the regulation of circulation | CVS-S1-Phy-11 Nervous regulation of circulation | | |
| 33 | <ul style="list-style-type: none"> Define systolic blood pressure, diastolic blood pressure, pulse pressure and mean arterial pressure Mention important factors on which blood pressure depends List various mechanisms that regulate/control blood pressure Describe role of baroreceptor reflex in regulation of blood pressure | CVS-S1-Phy-12 Blood pressure and its Regulation-I (Baroreceptor reflex mechanism) | | |
| Biochemistry | | | | |
| 34 | Explain the metabolism and function of Cholesterol | CVS-S1-Bio-3 Cholesterol | Interactive Lecture | SBQs & OSVE |
| | Cholesterol and its clinical significance in CVS diseases | | | |
| 35 | Describe the prostaglandins & leukotriens, their synthesis and general functions. | CVS-S1-Bio-4 Prostaglandins and Leukotriens | | |
| 36 | Demonstrate the estimation of the serum cholesterol | CVS-S1-Bio-P1 Serum Cholesterol estimation | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 37 | To describe the drugs used in CVS | CVS-S1-Pharm-1 Introduction to drugs used in CVS | Interactive Lecture | SBQs & OSVE |
| Medicine (Cardiology) | | | | |
| 38 | <ul style="list-style-type: none"> Define hypertension. List the causes of hypertension. Describe the pathogenesis of hypertension. Explain the compensatory measures that maintain the blood pressure on rising from supine positions. Explain the Physiological basis of the treatment principles in hypertension | CVS-S1-Cardio-2 Hypertension | Interactive Lecture | SBQs & OSVE |

| Theme 4: Heart Attack | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |

Anatomy

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| 39 | <ul style="list-style-type: none"> Identify different chambers/structures of the heart. | CVS-S1-Ana-G-6 Model study of heart | Demonstration | SBQs & OSPE & OSVE |
| 40 | <ul style="list-style-type: none"> Identify different chambers/structures of the heart. | CVS-S1-Ana-G-7 Model study of heart | | |
| 41 | <ul style="list-style-type: none"> Describe circulatory changes before and after birth. Name the adult derivatives of embryonic structures? | CVS-S1-Ana-E-7 Circulation before and after birth | Interactive Lecture | SBQs & OSVE |
| 42 | Identify the capillaries with the help of light microscope. | CVS-S1-Ana-H-4 Histology of capillaries | Practical | OSPE & OSVE |

Physiology

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| 43 | <ul style="list-style-type: none"> Explain renal-body fluid system and its role in arterial pressure control Describe Renin-Angiotensin system and its role in arterial pressure control | CVS-S1-Phy-13 Blood pressure and its regulation-II (Role of kidneys in long-term control of blood pressure) | Interactive Lecture | SBQs & OSVE |
| 44 | <ul style="list-style-type: none"> Define cardiac output and mention its relationship to stroke volume & heart rate Describe factors regulating cardiac output Describe Frank-Starling mechanism of heart | CVS-S1-Phy-14 Cardiac output and venous return | | |
| 45 | <ul style="list-style-type: none"> Mention some pathological conditions that cause high cardiac output Mention some pathological conditions that cause low cardiac output Mention the methods of measurement of cardiac output | CVS-S1-Phy-15 Cardiac output and venous return | | |
| | <ul style="list-style-type: none"> Define venous return and mention factors that affect/regulate venous return Describe central venous pressure | | | |
| 46 | <ul style="list-style-type: none"> Define circulatory shock Describe causes and major types of shock Mention stages of shock Describe the Physiology of non-progressive and progressive hemorrhagic shock | CVS-S1-Phy-16 Circulatory shock | | |
| 47 | <ul style="list-style-type: none"> Mention compensatory mechanisms that attempt to return cardiac output and arterial pressure to normal in a hemorrhagic shock (hypovolemic shock) Mention factors that lead to progression of shock (i.e. factors worsening the shock) Describe the Physiological basis of treatment of circulatory shock | CVS-S1-Phy-17 Circulatory shock | | |

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| 48 | <ul style="list-style-type: none"> To record pulse rate manually & on the PowerLab To record blood pressure manually & on the PowerLab To record ECG on ECG machine & power lab To auscultate heart sounds | CVS-S1-Phy-18 Pulse rate, blood pressure, and ECG recording on power lab. and ECG machine | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 49 | Discuss lipoproteins' metabolism and their clinical significance in CVS diseases | CVS-S1-Bio-5 Lipoproteins | Interactive Lecture | SBQs & OSVE |
| 50 | Interpret lipid profile and its significance | CVS-S1-Bio-P2 Lipid Profile | Practical | OSPE & OSVE |
| Pathology | | | | |
| 51 | <ul style="list-style-type: none"> Define shock Enlist types of shock Describe causes, patho-physiology, signs and symptoms of shock | CVS-S1-Path-4 Shock | Interactive Lecture | SBQs & OSVE |
| Medicine (Cardiology) | | | | |
| 52 | <ul style="list-style-type: none"> Define heart failure. Explain the Physiological basis of common clinical manifestations of heart failure. Describe different types of heart failure. Describe hemodynamic, neuroendocrine, and cellular changes that occur in heart failure. Describe the Physiological basis of treatment principles in heart failure. | CVS-S1-Cardio-3 Heart failure | Interactive Lecture | SBQs & OSVE |

RESPIRATORY MODULE 1

Introduction This exciting module will serve as a 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 interactive activities. An understanding of the structure of the chest wall and the diaphragm is essential if one has to understand the normal movements of the chest wall. Contained within the protective thoracic cage are the important life sustaining organs, such as lungs, Heart and the major blood vessels. Although the chest wall is strong, blunt or penetrating wounds can injure the soft organs. Flail chest (stove-in chest) is an extremely painful injury and impairs ventilation, thereby affecting oxygenation of the blood. This module will explain the Patho-Physiology of all the related conditions.

Rationale There is a high prevalence of respiratory diseases in our community which may leads to increased morbidity and mortality. A practitioner can only be able to deal with the patients suffering from the respiratory diseases when he/she has the basic concepts regarding the structural and functional knowledge of respiratory system. Acute respiratory infections, like pneumonia are critical for children, older adults and people with immune system disorders. For the management certain respiratory diseases, oxygen administration and artificial ventilation are required, hence it is better to explain the students on these topics in earlier years. Smoking is high risk factor for the development of COPD and lung cancer; therefore, its Patho-Physiology is important to learn. Respiratory module is designed in such a way that a student can understand structure, functions, pathogenesis, prescriptions including drug prescription and can educate the community regarding prevention of diseases and promotion of health.

Duration 5 weeks

Learning Outcomes

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

- Describe the development and anomalies of the respiratory system.
- Define and identify the microscopic features of the respiratory system
- Describe the anatomy of the different parts of the respiratory system in detail
- Describe the functions of the respiratory system
- Interpret the Biochemical changes in the body related to the respiratory system
- Explain obstructive and restrictive pathologies involving respiratory system
- Describe the management of 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 parts of the respiratory system.
- Perform the spirometry & plot a graph of lung volume
- Perform the cardiopulmonary resuscitation(CPR)
- Analysis of general properties of lipids
- Application of pH meter
- Interpretation of ABGs, PFT
- Perform clinical examination of the respiratory 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, cadavers, peers, staff and teachers.
- Communicate effectively in a team with peers and teachers.
- Demonstrate the ability to reflect on the performance.

Themes

Theme 1: The Chest / Thoracic wall and trauma
Theme 2: Airways and their conditions or diseases
Theme 3: Lung parenchyma & interstitium and the related diseases

| TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | | |
|---|----------------------------|--------------|--------------------------|--------------------|
| Theme 1: The Chest/ Thoracic Wall and Trauma | | | | |
| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
| Anatomy | | | | |

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|-------------------|---|---|---------------------|-------------------|
| 1 | <p>Define anatomical classification of the</p> <p>Define structure of the thoracic cage & wall.</p> <ul style="list-style-type: none"> • Define thoracic inlet & thoracic outlet. • Discuss thoracic outlet syndrome. | RESP-S1-Ana-G-1 General introduction of the Respiratory system and Anatomy of the thorax | Interactive Lecture | SBQs & OSVE |
| 2 | <ul style="list-style-type: none"> • Define general features of the sternum. • Define general features of the ribs. • Differentiate typical and atypical ribs. • Define costal cartilages. • Discuss attachment of various muscles. | RESP-S1-Ana-G-2 Osteology of the Ribs and the Sternum | | |
| 3 | <ul style="list-style-type: none"> • Define general features of the thoracic vertebra. • Differentiate typical and atypical thoracic vertebrae. • Discuss joints of the thoracic walls. | RESP-S1-Ana-G-3 Osteology of the thoracic vertebrae | Demonstration | SBQs, OSPE & OSVE |
| 4 | <ul style="list-style-type: none"> • Define three morphological layers of the muscles of the thoracic wall. • Define intercostal spaces. • Define the endothoracic fascia. • Discuss supra supra-pleural membrane. | RESP-S1-Ana-G-4 Muscles of the thoracic wall and intercostal spaces | | |
| 5 | <ul style="list-style-type: none"> • Define intraembryonic mesoderm and its parts. • Discuss divisions of lateral plate mesoderm into visceral and parietal layers. • Define extent of the intraembryonic coelom and its divisions. • Discuss formation of the pleuro- pericardial and pleuro-peritoneal membranes. | RESP-S1-Ana-E-1 Formation of the intraembryonic cavity , Serous membranes and thoracic cavity | Interactive Lecture | SBQs & OSVE |
| 6 | <ul style="list-style-type: none"> • Discuss the steps of the development of the diaphragm from its composite embryonic derivatives. • Discuss anomalies related to its development | RESP-S1-Ana-E-2 Development of the diaphragm | | |
| 7 | <ul style="list-style-type: none"> • Describe histological features of different layers of the Trachea. • Identify tracheal epithelium and other microscopic features of the trachea with the help of a light microscope. | RESP-S1-Ana-H-1 Histology of the Trachea | Practical | OSPE & OSVE |
| Physiology | | | | |
| 8 | <ul style="list-style-type: none"> • Describe an overview of respiration • Describe parts and functions of the respiratory tract • Define pulmonary ventilation | RESP-S1-Phy-1 Overview of the respiratory tract, functions | | |

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| 9 | <ul style="list-style-type: none"> Describe the mechanics of pulmonary ventilation and muscles of respiration Describe changes in the lung volume, alveolar pressure, pleural pressure & Transpulmonary pressure & its changes during respiration. Discuss alveolar ventilation & dead space also describe cough & sneezing reflexes | RESP-S1-Phy-2 The mechanics of breathing | | |
| 10 | <ul style="list-style-type: none"> Define lung compliance & list factors affecting lung compliance Describe composition & role of surfactant in maintaining alveolar stability & infant respiratory distress syndrome Differentiate compliance work, tissue resistance work & airway resistance work | RESP-S1-Phy-3 Lung compliance & work of breathing and surfactant | Interactive Lecture | SBQs & OSVE |
| 11 | <ul style="list-style-type: none"> Define pulmonary volumes & capacities with their normal values & significance in pulmonary function tests. Discuss alveolar ventilation & dead space | RESP-S1-Phy-4 Lung volumes & capacities | | |
| 12 | <ul style="list-style-type: none"> Record the effect of respiration during sitting & standing of a young adult on the power lab & plot a graph. Record the effect of swallowing & deglutition on respiration in healthy adult on power lab & plot a graph | RESP-S1-Phy-5 Respiratory adaptations during standing, sitting, and swallowing in the power lab | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 13 | <ul style="list-style-type: none"> Concept of pH, Buffers & their mechanism of action, Types of Buffers in humans | RESP-S1-Bio-1 Concept of pH, Buffers & their mechanism of action, Types of Buffers in humans | Interactive Lecture | SBQs & OSVE |
| 14 | <ul style="list-style-type: none"> Describe the acid base balance. Explain the respiratory and metabolic acidosis & alkalosis with causes and compensatory mechanisms. | RESP-S1-Bio-2 Acid Base Balance/ Metabolic & Respiratory Acidosis & Alkalosis | | |
| 15 | <ul style="list-style-type: none"> Description & Biomedical significance of Compound Lipids | RESP-S1-Bio-3 Biomedical significance of Compound Lipids | | |
| 16 | <ul style="list-style-type: none"> Describe the Synthesis & Functions of Phospholipids. Discuss role of lecithin in respiration | RESP-S1-Bio-4 Synthesis of Phospholipids & Role Of Lecithin in Respiration | | |

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| 17 | Demonstrate the pH Meter, Significance, interpretation | RESP-S1-Bio-5 Introduction to pH Meter, Significance, interpretation | Practical | OSPE & OSVE |
| Pathology | | | | |
| 18 | <ul style="list-style-type: none"> Identify congenital anomalies of lungs. Define acute lung injury Describe causes of ARDS. Discuss characteristic features, morphology and pathogenesis of ARDS. Describe its consequences and clinical course. | RESP-S1-Patho-1 Congenital anomalies, acute lung injury and ARDS | Practical | OSPE & OSVE |
| CLINICAL CLASSES | | | | |
| 20 | <ul style="list-style-type: none"> Define Chyne-stokes breathing and its effects on body. Define COPD and RLD. Differentiate between RLD & COLD & effects on body (obstructive & restrictive lung disease). Is COVID-19 RLD or a cold type of disease Define emphysema, chronic bronchitis. Define Bronchiectasis. Define interstitial lung diseases | RESP-S1-MED-1 Obstructive and Restrictive Lung Diseases | Interactive Lecture | SBQs & OSVE |

Theme 2: Airways and Their Conditions or Diseases

| S # | LEARNING OBJECTIVES | TOPICS | TEACHING STRATEGY | ASSESS MENT |
|----------------|--|--|---------------------------------|-------------------|
| Anatomy | | | | |
| 21 | <ul style="list-style-type: none"> Discuss attachments of the diaphragm. Define blood and nerve supply of the diaphragm. Identify openings in the diaphragm with levels. Define structures passing through these openings. <p>Define functions of the diaphragm.</p> | RESP-S1-Ana-G-5 The Diaphragm and its Openings | Demonstration | SBQs, OSPE & OSVE |
| 22 | <ul style="list-style-type: none"> Describe mediastinum Describe boundaries and divisions of the mediastinum Enumerate structures present in it | RESP-S1-Ana-G-6 Mediastinum | Interactive Lecture | SBQs & OSVE |
| 23 | <ul style="list-style-type: none"> Define the anatomy of the trachea. Discuss clinical conditions related to the trachea. | RESP-S1-Ana-G-7 Anatomy of the trachea | | |

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| 24 | <ul style="list-style-type: none"> Define the anatomy of the principal bronchi. Discuss clinical conditions related to bronchi. | RESP-S1-Ana-G-8 Anatomy of the bronchi | Demonstration | SBQs, OSPE & OSVE |
| 25 | <ul style="list-style-type: none"> Describe the development of the larynx, trachea, and bronchi. Discuss anomalies related to the development of these structures. | RESP-S1-Ana-E-3 Formation of the Larynx, Trachea, and Bronchi | Interactive Lecture | SBQs & OSVE |
| 26 | <ul style="list-style-type: none"> Describe microscopic features of the bronchi. Differentiate primary bronchioles from the tertiary bronchioles. Identify general histological features of bronchi and bronchioles with the help of a light microscope. | RESP-S1-Ana-H-2 The Histology of the Bronchi: Primary and Tertiary Bronchioles | Practical | OSPE & OSVE |
| Physiology | | | | |
| 27 | <ul style="list-style-type: none"> Describe the structure & functions of the Respiratory membrane Gas exchange across the respiratory membrane Factors affecting exchange through membrane | RESP-S1-Phy-6 Diffusion of Gases | Interactive Lecture | SBQs & OSVE |
| 28 | <ul style="list-style-type: none"> Describe transport of oxygen in the blood. Discuss the oxygen Hb dissociation curve & factors affecting it | RESP-S1-Phy-7 Transport of oxygen | | |
| 29 | <ul style="list-style-type: none"> Describe transport of CO₂ in the blood & gasses exchange between blood & body cells (chloride shift) | RESP-S1-Phy-8 Transport of CO ₂ | | |
| 30 | <ul style="list-style-type: none"> Enlist respiratory centers Describe mechanisms of nervous regulation of respiration Describe reflexes involved in nervous regulation | RESP-S1-Phy-9 Nervous regulation of respiration | | |
| 31 | <ul style="list-style-type: none"> Record the effect of exercise on respiration in healthy adult on power lab & plot a graph Interpret Pulmonary Function Tests | RESP-S1-Phy-10 Record the lung volumes and capacities on power lab & plot a graph | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 32 | Describe the Glycolysis in detail. | RESP-S1-Bio-6 Glycolysis | Interactive Lecture | SBQs & OSVE |
| 33 | Describe the role of the TCA Cycle in cellular respiration | RESP-S1-Bio-7 Role of TCA Cycle in cellular respiration | | |

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| 34 | <ul style="list-style-type: none"> Demonstrate the Arterial blood gases significance Describe the ABG's interpretation with various respiratory disorders | RESP-S1-Bio-8 Arterial blood gases (ABGs) interpretation | Practical | OSPE & OSVE |
| Pathology | | | | |
| 35 | <ul style="list-style-type: none"> Define chronic obstructive lung disease (COPD) Classify the types of COPD Describe its pathogenesis & clinical features. | RESP-S1-Path-2 Chronic obstructive lung diseases (COPD) | Interactive Lecture | SBQs & OSVE |
| Pharmacology | | | | |
| 36 | <ul style="list-style-type: none"> Classify drugs used to treat dry and productive cough according to their mechanism of action. Describe adverse effects, contraindications, and drug interactions of the drugs used to treat various types of cough. | RESP-S1-Pharm-1 The Anti-Tussive Drugs | Interactive Lecture | SBQs & OSVE |
| Clinical Classes | | | | |
| 37 | <ul style="list-style-type: none"> Define hypoxia and its types. Explain effects of the hypoxia. Explain psychogenic dyspnea & causes of psychogenic dyspnea Define cyanosis. Explain prevention strategies of cyanosis. Enlist three principal reasons of cyanosis. Define CO2 poisoning. Explain the effects of CO2 poisoning and preventing measures of CO2. | RESP-S1-MED-2 Hypoxia Cyanosis CO2 poisoning | Interactive Lecture | SBQs & OSVE |

Theme 3: Lung Parenchyma and Interstitium and their Conditions or Diseases

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESS MENT |
|----------------|---|--|-------------------|-------------------|
| Anatomy | | | | |
| 38 | Define structure and nerve supply of pleura | RESP-S1-Ana-G-9 Anatomy of the pleurae | Demonstration | SBQs, OSPE & OSVE |
| 39 | <ul style="list-style-type: none"> Describe gross anatomy of the lungs. Discuss the phases of the respiration | RESP-S1-Ana-G-10 Anatomy of the lungs Mechanism of the respiration-1 | | |

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| 40 | <ul style="list-style-type: none"> Define bronchopulmonary segments. Define types of the respiration. Discuss clinical conditions related with lungs. | RESP-S1-Ana-G-11 Anatomy of the lungs Mechanism of the respiration-2 (bronchopulmonary segment) | | |
| 41 | <ul style="list-style-type: none"> Define blood and nerve supply of the lungs. Discuss clinical conditions related with lungs. | RESP-S1-Ana-G-12 Anatomy of the lungs-3 (Blood supply) | | |
| 42 | <ul style="list-style-type: none"> Define clinical significance of chest X- ray in respiratory diseases. | RESP-S1-Ana-G-13 Radiology: Basics of chest X-ray | | |
| 43 | <ul style="list-style-type: none"> Discuss formation of laryngo-tracheal groove & respiratory diverticulum or lung buds. Define anomalies related with development of the lung buds. Discuss stages of development / maturation of the lungs. Discuss anomalies related to the lung maturation | RESP-S1-Ana-E-4 Formation of the lung buds The maturation of the Lungs | Interactive Lecture | SBQs & OSVE |
| 44 | <ul style="list-style-type: none"> Identify structure of the alveoli and inter-alveolar septum under the microscope and correlate functions of different types of cells, forming the alveolar wall. Identify structure and function of the blood air barrier | RESP-S1-Ana-H-3 The Histology of the Lungs: Alveoli | Practical | OSPE & OSVE |
| Physiology | | | | |
| 45 | <ul style="list-style-type: none"> Describe chemical control of respiration Explain chemoreceptor involved in chemical respiration. Describe regulation of respiration during exercise. Explain Periodic breathing | RESP-S1-Phy-9 Chemical regulation of Respiration: Regulation during exercise | | |
| 46 | <ul style="list-style-type: none"> Describe pulmonary circulation & blood flow through various zones of lung (1, 2, 3). Explain pulmonary capillary dynamics. Explain mechanism of development of pulmonary edema, pleural effusion Ventilation perfusion ratio (V/Q ratio) | RESP-S1-Phy-10 Pulmonary Circulation & V/Q relationships | Interactive Lecture | SBQs & OSVE |
| 47 | <ul style="list-style-type: none"> Define respiratory changes associated with High altitude Discuss hypoxia and its types. | RESP-S1-Phy-11 High altitude & Hypoxia | | |

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| 48 | <ul style="list-style-type: none"> Explain deep sea diving Physiology Describe caisson's disease | RESP-S1-Phy-12 Deep sea Diving Physiology | | |
| Biochemistry | | | | |
| 49 | Describe the organization of the Electron Transport Chain | RESP-S1-Bio-9 Organization of the Electron Transport Chain | Interactive Lecture | SBQs & OSVE |
| 50 | Describe Oxidative phosphorylation & ATP Synthesis | RESP-S1-Bio-10 Oxidative Phosphorylation & ATP Synthesis | | |
| 51 | Demonstrate the role of emulsification in respiration and digestion. | RESP-S1-Bio-11 Role of Emulsification in respiration and digestion | Practical | OSPE & OSVE |
| Pathology | | | | |
| 52 | <ul style="list-style-type: none"> Define pneumonia. Discuss etiological classification of pneumonia. Discuss its clinical presentation. Describe diagnostic tools for pneumonia. | RESP-S1-Path-3 Pneumonia | Interactive Lecture | SBQs & OSVE |
| Clinical | | | | |
| 53 | <ul style="list-style-type: none"> Define RDS. Describe signs and symptoms of the respiratory distress syndrome. Enlist the causes of the respiratory distress syndrome Discuss the management | RESP-S1-Med-3 Respiratory distress syndrome | Interactive Lecture | SBQs & OSVE |

BEHAVIOURAL SCIENCES

Introduction

Behavioral sciences (BS) is the scientific study of human behavior, and it includes psychology, sociology, and anthropology. These three disciplines are taught together in undergraduate curricula around the world because they are all concerned with understanding human behavior from different perspectives. BS is similar to other basic medical sciences, such as anatomy, biochemistry, physiology, and pathology, in that it explains existing behavior and can be used to predict the behavior of patients and healthcare providers in both clinical and non-clinical situations.

Behavioral sciences are essential for physicians to understand the psychosocial aspects of medical disorders. A physician who has been trained in BS is aware of the impact of history, culture, environment, and psychology on the manifestation of various symptoms. This knowledge allows physicians to communicate more effectively and ethically with their patients, and to develop treatment plans that include not only the patient but also the family.

Behavioral sciences can also be beneficial to medical students on a personal level. By understanding the modern theories of learning, memory, and cognition, students can improve their own learning abilities. Additionally, the knowledge of behavioral sciences can help students to better understand themselves and their relationships with

others.

In 2022, the Pakistan Medical & Dental Council (PM&DC) assigned 50 teaching hours to the subject of behavioral sciences in the curriculum of MBBS. This is a significant step in the right direction, as it acknowledges the importance of BS in medical education. It will help to produce physicians who are better equipped to understand and treat the psychosocial aspects of medical disorders. This will ultimately lead to improved patient care.

Rationale

- To provide medical and dental graduates with a broader bio-psycho-social perspective on health and illness.
- To teach students how to use principles of learning and behavior change to enhance their own learning capabilities and to help their patients make positive behavioral changes.
- To help medical graduates develop the ethical and personal qualities necessary to provide compassionate and effective care.

Learning Outcomes of Behavioral Sciences Among MBBS Students:

Upon completion of a BS course in undergraduate MBBS, students should be able to:

KNOWLEDGE:

- Comprehend BS in clinical practice.
- Conceptualize the holistic aspect of medical learning.
- Understand communication skills in clinical and non-clinical settings.
- Understand human cognitive faculties like learning, memory, perception, thinking, intelligence, and meta-cognition that regulate behavior.
- Demonstrate the psychological components of health and disease like defense mechanisms and personality in various behavioral states.
- Apprehend psychosocial issues in special hospital settings.
- Learn psychosocial aspects of aging, death, pain, and terrorism.
- Be aware of sex and gender issues in pre-clinical, clinical, and professional settings.
- Understand and recognize common psychiatric ailments like anxiety, depression, and stress.

SKILLS

- Keep an eye on behavioral issues while working in pre-clinical, clinical, and professional settings.
- Understand patients' stance while taking a comprehensive history or in any other scenario like breaking bad news, conflict resolution, disaster management, information care, etc.
- Communicate well his/her own understanding and strategy in interpersonal relationships.
- Use cognitive and behavioral theories while communicating with others and in any clinical or non-clinical activity.
- Believe in the implication of socio-cultural factors such as gender, race, social class, family, and occupations in health and disease.
- Be able to correlate the psychosocial aspects with the common clinical conditions (DM, Coronary Artery Disease, AIDS, etc.)
- Identify the social and anthropological factors that influence detection, management, compliance, and clinical outcome (stigma, myths, cultural taboo, somatization, etc.)
- Demonstrate stress management skills towards self, patients, and colleagues.
- Be highly concerned about the psychosocial factors in important clinical settings like hospitalization, emergency, ICU, cancer wards, etc.

ATTITUDE

- Exhibit the highest level of ethical and professional standards in his/her character with the patients, colleagues, teachers, relatives, attendants, pharmaceutical industry, and public as a whole.

- Be highly concerned about the rights of patients and doctors envisaged in law, constitution, and religion.
- Acknowledge the social, cultural, and anthropological aspects of health and disease.
- Demonstrate confidentiality and privacy of their patient's information in their clinical practice, interaction with colleagues, and medical/dental and other authorities.
- Undertake an informed consent from the patient.
- Demonstrate principles of these Medical/Dental Ethics in their interactions with patients, their relatives, colleagues, pharmaceutical industry, and medical/dental as well as other authorities.

In conclusion, BS is an essential component of medical education. It provides students with the knowledge, skills, and attitudes necessary to provide comprehensive and patient-centered care.

LEARNING METHODOLOGIES

The following teaching / learning methods are used to promote better understanding:

- Lectures
- Interactive Lectures
- Demonstrations
- Hospital / Clinic visits
- Problem- Based Learning (PBL)
- Case- Based Learning (CBL)
- Practical's
- Skills session
- E-Learning
- Self-learning

| THEME 1: Introduction to Behavioral Sciences and Its Importance in Health | | | | |
|---|---|---|-------------------|--|
| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | |
| 1. | Comprehend the significance of behavioral sciences in medical practice. Understand the bio psycho-social model in clinical practice, along with the impact of culture on medical practice. gain a comprehensive understanding of psychology, sociology, anthropology, and the biological determinants of health and disease in clinical practice, and be able to identify normal and abnormal behaviors | PAR-S-1-BS-1 Introduction to Behavioral Sciences and its importance in health. <ul style="list-style-type: none"> • The importance of behavioral sciences in healthcare • The Bio-psychosocial model of health and illness • The connection between health and behavioral sciences (psychology, sociology, anthropology). • The correlation between body, brain, mind and behavioral sciences • Normality vs. abnormality | LECTURE | |

THEME 2: Understanding Behavior

| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
|----|--|---|-------------------|
| 1. | <p>Analyze human behavior by examining factors such as sensation, sensory organs, perception, attention, concentration, memory, thinking, and communication.</p> <p>Evaluate how these elements influence the development of psychological and behavioral disorders, applying clinical reasoning and fostering personal growth in learning and practice.</p> | <p>PAR-S-1-BS-2</p> <p>Understanding Behavior: Sensation, Perception, Attention, Memory, Thinking, and Communication.</p> <ul style="list-style-type: none"> • Explore sensation and the functions of sensory organs. • Define perception, its influencing factors, and abnormalities, including extrasensory perception (ESP). • Examine attention and concentration, focusing on factors that affect their efficacy. • Discuss memory, including its stages, types, and strategies for enhancement. • Analyze thinking, its types, and related theories, along with levels of cognition, problem-solving techniques, and decision-making strategies. • Define communication, highlighting its types, modes, influencing factors, non-verbal cues, and The characteristics of effective communication. | LECTURE |

THEME 3: THEME 3: Individual Differences

| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
|----|--|---|-------------------|
| 1. | <p>Analyze the types of human personality and the stages of personality development, emphasizing their influence on behavior and growth. Assess the role of intelligence in shaping personal and professional success.</p> | <p>PAR-S-1-BS-3</p> <p>Understanding Individual Differences: Personality, Intelligence.</p> <ul style="list-style-type: none"> • Explore the stages and key characteristics of psychological human growth and development. • Define personality and examine cognitive and psychodynamic theories, factors influencing personality development, and methods of assessment. Analyze how personality impacts responses to health, disease, hospitalization, and stress. • Define intelligence and its various types, including IQ and EQ, and their relevance in a doctor's life. Discuss strategies to enhance EQ and effectively utilize IQ. • Examine factors influencing intelligence and methods of assessment. | LECTURE |

| | | | |
|----|---|---|---------|
| 2. | <p>Explain the complex relationship between brain function and behavior, focusing on emotions, motivation, and learning, as well as strategies to manage and enhance these processes effectively.</p> | <p>PAR-S-1-BS-4 Interplay of Brain and Behavior: Emotions, Motivation/need/drive and Learning</p> <ul style="list-style-type: none"> Define emotions, their types, and the concept of Emotional Quotient (EQ), emphasizing emotional literacy and its practical utility. Define motivation, its types, and the application of motivational theories to improve learning and treatment adherence. Define learning and explore its principles, modern methods, learning styles, and types of learners. Discuss cognitive theories of learning and strategies to enhance learning skills effectively | LECTURE |
|----|---|---|---------|

| THEME 4: Doctor-Patient Relationship and Medical Ethics | | | |
|---|---|---|-------------------|
| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
| 1. | <p>Critically evaluate complex clinical scenarios to identify and resolve ethical and practical challenges while upholding ethical boundaries within the doctor patient relationship. Demonstrate professionalism and strive for excellence in fostering trust and maintaining a healthy, effective doctor-patient dynamic.</p> | <p>PAR-S-1-BS-5 Doctor-Patient Relationship and Medical Ethics.</p> <ul style="list-style-type: none"> Professional boundaries and psychological aspects (e.g., transference, counter-transference). Ethical principles: Hippocratic Oath, medical/dental ethics, and patient-doctor rights (international law, Pakistan's Constitution, PM&DC, Islam). Ethical dilemmas in interactions with families, colleagues, and the pharmaceutical industry. Emerging issues: e-consultation, telemedicine, euthanasia, and physician-assisted suicide | LECTURE |

THEME 5: Communication skills and Non-Pharmacological Interventions

| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
|----|--|--|-------------------|
| 1. | <p>Demonstrate effective communication skills in clinical practice, including the use of non-pharmacological interventions such as counseling, providing informational care, and sensitively breaking bad news, in conjunction with appropriate medication management.</p> <p>Effectively handle patient information across diverse clinical scenarios while maintaining confidentiality and professionalism. Develop the ability to navigate and manage uncertain situations with confidence and empathy in clinical practice</p> | <p>PAR-S-1-BS-6</p> <p>Communication skills and Non- Pharmacological Interventions (NPIs) in Clinical Practice.</p> <ul style="list-style-type: none"> • Principles of effective communication: active listening, the art of questioning, and the art of listening. Characteristics of good and bad listeners. • Counseling: Scope, indications, contraindications, steps, do's and don'ts. Managing real-life crisis and conflict situations in health settings. • Informational Care: Communicating with patients about disease, medications, prognosis, etc. • Breaking bad news: Introduction, model, and approach to patient and caregivers | LECTURE |

COMMUNITY MEDICINE

LEARNING OUTCOMES:

- This module has been designed to introduce the basics of Community Medicine and Public health sciences.
- The course will cover the Introduction about community medicine and difference between clinical and community medicine.
- This module will also clear the concept of health and diseases and their determinants and help in understanding the level of prevention.
- This module will teach the various National and International health issues and their agendas.
- At the end of this module, students will be able to understand the basics of community medicine, its role and importance for clinicians.

RATIONALE:

Community Medicine is the main branch of medicine concerned with the health of people. It aims to protect and promote the health and well-being of the community through the Primary Health Care approach. Community Medicine plays an important role for making effective intervention and prevention strategies; it is also helpful for greater understanding of the risk factors of chronic disease processes and their effects on function and quality of life. So, the essential mission of teaching Community Medicine is to contribute in the development of a well-formed health professional.

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
|------|---------------------|-------|-------------------|
|------|---------------------|-------|-------------------|

| | | | |
|----|---|--|---------|
| 01 | <ul style="list-style-type: none"> • To define different definitions of public health / Community Medicine • To learn the evolution of public health, its importance in today's world • To discuss the basic functions of public health/community Medicine • To define the difference between clinical and community medicine | PAR-S-1-CM-1 Introduction to Community Medicine & Public Health (introduction to course/ department/ faculty) | LECTURE |
| 02 | <ul style="list-style-type: none"> • To understand the concept of disease and health • To discuss the Spectrum of health and the Iceberg phenomenon of disease • To understand the Health Dimensions | PAR-S-1-CM-2 Concept of Health and Disease | LECTURE |
| 03 | <ul style="list-style-type: none"> • To understand determinants of health with special focus on social determinants of health (SDH) • To define responsibility for Health • To define a health indicator • To describe the Types of indicators | PAR-S-1-CM-3 Determinants of Health and Health Indicators | LECTURE |
| 04 | <ul style="list-style-type: none"> • To define Health • To discuss the “health for All”, background, concepts and progress. • To define Primary health care • To discuss the Alma Ata Declaration • To discuss the Universal Health Coverage • To learn about health delivery system of Pakistan | PAR-S-1-CM-4 Primary Health Care”: Concepts and progress, and Health Delivery system of Pakistan | LECTURE |
| 05 | <ul style="list-style-type: none"> • To discuss the important global health issues • To understand the important public health issues of Pakistan • To define the health inequalities <ul style="list-style-type: none"> ○ Developing vs developed, ○ urban vs, rural, ○ rich vs poor, ○ male vs female • To discuss the health and its relationship with development • To learn global development goals <ul style="list-style-type: none"> I. Millennium Development Goals (MDGs) II. Sustainable Development Goals (SDGs) | PAR-S-1-CM-5 Global and Local health issues & Global Health Agendas | LECTURE |

INFORMATION TECHNOLOGY

Introduction/ Rationale

The integration of information technology into the MBBS (Bachelor of Medicine and Bachelor of Surgery) curriculum is essential in today's rapidly evolving healthcare landscape. IT proficiency is vital, as it will equip MBBS students with the skills needed to navigate electronic health records, telemedicine platforms, and advanced diagnostic tools. It enables efficient data management and evidence-based decision-making. Moreover, IT skills are crucial for facilitating interdisciplinary collaboration, ensuring that MBBS graduates can research, access academic literature, and adapt to emerging healthcare technologies. By incorporating an IT module, the MBBS curriculum aligns with the evolving healthcare environment. It is time that healthcare professionals stay updated with the latest medical research, clinical guidelines, and best practices. IT modules will help students leverage digital resources for continuous learning, including online courses, webinars, and virtual conferences, ultimately leading to ongoing professional development. Understanding healthcare management systems, hospital information systems (HIS), and administrative software is crucial for effective healthcare administration. IT modules will provide relatable knowledge to students.

Learning Outcomes

After completing this IT module, students will be able:

- To effectively use office software (e.g., Microsoft office, google workspace) for tasks such as word processing, spreadsheet analysis, and presentation creation.
- To organize, store, and manage medical documents and reports using office automation tools.
- To proficiently use medical databases (e.g., PubMed, The Cochrane Library) to access scholarly articles, research, and evidence-based resources.
- To edit medical images and videos for presentations, reports, and patient education, ensuring accuracy and clarity.
- To use visuals effectively to convey medical information, diagnoses, and treatment plans.
- To comprehend the fundamental principles of electronic health records (EHR), including their structure, purpose, and functionalities. They will learn to enter, update, and manage patient information and medical records in EHR systems.

| TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | |
|--|--|--|-------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
| 01 | To learn the basics of IT, its importance, benefits, and major areas of Information Technology | PAR-S-1-IT-1 Introduction to IT & its Importance in Healthcare | Lecture |
| | | PAR-S-1-IT-2 Advanced applications of IT in healthcare (AI, EHR, mHealth, IoT) | |
| 02 | Learn efficient content delivery and resource management in a digital environment | PAR-S-1-IT-3 Google Classroom | Practical |
| 03 | Comprehensive understanding of computer system components, their functions, and the skills necessary for hardware maintenance, troubleshooting, and optimization | PAR-S-1-IT-4 Components of a Computer System | Lecture |
| | | PAR-S-1-IT-5 Hardware & Software | |
| | | PAR-S-1-IT-6 Types of Software | |
| | | PAR-S-1-IT-7 Software Installation and Troubleshooting | Practical |
| | | PAR-S-1-IT-8 Operating System | Lecture |
| | | PAR-S-1-IT-9 Microprocessors, mobile computing | |
| | | PAR-S-1-IT-10 Word Processing Software | Practical |
| | | PAR-S-1-IT-11 Presentation Software | |
| | | PAR-S-1-IT-12 Data Analysis using MS Excel software | |

Recommendation:

Relevant reading material and supplementary handouts will be provided during classes/ lectures

BIOMEDICAL ETHICS

Introduction/ Rationale

The rationale for teaching Biomedical Ethics to MBBS students at LUMHS is rooted in several important considerations related to the fields of medicine, healthcare, and related professions. This will provide ethical guidance and education, promote ethical behavior, protect patient rights and resolve ethical dilemmas. This will help students as future professionals to navigate complex ethical challenges and ensures that ethical principles and values are integrated into the practice of medicine, research, and other professional fields. Ultimately, this course will play a vital role in promoting ethical conduct and maintaining the trust and integrity of these professions.

| TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | |
|--|--|--|---------------------|
| S # | LEARNING OUTCOMES | TOPIC | TEACHING STRATEGY |
| 01 | <ul style="list-style-type: none">Students should be able to understand the principles of bioethics and what is ethical practice is and what an ethical dilemmaStudents should be able to understand harms and benefits in health care settingsStudents should be able to understand the concepts of autonomy and individual responsibility and to understand their significance for the health care provider patient relationshipStudents should be able to understand concept of non-maleficence and Hippocratic oathStudents should be able to understand concept of justice in health care setting and equity in resource allocation | PAR-S-1-ETH-1 Introduction to Biomedical Ethics | Lecture e SGD |

RESEARCH

Introduction

The foundation of any institution is research. Advanced nations assert that their advancements in research and development have modernized them and enabled them to generate revenue. Globally, medical universities are essential to the advancement of healthcare. Beginning with health issue prediction surveys and continuing with the creation of innovative medications and diagnostic methods.

Any institution's greatest asset is its student population. Here, we offer the guidelines and framework for research curriculum, which will assist you in reaching degree program standards.

The scientific research element of the medical curriculum aims to develop a research-oriented mindset in students that promotes evidence-based practice, critical thinking, and a more comprehensive understanding of medical science. This module focuses on bridging the knowledge gap between theory and clinical application by giving students the tools they need to carry out significant medical research.

Rationale

Research is essential to expanding our understanding of medicine and enhancing patient care. Students who engage in research projects improve their analytical and critical thinking skills, strengthen their capacity to understand scientific literature, and make a positive impact on the continuous advancement of medical science. Students' academic journeys are further enhanced by research experiences, which equip them to make evidence-based decisions in their future healthcare endeavors.

Learning Objectives:

- **Develop Research Competence:** Get the know-how required to plan, carry out, and evaluate medical research on your own.
- **Critical Thinking:** Gain the capacity to evaluate scientific literature critically, understanding research techniques and coming to conclusions supported by data.
- **Communication Skills:** Improve your written and verbal communication abilities to effectively communicate research findings to a variety of audiences.
- **Ethical Considerations:** Show your dedication to responsible and open scientific inquiry by understanding and putting ethical principles into practice in your research.

| TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | |
|--|--|---|-------------------|
| S # | LEARNING OBJECTIVE | TOPICS | TEACHING STRATEGY |
| 1 | Define Research Fundamentals | PAR-S-1-RES-1 Introductory class | Lecture |
| 2 | Describe Fundamentals of Biostatistics | PAR-S-1-RES-2 Introduction to Biostatistics | |
| 3 | Enlist the types of research variables | PAR-S-1-RES-3 Types of Research Variables | |
| 4 | Identify methods of measuring Central Tendencies & Measures of Dispersion | PAR-S-1-RES-4 Central Tendencies & Measures of Dispersion | |
| 5 | Summarize the Concepts of basic research | PAR-S-1-RES-5 Basic Research | |
| 6 | Demonstrate an understanding of different research designs | PAR-S-1-RES-6 Study Designs | |
| 7 | Summarize and synthesize relevant literature to establish the research context | PAR-S-1-RES-7 Literature search | |
| 8 | Identify and apply appropriate research methods and techniques. | PAR-S-1-RES-8 Basic Laboratory Techniques | |
| 9 | Define a research proposal and its contents | PAR-S-1-RES-9 What is a research proposal, and how to write it? | |
| 10 | Define a research proposal and its contents | PAR-S-1-RES-10 What are the components of proposal writing? | |
| 11 | Define a research proposal and its contents | PAR-S-1-RES-11 Presentation of Research Proposal | Discussion |



LIAQUAT UNIVERSITY
of Medical & Health Sciences, Jamshoro, Sindh, Pakistan
DIRECTORATE OF ACADEMICS

DOC.# LUMHS/DA/-
DATE: 10/09/2025

DIRECTOR

"SAY NO TO CORRUPTION"

**TABLE OF SPECIFICATION FIRST YEAR MBBS
(BATCH 2024-2025)**

| S.NO | SUBJECTS | ANA | | PHY | | BIO | | PHAR | | PATHO | | B.S BME MEDICAL RESEARCH | | GRAND TOTAL |
|------|--|---------|----|---------|----|---------|----|---------|----|---------|----|--------------------------|----|-------------|
| 01. | PAPER - I (FOUNDATION AND BLOOD - 1) Anatomy, Physiology , Biochemistry Pathology , Pharmacology Community Medicine , B.S BME MEDICAL RESEARCH | FOU | 18 | FOU | 11 | FOU | 12 | FOU | 06 | FOU | 03 | FOU | 04 | 100 |
| | | BLOOD I | 07 | BLOOD I | 11 | BLOOD I | 10 | BLOOD I | 03 | BLOOD I | 11 | BLOOD I | 04 | |
| | | TOTAL | 25 | TOTAL | 22 | TOTAL | 22 | TOTAL | 09 | TOTAL | 14 | TOTAL | 08 | |
| 02. | PAPER - II (MUSCULO SKELETAL) Anatomy, Physiology , Biochemistry Pathology , Pharmacology Community Medicine , B.S BME MEDICAL RESEARCH | TOTAL | 52 | TOTAL | 16 | TOTAL | 16 | TOTAL | 01 | TOTAL | 05 | TOTAL | 05 | 100 |
| 03. | PAPER - III (REPIRATORY I AND CVS- 1) Anatomy, Physiology , Biochemistry Pathology , Pharmacology Community Medicine , B.S BME MEDICAL RESEARCH | CVS I | 20 | CVS I | 16 | CVS I | 08 | CVS I | 01 | CVS I | 02 | CVS I | 03 | 100 |
| | | RESP I | 20 | RESP I | 13 | RESP I | 08 | RESP I | 02 | RESP I | 03 | RESP I | 04 | |
| | | TOTAL | 40 | TOTAL | 29 | TOTAL | 16 | TOTAL | 03 | TOTAL | 05 | TOTAL | 07 | |

| LEARNING RESOURCES | | |
|--|---|---|
| ANATOMY | | |
| GROSS ANATOMY | HISTOLOGY | EMBRYOLOGY |
| Clinical Anatomy by Richard S. Snell (10 th Edition) Clinically Oriented Anatomy by K.L. Moore (09 th Edition) Neuro Anatomy by Richard Snell (08 th , 09 th Edition) | Wheather's Functional Histology by B. Young J. W. Health (07 th Edition) Junqueira's Basic Histology by Anthony L. Mescher (17 th Edition) | The Developing Human by Keith L. Moore& TVN Persuad (10 th Edition) Langman's Medical Embryology by TW Saddler (15 th Edition) |
| BIOCHEMISTRY | PATHOLOGY/MICROBIOLOGY | COMMUNITY MEDICINE |
| Harper's Illustrated Biochemistry by Peter Kennelly (32 nd Edition) Lehninger Principle of Biochemistry by David L. Nelson Michael M. Cox (08 th Edition) Textbook of Biochemistry with Clinical Correlations by Thomas M. Devlin (05 th Edition) | Robbins & Cotran, Pathologic Basis of Disease, 9th edition. Rapid Review Pathology, 4th edition by Edward F. Goljan MD | Parks Textbook of Preventive and Social Medicine by K. Park (26 th Edition) Public health and Community Medicine by Ilyas, Ansari (08 th Edition) Textbook of Community Medicine and Public Health by Saira Afzal - Sabeen Jalal (01 st Edition) Fundamental of Preventive Medicine by Dr. Zulfikar Ali Shaikh (05 th Edition), Basic Statistics for the Health Sciences by Jan W. Kuzma (05 th Edition) |
| PHARMACOLOGY | BEHAVIORAL SCIENCES | BIOMEDICAL ETHICS |
| Lippincott's Illustrated Pharmacology by Karen Whalen (08 th Edition) Basic and Clinical Pharmacology by Bertram G. Katzung & Anthony Trevor (15 th Edition) | Hand book of Behavioral Sciences by Brig (Rtd) Mowadat H Rana (3 rd Edition) Introduction To Psychology By Atkinson & Hilgard (15 th Edition) Shorter Oxford Textbook of Psychiatry (7 th Edition) | Beauchamp TL, Childress JF. Principles of biomedical ethics. Oxford University Press, USA; Eighth edition Bioethics in Pakistan, Local Contexts, Local Cases, Editors: Kulsoom Ghias et al |
| PHYSIOLOGY | | |

| <p>Textbook of Medical Physiology by Guyton And Hall Ganong' S Review of Medical Physiology Human Physiology by Lauralee Sherwood Berne & Levy Physiology Best & Taylor Physiological Basis of Medical Practice</p> | <p>REFERENCE BOOKS Guyton & Hall Physiological Review by John E. Hall (04th Edition) Essentials of Medical Physiology by Jaypee Textbook of Medical Physiology by Indu Khurana Short Textbook of Physiology by Mrthur NMS Physiology Monoo's Physiology</p> | |
|---|--|---|
| RESEARCH | WEBLINK | JOURNALS |
| <p>Basic Biostatistics for Clinical Researchers" by Prof. Dr. Binafsha Manzoor Syed, PhD et al.</p> | <p>https://www.lumhs.edu.pk/publishers/documents/basicbio.pdf Research Methodology in Medicine" by John K. Last https://kth.diva-portal.org/smash/get/diva2:1547062/FULLTEXT01.pdf</p> | <p>New England Journal of Medicine Nature Medicine Journal of Clinical Investigation (JCI) Circulation Online database: PubMed</p> |

SECOND YEAR MBBS PROGRAM

| DISTRIBUTION OF MODULES, THEMES, CONTACT HOURS, CREDIT HOURS SECOND YEAR OF MBBS PROGRAM-2025 | | | | | | |
|--|--------------------------|------------------------|---|-----------------|------------------|---------------------------|
| SECOND YEAR MBBS | | | | | | |
| YEAR | MODULE | Theme | | THEME NAME | DURATION | CONTACT HOURS |
| Total 6 Modules | | Total 29 Themes | | 40 weeks | 1300 | 81.25 |
| 2 nd Year MBBS | Module-I Neuroscience | 1 | Spinal cord trauma, anterior horn cell disorders, neuropathies & myopathies <ul style="list-style-type: none"> Information Technology Research | 1 week | 32.5 | 2.03 |
| | | 2 | Disorders of the brain stem | 1 week | 32.5 | 2.03 |
| | | 3 | Cerebral cortex diseases (upper motor neuron lesions, tumours, trauma, dementia, Epilepsy <ul style="list-style-type: none"> Psychological Reactions and Psycho-Social Issues in Specialized Healthcare Settings. | 1 week | 32.5 | 2.03 |
| | | 4 | Gait abnormalities (Cerebellar diseases, Basal nuclei disorders). <ul style="list-style-type: none"> Research | 1 week | 32.5 | 2.03 |
| | | 5 | Cerebrospinal fluid/ ventricular system and hydrocephalus | 1 week | 32.5 | 2.03 |
| | | 6 | Cerebrovascular disorders, Intracranial hemorrhage, stroke <ul style="list-style-type: none"> Interviewing and Psychosocial History Taking Common Psychiatric Disorders in General Health Settings Life Events, Psycho-Trauma, Psychological Reactions, Stress and Stressor, Stress Management | 1 week | 32.5 | 2.03 |
| | | | BS | Assessment | 1 week | 32.5 |
| Total Contact Hours for 07 Weeks | | | | 07-Weeks | 227 Hours | 14.21 Credit Hours |
| Module-II Head & Neck | Module-II Head & Neck | 1 | Fracture of the Skull and Scalp Injuries | 1 week | 32.5 | 2.03 |
| | | 2 | Facial injuries and the Bells Palsy | 1 week | 32.5 | 2.03 |
| | | 3 | Disorders of the Salivary Glands and Neck lesion <ul style="list-style-type: none"> Research | 1 week | 32.5 | 2.03 |
| | | 4 | Waldeyers Rings, Tonsillitis and Oral Cancers <ul style="list-style-type: none"> Research | 1 week | 32.5 | 2.03 |
| | | 5 | Visual Field Defects, Glaucoma, Role | 1 week | 32.5 | 2.03 |

| | | | | | |
|--|---|--|-----------------|------------------|---------------------------|
| | | of Vitamin A <ul style="list-style-type: none"> • Research | | | |
| | 6 | Deafness, Vertigo, Otitis Media | 1 week | 32.5 | 2.03 |
| | | Assessment | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 07-Weeks | | | 07-Weeks | 227 Hours | 14.21 Credit Hours |
| Module: III GIT & Liver-I | 1 | The Anterior Abdominal Wall and the Hernias | 2 weeks | 32.5*2= 65 Hours | 4.06 |
| | 2 | Upper Gastrointestinal Tract Disorder | 1 week | 32.5 | 2.03 |
| | 3 | Hepatic and Portal System Disorders: Biomedical Ethics | 2 weeks | 32.5*2= 65 Hours | 4.06 |
| | 4 | Lower Gastrointestinal Tract Disorders | 1 week | 32.5 | 2.03 |
| | 5 | Vascular Disorders | 1 week | 32.5 | 2.03 |
| | | Assessment | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 08-Weeks | | | 08-Weeks | 260 Hours | 16.25 Credit Hours |
| Module-IV Endocrinology -I | 1 | Short/tall stature and the role of the pituitary gland | 1 week | 32.5 | 2.03 |
| | 2 | Neck Swellings and Bulging Eyes & Tetany and the Role of the Thyroid Glands | 1 week | 32.5 | 2.03 |
| | 3 | Increase Thirst and Urination (Diabetes Mellitus/ Diabetes Insipidus) and the Role of the Pancreas | 1 week | 32.5 | 2.03 |
| | 4 | Moon face and the role of the adEx-S1 gland | 2 weeks | 32.5*2= 65 Hours | 4.06 |
| | | Assessment | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 06-Weeks | | | 06-Weeks | 195 Hours | 12.18 Credit Hours |
| Module-V Renal and Excretory- I | 1 | Overview structure & functions of the Ex-S1 system | 1 Week | | |
| | 2 | Ex-S1 circulation, GFR & its regulation Pain, Sleep, Consciousness, and Sexuality | 2 weeks | 32.5*2= 65 Hours | 4.06 |
| | 3 | Tubular Re-Absorption and Secretion | 1 week | 32.5 | 2.03 |
| | 4 | Electrolyte and Fluid Balance, Acid-Base Balance | 1 week | 32.5 | 2.03 |
| | | Assessment | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 06-Weeks | | | 06-Weeks | 195 Hours | 12.18 Credit |

| | | | | | Hours |
|--|---|--|--------|-----------------|---------------------------|
| Module-VI Reproductive System-I | 1 | Pelvimetry and the Injuries to the Pelvic Floor | 1 week | 32.5 | 2.03 |
| | 2 | Morbidity and mortality related to genital organ malignancies | 1 week | 32.5 | 2.03 |
| | 3 | Pregnancy, Parturition, Child Birth And Congenital Anomalies | 1 week | 32.5 | 2.03 |
| | 4 | Role of Reproductive Hormones, Contraception and Menopause <ul style="list-style-type: none"> • Cultural Influences on Medical Practice and Child-Rearing | 1 week | 32.5 | 2.03 |
| | | Assessment | 1 week | 32.5 | 2.03 |
| | Total Contact Hours for 06 Weeks | | | 06-Weeks | 195 Hours |
| | | | | | 12.18 Credit Hours |

| SECOND YEAR MBBS LIST OF SKILLS-BASED WORKSHOPS ACCORDING TO MODULES | | | | |
|---|---|---|------------------------------------|------------------------------|
| MODULE NAME | PSYCHOMOTOR DOMAINS | LUMHS LEARNING OBJECTIVES | NAME OF WORKSHOP | VENUE |
| MOD-I Neuroscience-I | | Identification of nervous tissues under the microscope with points of Identification. | Central Nervous System Examination | Histology lab |
| | Central Nervous System Examination | Superficial reflexes Deep reflexes | Temperature measurement | Physiology Lab |
| | Temperature measurement | Examine fever by using a thermometer and assess its clinical interpretation | | Physiology Lab |
| | EEG | Perform EEG | EEG | Skills Lab |
| | Cerebral function test | Cerebral function test | Cerebral function test | Physiology Lab/Skills Lab |
| MOD-2 Head & Neck Special Senses | Cranial nerves examination | Perform a clinical examination of the nervous system | Cranial nerves examination | Skills Lab/Hospital rotation |
| | Eye examination | Examination of Oculomotor, Trochlear and Abducent Nerves | Eye examination | Skills Lab/Hospital rotation |
| | Trigeminal Neuralgia Examination | Examination of the Facial and Trigeminal Nerve | Trigeminal Neuralgia Examination | Skills Lab/Hospital rotation |
| | Examination of sensory and motor reflexes | Examination of Glossopharyngeal, Vagus, Accessory, and Hypoglossal nerve | | Skills Lab/Hospital rotation |
| | Examination of special senses | Examination of taste and smell Examination of the Vestibulocochlear nerve | Auditory acuity | Skills Lab/Hospital rotation |
| | Abdominal Examination | Demonstrate abdominal examination | Abdominal Examination | Skills Lab |

| | | | | |
|---|--------------------------------------|---|--|----------------|
| MOD-3 GIT & Liver | Nasogastric Intubation | Demonstrate the procedure of how to pass the nasogastric tube | NG Tube | Skills Lab |
| MOD-4 Endocrinology | Examination of Prostate | Examination of Prostate | Examination of Prostate | Skills Lab |
| | Calculation of BMI | Calculate of BMI | Calculation of BMI | Skills Lab |
| MOD-5 Renal & Excretory System-I | Male urethral catheterization | Perform Male urethral catheterization | Male & Female urethral catheterization | Skills Lab |
| | Female urethral catheterization | Female urethral catheterization | | |
| | Histology of the Urethra | | Histology of the Urethra | Histology Lab |
| | Interpret Renal Function Tests | How to approach a urological patient How to investigate a urological patient | Interpret Renal Function Tests | Pathology Lab |
| MOD-6 Reproductive System | Histology of the Reproductive System | Microscopic features of Ovary and Fallopian tube, Histology of Prostate, Seminal Vesicle Histology of the uterus, cervix, and vagina Microscopic features of the Ovary and the Fallopian tube | Histology of the reproductive system | Histology Lab |
| | Pelvimetry | Demonstrate clinical pelvimetry, identify different pelvic types, and interpret their obstetric significance in labor and delivery | Pelvimetry | Skills Lab |
| | Interpret the pregnancy test | Pregnancy test | Interpret the pregnancy test | Physiology Lab |
| IT | | Visual Design with Canva Image Editing for | | |

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|-----------------|--------------------------------------|--|-----------------------|--------|
| | Cyber security | Medical Illustrations AI-based image editing tools Exploring EHR and HMIS Applications Data and Evidence Recovery in Medical Investigations Security Issues Tools and Techniques for Data Visualization | Cyber security | IT Lab |
| Research | (Biostatistics, Epidemiology) | Introduction to SPSS SPSS Software Sampling Techniques: Designing Questionnaire/Pro Forma How to write a Research proposal and develop research questionnaire Data entry and Statistical analysis | Research | IT Lab |

NEUROSCIENCE MODULE-I

Introduction Welcome to the neuroscience module. This module is necessary for your future work as doctors. This module is designed to make your learning both interesting and productive by including activities.

This module provides basic understanding by integrating the teaching of Human Anatomy, physiology, Biochemistry of neurotransmitters, and the basic Pharmacology and Pathology related to the disorders of the central and peripheral nervous system and their relevant clinical applications. 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 (themes), which you are likely to encounter as second year medical students. You will be expected to think about the themes 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 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 degenerative and demyelinating diseases like Parkinson's disease and multiple sclerosis is important to reduce the occurrence of disability burden on community. Understanding the structure and function of nervous system and its relationship with pathophysiology of diseases is essential for diagnosis and management.

DURATION: 06 WEEKS

LEARNING OUTCOMES: AT THE END OF THIS MODULE STUDENTS WILL BE ABLE TO:

- Describe the anatomy of brain and spinal cord and the general organization of nervous system.
- Analyze the physiology of nervous system and Biochemistry of neuro-metabolites.
- Explain the mechanism of ischemia, hypoxia, infarction and intracranial hemorrhage.
- Elaborate the approach to a neurologic patient with its screening

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

- Recognize the structure and function of major division and components of central, peripheral and autonomic nervous system
- Recognize the structure and function of major division and components of central, peripheral and autonomic nervous system, with the role of hypothalamus
- Interpret the various clinical presentations of spinal cord disorders correlating with its organization, structure and function.
- Localize the common brain stem and cranial nerves lesions by recognizing the structure of brainstem and the associated cranial nerves.
- Differentiate between pyramidal and extrapyramidal syndromes and upper and lower motor neuron lesions with the knowledge of structure and types of fiber bundles traversing the brain and their functions.
- Differentiate between the functions of dominant and non-dominant cerebral hemispheres and between various parts of each hemisphere by identifying the surfaces, lobes, sulci & gyri of cerebral hemisphere.
- Correlate the clinical presentation of Parkinson's disease with the topographic anatomy and function of basal nuclei
- Appreciate the changes in emotions, behavior and personality by recalling the structure and functions of limbic system.
- Interpret the effects of increased intracranial pressure with the structure of crano-spinal meninges,

ventricular system, and mechanism of formation, flow, drainage and chemistry of C.S.F in normal and in disease.

- Relate the different syndromes of ischemia in brain and ischemic myelopathy with the pattern of arterial supply of brain and spinal cord, together with knowledge of blood brain barrier.
- Recognize the effects of venous stasis and obstruction by applying the knowledge of venous drainage and dural venous sinuses
- Identify various congenital malformations of brain and spinal cord by knowing the embryological basis of neurulation and transformation of neural tube into CNS and the anomalies in the process
- Deduce the neuro-anatomic basis of ataxia and incoordination by applying the knowledge of cerebellar cortex, nuclei and peduncles.

Clinical/ Practical Skills

- Identification of nervous tissues under the microscope with points of identification. (Students are required to draw and label microscopic sections of nervous components in histology journal. The journal will be assessed during end-module examination).
- Perform clinical examination of the nervous 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: Spinal cord trauma, anterior horn cell disorders, neuropathies & myopathies

Theme 2: Disorders of brain stem

Theme 3: Cerebral cortex diseases (upper motor neuron lesions, tumors, trauma, dementia, Epilepsy)

Theme 4: Gait abnormalities (Cerebellar diseases, Basal nuclei disorders).

Theme 5: Cerebrospinal fluid/ ventricular system and hydrocephalus

Theme 6: Cerebrovascular disorders, Intracranial hemorrhage, stroke

These themes will be covered in different topics which will be taught in Lectures, demonstrations, Practical's, small group discussions, CBLs and skill lab.

| TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | | |
|---|---|-------------------------------|-------------------|------------|
| Theme 1: Spinal Cord Trauma, Anterior Horn Cell Disorders, Neuropathies & Myopathies | | | | |
| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 1 | <ul style="list-style-type: none"> Describe organization and components of Nervous System. Describe the parts of Brain and Spinal cord. Describe the components of Peripheral Nervous System. Describe the cranial and spinal | NS-S1-Ana-G-1 Introduction | tc | |

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| | <p>nerves.</p> <ul style="list-style-type: none"> Describe the components of Autonomic Nervous System. Associated clinical correlates and Imaging techniques. | | | |
| 2 | <ul style="list-style-type: none"> Describe external morphology of spinal cord. | NS-S1-Ana-G-2 Spinal cord I | Interactive Lecture | SBQs & OSVE |
| 3 | <ul style="list-style-type: none"> Describe Internal structure of spinal cord (Gray Matter) | NS-S1-Ana-G-3 Spinal cord II | | |
| 4 | <ul style="list-style-type: none"> Describe Internal structure of spinal cord (White Matter) | NS-S1-Ana-G-4 Spinal cord III | | |
| 5 | <ul style="list-style-type: none"> Describe the development of neural tube, and neural crest cells, and their derivatives. Clinical correlates | NS-S1-Ana-E-1 Development of | | |
| 6 | <ul style="list-style-type: none"> Describe the development of spinal cord Clinical correlates | NS-S1-Ana-E-2 Development of spinal cord | | |
| 7 | <ul style="list-style-type: none"> Describe the nervous tissue Define neuron, its structure and function & types of neurons Define neuroglia, their types and functions | NS-S1-Ana-H-1 Microscopic anatomy of nervous tissue | | |
| 8 | <ul style="list-style-type: none"> Describe the nervous tissue Define neuron, its structure and function & types of neurons Define neuroglia, their types and functions | NS-S1-Ana-H-2 Histology of the Nervous tissue (Types of Neuron and neuroglia) | Practical | OSPE & OSVE |
| 9 | <ul style="list-style-type: none"> Able to identify the microstructure of the spinal cord. | NS-S1-Ana-H-3 Histology of the Spinal Cord | | |
| Physiology | | | | |
| 10 | <ul style="list-style-type: none"> Definition & Organization of the nervous system Know about Physiological division of nervous system Determine different Levels of nervous system | NS-PHYS-1 Nervous system – overview | | |

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|----|--|--|---------------------|-------------|
| 11 | <ul style="list-style-type: none"> Discuss electrical properties of neuron Discuss generation of action potential List functions of neoroglial cells Define Myelin sheath Define Saltatory conduction Regeneration of nerve fiber Blood brain barrier | NS-PHYS-2 Neuron & Neuroglia | Interactive Lecture | SBQs & OSVE |
| 12 | <ul style="list-style-type: none"> Define Synapse, types and properties of synapse Determine Structure of synapses Discuss transmission of electrical signals between neurons | NS-PHYS-3 Synapses | | |
| 13 | <ul style="list-style-type: none"> Describe briefly the physiological Anatomy of spinal cord Meninges, parts & functions of spinal cord | NS-PHYS-4 Spinal cord | | |

Clinical Lecture

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|----|---|---|---------------------|-------------|
| 15 | Discuss the clinical correlates and injuries of spinal cord | NS-S1-NeurS-1 Injuries/trauma and clinical conditions associated with spinal cord | Interactive Lecture | SBQs & OSVE |
| 16 | Discuss the clinical presentations of anterior horn cell disorders | NS-S1-NeurM-1 Anterior horn cell disorders | | |
| 17 | Discuss the clinical presentations of Neuropathies /myasthenia Gravis | NS-S1-NeurM-2 Neuropathies/ myasthenia Gravis | | |

| Theme 2: Disorders of the Brain Stem | | | | |
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| S # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 18 | <ul style="list-style-type: none"> Describe the development of brain vesicles. Discuss the development of brain stem | NS-S1-Ana-E-3 Development of brain stem | | |
| 19 | <ul style="list-style-type: none"> Describe External structure of brain stem at different level (Medulla Oblongata, pons, midbrain) | NS-S1-Ana-G-5 Brain stem I | | |

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|-------------------|--|--|---|-------------|
| 20 | <ul style="list-style-type: none"> Describe External structure of brain stem at different level (Medulla Oblongata, pons, midbrain) | NS-S1-Ana-G-6 Brain stem III | Interactive Lecture | SBQs & OSVE |
| 21 | <ul style="list-style-type: none"> Describe internal structure of brain stem at different levels. (Medulla Oblongata, pons, midbrain) | NS-S1-Ana-G-7 Brain stem III | | |
| 22 | <ul style="list-style-type: none"> Describe internal structure of brain stem at different levels. (Medulla Oblongata, pons, midbrain) | NS-S1-Ana-G-8 Brain stem IV | | |
| 23 | <ul style="list-style-type: none"> Define the organization, connections and distribution of the cranial nerves from cranial nerve-III to VI Clinical correlates | NS-S1-Ana-G-9 Cranial nerves I | | |
| 24 | <ul style="list-style-type: none"> Define the organization, connections and distribution of the cranial nerves from cranial nerve-VII-XII Clinical correlates | NS-S1-Ana-G-10 Cranial nerves II | | |
| 25 | <ul style="list-style-type: none"> Describe the organization and division of the autonomic nervous system. Define preganglionic and post ganglionic sympathetic and parasympathetic fibers | NS-S1-Ana-G-11 The Autonomic Nervous System | | |
| physiology | | | | |
| 26 | <ul style="list-style-type: none"> Describe general characteristics of Receptors Classify receptors according to location and Modalities of sensation. Define receptor potential and transduction Define Touch & its receptors Define Pressure & its receptors Define Vibration & its receptors Define Tickle & itch, its receptors | NS-PHYS-5 Sensory receptors & its modalities | Interactive Lecture | SBQs & OSVE |
| 27 | <ul style="list-style-type: none"> Antero-lateral system (spino- List different types of sensory pathway Discuss dorsal column medial lemniscus system, its location, receptors, tracts and sensory modalities. Discuss thalamic), its location, receptors, tracts and sensory modalities. Lesions of sensory pathways | NS-PHYS-6 Sensory pathway (Anterolateral pathway & DCMLP) | | |
| 28 | <ul style="list-style-type: none"> Describe Unconscious sensation & their pathways | NS-PHYS-7 Spinocerebellar pathways | | |

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|-------------------------|--|--|---------------------|-------------|
| 29 | <ul style="list-style-type: none"> Define Pain Types, qualities and receptors Which Pathways are involved, discuss dual pathways for transmission of pain signals into CNS What is Referred pain, differentiate btw somatic & Visceral pain | NS-PHYS-8 Pain pathways | | |
| 30 | <ul style="list-style-type: none"> Define Analgesic system of brain & its physiological role Define Methods of analgesia Define Hyperalgesia List pain suppression and brain opioid system. | NS-PHYS-9 Analgesic pathway | | |
| 31 | <ul style="list-style-type: none"> Brainstem Motor Function | NS-PHYS-10 Midbrain, pons & Medulla | | |
| 32 | <ul style="list-style-type: none"> Define following terms & their physiological importance: Preganglionic & Postganglionic Sympathetic & Parasympathetic Define Dual innervations of viscera AdExc-S1 medulla Define Sympathetic discharge Differentiate btw Receptors, Neurotransmitters & drugs | NS-S1-Phy-11 Autonomic nervous system | | |
| 33 | <ul style="list-style-type: none"> To perform superficial & deep reflexes and its significance in different neurological disorders. To perform Corneal reflexes To perform Abdominal reflexes To perform Plantar reflexes To perform superficial deep reflexes and its significance | NS-S1-Phy-P-1 Superficial reflexes and deep reflexes | Practical | |
| Pharmacology | | | | |
| 34 | <ul style="list-style-type: none"> To modulate the activity of the brain and spinal cord Describe its side effects | NS-S1-Pharm-1 Introduction drugs related to CNS | Interactive Lecture | SBQs & OSVE |
| Clinical Lecture | | | | |
| 35 | <ul style="list-style-type: none"> Discuss the clinical correlates and injuries of spinal cord | NS-S1-NeurS-2 clinical conditions associated with brain stem | Interactive Lecture | SBQs & OSVE |
| 36 | <ul style="list-style-type: none"> Discuss the clinical presentations of anterior horn cell disorders | NS-S1-NeurM-3 clinical conditions associated with brain stem | | |

| Theme 3: Cerebral Cortex Diseases (Upper Motor Neuron Lesions, Tumors, Trauma, Dementia, Epilepsy) | | | | |
|--|--|--|---------------------|-------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 40 | <ul style="list-style-type: none"> Describe the structure of Diencephalon Describe divisions of Diencephalon (thalamus, hypothalamus, subthalamus, epi-thalamus) | NS-S1-Ana-G-12 Diencephalon I (boundaries of Diencephalon & thalamus) | | |
| 41 | <ul style="list-style-type: none"> Describe the morphological features and nuclei of thalamus Explain the connections of thalamus and its relations | NS-S1-Ana-G-13 Diencephalon II (thalamus) | | |
| 42 | <ul style="list-style-type: none"> Describe the hypothalamus Identify the location, components & connections of limbic system. | NS-S1-Ana-G-14 Hypothalamus and limbic system | Interactive Lecture | SBQs & OSVE |
| 43 | <ul style="list-style-type: none"> Explain the dominance & non-dominance correlation with structure & functions of cerebral cortex | NS-S1-Ana-G-15 Cerebral cortex I (gray matter) | | |
| 44 | <ul style="list-style-type: none"> Describe functional areas of cerebral cortex Discuss lesions of functional areas of cerebral cortex | NS-S1-Ana-G-16 Cerebellar cortex I (gray matter) | | |
| 45 | <ul style="list-style-type: none"> Describe different types of fibers in the cerebral hemisphere; association, | NS-S1-Ana-G-17 Cerebral cortex III (White matter; association, | | |

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| | <ul style="list-style-type: none"> projection & commissural fibers. Explain parts of the corpus callosum and fornix. Clinical correlates. | projection & commissural fibers, corpus callosum, and fornix) | | |
| 46 | <ul style="list-style-type: none"> Name the parts and tracts of the internal capsule. Clinical correlates. | NS-S1-Ana-G-18 Cerebral cortex IV (white matter. internal capsule) | | |
| 47 | <ul style="list-style-type: none"> Define the organization, connections and distribution of the cranial nerves from cranial Nerve-I & II Clinical correlates | NS-S1-Ana-G-19 Cranial nerves I | | |
| 48 | <ul style="list-style-type: none"> Describe the development of forebrain, diencephalon | NS-S1-Ana-E-4 Development of forebrain & Diencephalon | | |
| 49 | <ul style="list-style-type: none"> Explain and identify the different types of cells of cerebral cortex Describe and identify the layers of cerebral cortex | NS-S1-Ana-H-4 Histology of cerebral cortex | Practical | OSPE & OSVE |

Physiology

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|----|---|--|---------------------|-------------|
| 50 | <ul style="list-style-type: none"> Functions of Specific Cortical Areas Motor & sensory areas Cortical Control of Motor Function | NS-PHYS-12 Areas of cerebral cortex | | |
| 51 | <ul style="list-style-type: none"> Define Superficial & deep reflexes & their control by Upper & lower motor neurons Difference b/w Upper & lower motor neurons lesion | NS-PHYS-13 Spinal cord reflexes, reflex arc, reflex action | Interactive Lecture | SBQs & OSVE |
| 52 | <ul style="list-style-type: none"> Define Pyramidal tracts features & its pathway, Define Extra pyramidal tracts features & its Pathway Define brown-sequard syndrome & its pathophysiology. | NS-PHYS-14 Descending pathways- (Pyramidal & extra pyramidal tracts | | |
| 53 | <ul style="list-style-type: none"> Define memory Give various types of memory & their importance Describe neural mechanism involved in memory | NS-S1-Phy-15 Memory & Speech and its disorders | | |

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| | <ul style="list-style-type: none"> • Give disorders of memory (Alzheimer's disease) • Define speech • Name motor and sensory cortical areas of speech & their function • Describe speech disorders | | | |
| | <ul style="list-style-type: none"> • To examine body temperature and to related abnormalities | NS-S1-Phy-P-2 Body temperature | Practical | OSPE & OSVE |
| 54 | <ul style="list-style-type: none"> • To perform cerebellar function tests and to identify associated disorders. | NS-S1-Phy-P-3 Cerebral function tests | Practical | OSPE & OSVE |
| 55 | <ul style="list-style-type: none"> • To examine brain waves with the help of power lab. | NS-S1-Phy-P-4 EEG | | |
| Pharmacology | | | | |
| 57 | <ul style="list-style-type: none"> • It is drug that can be used for recreational, medicinal or spiritual purposes | NS-S1-Pharm-2 Alcohol | Interactive Lecture | SBQs & OSVE |

| Theme 4: Gait Abnormalities (Cerebellar Diseases, Basal Nuclei Disorders) | | | | |
|--|--|--|---------------------|---------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 59 | <ul style="list-style-type: none"> • Describe the detailed Anatomy of cerebellum • Explain the anatomical & physiological divisions of cerebellum • Discuss characteristic features of cerebellar cortex; gray matter, white matter & deep cerebellar nuclei. | NS-S1-Ana-G-20 Cerebellum I | | |
| 60 | <ul style="list-style-type: none"> • Explain connections of cerebellar cortex and deep cerebellar nuclei. • Clinical correlates. | NS-S1-Ana-G-21 Cerebellum II | Interactive Lecture | Interactive Lecture |

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| 61 | <ul style="list-style-type: none"> Identify the location and components of basal nuclei. Explain the connections of basal nuclei. Describe clinical aspects related to basal nuclei. | NS-S1-Ana-G-22 Basal nuclei and their connections | | |
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|----|---|---|-----------|-------------|
| 62 | <ul style="list-style-type: none"> Describe the development of hindbrain/cerebellum | NS-S1-Ana-E-5 Development of hind brain/ cerebellum | | |
| 63 | <ul style="list-style-type: none"> Describe and identify the layers of cerebellar cortex Describe and identify the cells of cerebellar cortex | NS-S1-Ana-H-5 Histology of cerebellar cortex | Practical | OSPE & OSVE |

| Physiology | | | | |
|-------------------|--|---|---------------------|-------------|
| 64 | <ul style="list-style-type: none"> Give the special features of cerebellum Name its physiological divisions & their function Explain the internal neuronal circuit of the cerebellum and its functioning Describe the features of cerebellar lesions | NS-PHYS-16 Cerebellum & its lesion | | |
| 65 | <ul style="list-style-type: none"> Name the basal ganglia List the functions of basal ganglia Describe the functions of caudate & putamen circuits Describe the lesions of the basal ganglia (Parkinson's disease) | NS-PHYS-17 Basal nuclei and its' diseases | Interactive Lecture | SBQs & OSVE |

| Theme 5: CSF & Hydrocephalus | | | | |
|---|---|--|-------------------|------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 66 | <ul style="list-style-type: none"> Identify the ventricles of brain along with their location; Lateral, and 3RD ventricle | NS-S1-Ana-G-23 Ventricular system, lateral and third ventricle | | |

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| 67 | <ul style="list-style-type: none"> Discuss the location and structure of 4th ventricle and choroid plexus | NS-S1-Ana-G-24 4 th ventricle and choroid plexus | Interactive Lecture | SBQs & OSVE |
| 68 | <ul style="list-style-type: none"> Explain the formation, circulation and drainage of CSF | NS-S1-Ana-G-25 Cerebrospinal fluid | | |
| Physiology | | | | |
| 69 | <ul style="list-style-type: none"> To explain the structure of the Ventricles of brain | NS-PHYS-18 Formation, circulation & | Interactive Lecture | SBQs & OSVE |

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| | <ul style="list-style-type: none"> To Describe how the brain and spinal cord are protected and nourished (CSF) Obstruction of the flow of CSF | functions of CSF & abnormalities | | |
| Pathology | | | | |
| 70 | <ul style="list-style-type: none"> Enlist the causes of meningitis. Discuss the CSF findings of different types of meningitis | NS-S1-Path-1 Meningitis & CSF Findings | Interactive Lecture | SBQs & OSVE |
| Clinical Lecture | | | | |
| 71 | <ul style="list-style-type: none"> Discuss clinical presentation & management of Hydrocephalus | NS-S1-NeuS-3 Hydrocephalus | Interactive Lecture | SBQs & OSVE |

| Theme 6: Cerebrovascular disorders, intracranial hemorrhage, stroke | | | | |
|--|---|---|---------------------|-------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 72 | <ul style="list-style-type: none"> Describe the arterial supply and venous drainage of cerebral hemispheres | NS-S1-Ana-G-26 Blood supply of spinal cord, brain stem and cerebellum | Interactive Lecture | SBQs & OSVE |
| 73 | <ul style="list-style-type: none"> Describe the branches of internal carotid artery Formation of circle of villous and its distribution | NS-S1-Ana-G-27 Internal carotid artery & Circle of villous | | |

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|-------------------|--|---|---------------------|-------------|
| 74 | <ul style="list-style-type: none"> Describe the arterial supply and venous drainage of cerebral hemispheres | NS-S1-Ana-G-28 Blood supply of cerebral hemispheres | | |
| 75 | <ul style="list-style-type: none"> Explain how the Blood brain barrier is formed and what is its clinical significance | NS-S1-Ana-G-29 Blood brain barrier | | |
| Physiology | | | | |
| 76 | <ul style="list-style-type: none"> To explain vegetative functions of hypothalamus To explain the different functions of limbic system To explain the functions of reward and punishment centers. | NS-PHYS-19 Hypothalamus & Limbic System | Interactive Lecture | SBQs & OSVE |
| 77 | <ul style="list-style-type: none"> To explain the physiology | NS-PHYS-20 | | |

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|-------------------------|---|-----------------------|--|--|
| | <ul style="list-style-type: none"> of slow wave sleep & rapid eye movement (REM) sleep. To explain the basic theories of sleep Describe the names & origin of brain waves. Describe epilepsy & clinical correlates | Sleep & its disorders | | |
| Clinical Lecture | | | | |

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|----|---|---|---------------------|-------------|
| 76 | <ul style="list-style-type: none"> Discuss Surgical aspect of cerebrovascular disease | NS-S1-NeuS-4 Surgical aspect of cerebrovascular disease | Interactive Lecture | SBQs & OSVE |
| 77 | <ul style="list-style-type: none"> Discuss clinical aspects of cerebrovascular disease | NS-S1-NeuM-4 clinical aspect of cerebrovascular disease | | |

HEAD AND NECK MODULE

Introduction: Head & neck module includes anatomical structures of head & neck as well as physiological aspect of structures like Eyes (Vision), Ear (Hearing & body balance), nose (olfaction), & mouth (taste) i.e. physiology of special senses.

Although head & neck is not a separate system but its study as a system is essential as it contains important organs like eyes, ears, nose, mouth, larynx etc. These are all in proximity to one another and often diseases afflicting one of these also affect other organs by contiguity. Injuries to the region of head, face & neck are associated with high

mortality & morbidity.

The head and neck module (HNM) for 2nd year MBBS aims to integrate both basic and clinical sciences. In basic sciences, students will be able to explain developmental, gross and microscopic anatomy of the head, neck, eyes, and ears along with relevant neurophysiology, pathology and Biochemistry. Integration with relevant clinical sciences disciplines will help students apply their knowledge from a meaningful clinical perspective.

This module provides the basic understanding of the anatomy and physiology of the components of head and neck

Rationale Head & neck contains very important structures like eyes, nose, ears, oral cavity, larynx and pharynx. A student should be well aware of anatomy of these structures as well their function. The diseases of these structures are very common like tonsillitis, rhinitis, sore throat, red eye etc.

With knowledge of basic science and relevant clinical knowledge obtained through clinical lectures and case based scenarios, a student would be able to help patients in their community with these common diseases. Thus they can benefit their society and be a responsible member of community.

DURATION 06 WEEKS

LEARNING OUTCOMES AT THE END OF THIS MODULE STUDENT SHOULD BE ABLE TO:

- Describe in detail the anatomy of structures of head and neck
- Describe the development of branchial arches
- Elaborate the histopathology of neoplastic lesions involving head and neck
- Describe the and microscopic structural and functional anatomy of the EYE
- Explain the physical principles of optics
- Describe the errors of refraction & their correction
- Explain mechanism of Photo-transduction, Excitation and Receptor Potential of the Rods
- Explain the photochemistry of color vision by cones and the color blindness
- Describe the physiology of visual pathway, areas VISUAL CORTEX and Lesion at the different levels of visual pathway
- Explain the muscular control of eye movement,
- Describe the primary sensation of taste, the mechanism of taste perception and its transmission into central nervous system
- Discuss the primary sensation of smell, excitation of olfactory cells & its transmission into central nervous 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

To achieve these overall aims, this module comprises of seven weeks with a separate theme for each week for enhancing your learning around key areas in the region of Head & Neck and special senses diseases.

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| Theme 1: | Fractures of the Skull & Scalp injuries |
| Theme 2: | Facial injuries and the bell's palsy |
| Theme 3: | Disorders of the salivary glands and neck lesions Theme |
| Theme 4: | Waldeyer's ring, Tonsillitis and oral cancers |
| Theme 5: | Visual field defects, Glaucoma, Role of Vitamin A Theme |

Theme 6: Deafness, vertigo, otitis media

These themes will be covered in different topics which will be taught in Lectures, demonstrations, Practical's, small group discussions, CBLs and skill lab

| TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | | |
|--|--|---|---------------------|-------------------|
| Theme 1: Fractures of the Skull & Scalp Injuries | | | | |
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 1 | <ul style="list-style-type: none"> • Explain the overview of neck regions • Explain the overview of head surface, muscles, innervations, blood supply & venous drainage | HN-S1-Ana-G-1 Overview of the head and neck regions | | |
| 2 | <ul style="list-style-type: none"> • Define axial skeleton • Describe bones of skull and cranium • Explain overview of Skull Geography & Sutures • Differentiate the various views of the skull | HN-S1-Ana-G-2 Osteology of the Skull and the vault | Interactive Lecture | SBQs & OSVE |
| 3 | <ul style="list-style-type: none"> • Define norma frontalis • Explain the different regions of it • Enumerate muscle attachment • Describe Boundaries and features of its structure. | HN-S1-Ana-G-3 Skull: Norma frontalis | | |
| 4 | <ul style="list-style-type: none"> • Enlist various bones in • Describe the Cranial and facial subdivisions • Define External acoustic meatus | HN-S1-Ana-G-4 Norma lateralis and occipitalis | Demonstration | SBQs, OSPE & OSVE |
| 5 | <ul style="list-style-type: none"> • Describe bones forming the base of skull • Explain the details of anterior, middle and posterior part of base of skull • Identify different foramina and structures passing through them at the base • Explain the attachments and relations of base of skull | HN-S1-Ana-G-5 Norma Basalis Anterior, middle and posterior parts | | |

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| 6 | <ul style="list-style-type: none"> Describe bones forming the cranial cavity Explain the details of anterior, middle and | HN-S1-Ana-G-6 Cranial cavity | | |
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| | posterior fossae of the cranial cavity <ul style="list-style-type: none"> Identify different foramina and structures passing through them. | | | |
| 7 | <ul style="list-style-type: none"> Describe the meninges of the brain and spinal cord. Discuss the venous sinuses. Discuss the related clerical's | HN-S1-Ana-G-7 The meninges of brain and spinal cord & the venous sinuses | | |
| 8 | <ul style="list-style-type: none"> Explain the extent of scalp Describe five layers of scalp Identify the nerves and vessels of scalp Enumerate the clinical correlates | HN-S1-Ana-G-8 Scalp (layers, Nerves &Vessels) | | |
| 9 | <ul style="list-style-type: none"> Describe development of pharyngeal Apparatus List the Parts of pharyngeal apparatus. Describe development of pharyngeal arches. Enlist the derivatives of pharyngeal arches. Describe the related congenital anomalies. | NS-S1-Ana-E-1 Pharyngeal Apparatus. Pharyngeal Arches | Interactive Lecture | SBQs & OSVE |
| 10 | <ul style="list-style-type: none"> Describe the development of pharyngeal pouches & clefts. Enlist the derivatives of pharyngeal pouches & clefts. Describe the related congenital anomalies. | NS-S1-Ana-E-2 Pharyngeal pouches & clefts. | | |

Physiology

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| 11 | <ul style="list-style-type: none"> To perform the movements of eye ball and muscles controlling these movements Accommodation reflex & pupillary light reflex their pathway Diplopia, squint, Nystagmus, strabismus. | HN-S1-Phy-1 Examination of oculomotor, Trochlear and Abducent nerve | Practical | OSPE & OSVE |
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| Theme 2: Facial Injuries & Bell's Palsy | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 12 | <ul style="list-style-type: none"> Describe the boundaries and contents of temporal fossa. Describe the type, formation, neurovascular supply and movements of Temporomandibular joint. Clinically correlate disorders of the Temporo- mandibular joint. Describe the muscles of mastication. | HN-S1-Ana-G-9 Temporal Region & Temporo- mandibular Joint and muscles of mastication | Interactive Lecture | SBQs & OSVE |
| 13 | <ul style="list-style-type: none"> Describe boundaries and contents of Pterygopalatine & Infratemporal fossae. Describe the muscles of mastication. | HN-S1-Ana-G-10 Pterygopalatine & Infratemporal fossae. | | |
| | <ul style="list-style-type: none"> Describe Parts of mandible | | | |
| 14 | <ul style="list-style-type: none"> Explain general and special features of each part. Describe the blood and nerve supply of mandible Interpret applied anatomy of mandible. Explain general and special features of Hyoid bone. | HN-S1-Ana-G-11 Mandible & Hyoid bone. | demonstration | SBQs, OSPE & OSVE |
| 15 | <ul style="list-style-type: none"> Describe the boundaries of face Enumerate the muscles and innervations of face Describe the disorders and applied of face | HN-S1-Ana-G-12 Muscles of the facial expression | | |

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| 16 | <ul style="list-style-type: none"> Describe the cutaneous supply of the head and neck regions. | HN-S1-Ana-G-13 Cutaneous supply of the head & neck region | | |
| 17 | <ul style="list-style-type: none"> Describe arterial supply of head and neck | HN-S1-Ana-G-14 Arteries & Veins of the Head & Neck. | Interactive Lecture | SBQs & OSVE |

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| | <ul style="list-style-type: none"> Major venous drainage to sinuses, Head and neck major veins. | | | |
| 18 | <ul style="list-style-type: none"> Describe the Developmental stages of Face Explain the congenital Anomalies of face Describe the development of the nasal cavity Describe the development of the paranasal sinuses. Explain the congenital Anomalies of face | HN-S1-Ana-E-3 Development of face and nose | | |

Physiology

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| 19 | <ul style="list-style-type: none"> To examine muscle of facial expression To define and classify Bell's facial palsy Correlate between 5th and 6th nerve Interpret the problems of trigeminal nerve injury | HN-S1-Phy-P-2 Examination of facial and trigeminal nerve. | Practical | OSPE & OSVE |
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Theme 3: Disorders of the Salivary Glands & Neck Lesions

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
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| Anatomy | | | | |
| 20 | <ul style="list-style-type: none"> Explain the parotid region. Describe the anatomy parotid gland. Define what otic ganglion is. Interpret Applied anatomy of parotid gland | HN-S1-Ana-G-15 Parotid region | | |
| 21 | <ul style="list-style-type: none"> Explain the submandibular region. List the Suprahyoid muscles. Describe the submandibular gland. Describe the sublingual gland. Define what is submandibular ganglion | HN-S1-Ana-G-16 Submandibular region | Demonstration | SBQs, OSPE & OSVE |
| 22 | <ul style="list-style-type: none"> Describe the deep cervical fascia Explain the four parts of deep cervical fascia and the structures it encloses: the investing layer, pretrachial fascia, prevertebral fascia & the carotid sheath. Define platysma muscle. | HN-S1-Ana-G-17 Deep Cervical fascia & platysma | | |
| 23 | <ul style="list-style-type: none"> Discuss the boundaries and divisions of the anterior triangle of neck List the subdivision of anterior triangle of neck. Describe the boundaries and contents of subdivisions of anterior triangle. | HN-S1-Ana-G-18 Anterior triangle of neck | | |
| 24 | <ul style="list-style-type: none"> Describe the division and boundaries of posterior triangle of neck List the contents of posterior triangle of the neck Discuss the clinical conditions associated with posterior triangle of the neck | HN-S1-Ana-G-19 Posterior triangle of neck | | |
| 25 | <ul style="list-style-type: none"> Discuss the formation and branches of the cervical plexus Discuss the origin, course, branches and functions of cranial nerve XI. | HN-S1-Ana-G-20 cervical plexus & cranial nerve XI. | Interactive Lecture | SBQs & OSVE |
| 26 | <ul style="list-style-type: none"> Name the Salivary glands and their location. Describe the histology of parotid gland Describe the histology of | HN-S1-Ana-H-1 Salivary Glands | Practical | OSPE & OSVE |

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| | <ul style="list-style-type: none"> the submandibular gland Describe the histology of the sublingual gland. | | | |
| Pathology | | | | |
| 27 | <ul style="list-style-type: none"> To describe the etiology, pathogenesis and major subtypes of Inflammatory, non-neoplastic lesions of salivary glands | HN-S1-Path-1 Inflammatory and non-neoplastic lesions of salivary glands | Interactive Lecture | SBQs & OSVE |
| Physiology | | | | |

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| | <ul style="list-style-type: none"> To perform and interpret the function of nerves The gag reflex. To observe shrugging of shoulders with and without resistance Check movements of tongue in all directions Test the sensation of taste To assess the deviation of the tongue when extended toward the weak side | HN-S1-Phy-3 Examination of Glossopharyngeal Vagus, Accessory and Hypoglossal nerves. | Practical | OSPE & OSVE |
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| Theme 4: Waldeyer's Ring, Tonsillitis & Oral Cancers | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 29 | <ul style="list-style-type: none"> Describe the anatomy of external nose. Define the boundaries of nasal cavity. Describe the lateral wall of nose. Identify & Describe Arterial & Venous supply of nose and nasal cavity. Describe Nerve supply of nose and nasal cavity | HN-S1-Ana-G-21 External nose & nasal cavity | Demonstration | SBQs, OSPE & OSVE |
| 30 | <ul style="list-style-type: none"> Define & list names of paranasal sinuses Describe functions of paranasal sinuses. Identify Radiographic Protocols for sinuses Explain diseases of sinuses. | HN-S1-Ana-G-22 Para-nasal sinuses | | |

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| 31 | <ul style="list-style-type: none"> Define the boundaries of oral cavity (The roof, lateral walls and floor of oral cavity). Describe the hard & soft palate. Describe the vasculature and innervation of the oral cavity & palate. Define the muscles of the soft palate. | HN-S1-Ana-G-23 Oral cavity hard and soft palate | Interactive Lecture | SBQs & OSVE |
| 32 | <ul style="list-style-type: none"> Describe what is tongue and Papilla. Enumerate the Extrinsic and Intrinsic muscles of the tongue Define the sensory & motor nerve supply of the tongue. | HN-S1-Ana-G-24 The tongue | Interactive Lecture | SBQs & OSVE |
| 33 | <ul style="list-style-type: none"> Explain the structure, functions of various parts of pharynx & their blood supply & innervation. Interpret related applied anatomy. | HN-S1-Ana-G-25 Pharynx | | |
| 34 | <ul style="list-style-type: none"> Explain the structure, cartilages and functions of the various parts of larynx. | HN-S1-Ana-G-26 Larynx-1 | | |
| 35 | <ul style="list-style-type: none"> Describe the muscles, blood supply & innervation of the larynx. Interpret related applied anatomy. | HN-S1-Ana-G-27 Larynx-2 | Demonstration | SBQs, OSPE & OSVE |
| 36 | <ul style="list-style-type: none"> Identify the microscopic features of the nose and paranasal sinuses. Discuss the respiratory epithelium. Explain the Olfactory epithelium. | NS-S1-Ana-H-2 Histology of the Nasal cavity | | |
| 37 | <ul style="list-style-type: none"> Describe the different parts of oral cavity. Explain the histology of cheek and lip. Describe microscopic features of tongue. | NS-S1-Ana-H-3 Histology of oral cavity | Practical | OSPE & OSVE |
| Physiology | | | | |
| 38 | <ul style="list-style-type: none"> Primary tastes & taste receptors Taste transduction, Taste pathway Olfactory mucosa, Smell pathway Role of smell in memory & sex | HN-S1-Phy-4 Chemical senses taste & smell | Interactive Lecture | SBQs & OSVE |

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| 39 | <ul style="list-style-type: none"> To examine and interpret the sense of taste and smell in a subject | HN-S1-Phy-5 Examination of s taste & smell sensations | Practical | OSPE & OSVE |
| ENT | | | | |

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| 40 | <ul style="list-style-type: none"> Discuss clinical significance of tonsils | HN-S1-Ent-1 Tonsillitis | Interactive Lecture | SBQs & OSVE |
| 41 | <ul style="list-style-type: none"> Correlate causes with clinical presentation of epistaxis | HN-S1-Ent-2 Epistaxis | | |

| Theme 5: Visual Field Defects, Glaucoma, Role of Vitamin A | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 42 | <ul style="list-style-type: none"> Describe the boundaries of the orbit Define the openings of the orbital cavity and their contents Define the orbital fascia | HN-S1-Ana-G-28 The Orbit (boundaries & openings) | | |
| 43 | <ul style="list-style-type: none"> Explain the Extrinsic muscles and their innervations Explain the structures supplied by nerves of orbital cavity. Describe the blood vessels of orbit. | HN-S1-Ana-G-29 Contents of the orbital cavity (Extraocular muscles, nerves & vessels) | Demonstration | SBQs, OSPE & OSVE |
| 44 | <ul style="list-style-type: none"> Describe the palpebral fissure Explain the different layers of the eyelid and its muscles. Enumerate the blood supply and innervations of the eyelids. Illustrate lacrimal apparatus ciliary ganglion and their disorders. Interpret related applied anatomy. | HN-S1-Ana-G-30 Eyelids & lacrimal Apparatus & Ciliary Ganglion | | |

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| 45 | <ul style="list-style-type: none"> Enlist the coats of Eyeball. Describe the Cornea & Sclera Describe the Choroid, Ciliary body & Iris Describe the Retina | HN-S1-Ana-G-31 Structure of the eye Eyeball-1 (Coats) | Interactive Lecture | SBQs & OSVE |
| 46 | <ul style="list-style-type: none"> Describe the Aqueous humor, Vitreous body & lens Interpret related applied anatomy. | HN-S1-Ana-G-32 Eyeball-2 (Contents) | | |
| 47 | <ul style="list-style-type: none"> Describe the steps of development of human eye. Explain the derivatives of different embryonic primitive eye layers. Describe the development of various layers of eye individually, along with optic nerve. | HN-S1-Ana-E-4 Development of Eye | | |
| 48 | <ul style="list-style-type: none"> Describe the histology of Eyelids, Conjunctiva & Lacrimal Apparatus. | HN-S1-Ana-H-4 Histology of Eyelids, Conjunctiva, Lacrimal Apparatus | Practical | OSPE & OSVE |
| Physiology | | | | |
| 49 | <ul style="list-style-type: none"> Describe the physiological anatomy of eye, Its layers, Its chambers & Its systems Describe the Lens and its attachment Describe the Formation, composition, circulation & functions of aqueous humor | HN-S1-Phy-6 Physiological Anatomy Aqueous humor | | |
| 50 | <ul style="list-style-type: none"> Describe the physical principles of optics Describe accommodation reflex & its control Describe the refracting surfaces of eye Describe the errors of refraction & their correction | HN-S1-Phy-7 Optics of vision | Interactive Lecture | SBQs & OSVE |

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| 51 | <ul style="list-style-type: none"> Describe the functional anatomy of retina Describe the special features of photoreceptors i.e. rods & Cones Describe the neuronal circuits within retina Discuss Importance of Pigmented Layer of the Retina (albinos) Describe Blind spot & Fovea & their importance | HN-S1-Phy-8 Retina | | |
| 52 | <ul style="list-style-type: none"> Describe the basic mechanism of photo- transduction Describe the structure of rhodopsin and its bleaching by light Describe the role of Bipolar and ganglion cells in phototransduction Describe the steps involved in photo-transduction | HN-S1-Phy-9 Photo-transduction | | |
| 53 | <ul style="list-style-type: none"> Name the three primary color Describe Young - Helmholtz - theory of color vision. Describe color vision pathway Describe color blindness and tests to detect it Describe the mechanism of dark adaptation Describe the mechanism of light adaptation Describe night blindness & its cause | HN-S1-Phy-10 Color vision Duplicity of vision & adaptation | | |
| 54 | <ul style="list-style-type: none"> Describe visual pathway & its order neurons Describe the lesions of visual pathway Describe functions of superior colliculi and lateral geniculate body. Describe visual cortex Describe structure & function of lacrimal gland | HN-S1-Phy-11 Visual pathway & its lesions Lacrimal apparatus | Interactive Lecture | SBQs & OSVE |
| 55 | <ul style="list-style-type: none"> To demonstrate visual acuity of eye using Snelling eye chart in a subject provided To interpret the visual acuity recording To examine the color vision of a subject using ishiara eye | HN-S1-Phy-12 examination of the Optic nerve | Practical | OSPE & OSVE |

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| | <ul style="list-style-type: none"> chart. To perform the technique of plotting visual field. | | | |
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| | <ul style="list-style-type: none"> Read and interpret a given perimeter chart. Examine pupillary reflexes | | | |
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Biochemistry

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| 56 | <ul style="list-style-type: none"> Sources, RDA, Active forms, Absorption, Functions | HN-S1-Bio-1 Vitamin A (I) | Interactive Lecture | SBQs & OSVE |
| 57 | <ul style="list-style-type: none"> Deficiency states & Hypervitaminosis. Visual Cycle | HN-S1-Bio-2 Vitamin A (II) | | |

Ophthalmology

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| 58 | <ul style="list-style-type: none"> Define & Describe Refractive Errors, Emmetropia, Hypermetropia, Astigmatism | HD-Oph-1 Errors of refraction, presbyopia and their correction | Interactive Lecture | SBQs & OSVE |
| 59 | <ul style="list-style-type: none"> Describe Distribution of cranial nerves Explain Functional classification of cranial nerves, their pathways Explain Clinical features related to the disorders | HD-Oph-2 Cranial nerve palsy affecting the eye and pupillary disorder | | |
| 60 | <ul style="list-style-type: none"> Blockage of drainage (Glaucoma) Discuss the Anatomy of angle, production and drainage of Aqueous | HD-Oph-3 Glaucoma & its treatment | | |
| 61 | <ul style="list-style-type: none"> Define cataract Describe the types of cataract Discuss its management | HN-S1-Oph-4 Cataract & its treatment | | |

Pharmacology

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| 62 | <ul style="list-style-type: none"> Describe principles of pharmacological treatment. Describe the adverse effects of drug used Describe the mechanism of action of drug used | HN-S1-Pharm-1 Pharmacological treatment of glaucoma | Interactive Lecture | SBQs & OSVE |
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| 63 | <ul style="list-style-type: none"> To observe effect of Atropine on frogs eye | HN-S1- Pharm-2 Effects of Atropine | Practical | OSPE & OSVE |
| 64 | <ul style="list-style-type: none"> To observe effect of Pilocarpine on frogs eye | HN-S1- Pharm-3 Effects of Pilocarpine | | |

| Theme 6: Deafness, Vertigo, Otitis Media | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | Assessment |
| Anatomy | | | | |
| 65 | <ul style="list-style-type: none"> Describe the parts of ear. Explain gross features of middle ear. Describe the applied anatomy of middle ear. | HN-S1-Ana-G-33 External Ear & Middle Ear | Demonstration | SBQs, OSPE & OSVE |
| 66 | <ul style="list-style-type: none"> Explain the organ of hearing and balance. Interpret the applied anatomy of inner ear. | HN-S1-Ana-G-34 Inner Ear (cochlea & semicircular canals) | | |
| 67 | <ul style="list-style-type: none"> Explain the development of inner ear. Describe development of middle ear. Elaborate development of the external ear | NS-S1-Ana-E-5 Development of Ear | Interactive Lecture | SBQs & OSVE |
| 68 | <ul style="list-style-type: none"> Describe the histology of the different parts of the Ear | HN-S1-Ana-H-5 Histology of the Ear | Practical | OSPE & OSVE |
| Physiology | | | | |
| 69 | <ul style="list-style-type: none"> Define sound and describe its characteristics Describe the tympanic membrane as resonator Name ossicles of middle ear and their lever system Define impedance matching & describe attenuation reflex Define Masking | HN-S1-Phy-13 External & middle ear | | |

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| 70 | <ul style="list-style-type: none"> Discuss Physiologic anatomy of cochlea & organ of Corti Describe passage of sound waves to inner ear Describe Sound transduction Describe Pitch & loudness discrimination Describe Auditory pathway | HN-S1-Phy-14 Inner ear | Interactive Lecture | SBQs & OSVE |
| 71 | <ul style="list-style-type: none"> Head movements Functional anatomy of vestibular apparatus | HN-S1-Phy-15 Vestibular Apparatus | | |

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| | <ul style="list-style-type: none"> To determine the role of utricle & saccule in static equilibrium. To determine the role of semicircular D u c t s in Angular Acceleration. | | | |
| 72 | <ul style="list-style-type: none"> To perform and examine the Rinne's & weber's test by using a tuning fork Identify conductive and sensorineural deafness based on the result and interpretation of tuning fork tests. | HN-S1-Phy-16 Examination of the Vestibulocochlear nerve | Practical | OSPE & OSVE |

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| 73 | <ul style="list-style-type: none"> Describe the causes of deafness Describe the types of deafness Discuss the management of deafness | HN-S1-Ent-3 Deafness | Interactive Lecture | SBQs & OSVE |
| 74 | <ul style="list-style-type: none"> Define vertigo Describe the pathophysiology of Meniere's disease | HN-S1-Ent-4 Vertigo & Meniere's disease | | |

3 GIT & LIVER MODULE-I

INTRODUCTION THIS MODULE IS DESIGNED TO PROVIDE THE STUDENTS SOLID KNOWLEDGE OF ONE OF THE MOST ESSENTIAL SYSTEMS OF THE HUMAN BODY, GIT AND BILIARY SYSTEM AND HELP STUDENTS DEVELOP NECESSARY SKILLS TO BUILD THEIR ABILITY TO APPLY INFORMATION TO SOLVE HEALTH RELATED PROBLEMS OF GENERAL PUBLIC.

This module aims to provide students opportunities to understand the basis of how to integrate their knowledge of

gross anatomy, histology and embryology related to GIT and liver with physiology, Biochemistry, pathology and pharmacology of GI system to diagnose and treat a disease. The students will learn basic structure, physiological and Biochemical aspects of Liver and viscera of GIT and will study different types of secretions of GIT and their role in processes of absorption and digestion. They will also learn basic knowledge of pathophysiology of common diseases of gastrointestinal tract and liver occurring in our country.

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.

Basic knowledge of the structure and function of GIT is must to achieve the goal.

This module provides an integrative understanding and detailed and clinically relevant information of anatomy, physiology, the Biochemistry along with pharmacology and pathology related to the digestive and biliary system.

DURATION 8 WEEKS

LEARNING OUTCOMES AT THE END OF THE MODULE, THE STUDENTS WILL BE ABLE TO RELATE UNDERSTANDING OF THE DEVELOPMENT AND STRUCTURE WITH THE FUNCTIONS AND BIOCHEMICAL PROCESSES RELATED TO THE GASTROINTESTINAL TRACT & LIVER.

Knowledge: By the end of the module, the students should be able to:

- Describe the development of foregut, mid gut and hind gut.
- Discuss the anomalies of the gut.
- Describe gross and microscopic anatomy of various parts of GIT.
- Describe gross and microscopic features of liver and biliary system.
- Explain the physiology of GIT.
- Describe Biochemistry of digestive juices
- Describe Biochemistry of digestion and absorption of carbohydrates, proteins and lipids
- Understand and explain the mechanism of the metabolism of the liver
- Explain pathological findings identified in GIT pathology
- Enlist pathologies involving gastrointestinal tract.
- Identify role of pharmaceutical agents used for diseases involving GIT like vomiting and diarrhea.
- Interpret radiological investigations in relation to GIT.

Attitude The students must show positive attitude to:

- Develop good manners and should be honest to their studies
- Work hard and be regular and punctual in the class
- Participate in class and practical work efficiently
- Follow the basic laboratory protocols.
- Develop communication skills with sense of responsibility
- Demonstrate the effective attitude towards the teachers and colleagues
- Maintain ethical values in dealing with patients.

Demonstrate a professional attitude, team building spirit and good communication skills This module comprises of 08 weeks to achieve the target with the learning of the following themes related to basic discipline.

THEMES

- Theme 1: The anterior abdominal wall and the Hernias
- Theme 2: Upper Gastrointestinal tract disorders
- Theme 3: Hepatic and Portal system disorders
- Theme 4: Lower Gastrointestinal tract disorders
- Theme 5: Vascular disorders

These themes will be covered in different topics which will be taught in Lectures, demonstrations, Practical's, small group discussions, CBLs and skill

| Theme 1: The Anterior Abdominal Wall & the Hernias TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 1 | <ul style="list-style-type: none"> • Describe divisions & • Describe the planes and nine abdominal regions. • Identify four quadrants of abdomen. • Describe the arrangement of viscera in nine abdominal regions. | GIL-S1-Ana-G1 An Overview of GIT & Surface anatomy of Abdomen | Interactive Lecture | SBQs & OSVE |
| 2 | <ul style="list-style-type: none"> • Discuss the attachment of the fasciae and muscles of antero-lateral abdominal wall in relation to its clinical importance. • Explain formation of rectus sheath with its contents | GIL-S1-Ana-G2 Anterior abdominal wall-1 | Demonstration | SBQs, OSPE & OSVE |
| 3 | <ul style="list-style-type: none"> • Describe nerve supply, blood supply and lymphatic drainage of antero-lateral abdominal wall | GIL-S1-Ana-G3 Anterior abdominal wall-2 | | |
| | <ul style="list-style-type: none"> • Identify and palpate the bony landmarks of the abdomen like anterior superior iliac spine, pubic tubercle. • Identify surface marking of inguinal ligament, mid inguinal point, McBurney's point and lateral border of rectus abdominis. | | | |

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| 4 | <ul style="list-style-type: none"> Describe the inguinal canal under following heads: <ol style="list-style-type: none"> Location and Dimension Walls of inguinal canal Inguinal rings Functions and mechanics of the inguinal canal. | GIL-S1-Ana-G4 Inguinal canal | | |
| 5 | <ul style="list-style-type: none"> Explain coverings and contents of spermatic cord Contents of inguinal canal in male & female Define hernia and describe direct & indirect inguinal hernia Differentiate between inguinal and femoral hernia | GIL-S1-Ana-G5 Spermatocide | | |
| 6 | <ul style="list-style-type: none"> Explain the development of the inguinal canal and briefly give an overview of the Scrotum, testis and epididymides. Briefly define the labia majora. | GIL-S1-Ana-G6 Development of the inguinal canal and Overview of the male and female genitalia | Interactive Lecture | SBQs & OSVE |
| 7 | <ul style="list-style-type: none"> Define peritoneum and peritoneal cavity. Discuss intraperitoneal and retroperitoneal relationships. Explain peritoneal ligaments. Define omenta and mesentery. | GIL-S1-Ana-G7 Peritoneum-1: General arrangement | | |
| 8 | <ul style="list-style-type: none"> Discuss in detail the peritoneal pouches, recesses, spaces and gutters. Describe the boundaries of the greater and lesser sac Define the nerve supply of the peritoneum. Discuss the functions of the peritoneum. | GIL-S1-Ana-G8 The peritoneum-2: Pouches, Recesses, Spaces & Gutters | Demonstration | SBQs, OSPE & OSVE |
| | <ul style="list-style-type: none"> Discuss the clinical conditions related with peritoneum. | | | |
| 9 | <ul style="list-style-type: none"> Explain the process of development of GIT and divisions of primitive gut. | GIL-S1-Ana-E1 Overview of the GIT development | Interactive Lecture | SBQs & OSVE |

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| 10 | <ul style="list-style-type: none"> Discuss the general plan of histology of the wall of the alimentary canal Identify histological features of different layers of GIT. Give an overview of the different parts of esophagus Identify the microscopic features of the thoracic and abdominal parts of esophagus. | GIL-S1-Ana-H1 General plan of GIT histology Histology of Esophagus | Practical | OSPE & OSVE |
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Physiology

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| 11 | <ul style="list-style-type: none"> Mention primary/basic functions of GIT Describe the physiological anatomy of the gastrointestinal wall Describe the electrical activity of gastrointestinal smooth muscle | GIT-S1-Phy-1 Overview of GIT physiology | | |
| 12 | <ul style="list-style-type: none"> Describe the enteric nervous system and its two main plexuses Mention the role of the enteric nervous system in control of GIT function Mention the role of autonomic nervous system in control of GIT function Define three types of gastrointestinal reflexes that are essential to gastrointestinal control | GIT-S1-Phy-2 Neural control of GIT function | Interactive Lecture | SBQs & OSVE |

Biochemistry

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| 13 | <ul style="list-style-type: none"> Composition, functions and regulation of saliva and gastric juice | GIT-S1-Bio-1 saliva and gastric juice | | |
| 14 | <ul style="list-style-type: none"> Composition, functions and regulation of pancreatic, bile and intestinal juice | GIT-S1-Bio-2 pancreatic juice, bile juice and intestinal juice | Interactive Lecture | SBQs & OSVE |
| 15 | <ul style="list-style-type: none"> Sites and enzymes involved in digestion, classification and functions of glucose transporters, factors affecting rate of absorption, lactose intolerance | GIT-S1-Bio-3 digestion and absorption of carbohydrates | | |
| 16 | <ul style="list-style-type: none"> Describe the process and enzymes involved in digestion and absorption of proteins. Explain hartnup and maple serum disease. | GIT-S1-Bio-4 Digestion & Absorption of proteins | | |

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| 17 | <ul style="list-style-type: none"> Describe the process of digestion and absorption. Explain steatorrhea | GIT-S1-Bio-5 Digestion & Absorption of lipids and fatty acids | | |
| 18 | <ul style="list-style-type: none"> Interpret the normal levels of HCL | GIT-S1-Bio-6 Interpretation of HCL | Practical | OSPE & OSVE |
| Pathology | | | | |
| 19 | <ul style="list-style-type: none"> Define atresia, fistulae, duplications, diaphragmatic hernia, omphalocele, gastroschisis, ectopia, meckel diverticulum, pyloric stenosis and Hirschsprung disease | GIL-S1-Path-1 Congenital Abnormalities of the GIT | Interactive Lecture | SBQs & OSVE |

| Theme 2: Upper Gastrointestinal Disorder | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | Assessment |
| Anatomy | | | | |
| 20 | <ul style="list-style-type: none"> Explain gross features of esophagus in relation to its location and dimensions. Mention its important relations especially in posterior mediastinum. Describe its blood supply, nerve supply & lymphatic drainage. Discuss its different areas of compression and their clinical importance | GIL-S1-Ana-G9 Esophagus | Demonstration | SBQs, OSPE & OSVE |
| 21 | <ul style="list-style-type: none"> Mention different parts of stomach. Describe gross anatomical features of stomach including interior of stomach. Give blood, nerve supply and lymphatic drainage. Identify the structures forming stomach bed. Explain peritoneal covering of the stomach and mention different peritoneal folds related to this organ along with contents. | GIL-S1-Ana-G10 Stomach | | |

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| 22 | <ul style="list-style-type: none"> Mention different parts of small intestine. Describe different parts of duodenum along with relations of each part. Mention the vessels and nerves supplying the duodenum. | GIL-S1-Ana-G11 Small intestine (duodenum) | | |
| 23 | <ul style="list-style-type: none"> Explain basic anatomy of jejunum and ileum. Distinguish between jejunum and ileum regarding their anatomical features. Explain the terms mesentery, duodenal flexure and Meckel's diverticulum. | GIL-S1-Ana-G12 Small intestine (jejunum and ileum) | | |
| 24 | <ul style="list-style-type: none"> Explain the process of development of GIT and divisions of primitive gut. List the derivatives of foregut. Describe the development of: <ol style="list-style-type: none"> Esophagus Stomach Lesser & greater sac Discuss the following congenital anomalies: <ol style="list-style-type: none"> Esophageal atresia/stenosis Congenital hypertrophic pyloric stenosis Duodenal atresia/stenosis | GIL-S1-Ana-E2 Foregut | Interactive Lecture | SBQs & OSVE |
| 25 | <ul style="list-style-type: none"> Explain the development of the duodenum. Describe the development of liver, biliary apparatus and gall bladder. Discuss extrahepatic biliary atresia | GIL-S1-Ana-E3 Development of the Duodenum, Liver and gall bladder | Interactive Lecture | SBQs & OSVE |
| 26 | <ul style="list-style-type: none"> Identify various layers of the wall of stomach Describe histology of gastric mucosa including different glands and cell types in different regions of stomach. Identify different cells of mucosa under the microscope and mention their functions. | GIL-S1-Ana-H2 Histology of the stomach | | |

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| 27 | <ul style="list-style-type: none"> Identify the parts of small intestine Identify microscopically different layers of small intestine Identify modifications of the luminal surface Describe the glands and cells present in the small intestine Discuss special microscopic features of duodenum, jejunum and ileum | GIL-S1-Ana-H3 Histology of Small intestine | Practical | OSPE & OSVE |
| Physiology | | | | |
| 28 | <ul style="list-style-type: none"> Mention major salivary glands Describe the composition and function of saliva Describe the role of saliva in oral hygiene Explain regulation/control of salivary secretion | GIT-S1-Phy-3 Saliva: its composition, function and regulation | Interactive Lecture | SBQs & OSVE |
| 29 | <ul style="list-style-type: none"> Define mastication/chewing and mention its importance | GIT-S1-Phy-4 Mastication and Deglutition | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Define swallowing/deglutition and name its stages. Describe the mechanism of each Stage Mention the function of lower esophageal sphincter | | | |
| 30 | <ul style="list-style-type: none"> Describe physiological anatomy of gastric glands Describe the composition of gastric juice Mention functions of important constituents of gastric juice Describe regulation/control of gastric juice secretion | GIT-S1-Phy-5 Gastric juice: its composition, function, and regulation | | |
| 31 | <ul style="list-style-type: none"> Describe the mechanism of HCl secretion by parietal cells of oxyntic/gastric glands Mention function of gastric NCl Describe regulation of gastric acid secretion | GIT-S1-Phy-6 Mechanism of gastric acid (NCl) secretion and its control | Interactive Lecture | SBQs & OSVE |

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| 32 | <ul style="list-style-type: none"> Describe the motor functions of stomach Explain how the gastric emptying is regulated | GIT-S1-Phy-7 Motor functions of stomach | | |
| 33 | <ul style="list-style-type: none"> Define the indications, contraindications and the complications of the nasogastric tube | GIT-S1-Phy-8 Nasogastric Tube-1 | Practical | OSPE & OSVE |
| Clinical Lecture | | | | |
| 34 | <ul style="list-style-type: none"> Discuss Clinical correlates of upper GIT (surgical aspects) | GIT-S1-Surg-1 Upper GI disorders | Interactive Lecture | SBQs & OSVE |
| 35 | <ul style="list-style-type: none"> Discuss Clinical correlates of upper GIT (surgical aspects) | GIT-S1-Med-1 Upper GI disorders | | |

| Theme 3: Hepatic & Portal System Disorders | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 36 | <ul style="list-style-type: none"> Identify location of liver Describe the surfaces and different peritoneal relations | GIL- S1-Ana-G13 Liver | Demonstration | SBQs, OSPE & OSVE |
| | <ul style="list-style-type: none"> Discuss formation of anatomical and functional (physiological) lobes of liver. Identify porta hepatis and its contents. Mention blood vessels especially describing blood circulation through the liver Discuss lymphatic drainage and nerve supply of this organ. | | | |
| 37 | <ul style="list-style-type: none"> Explain the hepatic portal circulation Discuss basic anatomy of portal vein. Mention its tributaries Discuss the sites of porto-systemic anastomosis with clinical importance. | GIL- S1-Ana-G14 Hepatic portal system | | |

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| 38 | <ul style="list-style-type: none"> Describe location and parts of gall bladder Mention its important relations Name blood and lymph vessels including nerves supplying this organ. Describe clinical correlates of biliary system. | GIL-S1-Ana-G15 Gall bladder | | |
| 39 | <ul style="list-style-type: none"> List different components of intra & extra-hepatic biliary system Describe formation and termination of common bile duct. Mention its important relations Name blood vessels supplying different parts of bile duct including lymphatic drainage. | GIL-S1-Ana-G16 Duct system of liver (hepatic biliary system) | | |
| 40 | <ul style="list-style-type: none"> Discuss location and gross features of pancreas Mention its peritoneal relations Describe the arterial supply, venous drainage and nerve supply of pancreas Discuss the clinical correlates | GIL-S1-Ana-G17 Pancreas | | |
| 41 | <ul style="list-style-type: none"> Explain the location, surfaces, and borders of the spleen. Mention its important relations with surrounding organs Discuss peritoneal folds connecting spleen with other organs Mention the vessels and nerves supplying the spleen | GIL-S1-Ana-G18 Spleen | | |
| 42 | <ul style="list-style-type: none"> Describe the development of pancreas Describe the following anomalies of the pancreas: <ul style="list-style-type: none"> i. Annular pancreas ii. Accessory pancreatic tissue | GIL-S1-Ana-E4 Development of the Pancreas | Interactive Lecture | SBQs & OSVE |
| 43 | <ul style="list-style-type: none"> List the derivatives of midgut Describe the development of mid gut under following headings. <ul style="list-style-type: none"> i. Physiological herniation ii. Rotation of the mid gut iii. Retraction of herniated loops iv. Fixation of intestines Discuss the following congenital anomalies involving midgut: <ul style="list-style-type: none"> i. Body wall defects ii. Vitelline duct abnormalities iii. Gut rotation defects | GIL-S1-Ana-E5 Midgut | | |

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| | iv. Gut atresia and stenoses | | | |
| 44 | <ul style="list-style-type: none"> • Explain general hepatic structure. • Discuss the concept of three hepatic lobules. • Describe the histology of classical hepatic lobule. | GIL-S1-Ana-H 4 Histology of liver | Practical | OSPE & OSVE |
| 45 | <ul style="list-style-type: none"> • Describe the different components of biliary tract • Describe the microscopic structure of gall bladder | GIL-S1-Ana-H5 Histology of Gall bladder | | |
| 46 | <ul style="list-style-type: none"> • Identify microscopically exocrine and endocrine pancreas | GIL-S1-Ana-H6 Histology of Pancreas | | |

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| | <ul style="list-style-type: none"> Discuss the histological features of secretory and duct part of exocrine pancreas Identify and explain endocrine pancreas and its different cell types. | | | |
| Physiology | | | | |
| 47 | <ul style="list-style-type: none"> Mention physiological anatomy of exocrine part of pancreas Describe the composition of pancreatic juice Mention functions of pancreatic juice Mention the importance of trypsin inhibitor Describe basic stimuli that cause pancreatic secretion Mention the phases of pancreatic secretion | GIT-S1-Phy-9 Pancreatic juice; its composition, function and regulation | | |
| 48 | <ul style="list-style-type: none"> Describe the main functions of liver Describe the composition of bile juice Mention difference between hepatic bile and gallbladder bile | GIT-S1-Phy-10 Functions of liver and composition of bile | Interactive Lecture | SBQs & OSVE |
| 49 | <ul style="list-style-type: none"> List the functions of bile Mention the role of bile acids/salts in fat digestion and absorption Describe enterohepatic circulation of bile salts Describe regulation of bile secretion Describe the mechanism of gallbladder emptying | GIT-S1-Phy-11 Function and regulation of bile secretion | | |
| 50 | <ul style="list-style-type: none"> Demonstrate the procedure of how to pass the nasogastric tube | GIL-S1-Phy-12 Nasogastric Tube- II | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 51 | <ul style="list-style-type: none"> Definition/ Site/ Substrate required for gluconeogenesis Pathway of Gluconeogenesis Regulatory Enzymes / Steps of gluconeogenesis | GIL-S1-Bio-7 Gluconeogenesis & cori's cycle | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Stimulator & Inhibitor Factors of the Gluconeogenesis Pathway | | | |

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| 52 | <ul style="list-style-type: none"> • Definition / Site • Types or Phases of HMP Shunt • Name of regulatory Enzyme • Biochemical importance of HMP Shunt • Role of NADPH compound in Human Life • Regulatory Steps of HMP Shunt & Their Regulatory factors | GIL-S1-Bio-8 HMP Shunt | |
| 53 | <ul style="list-style-type: none"> • Definition / Site / Substrates • Pathway of Glycogenesis & glycogenolysis • Regulatory Steps/ Enzymes • Biomedical Importance of Glycogenesis & glycogenolysis | GIL-S1-Bio-9 Glycogenesis Glycogenolysis | |
| 54 | <ul style="list-style-type: none"> • Regulatory Enzymes of Glycogen Metabolism • Glycogen Storage Diseases | GIL-S1-Bio-10 Regulation of glycogen metabolism & glycogen storage diseases | |
| 55 | <ul style="list-style-type: none"> • Site/ Substrates • Pathways • Regulatory Steps/ Regulatory Factors • Biomedical Importance • Clinical Importance of Fructose & Sorbitol Pathway | GIL-S1-Bio-11 Fructose & Sorbitol Metabolism | |
| 56 | <ul style="list-style-type: none"> • Define Amino Acids Pool • Describe Protein turn over • Describe Protein Degradation • Define Nitrogen Balance • Describe Positive & Negative Nitrogen Balance | GIL-S1-Bio-12 Amino Acids Pool & nitrogen balance | |
| 57 | <ul style="list-style-type: none"> • Describe Transamination & its Biomedical importance • Describe Deamination & Its Biomedical importance • Describe Transmethylation & Biomedical importance • Describe Decarboxylation & its Biomedical Importance | GIL-S1-Bio-13 Amino Acids Reactions | |
| 58 | <ul style="list-style-type: none"> • Definition/ Site/ Substrate/ Products | GIL-S1-Bio-14 Urea Cycle | |

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| | <ul style="list-style-type: none"> Pathways Mitochondrial/ Cytosol Steps Regulatory Enzymes Regulatory Factors of Urea Cycle Relation of Urea Cycle with TCA Cycle Disorders of urea Cycle | | |
| 59 | <ul style="list-style-type: none"> Definition Types Clinical Manifestation & their Biochemical causes of clinical features Names of Enzymes involve in Ammonia Intoxication Definition of Uremia Normal Level of Blood Urea & Ammonia Causes of Hyperureamia | GIL-S1-Bio-15 Ammonia Intoxication | |
| 60 | <ul style="list-style-type: none"> Metabolic Pathway of Phenylalanine, Tyrosine, Tryptophan Describe Phenylketonuria Describe tyrosinemia & Types Describe Albinism Describe Alkaptonuria | GIL-S1-Bio-16 Metabolism of Aromatic Amino Acids | |
| 61 | <ul style="list-style-type: none"> Describe Metabolic Pathway of Methionine/ Cysteine & Cystine Describe their metabolic disorder | GIL-S1-Bio-17 Metabolism of Sulphur-containing Amino Acids | |
| 62 | <ul style="list-style-type: none"> Types of Oxidation of F.A Definition of Alpha/ beta/ Omega Oxidation Explain the Metabolic Pathway of Beta Oxidation Biomedical importance of Beta Oxidation ATP molecules formation in Beta oxidation | GIL-S1-Bio-18 Oxidation of Fatty Acids | |

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| 63 | <ul style="list-style-type: none"> • Definition / Site / Substrates/ Products & Metabolic Pathway of Ketogenesis • Regulatory Steps or Enzymes of Ketogenesis • Definition of Ketonemia/ Ketonurea/ Ketosis | GIL-S1-Bio-19 Ketonegenesis & ketolysis | | |
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| 64 | <ul style="list-style-type: none"> • Diabetic ketoacidosis • Definition / Sites / Substrates • Describe the metabolic Pathway of ketolysis • Regulatory Enzymes & Regulatory Factors • Role of thiophorase enzyme • Clinical Importance of ketolysis | | | | | |
| 65 | <ul style="list-style-type: none"> • Enlist the components of L.F.T • Explain the functions of different components of L.F.T • Estimation of serum SGOT, SGPT. • Role of the L.F.T in the diagnosis/ prognosis of clinical disorders | GIL-S1-Bio-20 Liver Function Test | | | | |
| 66 | <ul style="list-style-type: none"> • Enlist the components of L.F.T • Explain the functions of different components of L.F.T • Estimation of serum SGOT, SGPT. • Role of the L.F.T in the diagnosis/ prognosis of clinical disorders | GIL-S1-Bio-21 Liver function test | Practical | OSPE & OSVE | | |
| 67 | <ul style="list-style-type: none"> • To estimate the normal serum urea level. • Describe the conditions of increased or decreased urea levels. | GIL-S1-Bio-22 estimation of serum urea | | | | |
| 68 | <ul style="list-style-type: none"> • To estimate albumin: globulin ratio from the given sample | GLI-S1-Bio-23 Albumin: Globulin ratio | | | | |
| 69 | <ul style="list-style-type: none"> • To estimate serum bilirubin direct & indirect from given sample | GLI-S1-Bio-24 Serum bilirubin direct & indirect | | | | |
| 70 | <ul style="list-style-type: none"> • To interpret the PT & APTT | GLI-S1-Bio-25 Interpretation of PT & APTT | | | | |

| Pathology | | | | |
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| 70 | <ul style="list-style-type: none"> Explain etiology, pathogenesis, mode of transmission, clinical diagnosis of Hepatitis. | GIL-S1-Path-2 Hepatitis | Interactive Lecture | SBQs & OSVE |
| Clinical lecture | | | | |
| 71 | <ul style="list-style-type: none"> Discuss the clinical presentation and management of hepatitis | GIL-S1-Med-2 Hepatitis | Interactive Lecture | SBQs & OSVE |
| 72 | <ul style="list-style-type: none"> Discuss the clinical presentation and Management of cholecystitis | GIL-S1-Surg-2 Hepatitis | | |

| Theme 4: The Lower Gastrointestinal Disorders | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 73 | <ul style="list-style-type: none"> Identify different parts of large intestine. Mention general characteristics of most of large intestine. Discuss basic anatomical differences between large and small intestine. Explain basic anatomy of cecum and vermiform appendix. Identify different positions of the appendix and give clinical importance. | GIL-S1-Ana-G19 Large intestine-1 Cecum and Vermiform appendix | | |
| 74 | <ul style="list-style-type: none"> Discuss gross features of different parts of colon: Ascending colon, Transverse colon, descending colon and mention their peritoneal covering. Give blood and nerve supply. | GIL-S1-Ana-G20 Large intestine-2 Colon | Demonstration | SBQs, OSPE & OSVE |
| 75 | <ul style="list-style-type: none"> Describe location, course and other gross anatomical features of rectum. Mention important relations. Explain blood supply, lymph drainage & nerve supply. Discuss clinical correlates of rectum Explain the difference of peritoneal covering in a male and female. | GIL-S1-Ana-G21 Rectum | | |

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| 76 | <ul style="list-style-type: none"> Describe the anorectal junction Discuss the location and basic structure of anal canal | GIL-S1-Ana-G22 Anal canal | | |
| 77 | <ul style="list-style-type: none"> Describe the difference of neurovascular supply and lymphatic drainage between upper and lower half of anal canal. Explain the relations of the anal canal. Discuss the anatomy of anal sphincters. Discuss the clinical correlates. Describe ischiorectal fossa. | | | |
| 77 | <ul style="list-style-type: none"> List the derivatives of hindgut. Describe the developmental process of the following. <ul style="list-style-type: none"> Partitioning of the cloaca Anal canal Discuss main features related to abnormalities of the hindgut including: <ul style="list-style-type: none"> Recto-anal atresia, and fistula Imperforate anus Congenital megacolon | GIL-S1-Ana-E6 Hind gut | Interactive Lecture | SBQs & OSVE |
| 78 | <ul style="list-style-type: none"> Discuss the important gross and histological features of large intestinal wall. Identify intestinal glands and different cell types. Identify and explain the lymphoid ring around the veriform appendix. Differentiate between gross and microscopic features of large and small intestine. Describe the histology of anorectal junction. | GIL-S1-Ana-H7 Histology of Large intestine | Practical | OSPE & OSVE |
| Physiology | | | | |
| 79 | <ul style="list-style-type: none"> Mention the physiological anatomy of the small intestine Describe the secretion of small intestine | GIT-S1-Phy-13 Secretion and movements of small intestine | Interactive Lecture | SBQs & OSVE |

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| | <ul style="list-style-type: none"> Mention function and regulation of small intestinal secretion Mention enzymes present in the brush border of small intestine Describe movements of small intestine | | | |
| 80 | <ul style="list-style-type: none"> Mention physiological anatomy of large intestine Describe the secretions of large intestine and mention their function Describe movements of large intestine Describe defecation and defecation reflex | GIT-S1-Phy-14 Secretion and movements of large intestine | | |
| Pharmacology | | | | |
| 81 | <ul style="list-style-type: none"> To treat Nausea and Vomiting Uses in Motion sickness | GIL- S1-Pharm-1 Drugs used as Anti-Emetics | Interactive Lecture | SBQs & OSVE |
| Clinical lecture | | | | |
| 83 | <ul style="list-style-type: none"> Discuss clinical presentation and surgical management of lower GI disorders | GIL- S1-Surg-3 Lower GI disorders | Interactive Lecture | SBQs & OSVE |
| 84 | <ul style="list-style-type: none"> Discuss clinical presentation and management of lower GI disorders | GIL- S1-Med-3 Lower GI disorders | | |

| Theme 5: Vascular Disorders | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | Assessment |
| Anatomy | | | | |
| 85 | <ul style="list-style-type: none"> Describe general characteristics of lumbar vertebrae Explain the attachments of lumbar fascia. Discuss attachment of muscles of posterior abdominal wall. | GIL-Ana-G28 Posterior abdominal wall-I: Lumbar vertebrae & muscles | Demonstration | SBQs, OSPE & OSVE |
| | <ul style="list-style-type: none"> Discuss lumbosacral plexus Explain formation of cisterna chyli and thoracic duct | GIL-Ana-G29 Posterior abdominal wall-II | | |

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| | <ul style="list-style-type: none"> Discuss nerve supply, lymphatic drainage of abdominal walls and viscera | | | |
| 87 | <ul style="list-style-type: none"> Describe the location of abdominal aorta in respect of beginning, course and termination mentioning important relations and vertebral levels. Identify paired and unpaired branches & area of their supply. | GIL-Ana-G30 Blood supply of the gastrointestinal tract-I Abdominal Aorta | | |
| 88 | <ul style="list-style-type: none"> Describe the formation, course and termination of inferior vena cava List the tributaries of inferior vena cava | GIL-Ana-G31 Blood supply of the gastrointestinal tract-II Inferior vena cava | | |
| 89 | <ul style="list-style-type: none"> Name the groups of lymph nodes draining the abdomen. Explain them. Describe lymphatic trunks, cisterna chili & thoracic duct. | GIL-Ana-G32 Lymphatic drainage of GIT | | |
| Physiology | | | | |
| 90 | <ul style="list-style-type: none"> List important hormones secreted from the GIT mucosa Describe role of these hormones in regulation/control of GIT function | GIT-1-Phy-15 Hormones of GIT | Interactive Lecture | SBQs & OSVE |

ENDOCRINOLOGY MODULE-I

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 structure, physiological actions & 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 2nd year MBBS students

will learn not only knowledge application but also the ability to link normal and the abnormal in the 2nd spiral of the curriculum.

DURATION 06 WEEKS
LEARNING OUTCOMES

- To explain the role of the endocrine system in maintaining homeostasis, integrating growth and development and promoting successful reproduction.
- To study the histological features of different glands.
- To distinguish between endocrine, paracrine and autocrine messengers.
- To describe the chemical structures of hormones & their mechanism of action.
- To describe the synthesis and modes of secretion of hormones.
- To explain how the secretion of hormones is regulated, including the principles of negative and positive feedback mechanisms.
- To explain how hormones are transported in the blood and the consequences of the reversible binding of many hormones by plasma proteins.
- To explain the basis of hormone assays and assessment of Biological activity.
- To describe how hormones are metabolized in blood and tissues and the importance of hormone activation and degradation.
- To discuss the clearance and excretion of hormones and their metabolic derivatives.
- To define and discuss the physiological actions of hormones
- To explain the consequences of under and overproduction of hormones.
- 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.
- To understand the role of pharmacology to treat common endocrine disorders.
- Discuss the epidemiology and consequences of iodine deficiency and the salient features of the 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

Practical/ Laboratory Work

- Microscopic features of Pituitary & Pineal gland
- Microscopic features of Thyroid & Parathyroid gland.
- Microscopic features of AdExc-S1 gland.
- Microscopic features of Endocrine Pancreas
- To detect the hormonal level by the ELISA method
- Thyroid function test (TSH, T3, T4)
- Laboratory diagnosis of diabetes mellitus (HbA1C, GCT, OGTT, FBS, RBS)
- To calculate BMI (Body Mass Index)

The outcomes of the Endocrinology Module, According to the PMC are as follows:

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

Cognitive Domain

By the end of this module, 2nd year MBBS students shall be able to:

- Identify the various endocrine glands their Anatomy, Physiology & Biochemistry & pathology.
- Describe the synthesis, structure, histological features, functions and Pathophysiology of various hormones secreted by endocrine glands.
- Describe the regulation of hormones (Positive & Negative feedback mechanism).
- Describe the conditions associated with dysfunction of endocrine glands.
- Describe the basic mechanism of action of drugs used to treat these disorders.

Psychomotor Domain

By the end of endocrine Module, the student should be able to:

- Carry out practical work as instructed in an organized and safe manner
- Make and record observations accurately.
- Determine the serum levels of different hormones by ELISA technique and have knowledge of normal and abnormal value.
- Determine the different blood sugar level HbA1c and know normal and abnormal value.

Attitude & Behaviour

By the end of the Endocrine Module, the student shall gain the ability and carry responsibility to:

- Give and receive feedback, respect for self and peers.
- Demonstrate sympathy and care to patients.
- Having respect for patients, colleagues, and other health professionals
- Organize & distribute tasks
- Exchange opinion & knowledge
- Develop communication skills with a sense of responsibility.
- Regularly attend the classes
- Demonstrate good laboratory practices

THEMES

To achieve these overall aims, this module comprises of four weeks with a separate theme for each week for enhancing your learning around key areas in endocrinology.

Theme 1: Short/Tall stature and the role of the pituitary gland

Theme 2: Neck swelling with bulging eyes & Tetany and the role of the thyroid gland

Theme 3: Increased thirst and urination (Diabetes Mellitus/ Diabetes Insipidus) and the role of the pancreas

Theme 4: Moon face and the role of the adEx-S1 gland

These themes will be covered in different topics which will be taught in Lectures, demonstrations, Practical's, small group discussions, CBLs, and skill lab

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

Theme1: Short/Tall Stature &the Role of the Pituitary Gland

| S. # | LEANING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|---------|--------------------|-------|-------------------|------------|
| Anatomy | | | | |

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|---------------------|--|--|---------------------|-------------|
| 1 | <ul style="list-style-type: none"> Define the endocrine system. Classify the endocrine system. What are the functions of the endocrine system? | Endo-S1-Ana-G-1 Introduction of the anatomy of the Endocrine system | | |
| 2 | <ul style="list-style-type: none"> Describe the embryological development & congenital anomalies of pituitary & Pineal gland. | Endo-S1-Ana-E-1 Embryological development of pituitary and Pineal gland. | Interactive Lecture | SBQs & OSVE |
| 3 | <ul style="list-style-type: none"> Describe the gross anatomy, neurovascular supply & Clinical correlates of Pituitary & Pineal gland | Endo-S1-Ana-G-2 Gross Anatomy of Pituitary and Pineal gland. | | |
| 4 | <ul style="list-style-type: none"> Discuss the microscopic features of the Pituitary & Pineal gland | Endo-S1-Ana-H-1 Microscopic Anatomy of Pituitary & Pineal gland | | |
| Biochemistry | | | | |
| 5 | How Hormones are classified based on their Chemical Nature | Endo-S1-Bio-1 Classification of Hormones based on chemical Nature. | Interactive Lecture | SBQs & OSVE |
| 6 | How hormones act through cAMP/cGMP/Tyrosine kinase pathway | Endo-S1-Bio-2 Mechanism of action of Hormones (second messenger system) | | |
| Physiology | | | | |
| 7 | <ul style="list-style-type: none"> Define different types of chemical messengers Describe the functional relationships between the Hypothalamus – Pituitary Axis | Endo-S1-Phy-1 Introduction to endocrinology Hypothalamus-pituitary Axis | Interactive Lecture | SBQs & OSVE |
| 8 | Describe the hormones secreted by the anterior pituitary gland and describe their hypothalamic control & regulation by positive and negative feedback Mechanism | Endo-S1-Phy-2 Classification of hormones, Regulation of secretion | | |
| 9 | <ul style="list-style-type: none"> Explain the structure, mechanism of action and physiological effects of Growth hormone. | Endo-S1-Phy-3 Physiology and regulation of Growth hormone | | |

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| 10 | <ul style="list-style-type: none"> Describe the functions of Pineal gland, how it controls body's circadian rhythm. | Endo-S1-Phy-4 Physiological effects of pineal gland | | |
| Clinical lectures | | | | |
| 11 | <ul style="list-style-type: none"> Define the clinical conditions related to the pineal and the pituitary gland | Endo-S1-Med-1 Clinical conditions related with pineal and pituitary gland. | Interactive Lecture | SBQs & OSVE |
| Pathology | | | | |
| 12 | <ul style="list-style-type: none"> Describe the different types of Anterior Pituitary gland disorders. | Endo-S1-Path-1 Disorders of the Pituitary gland. | Interactive Lecture | SBQs & OSVE |

| Theme 2: Neck Swelling with Bulging Eyes & Tetany and the Role of the Thyroid Gland | | | | |
|--|---|---|---------------------|-------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 13 | <ul style="list-style-type: none"> Describe the embryological development & congenital anomalies of Thyroid & Parathyroid gland. | Endo-S1-Ana-E-2 Embryological development of Thyroid & Parathyroid gland. | Interactive Lecture | SBQs & OSVE |
| 14 | <ul style="list-style-type: none"> Describe the gross anatomy, neurovascular supply, & Clinical correlates of Thyroid & Parathyroid gland. | Endo-S1-Ana-G-3 Gross Anatomy of Thyroid & Parathyroid gland. | | |
| 15 | <ul style="list-style-type: none"> Discuss the microscopic features of Thyroid & Parathyroid gland. | Endo-S1-Ana-H-2 Microscopic Anatomy of Thyroid & Parathyroid gland. | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 16 | <ul style="list-style-type: none"> Describe the Biosynthesis of thyroid hormones from Tyrosine and Iodine trapping by thyroid gland. | Endo-S1-Bio-3 Synthesis of thyroid hormones | Interactive Lecture | SBQs & OSVE |
| 17 | <ul style="list-style-type: none"> What are thyroid function tests (TFTs)? Describe their Biochemical interpretation. | Endo-S1-Bio-4 Biochemical Interpretation of Thyroid Function Tests (TFTs) | | |
| 18 | <ul style="list-style-type: none"> Describe the Biochemical role of parathyroid hormones in Calcium and phosphate metabolism in humans. | Endo-S1-Bio-5 Biochemical actions of parathyroid hormones | | |

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|--------------------------|---|--|---------------------|-------------|
| 19 | <ul style="list-style-type: none"> • Estimation of thyroid hormones | Endo-S1-Bio-6 Estimation of thyroid hormones | Practical | OSPE & OSVE |
| • Physiology | | | | |
| 20 | <ul style="list-style-type: none"> • Describe formation, Secretion and transport of thyroid hormones | Endo-S1-Phy-5 Introduction of Thyroid hormones | | |
| 21 | <ul style="list-style-type: none"> • Describe Physiological effects of Thyroid Hormone on Growth, metabolism and body systems | Endo-S1-Phy-6 Physiological role of thyroid hormones | | |
| 22 | <ul style="list-style-type: none"> • Explain Mechanism of action/target organ of PTH • Describe Effect of Parathyroid Hormone on Calcium regulation | Endo-S1-Phy-7 Physiological role of PTH hormones | Interactive Lecture | SBQs & OSVE |
| 23 | <ul style="list-style-type: none"> • Explain the function, secretion and regulation of Vitamin D and Calcitonin • Describe Effect of Parathyroid Hormone on Calcium regulation Vitamin D and calcitonin Hormone on Calcium regulation | Endo-S1-Phy-8 Physiological role of Vitamin D and Calcitonin | | |
| Pathology | | | | |
| 24 | <ul style="list-style-type: none"> • Discuss the different disorders of Thyroid gland | EndoS1-Path-2 Disorders of Thyroid gland | Interactive Lecture | SBQs & OSVE |
| Clinical Lectures | | | | |
| 25 | <ul style="list-style-type: none"> • Define the procedure of thyroidectomy. • What are the indications for thyroid surgery? • What are the complications related to this surgery? | Endo-S1-Surg-1 Thyroidectomy | Interactive Lecture | SBQs & OSVE |

Theme 3: Increased Thirst and Urination (DM/DI) and the Role of the Pancreas

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|----------------|--|---|-------------------|------------|
| Anatomy | | | | |
| 26 | <ul style="list-style-type: none"> • Describe the embryological development & congenital anomalies of the Endocrine Pancreas. | Endo-S1-Ana-E-3 Embryological development of Endocrine Pancreas | Interactive | |

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|--------------------------|---|---|---------------------|-------------|
| 27 | <ul style="list-style-type: none"> Describe the gross anatomy, neurovascular supply, & Clinical correlates of the Endocrine Pancreas | Endo-S1-Ana-G-4 Gross Anatomy of Endocrine Pancreas | Lecture | SBQs & OSVE |
| Biochemistry | | | | |
| 28 | <ul style="list-style-type: none"> Biosynthesis of Insulin. Structure of Insulin. Mechanism of action of Insulin and Glucagon. Factors affecting Insulin secretion. Metabolic functions of Insulin and Glucagon. | Endo-S1-Bio-7 Insulin and glucagon | Interactive Lecture | SBQs & OSVE |
| 29 | <ul style="list-style-type: none"> How blood glucose is maintained throughout a day in humans during different metabolic states | Endo-S1-Bio-8 Maintenance of blood sugar during starvation and in well-fed states | | |
| 30 | <ul style="list-style-type: none"> What are Ketotic & non ketotic Complications of Diabetes Mellitus and explain their Biochemical basis. | Endo-S1-Bio-9 Ketotic & Non-ketotic Complications associated with Diabetes Mellitus | | |
| 31 | <ul style="list-style-type: none"> Estimation of serum Insulin | Endo-S1-Bio-10 Estimation of serum Insulin | Practical | OSPE & OSVE |
| Physiology | | | | |
| 32 | <ul style="list-style-type: none"> Describe secretion and physiological functions of ADH Describe SIADH (syndrome of inappropriate Anti Diuretic Hormone) | Endo-S1-Phy-9 Post pituitary | Interactive Lecture | SBQs & OSVE |
| 33 | <ul style="list-style-type: none"> Name the hormones of pancreas. Explain Mechanism of action of insulin. Describe the Control of Insulin Secretion | Endo-S1-Phy-10 Endocrine Pancreas | | |
| 34 | <ul style="list-style-type: none"> Describe the effects of insulin on carbohydrates, proteins, and Fats metabolism | Endo-S1-Phy-11 Pancreas (Insulin) | | |
| 35 | <ul style="list-style-type: none"> Describe regulation of glucagon & its effects on body | Endo-S1-Phy-12 Pancreas (Glucagon) | | |
| Clinical Lectures | | | | |

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|------------------|---|---|---------------------|-------------|
| 36 | <ul style="list-style-type: none"> Define diabetes mellitus. Types, risk factors, causes , clinical features, complications of DM | Endo-S1-Med-2 Diabetes Mellitus | Interactive Lecture | SBQs & OSVE |
| Pathology | | | | |
| 37 | Describe the different types of Endocrine Pancreas& discuss Diabetes Mellitus. | Endo-S1-Path-3 Disorder of Endocrine Pancreas, Diabetes Mellitus | Interactive Lecture | SBQs & OSVE |

| Theme 4: Moon Face and the Role of the AdExc-S1 Gland | | | | |
|--|---|--|---------------------|-------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 38 | <ul style="list-style-type: none"> Describe the embryological development & congenital anomalies of AdExc-S1 gland. | Endo-S1-Ana-E-4 Embryological development of AdExc-S1 gland. | Interactive Lecture | SBQs & OSVE |
| 39 | <ul style="list-style-type: none"> Describe the gross anatomy, neurovascular supply & Clinical correlates of AdExc-S1 gland. | Endo-S1-Ana-G-5 Gross anatomy of AdExc-S1 gland. | | |
| 40 | <ul style="list-style-type: none"> Discuss the microscopic features of AdExc-S1 gland. | Endo-S1-Ana-H-3 Microscopic Anatomy of AdExc-S1 gland | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 41 | <ul style="list-style-type: none"> Describe the actions of mineralocorticoid hormones in water and electrolyte balance. | Endo-S1-Bio-11 Biochemical actions of mineralocorticoids. | Interactive Lecture | SBQs & OSVE |
| 42 | <ul style="list-style-type: none"> Describe the Biochemical actions of Glucocorticoid hormones. | Endo-S1-Bio-12 Biochemical actions of Glucocorticoids | | |
| 43 | <ul style="list-style-type: none"> Estimation of serum Cortisol | Endo-S1-Bio-13 Estimation of serum Cortisol | Practical | OSPE & OSVE |
| Physiology | | | | |

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|--------------------------|--|--|---------------------|-------------|
| 44 | <ul style="list-style-type: none"> Name the hormones of adExc-S1 cortex, and Regulation of adrenocorticotrophic hormone secretion. | Endo-S1-Phy-13 AdExc-S1 cortex Regulation of secretion | Interactive Lecture | SBQs & OSVE |
| 45 | <ul style="list-style-type: none"> Describe the physiological Effects of Aldosterone | Endo-S1-Phy-14 Physiological Effects of Aldosterone | | |
| 46 | <ul style="list-style-type: none"> Describe Effects of Cortisol on Carbohydrate, Proteins and Fat Metabolism, role of Cortisol in Stress, Inflammation and Allergy | Endo-S1-Phy-15 Physiological effects of Glucocorticoid (Cortisol) | | |
| 47 | <ul style="list-style-type: none"> Describe BMI. Calculate BMI Describe factors affecting BMI Classify obesity Describe the factors affecting obesity | Endo-S1-Phy-16 Calculation of BMI | Practical | OSPE & OSVE |
| Pathology | | | | |
| 48 | <ul style="list-style-type: none"> Describe the hyper- secretory & hypo- secretory disorders of adExc-S1 cortex & Medulla | Endo-S1-Path-4 Hyper and Hypo- secretion of hormones from adExc-S1 medulla & cortex | Interactive Lecture | SBQs & OSVE |
| Pharmacology | | | | |
| 49 | <ul style="list-style-type: none"> To restore normal hormonal regulation and physiological functions Describe its uses and side effects | Endo-S1-Path-1 Instruction to Endocrine Pharmacology | Interactive Lecture | SBQs & OSVE |
| Clinical Lectures | | | | |
| 50 | <ul style="list-style-type: none"> Define the clinical conditions related with the AdExc-S1 gland | Endo-S1-Med-3 Clinical conditions related with AdExc- S1 gland | Interactive Lecture | SBQs & OSVE |

RENAL & EXCRETORY MODULE-I

INTRODUCTION WELCOME TO THE EXC-S1& EXCRETORY MODULE. THIS EXCITING MODULE WILL SERVE AS A 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 ACTIVITIES.

Fluid balance is the most important feature of life. Every cell in our body bathed in the cellular (extracellular and intracellular) fluid compartment, movements of ions and balance between the media is of the utmost important for the normal functioning of a human being. The functions of the kidneys and their excretory system are beautiful and well-organized. Human beings contain pair of kidneys, whose unit cell is the nephron, which functions in a systemic manner to perform many physiological functions, it is well oriented to counter the effect of fluid balance and maintain normal pH within physiological limits.

Rationale Exc-S1 system and excretory system is responsible for the body to get rid of waste and toxic substances. In this module the excretory system (Exc-S1 and excretory system will be examined in detail with emphasis on how the Exc-S1 system develops and functions on a cellular level as well as the mechanisms that underlie Exc-S1 diseases such as electrolyte imbalance, dehydration, Exc-S1 hypertension, Exc-S1 failure, polycystic kidney, nephrotic and nephritic syndrome.

This module will enable the students of second year to recognize the clinical presentations of common Exc-S1 diseases and relate clinical manifestations to basic sciences. It will be further revisited in the following years.

DURATION 06 WEEKS

LEARNING OUTCOMES AT THE END OF THIS MODULE, THE STUDENTS WILL BE ABLE TO:

- Describe the development, structure and functions of various parts of the Exc-S1& excretory system and its clinical importance.

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

- Describe the components of the Exc-S1& excretory system by learning and applying the relevant basic sciences.
- Apply the above knowledge to a few common real-life situations (Nephritis, Metabolic disorders, UTI) to explain how the anatomy, physiology and Biochemistry are altered in the given situation.
- Describe the anatomy of the different parts of the Exc-S1& excretory system in detail.
- Describe the development and anomalies of the Exc-S1& excretory system
- Define and identify the microscopic features of the Exc-S1& excretory system
- Describe the functions of the Exc-S1& excretory system
- Interpret the Biochemical changes in the body related to the Exc-S1& excretory system
- Enlist pathologies involving Exc-S1& excretory system
- Describe the management of the Exc-S1& excretory system
- Perform the Exc-S1& excretory system examination.
- Take the history of the patients and correlate the Exc-S1& excretory system sign & symptoms to reach the differential diagnosis.
- To counsel the people in the community regarding the risk factors of the Exc-S1 diseases.

THEMES

To achieve these overall aims, this module comprises four weeks with a separate theme for enhancing your learning.

Theme 1: Overview structure & functions of Exc-S1 system

Theme 2: Exc-S1 circulation, GFR & its regulation

Theme 3: Tubular reabsorption & secretion

Theme 4: Electrolyte and fluid balance, Acid-base balance (Micturition & Dialysis)

These themes will be covered in different topics which will be taught in Lectures, demonstrations, Practical's, small group discussions, CBLs and skill lab

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

Theme 1: OVERVIEW, STRUCTURE & FUNCTIONS OF EXC-S1 SYSTEM

| S. # | LEARNING OBJECTIVES | TOPICS | TEACHING STRATEGY | ASSESSMENT |
|----------------|---|---|---------------------|-------------------|
| Anatomy | | | | |
| 1 | <ul style="list-style-type: none"> Describe the different parts of excretory system. Describe the gross anatomical structure & internal structure of kidneys Differentiate the anterior and posterior surfaces and anatomical relations of kidneys. | EXC-S1-Ana-G-1 Gross anatomy of the kidneys | Interactive Lecture | SBQs & OSVE |
| 2 | <ul style="list-style-type: none"> Describe the blood supply (Exc-S1 artery, Exc-S1 vein) of the kidneys. Define the lymphatic drainage & innervation of the kidneys. | EXC-S1-Ana-G-2 Blood supply, nerve supply and lymphatic drainage of the kidneys | Demonstration | SBQs, OSPE & OSVE |
| 3 | <ul style="list-style-type: none"> Exc-S1 cortex and medulla, Exc-S1 lobe Exc-S1 lobule, medullary rays, Exc-S1 columns Nephron: Glomerulus, bowman's capsule, PCT, loop of Henle, DCT, collecting tubules, collecting duct, clinical correlates. Components of the juxtaglomerular apparatus, components of the filtration membrane | EXC-S1-Ana-H-1 Microscopic anatomy of the kidneys | Interactive Lecture | SBQs & OSVE |

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| 4 | <ul style="list-style-type: none"> Exc-S1 cortex and medulla, Exc-S1 lobe Exc-S1 lobule, medullary rays, Exc-S1 columns Nephron: Glomerulus, Bowmam's capsule, PCT, loop of henle, DCT, collecting tubules, collecting duct, clinical correlates. | EXC-S1-Ana-H-2 Histology of the kidneys-1 | Practical | OSPE & OSVE |
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| 5 | Describe the Development of intermediate mesoderm, the development of kidney (pronephron, mesonephron, metanephron) | EXC-S1-Ana-E-1 Development of kidney | Interactive Lecture | SBQs & OSVE |
| Physiology | | | | |
| 6 | <ul style="list-style-type: none"> Describe the different functions of the kidney and its role in homeostasis. Describe the different parts of the nephron. Distinguish between the 2 different types of nephrons. | EXC-S1-Phy-1 General functions of kidneys and excretory system | Interactive Lecture | SBQs & OSVE |
| Biochemistry | | | | |
| 7 | <ul style="list-style-type: none"> Discuss normal and abnormal constituents of urine (Urine analysis). Discuss all the reagents, instruments required along with the methodology. | EXC-S1-Bio-1 Analysis of Urine | Practical | OSPE & OSVE |
| Pathology | | | | |
| 8 | <ul style="list-style-type: none"> Discuss the congenital and developmental anomalies of kidney Describe autosomal dominant & autosomal recessive polycystic kidney disease | EXC-S1-Path-1 Anomalies of the kidney | Interactive Lecture | SBQs & OSVE |
| 9 | <ul style="list-style-type: none"> Describe the pathogenesis of the acute kidney injury | EXC-S1-Neph-1 Acute kidney injury | | |

| Theme 2: EXC-S1 Circulation, GFR & Its Regulation | | | | |
|--|--|--|-------------------|-------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 10 | <ul style="list-style-type: none"> Describe the gross structure of ureters Define its blood supply, innervation & lymphatic drainage | EXC-S1-Ana-G-3 Gross anatomical features of the ureters | Demonstration | SBQs, OSPE & OSVE |
| 11 | <ul style="list-style-type: none"> Ureter: Lumen, epithelium, histological layers, clinical correlates. Urinarybladder: epithelium, histological layers, clinical correlates. Urethra: parts, epithelium, | EXC-S1-Ana-H-3 Microscopic anatomy of the ureters, urinary bladder and urethra | Interactive | |

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| | histological layers, difference of male and female urethra, clinical correlates. | | Lecture | SBQs & OSVE |
| 12 | <ul style="list-style-type: none"> Explain the development of ureters, urinary bladder & urethra (male & female) | EXC-S1-Ana-E-2 Development of ureter, urinary bladder & urethra (male & female) | | |
| 13 | <ul style="list-style-type: none"> Components of the juxtaglomerular apparatus, components of filtration membrane, and clinical correlates. | EXC-S1-Ana-H-4 Histology of the kidneys-2 | Practical | OSPE & OSVE |
| Physiology | | | | |
| 14 | <ul style="list-style-type: none"> Explain how glomerular filtrate is formed. Describe the composition of the glomerular filtrate. State the main determinants of solute filterability. Define glomerular filtration rate (GFR) and state its normal value. Discuss the major factors that regulate the GFR (Net filtration pressure, hydrostatic, and colloid osmotic pressures) | EXC-S1-Phy-2 Glomerular filtration rate (GFR) and its regulating factors | Interactive Lecture | SBQs & OSVE |
| 15 | <ul style="list-style-type: none"> Define tubulo glomerular feedback Explain the functions of juxta glomerular apparatus and Macula densa Discuss myogenic autoregulation | EXC-S1-Phy-3 Autoregulation of GFR and Exc-S1 blood flow | | |
| 16 | <ul style="list-style-type: none"> Define the conditions when to pass the urinary catheter How to insert the urinary catheter. (perform the procedure) | EXC-S1-Phy-4 To pass the urinary catheter-1 | Practical | OSPE & OSVE |
| Pathology | | | | |
| 17 | <ul style="list-style-type: none"> Classify of glomerular diseases Discuss the clinical manifestation of glomerular diseases | EXC-S1-Path-2 Introduction to glomerular diseases | Interactive Lecture | SBQs & OSVE |
| Clinical Lecture | | | | |

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| 18 | <ul style="list-style-type: none"> Describe pathogenesis of chronic kidney injury | EXC-S1-Neph-2 Chronic kidney injury | Interactive Lecture | SBQs & OSVE |
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| Theme 3: Tubular Reabsorption & Secretion | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 19 | <ul style="list-style-type: none"> Describe the gross structure of urinary bladder and urethra, its blood supply, nerve supply | EXC-S1-Ana-G-4 Gross anatomical features of the urinary bladder and urethra | Demonstration | SBQs, OSPE & OSVE |
| 20 | <ul style="list-style-type: none"> Explain the congenital anomalies related with excretory system Differentiate between the congenital abnormalities and pathological conditions of excretory system. | EXC-S1-Ana-E-3 Congenital anomalies of excretory system | Interactive Lecture | SBQs & OSVE |
| 21 | <ul style="list-style-type: none"> Histology of the Ureter and Urinary Bladder Ureter: Lumen, epithelium, histological layers, clinical correlates. | EXC-S1-Ana-H-5 | Practical | OSPE & OSVE |
| | <ul style="list-style-type: none"> Urinary bladder: epithelium, histological layers, clinical correlates. Urethra: parts, epithelium, histological layers, difference of male and female urethra clinical correlates. | | | |
| Physiology | | | | |
| 22 | <ul style="list-style-type: none"> Describe features of the Exc-S1 tubules. Define the Exc-S1 processes: tubular reabsorption & tubular secretion. Discuss the transport mechanisms among different segments of Exc-S1 tubule. | EXC-S1-Phy-5 Features of Exc-S1 tubules | | |
| 23 | <ul style="list-style-type: none"> Explain the regulation of tubular reabsorption and secretion Define transport maximum (Tm), Exc-S1 plasma threshold and splay. | EXC-S1-Phy-6 Tubular reabsorption and secretion – I | | |

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| 24 | <ul style="list-style-type: none"> Describe the mode of reabsorption of different substances (e.g. Na^+, K^+, Cl^-, glucose, urea, and water). Describe the mode of secretion of different substances (e.g. K^+, H^+ and organic ions). | EXC-S1-Phy-7 Tubular reabsorption and secretion – II | Interactive Lecture | SBQs & OSVE |
| 25 | <ul style="list-style-type: none"> To describe the nervous mechanisms that regulates tubular function (Exc-S1 sympathetic nerves). To describe the hormonal mechanisms that regulate tubular function: <ul style="list-style-type: none"> i. Renin-angiotensin system. ii. Aldosterone. iii. Atrial natriuretic peptides. iv. Antidiuretic hormone. v. Parathyroid hormone | EXC-S1-Phy-8 Hormonal regulation of tubular functions | | |
| 26 | <ul style="list-style-type: none"> Define the conditions when to pass the urinary catheter How to insert the urinary catheter. (perform the procedure) | EXC-S1-Phy-9 To pass the urinary catheter-2 | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 27 | <ul style="list-style-type: none"> Describe the different sources of sodium. Enlist different functions of sodium. Justify their role in maintaining the osmolality of plasma. Interpret the Normal values of sodium in serum and urine. | EXC-S1-Bio-2 Na^+ Metabolism | Interactive Lecture | SBQs & OSVE |
| 28 | <ul style="list-style-type: none"> Describe the different sources of potassium & Chloride. Enlist different functions of potassium & Chloride. Justify their role in maintaining the osmolality of plasma. Interpret the Normal values of potassium & chloride in serum and urine | EXC-S1-Bio-3 K^+ , Cl^- Metabolism | | |
| 29 | <ul style="list-style-type: none"> To estimate the serum electrolytes level in a given serum. Discuss all the reagents, instruments required, along with the methodology | EXC-S1-Bio-4 Estimation of serum Electrolytes | Practical | OSPE & OSVE |
| Pharmacology | | | | |

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| 30 | Classification, Mechanism of action, indications, contraindications and adverse effects of excretory drugs | EXC-S1-Pharm-1 Drug excretion | Interactive Lecture | SBQs & OSVE |
| Clinical Lecture | | | | |
| 31 | <ul style="list-style-type: none"> Describe the pathogenesis of glomerular disorder Discuss the clinical manifestation of glomerular diseases | EXC-S1-Neph-3 Glomerular disease (Nephritic and nephrotic syndrome) | Interactive Lecture | SBQs & OSVE |

| Theme 4: Electrolyte and Fluid Balance, Acid-Base Balance (Micturition & Dialysis) | | | | |
|---|---|--|---------------------|-------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 32 | <ul style="list-style-type: none"> Explain perinephric abscess, nephrotosis, Exc-S1transplantation, Exc-S1 cysts, pain in paraExc-S1 region, accessory Exc-S1 vessels | EXC-S1-Ana-G-5 Applied anatomy related with kidneys | Interactive Lecture | SBQs & OSVE |
| 33 | <ul style="list-style-type: none"> Urethra: parts, epithelium, histological layers, difference of male and female urethra, clinical correlates. | EXC-S1-Ana-H-6 Histology of the Urethra | Practical | OSPE & OSVE |
| Physiology | | | | |
| 34 | <ul style="list-style-type: none"> Describe the mechanisms behind the establishment of an osmotic gradient in the medullary interstitium. Describe the countercurrent multiplication system. Describe how urea contributes to the hyperosmotic Exc-S1 medullary interstitium and to the urine concentration. | EXC-S1-Phy-10 Concentration and Dilution of urine-I | | |
| 35 | <ul style="list-style-type: none"> Describe the role of vasa recta as countercurrent exchanger in maintaining the hyperosmolarity of the Exc-S1 medulla. Describe how the kidneys produce dilute and concentrated urine. Define obligatory urine volume | EXC-S1-Phy-11 Concentration and Dilution of urine-II | Interactive Lecture | SBQs & OSVE |

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| 36 | <ul style="list-style-type: none"> Define micturition. Describe process of storage, elimination of urine and its control (Autonomic nervous system) Explain micturition reflex. Define atonic and autonomic bladder | EXC-S1-Phy-12 Micturition reflex and its abnormalities | | |
| 37 | <ul style="list-style-type: none"> Discuss different buffer systems in the body (bicarbonate, phosphate, ammonia) Explain the role of kidneys in acid base balance Discuss the changes in the level of urine PH (maximum /minimum level; 4.5-8) | EXC-S1-Phy-13 Acidification of urine | | |
| 38 | <ul style="list-style-type: none"> Define dialysis Describe mechanism of function of artificial kidney Define dialysate, uremia Discuss peritoneal dialysis technique Complications of the dialysis | EXC-S1-Sk.Lab.1 Dialysis | Practical | OSPE & OSVE |
| Biochemistry | | | | |
| 39 | <ul style="list-style-type: none"> Describe the Body Buffers. Describe its related disorders. Discuss its management | EXC-S1-Bio-4 Body Buffers | Interactive Lecture | SBQs & OSVE |

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| 40 | <ul style="list-style-type: none"> Define the Acid Base balance. Describe its related disorders. Discuss its management. | EXC-S1-Bio-5 Acid Base balance, Disorders & management | | |
| 41 | <ul style="list-style-type: none"> Describe glomerular function Explain clearance test (inulin, creatinine and urea) Discuss tubular function test Discuss proteinuria | EXC-S1-Bio-6 Exc-S1 Function Tests | | |
| 42 | Demonstrate the normal and abnormal blood Ph, bicarbonate, carbon dioxide and oxygen levels. | EXC-S1-Bio-7 Interpretation of ABG's | | |
| 43 | <ul style="list-style-type: none"> Describe glomerular function Estimation of serum creatinine Explain clearance test (inulin, creatinine and urea) Discuss tubular function test | EXC-S1-Bio-8 Exc-S1 Function Tests Discuss proteinuria | Practical | OSPE & OSVE |
| Pathology | | | | |
| 44 | <ul style="list-style-type: none"> Enlist infection related to kidney & lower urinary tract Define acute and chronic pyelonephritis Describe causes, of acute and chronic pyelonephritis Define acute and chronic cystitis and mention its causes | EXC-S1-Path-3 Infections of kidney & lower urinary tract | Interactive Lecture | SBQs & OSVE |
| Clinical Lectures | | | | |
| 45 | <ul style="list-style-type: none"> Describe the sign and symptoms of the urinary system diseases What should be the differential diagnosis to approach the urinary system diseases | EXC-S1-Uro-1 How to approach a urological patient | Interactive Lecture | SBQs & OSVE |
| 46 | Describe the basic investigations to diagnose urinary system diseases | EXC-S1-Uro-2 How to investigate a urological patient | | |

REPRODUCTION MODULE-I

INTRODUCTION

The reproductive module is designed to study the anatomy and physiology of the male and female reproductive organs in detail to 2nd year MBBS students aims to integrate both basic and clinical sciences.

The pelvis is the region of the trunk that lies below the abdomen. Although the abdominal and pelvic cavities are continuous, the two regions are described separately.

The pelvic cavity contains the lower ends of the intestinal and urinary tracts and the internal organs of reproduction. The physician is often confronted with problems involving infections, injuries and prolapses of the rectum, uterus and vagina. Emergency situations involving the bladder, the pregnant uterus, ectopic pregnancy, spontaneous abortion and acute pelvic inflammation diseases are examples of problems found in the female. The urinary bladder and the prostate in the male are the frequent sites of disease.

Without knowledge of the anatomic position of the veins in the anal canal, the physician would not have been able to make a diagnosis. The purpose of this module is to review the significant anatomy of the reproductive organs relative to clinical problems. This is a fact that in-depth knowledge of the anatomy and physiology of the pelvic and perineum regions is necessary before a physician can even contemplate making an initial examination and start treatment.

Rationale This module provides extensive information about reproductive system. It enables the undergraduate students to narrate the knowledge of Anatomy, Physiology, Biochemistry, Pharmacology and Pathology of the structures and functions of the male and female reproductive system. The motive is that students can correlate this knowledge with the clinical presentation of internal and external genital diseases in forthcoming years in order to be able to manage general gynecological problems, pregnancy related issues in the mother and neonates, sexually transmitted infections, infertility issues and breast disorders

DURATION 6 WEEKS
LEARNING OUTCOMES

Knowledge, Skill, Attitude

- Describe the anatomy of female reproductive organs.
- Describe the anatomy of male reproductive organs.
- Discuss the development of reproductive organs (male and female).
- Study the related embryological disorders of male and female reproductive system
- Identify the different histological features of male and female reproductive organs
- Describe the difference in reproductive functions of male & female
- Define Puberty and describe its onset by hormones
- Define what do you mean by secondary sexual characteristics
- Explain sex determination and differentiation
- Define & describe spermatogenesis
- Describe the role of hormones in spermatogenesis
- Describe the functions of male genital ducts & glands and their contribution in formation of semen
- Describe the secretion & functions of testosterone
- Define capacitation
- Describe the abnormalities of testicular function
- Describe the functions of ovary
- the secondary sexual features of female
- Describe Oogenesis
- Describe the ovarian cycle with hormonal attribution
- Describe the formation & function of corpus luteum
- Describe uterine cycle with hormonal attribution
- Define the terms Amenorrhea, polymenorrhea, oligomenorrhea, and menorrhagia
- Describe the process of fertilization
- Describe the changes in physiology of various body systems during pregnancy
- Describe the functions of placenta.
- Describe the process of fertilization
- Describe the changes in physiology of various body systems during pregnancy
- Define labor and describe the factors that initiate labor and mechanism of labor-hormonal attributions and

various stages of labor.

- Describe the development of breasts and changes at puberty Describe Lactation & its 'Control and the effects of lactation on menstrual cycle
- Define contraception and sterilization Describe the male and female methods of contraception.
- To explain the synthesis and regulation of reproductive hormones.
- To explain what metabolic changes occur in mother during pregnancy.
- To explain the Biochemical basis of tests used for determination of pregnancy.
- To explain the Biochemistry of contraception.
- To explain the Biochemistry of menopause.
- To explain the hormonal status of reproductive hormones after menopause and their impact on various organ systems with special emphasis on bones.
- Understand the importance of maternal healthcare
- Identify the approaches for reducing maternal mortality
- Understand the concept of Safe motherhood initiative
- Recognize the importance of family planning and contraception.
- Understand the importance adolescent Health

THEMES

Theme 1: Pelvimetry and the injuries to the pelvic floor

Theme 2: Morbidity and Mortality related with the Genital Organs Malignancies

Theme 3: Pregnancy, Parturition, Childbirth and the Congenital Anomalies

Theme 4: Role of the Reproductive hormones, Contraception and Menopause

These themes will be covered in different topics which will be taught in Lectures, demonstrations, Practical's, small group discussions, CBLs and skill lab

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

Theme 1: Pelvimetry and the Injuries to the Pelvic Floor

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|----------------|---|--|---------------------|-------------------|
| ANATOMY | | | | |
| 01 | <ul style="list-style-type: none"> • Describe the bony pelvis • Differentiate the types of bony pelvis | Rep-S1-Ana-G-1 Bony Pelvis (inlet and outlet) Difference b/w male & female pelvis Types of bony pelvis | Demonstration | SBQs, OSPE & OSVE |
| 02 | <ul style="list-style-type: none"> • Describe the structures that constitute the pelvic floor • Explain the pelvic walls | Rep-S1-Ana-G-2 Pelvic walls, Pelvic floor Pelvic fascia | | |
| 03 | <ul style="list-style-type: none"> • Describe the arrangement of viscera within the pelvic cavity • Define the male and female external and internal genital organs | Rep-S1-Ana-G -3 Overview of pelvic viscera (urinary bladder, sigmoid colon, Rectum and Male & female genital organs) | Interactive Lecture | SBQs & OSVE |

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| 04 | <ul style="list-style-type: none"> Discuss the gross features of testis and epididymis and ductus deferens Importance of descend of testis Correlate the arterial supply, venous drainage and lymphatic drainage of testis. Discuss the clinical correlates | Rep-S1-Ana-G -4 Tests, epididymis, Ductus deferens | Demonstration | SBQs, OSPE & OSVE |
| 05 | <ul style="list-style-type: none"> Describe the anatomy of prostate, Seminal vesicles and ejaculatory ducts Discuss the clinical correlates | Rep-S1-Ana-G -5 Prostate, Seminal vesicles, Ejaculatory ducts | | |
| 06 | <ul style="list-style-type: none"> Explain development of male reproductive system. Discuss the development of gonads. Discuss the fate of the genital ducts in the male. | Rep-S1-Ana-E-1 Development of Gonads and genital ducts | Interactive Lecture | SBQs & OSVE |
| 07 | <ul style="list-style-type: none"> Discuss the development of male external genitalia. Describe the anomalies of the male reproductive system. | Rep-S1-Ana-E-2 Development of male external genitalia | | |
| 08 | <ul style="list-style-type: none"> Identify the microscopic features of the parts of male reproductive system. Identify the histological features of testis and epididymis | Rep-S1-Ana-H-1 Microscopic features of testis and epididymis | Practical | OSPE & OSVE |
| 09 | <ul style="list-style-type: none"> Parts of male and female reproductive system. Primary sex organs, Accessory sex organs Hormones (terminologies) Puberty, Menarche. | Rep-S1-Phy-1 General introduction of Reproductive System | | |
| 10 | <ul style="list-style-type: none"> Explain the process (stages) spermatogenesis. Describe the hormonal influence on spermiogenesis. Discuss the function of prostate gland | Rep- S1-Phy-2 Spermatogenesis, spermiogenesis, sperm | | |
| 11 | <ul style="list-style-type: none"> To discuss the secretion & functions of testosterone with its metabolism. To describe mode of action of testosterone. Discuss the regulation of male sex hormone. | Rep- S1-Phy-3 Male Sex Hormones (Testosterone) Genital ducts and Glands | Interactive Lecture | SBQs & OSVE |

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| 12 | <ul style="list-style-type: none"> Describe the Synthesis & Regulation of Reproductive hormones | Rep-S1-Bio- 1 Synthesis & Regulation of Reproductive hormones | |
| 13 | <ul style="list-style-type: none"> Describe the synthesis , role and mechanism of action of male sex hormones | Rep-S1 Bio- 2 Male sex hormones | |
| 14 | <ul style="list-style-type: none"> Enlist congenital anomalies of penis Describe congenital anomalies of the testis & epididymis Discuss atrophy of testis | Rep-S1-Path-1 Congenital anomalies of the male genital tract | |
| 15 | <ul style="list-style-type: none"> Define BPH List the signs and symptoms of BPH Medical and surgical treatment of BPH Describe when a patient of BPH should contact to a urologist. | Rep-S1-Uro-1 Benign prostatic hypertrophy (BPH) | |

| Theme 2: Morbidity and Mortality Related with the Genital Organs Malignancies | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| ANATOMY | | | | |
| 16 | <ul style="list-style-type: none"> Describe the female internal genital organs Explain the anatomy of ovaries Discuss the anatomy of Fallopian tube | Rep-S1-Ana-G-6 Ovaries and Uterine tubes | Interactive Lecture | SBQs & OSVE |
| 17 | <ul style="list-style-type: none"> Explain the anatomy of Uterine tubes Describe the parts of uterus, supports of uterus. Explain the anatomy of vagina | Rep-S1-Ana- G-7 Uterus and vagina | | |
| 18 | <ul style="list-style-type: none"> Explain the boundaries of perineum Describe the division of the perineum Discuss the perineal body | Rep-S1-Ana-G-8 Divisions of perineum, Perineal body | | |
| 19 | <ul style="list-style-type: none"> Discuss the contents of the anal triangle Briefly discuss the anatomy of anal canal | Rep-S1-Ana-G-9 Contents of anal triangle Anal canal | Demonstration | SBQs, OSPE & OSVE |
| 20 | <ul style="list-style-type: none"> Identify the boundaries of the ischial fossa Discuss the contents of | Rep-S1-Ana-G-10 Ischiorectal fossa | | |

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| | the ischiorectal fossa. | | | |
| 21 | <ul style="list-style-type: none"> Discuss the microscopic Features of prostate and seminal vesicle | Rep-S1-Ana-H-2 Histology of Prostate, Seminal Vesicle | Practical | OSPE & OSVE |
| Pathology | | | | |
| 22 | <ul style="list-style-type: none"> Define inflammatory conditions of spermatic cord and testis. Describe morphology and its clinical feature | Rep-S1-Path-2 Inflammatory lesions of male genital organs | Interactive Lecture | SBQs & OSVE |
| Clinical lecture | | | | |
| 24 | <ul style="list-style-type: none"> Describe the menstrual cycle related abnormalities | Rep- S1-Gyne& obs1 Menstrual disorders | Interactive Lecture | SBQs & OSVE |

| Theme 3: Pregnancy, Parturition, Child Birth and the Congenital Anomalies | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 25 | <ul style="list-style-type: none"> Discuss the contents of the urogenital triangle in the male and female (external genitalia) | Rep-S1-Ana-G-11 Male and female external genitalia | Interactive Lecture | SBQs & OSVE |
| 26 | <ul style="list-style-type: none"> Discuss the contents of the superficial perineal pouch in the male Discuss the contents of the deep perineal pouch in males | Rep -S1-Ana- G-12 Urogenital diaphragm and contents of the superficial and deep perineal pouch in the male | Interactive Lecture | SBQs & OSVE |
| 27 | <ul style="list-style-type: none"> Discuss the contents of the superficial perineal pouch in females Discuss the contents of deep perineal pouch in female | Rep -S1-Ana-G-13 Contents of superficial perineal pouch and deep perineal pouch in the female | | |
| 28 | <ul style="list-style-type: none"> Describe the development of parts of female reproductive system Discuss the development of gonads | Rep -S1-Ana-E-3 Development of female reproductive System | | |
| 29 | <ul style="list-style-type: none"> Identify the microscopic features of the parts of female reproductive system. Discuss the epithelial lining of ovary and fallopian tube | Rep -S1-Ana- H-3 Microscopic features of Ovary and the Fallopian tube | Practical | OSPE & OSVE |

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| 30 | <ul style="list-style-type: none"> Discuss oogenesis, the phases of development of ova, and the development of corpus luteum Describe the synthesis, function, and regulation of estrogen and progesterone | Rep-S1-Phy-4 Oogenesis, Female sex hormones (Estrogen Progesterone) | Interactive Lecture | SBQs & OSVE |
| 31 | <ul style="list-style-type: none"> Discuss the ovarian cycle, endometrial cycle and its phases. Explain menarche, menopause. Describe the phases of the menstrual cycle. Describe the hormonal variations and regulatory mechanisms of changes occurring during cycle. Describe the hormonal changes and control mechanisms of the changes that occur at menopause. | Rep-S1-Phy-5 Female reproductive cycle Menstrual cycle, Menarche and Menopause. | | |
| 32 | <ul style="list-style-type: none"> Describe the syntheses, role and mechanism of action of female sex hormones | Rep-S1-Bio-3 Female sex hormones | | |
| 33 | <ul style="list-style-type: none"> Enlist congenital anomalies of the uterus and vagina | Rep-S1-Path-3 | | |

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| | <ul style="list-style-type: none"> Define pelvic inflammatory disease and organism involved in it. Discuss complications of pelvic inflammatory disease. | Female Genital Tract. Congenital anomalies & Inflammatory diseases | | |
| 34 | <ul style="list-style-type: none"> Endometrial histology during menstrual cycle Define dysfunctional uterine bleeding and its causes. Describe acute and chronic endometritis | Rep-S1-Path-4 Diseases of Endometrium | | |

| Theme 4: Role of the Reproductive Hormones, Contraception and Menopause | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Anatomy | | | | |
| 36 | <ul style="list-style-type: none"> Discuss the major blood vessels of the pelvis and perineum | Rep-S1-Ana-G-14 Internal iliac artery and its branches | | |
| 37 | <ul style="list-style-type: none"> Describe the nerves of pelvis and perineum Describe the sacral plexus and hypogastric plexus. | Rep-S1-Ana-G-15 Nerves of Pelvis & Perineum, sacral Plexus Hypogastric plexus | | |

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| 38 | <ul style="list-style-type: none"> Discuss the venous drainage of the pelvis and perineum. Explain the areas of lymph drainage of pelvis and perineum Clinical importance | Rep-S1-Ana-G-16 Venous & Lymphatic drainage of pelvis and perineum | Interactive Lecture | SBQs & OSVE |
| 39 | <ul style="list-style-type: none"> Discuss the development of genital ducts in female Discuss the development of female external genitalia. Explain the clinical correlates | Rep-S1-Ana-E-4 Development of genital ducts Development of female external genitalia | | |
| 40 | <ul style="list-style-type: none"> Discuss the microscopic features of uterus, cervix Discuss the microscopic features of vagina | Rep-S1-Ana-H-4 Histology of uterus, cervix, vagina | Practical | OSPE & OSVE |
| 41 | <ul style="list-style-type: none"> Describe the synthesis, and function of B-HCG (Human chorionic gonadotropin) Explain the effects of HCG in causing persistence in pregnancy Describe the physiological events taking place during Pregnancy. | Rep-S1-Phy-6 Physiology of Pregnancy, placenta and placental hormones | Interactive Lecture | SBQs & OSVE |
| 42 | <ul style="list-style-type: none"> Describe parturition and its various stages, & hormonal changes Discuss the secretion & functions of oxytocin. Describe mode of action of oxytocin Describe the changes in uterus during pregnancy, and after birth. Describe the involution of uterus. Describe the hormone required to develop mammary glands during pregnancy. | Rep-S1-Phy-7 Parturition and Oxytocin | | |
| 43 | <ul style="list-style-type: none"> Describe the physiology of the mammary gland. Describe the lactation reflex. Describe the weaning. | Rep-S1-Phy-8 Breast and Lactation | | |
| 44 | <ul style="list-style-type: none"> Perform the pregnancy test, on pregnancy test-strip | Rep-S1-Phy-9 Pregnancy test | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 45 | <ul style="list-style-type: none"> Describe The Pharmacology of Oral Contraceptive Drugs. To describe their adverse effects and contraindication. Explain drug Interactions of Oral Contraceptive Drugs. | Rep-S1-Pharm-1 Contraceptive Drugs | Interactive Lecture | SBQs & OSVE |
| Clinical Lecture | | | | |
| | <ul style="list-style-type: none"> Describe the patho- physiology | | | |

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| 46 | of mammary gland disorders. <ul style="list-style-type: none"> • Describe the lactation reflex • Describe the hormonal effect • Student guide for complete protocol of lactation and weaning | Rep-S1-PAEDS-1 Breast feeding guide for medical professionals | Interactive Lecture | SBQs & OSVE |
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BEHAVIOURAL SCIENCES

Introduction

Behavioral sciences (BS) is the scientific study of human behavior, and it includes psychology, sociology, and anthropology. These three disciplines are taught together in undergraduate curricula around the world because they are all concerned with understanding human behavior from different perspectives. BS is similar to other basic medical sciences, such as anatomy, biochemistry, physiology, and pathology, in that it explains existing behavior and can be used to predict the behavior of patients and healthcare providers in both clinical and non-clinical situations.

Behavioral sciences are essential for physicians to understand the psychosocial aspects of medical disorders. A physician who has been trained in BS is aware of the impact of history, culture, environment, and psychology on the manifestation of various symptoms. This knowledge allows physicians to communicate more effectively and ethically with their patients, and to develop treatment plans that include not only the patient but also the family.

Behavioral sciences can also be beneficial to medical students on a personal level. By understanding the modern theories of learning, memory, and cognition, students can improve their own learning abilities. Additionally, the knowledge of behavioral sciences can help students to better understand themselves and their relationships with others.

In 2022, the Pakistan Medical & Dental Council (PM&DC) assigned 50 teaching hours to the subject of behavioral sciences in the curriculum of MBBS. This is a significant step in the right direction, as it acknowledges the importance of BS in medical education. It will help to produce physicians who are better equipped to understand and treat the psychosocial aspects of medical disorders. This will ultimately lead to improved patient care.

Rationale

- To provide medical and dental graduates with a broader bio-psycho-social perspective on health and illness.
- To teach students how to use principles of learning and behavior change to enhance their own learning capabilities and to help their patients make positive behavioral changes.
- To help medical graduates develop the ethical and personal qualities necessary to provide compassionate and effective care.

Learning Outcomes of Behavioral Sciences Among MBBS Students:

Upon completion of a BS course in undergraduate MBBS, students should be able to:

KNOWLEDGE:

- Comprehend BS in clinical practice.
- Conceptualize the holistic aspect of medical learning.
- Understand communication skills in clinical and non-clinical settings.
- Understand human cognitive faculties like learning, memory, perception, thinking, intelligence, and meta-cognition that regulate behavior.
- Demonstrate the psychological components of health and disease like defense mechanisms and personality in various behavioral states.
- Apprehend psychosocial issues in special hospital settings.
- Learn psychosocial aspects of aging, death, pain, and terrorism.
- Be aware of sex and gender issues in pre-clinical, clinical, and professional settings.

- Understand and recognize common psychiatric ailments like anxiety, depression, and stress.

SKILLS

- Keep an eye on behavioral issues while working in pre-clinical, clinical, and professional settings.
- Understand patients' stance while taking a comprehensive history or in any other scenario like breaking bad news, conflict resolution, disaster management, information care, etc.
- Communicate well his/her own understanding and strategy in interpersonal relationships.
- Use cognitive and behavioral theories while communicating with others and in any clinical or non-clinical activity.
- Believe in the implication of socio-cultural factors such as gender, race, social class, family, and occupations in health and disease.
- Be able to correlate the psychosocial aspects with the common clinical conditions (DM, Coronary Artery Disease, AIDS, etc.)
- Identify the social and anthropological factors that influence detection, management, compliance, and clinical outcome (stigma, myths, cultural taboo, somatization, etc.)
- Demonstrate stress management skills towards self, patients, and colleagues.
- Be highly concerned about the psychosocial factors in important clinical settings like hospitalization, emergency, ICU, cancer wards, etc.

ATTITUDE

- Exhibit the highest level of ethical and professional standards in his/her character with the patients, colleagues, teachers, relatives, attendants, pharmaceutical industry, and public as a whole.
- Be highly concerned about the rights of patients and doctors envisaged in law, constitution, and religion.
- Acknowledge the social, cultural, and anthropological aspects of health and disease.
- Demonstrate confidentiality and privacy of their patient's information in their clinical practice, interaction with colleagues, and medical/dental and other authorities.
- Undertake an informed consent from the patient.
- Demonstrate principles of these Medical/Dental Ethics in their interactions with patients, their relatives, colleagues, pharmaceutical industry, and medical/dental as well as other authorities.

In conclusion, BS is an essential component of medical education. It provides students with the knowledge, skills, and attitudes necessary to provide comprehensive and patient-centered care.

LEARNING METHODOLOGIES

The following teaching / learning methods are used to promote better understanding:

- Lectures
- Interactive Lectures
- Demonstrations
- Hospital / Clinic visits
- Problem- Based Learning (PBL)
- Case- Based Learning (CBL)
- Practical's
- Skills session
- E-Learning
- Self-learning

THEME 1: Psychological Reactions and Psycho-Social Issues in Specialized Healthcare Settings.

| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
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| 1. | <p>To explore the emotional and psychological reactions to adversity, including grief, trauma, loss, chronic illness, and death, and to understand the psychosocial issues and assessment techniques in specialized healthcare settings.</p> | <p>PAR-S-1-BS-1 Psychological Reactions and Psycho-Social Issues in Specialized Healthcare Settings.</p> <ul style="list-style-type: none"> • Psychological Reactions to Loss, Illness, and Trauma: Grief, bereavement, death, dying, terminal illness, sexual assault, and torture. • Psycho-social Issues in Specialized Healthcare Settings: Emergency Departments, Intensive Care Units, Coronary Care Units, Operating Theaters, Oncology Wards, and Organ Transplant Units. | LECTURE |
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| THEME 2: Cultural Influences on Medical Practice and Child-Rearing | | | |
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| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
| 1. | <p>To understand how culture shapes health, it's essential to consider factors like group dynamics, social roles, and health beliefs. Cultural values and attitudes influence health behaviors and treatment adherence. Additionally, child rearing practices impact long-term health.</p> | <p>PAR-S-1-BS-2 Cultural Influences on Medical Practice and Child-Rearing</p> <ul style="list-style-type: none"> • Group dynamics, attitudes, values, beliefs, myths, social class, stigma, the sick role, illness, health belief models, and treatment adherence (compliance) • Child-rearing practices significantly influence individual development and health outcomes. | LECTURE |

| THEME 3: Pain, Sleep, Consciousness and Sexuality | | | |
|---|---|---|-------------------|
| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
| 1. | <p>To understand pain, its assessment, and management, especially in chronic and intractable cases, is crucial. Understanding the stages of sleep, consciousness, and the factors influencing them is essential for overall well-being. Additionally, exploring the psychological and social aspects of gender, sexuality, and Reproductive health is vital for holistic health.</p> | <p>PAR-S-1-BS-3 Neurobiology and Psycho-social Aspects of Human Behavior: Pain, Sleep, Consciousness, and Sexuality.</p> <ul style="list-style-type: none"> • Concept of pain, psychosocial assessment, and management of chronic and intractable pain • Sleep and its stages, consciousness and altered states of consciousness, influences on sleep and consciousness, non-pharmacological methods for inducing sleep, and changes in consciousness • Psychosocial aspects of gender and sexuality: sex, gender, psychosexual orientation, sexual behavior, stages of sexual activity, and reproductive health. | LECTURE |

THEME 4: Interviewing and Psychosocial History Taking

| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
|----|--|---|-------------------|
| 1. | Develop techniques for effective clinical interviewing and comprehensive psychosocial data collection across various medical specialties, including Medicine, Surgery, Gynecology & Obstetrics, Pediatrics, and general health conditions. | PAR-S-1-BS-5 Interviewing and Psychosocial History Taking. <ul style="list-style-type: none"> Effective clinical interviewing techniques and history-taking, focusing on the collection of psychological factors relevant to Medicine, Surgery, Gynecology and Obstetrics, Pediatrics, and other general health conditions. | LECTURE |

THEME 5: Common Psychiatric Disorders in General Health Settings

| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
|----|--|---|-------------------|
| 1. | Identify and understand the presentation and diagnosis of common psychiatric disorders encountered in general health settings. | PAR-S-1-BS-5 Common Psychiatric Disorders in General Health Settings. <ul style="list-style-type: none"> Mood Disorders Anxiety Disorders Psychotic Disorders Bodily Distress Disorders Dissociative Disorders Drug Abuse and Dependence Suicide and Deliberate Self-Harm (DSH) Delirium | LECTURE |

THEME 6: Life Events, Psycho-Trauma, Psychological Reactions, Stress and Stressor, Stress Management

| S# | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY |
|----|---|--|-------------------|
| 1. | Understand, analyze, and evaluate the concepts of stress, life events, and psycho-trauma, with a focus on their impact on health. Examine the role of life events and psycho-trauma in triggering stress-related conditions. Develop a comprehensive understanding of stress management strategies. | PAR-S-1-BS-6 Life Events, Psycho-Trauma, Psychological Reactions, Stress and Stressor, Stress Management <ul style="list-style-type: none"> Define and classify stress and stressors. Discuss the relationship between stress, stressors, and illness. Life events, Psycho-trauma: Explain concepts and their relationship with stress and illness. Stress management: Discuss coping skills, psychological defense mechanisms, conflict and frustration, and the concept of adjustment and maladjustment. | LECTURE |

INFORMATION TECHNOLOGY

Introduction/ Rationale

The integration of information technology into the MBBS (Bachelor of Medicine and Bachelor of Surgery) curriculum is essential in today's rapidly evolving healthcare landscape. IT proficiency is vital, as it will equip MBBS students with the skills needed to navigate electronic health records, telemedicine platforms, and advanced diagnostic tools. It enables efficient data management and evidence-based decision-making. Moreover, IT skills are crucial for facilitating interdisciplinary collaboration, ensuring that MBBS graduates can research, access academic literature, and adapt to emerging healthcare technologies. By incorporating an IT module, the MBBS curriculum aligns with the evolving healthcare environment. It is time that healthcare professionals stay updated with the latest medical research, clinical guidelines, and best practices. IT modules will help students leverage digital resources for continuous learning, including online courses, webinars, and virtual conferences, ultimately leading to ongoing professional development. Understanding healthcare management systems, hospital information systems (HIS), and administrative software is crucial for effective healthcare administration. IT modules will provide relatable knowledge to students.

Learning Outcomes

After completing this IT module, students will be able:

- To effectively use office software (e.g., Microsoft office, google workspace) for tasks such as word processing, spreadsheet analysis, and presentation creation.
- To organize, store, and manage medical documents and reports using office automation tools.
- To proficiently use medical databases (e.g., PubMed, The Cochrane Library) to access scholarly articles, research, and evidence-based resources.
- To edit medical images and videos for presentations, reports, and patient education, ensuring accuracy and clarity.
- To use visuals effectively to convey medical information, diagnoses, and treatment plans.
- To comprehend the fundamental principles of electronic health records (EHR), including their structure, purpose, and functionalities. They will learn to enter, update, and manage patient information and medical records in EHR systems.

| TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | |
|--|---|---|-------------------|
| S. # | LEARNING OBJECTIVES | LECTURE TITLE | TEACHING STRATEGY |
| 01 | To familiarize students with a range of tools and technologies used for medical visual communication, including illustration software, medical imaging tools, and 3D modeling | PAR-S-2-IT-1 Overview and importance of visual comm: for healthcare professionals | Lecture |
| | | PAR-S-2-IT-2 Visual Design with Canva | Practical |
| | | PAR-S-2-IT-3 Image Editing for Medical Illustrations | |
| | | PAR-S-2-IT-4 AI-based image editing tools | |
| | To know the significance of EHR and HMIS in modern healthcare. Learn to | PAR-S-2-IT-5 Introduction to EHR and HMIS | Lecture |

| | | | |
|----|---|---|----------------------|
| 02 | navigate and use EHR and HMIS effectively and develop skills for data entry, retrieval, and management within systems | PAR-S-2-IT-6 Exploring EHR and HMIS Applications | Practical |
| 03 | To learn about digital evidence types, e.g., electronic documents, emails, images, and videos. To familiarize students with the tools and techniques of digital forensics used to collect and preserve evidence. | PAR-S-2-IT-7 Data and Evidence Recovery in Medical Investigations | Lecture |
| | | PAR-S-2-IT-8 Security Issues | Lecture Practical |
| | | PAR-S-2-IT-9 Video Technology | Practical |
| 04 | To know about a range of data visualization tools and software (Tableau, Power BI, and Python libraries). To develop expertise in advanced visualization techniques, including heatmaps, treemaps, network diagrams | PAR-S-2-IT-10 Tools and Techniques for Data Visualization | Lecture |
| | | PAR-S-2-IT-11 Mastery of Tableau | Practical |

Recommendation:

Relevant reading material and supplementary handouts will be provided during classes/ lectures

BIOMEDICAL ETHICS

Introduction/ Rationale

The rationale for teaching Biomedical Ethics to MBBS students at LUMHS is rooted in several important considerations related to the fields of medicine, healthcare, and related professions. This will provide ethical guidance and education, promote ethical behavior, protect patient rights and resolve ethical dilemmas. This will help students, as future professionals, navigate complex ethical challenges and ensure that ethical principles and values are integrated into the practice of medicine, research, and other professional fields. Ultimately, this course will play a vital role in promoting ethical conduct and maintaining the trust and integrity of these professions.

| TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | |
|--|--|---|--------------------|
| S # | LEARNING OUTCOMES | TOPIC | TEACHING STRATEGY |
| 01 | <ul style="list-style-type: none">Students should be able to understand the principles of bioethics and what ethical practice is, and what is an ethical dilemmaStudents should be able to understand harms and benefits in health care settingsStudents should be able to understand the concepts of autonomy and individual responsibility and to understand their significance for the health care provider-patient relationshipStudents should be able to understand the concept of non-maleficence and the Hippocratic oathStudents should be able to understand the concept of justice in a health care setting and equity in resource allocation allocation | PAR-S-1-ETH-1 Introduction to Biomedical Ethics | Lecture SGD |

RESEARCH

Introduction

The foundation of any institution is research. Advanced nations assert that their advancements in research and development have modernized them and enabled them to generate revenue. Globally, medical universities are essential to the advancement of healthcare. Beginning with health issue prediction surveys and continuing with the creation of innovative medications and diagnostic methods.

Any institution's greatest asset is its student population. Here, we offer the guidelines and framework for research curriculum, which will assist you in reaching degree program standards.

The scientific research element of the medical curriculum aims to develop a research-oriented mindset in students that promotes evidence-based practice, critical thinking, and a more comprehensive understanding of medical science. This module focuses on bridging the knowledge gap between theory and clinical application by giving students the tools they need to carry out significant medical research.

Rationale

Research is essential to expanding our understanding of medicine and enhancing patient care. Students who engage in research projects improve their analytical and critical thinking skills, strengthen their capacity to understand scientific literature, and make a positive impact on the continuous advancement of medical science. Students' academic journeys are further enhanced by research experiences, which equip them to make evidence-based decisions in their future healthcare endeavors.

Learning Objectives:

- **Develop Research Competence:** Get the know-how required to plan, carry out, and evaluate medical research on your own.
- **Critical Thinking:** Gain the capacity to evaluate scientific literature critically, understanding research techniques and coming to conclusions supported by data.
- **Communication Skills:** Improve your written and verbal communication abilities to communicate research findings to a variety of audiences effectively.
- **Ethical Considerations:** Show your dedication to responsible and open scientific inquiry by understanding and putting ethical principles into practice in your research.

| TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES | | | |
|--|---|--|-------------------|
| S # | LEARNING OBJECTIVE | TOPICS | TEACHING STRATEGY |
| 1 | Explain the significance of hypothesis and P- value in research | PAR-S-1-RES-1 Introductory class & Hypothesis testing and P-value | Lecture |

| | | | |
|----------|---|--|-----------|
| 2 | Describe the basic principles of Statistical analysis software | PAR-S-1-RES-2 Introduction to SPSS | Practical |
| 3 | data analysis techniques and statistical methods. | PAR-S-1-RES-3 SPSS Software Introduction | Practical |
| 4 | Explain types of sampling techniques and their application | PAR-S-1-RES-4 Sampling Techniques Designing Questionnaire/Pro Forma | Lecture |
| 5 | Define different types of articles | PAR-S-1-RES-5 Types of articles | Lecture |
| 6 | Explain primary cell culture | PAR-S-1-RES-6 Primary cell culture | Lecture |
| 7 | Outline the expected outcomes and Findings of the research | PAR-S-1-RES-7 Finalizing Research Proposal | Practical |
| 8 | Reinforce the importance of research and its potential impact in Ethical review committee | PAR-S-1-RES-8 Research Ethics & Approval of Research proposal from ERC | Lecture |



LIAQUAT UNIVERSITY
of Medical & Health Sciences, Jamshoro, Sindh, Pakistan

DOC.# LUMHS/DA/-
DATE: 10/09/2025

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DIRECTOR

"SAY NO TO CORRUPTION"

**TABLE OF SPECIFICATION SECOND YEAR MBBS
(BATCH 2023-2024)**

| S.NO | SUBJECTS | ANA | | PHY | | BIO | | PHAR | | PATHO | | B.S BME IT MEDICAL RESEARCH | GRAND TOTAL |
|------|--|-------|----|-------|----|-------|----|-------|----|-------|----|-----------------------------|-------------|
| 01. | PAPER - I (HEAD AND NECK AND NERVOUS SYSTEM -1) Anatomy, Physiology, Biochemistry Pathology, Pharmacology Community Medicine, B.S BME, IT MEDICAL RESEARCH | H&N | 33 | H&N | 11 | H&N | 03 | H&N | 02 | H&N | 01 | H&N | 00 |
| | | NERV | 27 | NERV | 15 | NERV | 00 | NERV | 04 | NERV | 01 | NERV | 03 |
| | | TOTAL | 60 | TOTAL | 26 | TOTAL | 03 | TOTAL | 06 | TOTAL | 02 | TOTAL | 03 |
| 02. | PAPER - II (GIT AND ENDOCRINE -1) Anatomy, Physiology, Biochemistry Pathology, Pharmacology Community Medicine B.S BME, IT MEDICAL RESEARCH | GIL | 24 | GIL | 09 | GIL | 13 | GIL | 01 | GIL | 01 | GIL | 02 |
| | | ENDO | 15 | ENDO | 16 | ENDO | 12 | ENDO | 00 | ENDO | 04 | ENDO | 03 |
| | | TOTAL | 39 | TOTAL | 25 | TOTAL | 25 | TOTAL | 01 | TOTAL | 05 | TOTAL | 05 |
| 03. | PAPER - III (RENAL AND REPRODUCTIVE- 1) Anatomy, Physiology, Biochemistry Pathology, Pharmacology Community Medicine B.S BME, IT MEDICAL RESEARCH | REPR | 28 | REPR | 08 | REPR | 05 | REPR | 03 | REPR | 04 | REPR | 02 |
| | | RENA | 19 | RENA | 17 | RENA | 09 | RENA | 01 | RENA | 03 | RENA | 01 |
| | | TOTAL | 47 | TOTAL | 25 | TOTAL | 14 | TOTAL | 04 | TOTAL | 07 | TOTAL | 03 |



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OSPE EXAMINATION SECOND YEAR MBBS

| S.NO | SUBJECTS OF INTERACTIVE STATIONS | NUMBER OF INTERACTIVE STATIONS | MARKS OF EACH STATIONS | TOTAL MARKS |
|--|----------------------------------|--------------------------------|------------------------|-------------|
| 01. | ANATOMY | 03 | 20 MARKS EACH STATION | 60 MARKS |
| 02. | PHYSIOLOGY | 03 | 20 MARKS EACH STATION | 60 MARKS |
| 03. | BIOCHEMISTRY | 03 | 10 MARKS EACH STATION | 30 MARKS |
| TOTAL MARKS OF INTERACTIVE STATIONS = | | | | 150 |

| S.NO | SUBJECTS FOR STATIC STATION | NUMBER OF STATIC STATIONS | MARKS OF EACH STATIONS | TOTAL MARKS |
|---|-----------------------------|---------------------------|------------------------|-------------|
| 01. | ANATOMY | 06 | 06 MARKS EACH STATION | 36 MARKS |
| 02. | PHYSIOLOGY | 06 | 06 MARKS EACH STATION | 36 MARKS |
| 03. | BIOCHEMISTRY | 03 | 06 MARKS EACH STATION | 18 MARKS |
| TOTAL MARKS OF STATIC STATIONS = | | | | 90 |

| INTERNAL EVALUATION MARKS | 20 MARKS OF EACH MODULE / PAPER | 60 MARKS OF INTERNAL EVALUATION |
|----------------------------------|---------------------------------|---------------------------------|
| GRAND TOTAL | | |
| TOTAL INTERACTIVE MARKS | | 150 |
| TOTAL STATIC MARKS | | 90 |
| INTERNAL EVALUATION MARKS | | 60 |
| GRAND TOTAL | | 300 |

| ASSESSMENT | | | |
|--------------------------------|-----------------------|---------------------|------------|
| ASSESSMENT PLAN FOR EACH PAPER | END OF YEAR ASSESMENT | 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, and practicals, assignments) | 3% |
| | Block tests | 4% |
| | | 10% |
| TOTAL | | 20% |

| LEARNING RESOURCES | | |
|---|---|--|
| ANATOMY | | |
| GROSS ANATOMY | HISTOLOGY | EMBRYOLOGY |
| Clinical Anatomy by Richard S. Snell (10 th Edition) Clinically Oriented Anatomy by K.L. Moore (09 th Edition) Neuro Anatomy by Richard Snell (08 th , 09 th Edition) | Wheather's Functional Histology by B. Young J. W. Health (07 th Edition) Junqueira's Basic Histology by Anthony L. Mescher (17 th Edition) | The Developing Human by Keith L. Moore & TVN Persaud (10 th Edition) Langman's Medical Embryology by TW Saddler (15 th Edition) |

| BIOCHEMISTRY | PATHOLOGY/MICROBIOLOGY | COMMUNITY MEDICINE |
|--|--|---|
| Harper's Illustrated Biochemistry by Peter Kennelly (32 nd Edition) Lehninger Principle of Biochemistry by David L. Nelson Michael M. Cox (08 th Edition) Textbook of Biochemistry with Clinical Correlations by Thomas M. Devlin (05 th Edition) | Robbins & Cotran, Pathologic Basis of Disease, 9th edition. Rapid Review Pathology, 4th edition by Edward F. Goljan MD | Parks Textbook of Preventive and Social Medicine by K. Park (26 th Edition) Public health and Community Medicine by Ilyas, Ansari (08 th Edition) Textbook of Community Medicine and Public Health by Saira Afzal - Sabeen Jalal (01 st Edition) Fundamental of Preventive Medicine by Dr. Zulfikar Ali Shaikh (05 th Edition), Basic Statistics for the Health Sciences by Jan W. Kuzma (05 th Edition) |
| PHARMACOLOGY | BEHAVIORAL SCIENCES | BIOMEDICAL ETHICS |
| Lippincott's Illustrated Pharmacology by Karen Whalen (08 th Edition) Basic and Clinical Pharmacology by Bertram G. Katzung & Anthony Trevor (15 th Edition) | Hand book of Behavioral Sciences by Brig (Rtd) Mowadat H Rana (3 rd Edition) Introduction To Psychology By Atkinson & Hilgard (15 th Edition) Shorter Oxford Textbook of Psychiatry (7 th Edition) | Beauchamp TL, Childress JF. Principles of biomedical ethics. Oxford University Press, USA; Eighth edition Bioethics in Pakistan, Local Contexts, Local Cases, Editors: Kulsoom Ghias et al |
| PHYSIOLOGY | | |
| Textbook of Medical Physiology by Guyton And Hall Ganong' S Review of Medical Physiology Human Physiology by Lauralee Sherwood Berne & Levy Physiology Best & Taylor Physiological Basis of Medical Practice | REFERENCE BOOKS Guyton & Hall Physiological Review by John E. Hall (04 th Edition) Essentials of Medical Physiology by Jaypee Textbook of Medical Physiology by Indu Khurana Short Textbook of Physiology by Mrthur NMS Physiology Monoo's Physiology | |
| RESEARCH | WEBLINK | JOURNALS |

| | | |
|---|--|---|
| <p>Basic Biostatistics for Clinical Researchers" by Prof. Dr. Binafsha Manzoor Syed, PhD et al.</p> | <p>https://www.lumhs.edu.pk/publishers/documents/basicbio.pdf Research Methodology in Medicine" by John K. Last https://kth.diva-portal.org/smash/get/diva2:1547062/FULLTEXT01.pdf</p> | <p>New England Journal of Medicine Nature Medicine Journal of Clinical Investigation (JCI) Circulation Online database: PubMed</p> |
|---|--|---|

THIRD YEAR MBBS PROGRAM

| SCHEDULE OF HOSPITAL POSTING IN THE THIRD YEAR MBBS | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|---|--------------------------------|--------------------------------|
| Group | 20-01-2025 To 28-02-2025 | 03-03-2025 To 11-04-2025 | 14-04-2025 To 23-05-2025 | 26-05-2025 To 06-06-2025 & 07-07-2025 To 08-08-2025 | 11-08-2025 To 19-09-2025 | 22-09-2025 To 31-10-2025 |
| A | ENT | Gynae/Obs | Pediatrics | Eye | Surgery | Medicine |
| B | Gynae/Obs | Pediatrics | Eye | Surgery | Medicine | ENT |
| C | Pediatrics | Eye | Surgery | Medicine | ENT | Gynae/Obs |
| D | Eye | Surgery | Medicine | ENT | Gynae/Obs | Pediatrics |
| E | Surgey | Medicine | ENT | Gynae/Obs | Pediatrics | Eye |
| F | Medicine | ENT | Gynae/Obs | Pediatrics | Eye | Surgery |

The above-mentioned clinical rotation schedule is to be followed by every student throughout third year. Groups of students are decided by the Hospital Administration.

ATTENDANCE POLICY FOR STUDENTS

As per PMDC rules for eligibility in annual examinations.

- Minimum attendance requirement is 75% in each subject: attendance is for lectures, demos, practical's, clinics, PBLs, SURVIVE, CPC, presentations, etc, indoor and outdoor.
- The attendance is not simply for lectures.

Attendance is maintained by the Department of Student Affairs at MMC-ISUM.

| DISTRIBUTION OF MODULES, THEMES, CONTACT HOURS, CREDIT HOURS THIRD YEAR OF MBBS PROGRAM-2025 | | | | | |
|---|------------------------|---|-----------------|--------------------|---------------------------|
| Total 11 Modules | Total Themes=50 | | 40 weeks | 1300 | 81.25 |
| Module-I Foundation & Genetics-2 | 1 | Cell Pathology and Genetics | 1 week | 32.5 | 2.03 |
| | 2 | Hemodynamics | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 02-Weeks | | | 02-Weeks | 65 Hours | 4.06 Credit Hours |
| Module-2 Infectious Diseases | 1 | Immune-Pathogenesis | 1 week | 32.5 | 2.03 |
| | 2 | Diagnostic Approach to Infection | 1 week | 32.5 | 2.03 |
| | 3 | Pyogenic Bacteria-I | 1 week | 32.5 | 2.03 |
| | 4 | Pyogenic Bacteria-II | 1 week | 32.5 | 2.03 |
| | 5 | Pyrexia of Unknown Origin | 1 week | 32.5 | 2.03 |
| | 6 | Parasitic Infections | 1 week | 32.5 | 2.03 |
| | | Assessment | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 07-Weeks | | | 07-Weeks | 227.5 Hours | 14.21 Credit Hours |
| Module-3 Hematology-2 | 1 | Oncology | 1 week | 32.5 | 2.03 |
| | 2 | Pallor Ness Anemia | 1 week | 32.5 | 2.03 |
| | 3 | Hemostatic Abnormalities And Blood Transfusion | 1 week | 32.5 | 2.03 |
| | 4 | Lymphadenopathy | 1 week | 32.5 | 2.03 |
| | 5 | Hematological Malignancies | 1 week | 32.5 | 2.03 |
| | 6 | Immunological Disorders & Transplantation | 1 week | 32.5 | 2.03 |
| | | Assessment | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 07-Weeks | | | 07-Weeks | 227.5 Hours | 14.21 Credit Hours |
| Module-4 Respiratory- II | 1 | Lung Injury, Edema, Collapse & Obstructive Pulmonary Diseases | 1 week | 32.5 | 2.03 |
| | 2 | Chronic diffuse Interstitial/ Restrictive Lung diseases | 1 week | 32.5 | 2.03 |
| | 3 | Infectious & pleural diseases | | | |
| | 4 | Lung Tumors | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 03-Weeks | | | 03-Weeks | 97.5 Hours | 6.09 Credit Hours |

| | | | | | |
|---|---|---|-----------------|--------------|---------------------|
| Module-5 CVS-II | 1 | Hypertension | 1 week | 32.5 | 2.03 |
| | 2 | Atherosclerosis | | | |
| | 3 | Myocardial diseases | 1 week | 32.5 | 2.03 |
| | 4 | Diseases of vessels | | | |
| | 5 | Pericardial and endocardial diseases, and cardiac tumors | 1 week | 32.5 | 2.03 |
| | | Assessment | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 04-Weeks | | | 04-Weeks | 130 | 8.12 |
| | | | | Hours | Credit Hours |
| Module-6 GIT & Liver-II | 1 | Disease of oral cavity and esophagus | 1 week | 32.5 | 2.03 |
| | 2 | Disease of stomach | | | |
| | 3 | Diarrheal diseases and malabsorption syndromes | 1 week | 32.5 | 2.03 |
| | 4 | Intestinal disorders | | | |
| | 5 | Jaundice & cholestasis | 1 week | 32.5 | 2.03 |
| | 6 | Metabolic & drug/toxin related liver diseases | | | |
| | 7 | Cirrhosis | 1 week | 32.5 | 2.03 |
| | 8 | Tumors of liver and gall bladder | | | |
| Total Contact Hours for 04-Weeks | | | 04-Weeks | 130 | 8.12 |
| | | | | Hours | Credit Hours |
| Module-7 Endocrinology-II | 1 | Non- Neoplastic and Neoplastic Disease of Pituitary Gland | 1 week | 32.5 | 2.03 |
| | 2 | Non-Neoplastic and Neoplastic Disease of Thyroid and Parathyroid | | | |
| | 3 | Non-Neoplastic & Neoplastic Disease of Pancreas | | | |
| | 4 | Non-Neoplastic and Neoplastic Disease of Adrenal Gland | 1 week | 32.5 | 2.03 |
| | 5 | Multiple Endocrine Neoplasia Syndromes | | | |
| | | Assessment | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 03-Weeks | | | 03-Weeks | 97.5 | 6.09 |
| | | | | Hours | Credit Hours |
| Module-8 renal/Excretory System-II | 1 | Glomerular conditions including glomerular syndromes, conditions associated with systemic disorders and Isolated glomerular abnormalities | 1 week | 32.5 | 2.03 |

| | | | | | |
|---|---|--|-----------------|------------|-------------|
| | 2 | Kidney/ Excretory Infections and Renal Vascular Disorders | | | |
| | 3 | Obstructive uropathy (Urolithiasis, Hydronephrosis) | | | |
| | 4 | Tumors of Renal/ excretory System | | | |
| Total Contact Hours for 02-Weeks | | | 02-Weeks | 65 | 4.06 |
| Module-9 Reproductive System- II | 1 | Lesions of Female Genital Tract | 1 week | 32.5 | 2.03 |
| | 2 | Lesions of Breast | 1 week | 32.5 | 2.03 |
| | 3 | Lesions of Male Genital Tract | 1 week | 32.5 | 2.03 |
| | | Assessment | 1 week | 32.5 | 2.03 |
| Total Contact Hours for 04-Weeks | | | 04-Weeks | 130 | 8.12 |
| Module-10 MSK-II | 1 | Developmental Disorders of Bone & Cartilage, Basic Structure & Function of Bone. | 1 week | 32.5 | 2.03 |
| | 2 | Fractures, Osteomyelitis and Arthritis. | | | |
| | 3 | Benign Bone and Cartilage Forming Tumors, Malignant Bone and Cartilage Forming Tumors and Tumors of Unknown Origin | 1 week | 32.5 | 2.03 |
| | 4 | Soft Tissue Tumors | | | |
| Total Contact Hours for 02-Weeks | | | 02-Weeks | 65 | 4.06 |
| Module-11 Neuroscience-II | 1 | Meningitis Including Bacterial, Viral, Fungal and T.B Meningitis | 1 week | 32.5 | 2.03 |
| | 2 | Tumors of the Central Nervous System | 1 week | 32.5 | 2.03 |
| | 3 | Autonomic Nervous System | | | |
| Total Contact Hours for 02-Weeks | | | 02-Weeks | 65 | 4.06 |

THIRD YEAR MBBS
LIST OF WORKSHOPS AND COMPETENCIES ACCORDING TO MODULES

| Module Name | Psychomotor Domains | Learning Objectives | Name Of Workshop | Venue |
|---|---------------------------|---|--------------------------------|------------------------------|
| MOD-I Foundation & Genetics-2 | Attribute/Professionalism | <ul style="list-style-type: none"> Demonstrate professionalism and ethical reasoning while dealing with genetic information and patient confidentiality | Patient Confidentiality | Skills Lab/Hospital Rotation |

| | | | | |
|--|---|--|---|---------------------|
| MOD-2 Infectious Diseases | Culture Media-I & Culture Media-II | <ul style="list-style-type: none"> • Demonstrate preparation and sterilization of basic culture media. • Demonstrate safe laboratory practices while handling infectious material in culture procedures. • Apply understanding of culture media in clinical microbiology for diagnosis, research, and public health. | Culture Media-I & Culture Media-II | Pathology Lab |
| | Tropical and emerging infections | <ul style="list-style-type: none"> • Apply knowledge of tropical and emerging infections (malaria, dengue, tuberculosis, HIV/AIDS, COVID-19, etc.) in clinical scenarios. | Tropical and emerging infections | Pathology Lab |
| MOD-3 Blood-2 | Interpretation of Lab Profile | Specimen Collection & Handling Blood, urine, sputum, CSF, biopsy | Interpretation of Lab Profile | Pathology Lab |
| | | Laboratory diagnosis of Anemia Laboratory diagnosis of Acute & Chronic leukemia | | Pathology Lab |
| | | Non. Neoplastic WBC Disorders | | Pathology Lab |
| | | Isolation of microorganism/Lab diagnosis of infectious disease | | Pathology Lab |
| | | Acid-fast staining Culture Media Diagnostic approach of Neoplasia | | Pathology Lab |
| | | Acid fast staining Diagnostic approach of Neoplasia | | Pathology Lab |
| | | | | |
| | | | | |
| MOD-4 Respiratory-2 | Auscultation of Lungs | Perform Chest examination | Auscultation of Lungs | Skills Lab |
| | Tumors of lung | Morphological features & immunohistochemistry Tumors of lung | Tumors of lung | Histology Lab |
| MOD-5 CVS-2 | Auscultation of Heart | Interpret the following on a given biochemical report: Lipid Profile Cardiac Enzymes Pericardial Effusion | | Skills Lab |
| | Histopathological Interpretation | Interpret the gross and microscopic features of the following on a given histopathology report: <ul style="list-style-type: none"> • Hemangiomas Cardiac • Myxoma | Histopathological Interpretation | Histology Lab |
| MOD-6 | Abdominal | Demonstrate abdominal examination | Abdominal | Skills lab/Hospital |

| | | | | |
|--|--|---|---|---------------------------------|
| GIT & Liver-II(including Nutritional Disorders) | examination History Taking | | examination History Taking | Rotation |
| | Gastric Lavage | Demonstrate gastric lavage | Gastric Lavage | Skills Lab |
| MOD-7 Renal & Excretory System-II | Male & Female Urethral catheterization | Demonstrate Male & Female Urethral catheterization | Male & Female Urethral catheterization | Skills Lab |
| MOD-8 Endocrinology -II | Arterial Puncture | Interpret arterial blood gas (ABG) results in relation to acid-base balance, oxygenation, and ventilation. | Arterial Puncture | Skills Lab |
| MOD-9 Reproduction | Pap smear | Demonstrate Pap smear Explain the sample collection, gross, microscopic and chemical examination of semen Semen D/R | Pap smear | Skills Lab Pathology Lab |
| MOD-10 Forensic Medicine & Toxicology | Examination of physical, sexual and mental trauma | Perform physical examination and make accurate observations regarding physical, sexual and mental trauma caused by various causative agents/actions. | Examination of physical, sexual, and mental trauma | Skills Lab |
| | Steps to Recover and preserve biological and non-biological material from living and dead. | Recover and preserve biological and non- biological material from human body both in living and dead. | Steps to Recover and preserve biological and non- biological material from living and dead. | Skills Lab |
| | Trace evidence recognition, collection & preservation | Recognize, collect and preserve trace evidence providing clues regarding personal identification, crime detection from the locus of incident, living and dead body. | Trace evidence recognition, collection & preservation | Skills Lab |
| | Maintenance of Chain of Custody | Dispatch with justification, the biological and non-biological material to appropriate laboratory/agency, maintaining the chain of custody. | Chain of Custody | Skills Lab |
| | Autopsy on dead and exhumed bodies. | Conduct autopsy on dead and exhumed bodies. | Autopsy on dead and exhumed bodies. | Skills Lab |
| | Identification and detect death cause | Examine the skeletonized material and fragmentary remains for identification and detect cause, manner and time of death by using scientific knowledge and procedures. | Identification and detect death cause | Skills Lab |
| | Manage Poisoning | Diagnose, resuscitate and manage a case of poisoning. | Manage Poisoning | Skills Lab |

| | | | | |
|--|---------------------------------------|--|---------------------------------------|----------------------|
| | Preparation of a comprehensive report | Prepare medical documents depicting a comprehensive report of his/her observations and scientific opinion regarding the examination of living and dead for production before the investigators, attorneys, and courts. | Preparation of a comprehensive report | Skills Lab |
| | Medico legal documentation | FIR (copy), Warrant, Summon | Medico legal documentation | Skills Lab |
| | Radiological Examination | X-rays, Fracture, Foreign body Pallet, Bullet | Radiological Examination | Skills Lab/Radiology |

FOUNDATION MODULE 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 interactive activities.

This module marks the beginning of the 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 the third year to recognize the basics of general pathology. The student will develop an 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
- Describe the three stages of shock
- Discuss the transmission pattern of a single-gene disorder
- Discuss chromosomal abnormalities and define normal karyotypes and common
- Cytogenetic terminology
- Comprehend the basic concepts and definition of Demography
- Describe the concept of population or demographic transition.
- Interpret the population pyramid

Themes

Theme 1: Cell Pathology and Genetics
 Theme 2: Hemodynamics

| Theme 1: Cell Pathology and Genetics | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 1 | <ul style="list-style-type: none"> • Enumerate causes of Cell Injury • Discuss types of cell injury • Describes sequential Morphological changes in Cell Injury | Fnd-S2-Path-1 Cell injury | | |
| 2 | <ul style="list-style-type: none"> • Define Necrosis and its type • Describe the nuclear and cytoplasmic features of necrosis. | Fnd-S2-Path-2 Necrosis | | |
| 3 | <ul style="list-style-type: none"> • Define Apoptosis • Enumerate pathological and Physiological causes of Apoptosis • Describe Biochemical Features and Mechanism of Apoptosis | Fnd-S2- Path-3 Apoptosis | | |
| 4 | <ul style="list-style-type: none"> • Describe pathological calcification. • Discuss Dystrophic and metastatic calcification | Fnd-S2- Path-4 Calcification and Pigmentation | Interactive Lecture | SBQs & OSVE |
| 5 | <ul style="list-style-type: none"> • Define Mutation and its types. • Describe the effects of different types of mutations | Fnd-S2-Path-5 Mutations | | |
| 6 | <ul style="list-style-type: none"> • Define Mendelian Disorder • Explain the pattern of inheritance in Mendelian Disorders • List the examples of autosomal, Recessive and sex-linked disorders. | Fnd-S2-Path-6 Mendelian Disorders | | |
| 7 | <ul style="list-style-type: none"> • Describe normal Karyotype • Discuss various numerical and Structural abnormalities of chromosomes. | Fnd-S2-Path- 7 Chromosomal aberration. | | |
| 8 | <ul style="list-style-type: none"> • Discuss various techniques in the diagnosis of genetic diseases. | Fnd-S1- Path-8 Diagnosis of Genetic Diseases | | |
| 9 | <ul style="list-style-type: none"> • Define Hypertrophy, Hyperplasia, Atrophy, and Metaplasia. • Demonstrate gross and microscopic features of cellular adaptations | Fnd-S2-Path-9 Cellular adaptation | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 10 | <ul style="list-style-type: none"> • Drug absorption • Bioavailability and half-life • Drug distribution • Drug metabolism | | Interactive Lecture | SBQs & OSVE |

| Community Medicine | | | | |
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| 11 | <ul style="list-style-type: none"> • Define population and population studies • Comprehend the basic concepts and definition of Demography • Discuss the population doubling time • Describe the concept of population or demographic transition. • Describe and interpret the population pyramid • Compare the population pyramid of developing and developed countries | Fnd-S2-CM-1 Introduction to Demography | Interactive Lecture | MCQs & OSPE |
| 12 | <ul style="list-style-type: none"> • Discuss the epidemiological study design. • Differentiate between observational and experimental studies. • Identify the key concept of descriptive epidemiology. • Differentiate between Descriptive and analytical studies. • Determine how and when to select the appropriate study design | Fnd-S2-CM-2 Introduction to epidemiologic A study design | Interactive Lecture | MCQs & OSPE |
| 13 | <ul style="list-style-type: none"> • Define the measure of occurrences and effects of diseases. • Describe Proportions, Risk, Rate, Ratio and Odds • Understand the concept of prevalence and incidence. • Describe the concept of Crude, specific and standardized rates | Fnd-S2-CM-3 Measures of occurrence of diseases | Interactive Lecture | MCQs & OSPE |
| 14 | <ul style="list-style-type: none"> • Define sampling • Describe the purpose and importance of sampling. • Describe different methods of sampling. • Differentiate between probability and non-probability sampling | Fnd-S2-CM-4 Sampling | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| 15 | <ul style="list-style-type: none"> • Define Forensic Medicine and Toxicology and its various branches. • Discuss the importance and utility of Forensic Medicine and Toxicology Its various branches, its role in crime detection and other medical, legal and ethical issues in civilized society | Fnd-S2-FM-1 Introduction Forensic Medicine | Interactive Lecture | MCQs & OSPE |

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| 16 | <ul style="list-style-type: none"> Describe Hippocratic Oath and principles of Bioethics Discuss the duties of a doctor as advised by international code of Medical Ethics | Fnd-S2-FM-2 Medical Ethics | Interactive Lecture | MCQs & OSPE |
| 17 | <ul style="list-style-type: none"> Describe the composition and functions of the Pakistan Medical & Dental Council at present and its role in medical education | Fnd-S2-FM-3 PM & DC | Interactive Lecture | MCQs & OSPE |
| 15 | <ul style="list-style-type: none"> Define consent, types of consent & roles of consent in Medical Examination Discuss Criteria for giving valid consent Define the Doctrine of Informed Consent Determine Certain legal deviations/exemptions of consent | Fnd-S2-FM-4 Consent | Interactive Lecture | SBQs & OSVE |

| Theme 2: Hemodynamics | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 10 | <ul style="list-style-type: none"> Define edema Describe the pathophysiology of edema | Fnd-S2-Path-10 Edema | Interactive Lecture | SBQs & OSVE |
| 11 | <ul style="list-style-type: none"> Define Hemorrhage, Hyperemia, and Congestion Describe their causes and pathophysiology | Fnd-S2-Path-11 Hyperemia, Congestion | | |
| 12 | <ul style="list-style-type: none"> Define Shock Describe the pathophysiology of different type of Shock. | Fnd-S2-Path-12 Shock | | |
| 13 | <ul style="list-style-type: none"> Define Infarction Discuss the etiology of infarction Discuss the morphological classification of infarcts Describe the morphological features of infarcts. | Fnd-S2-Path-13 Infarction | | |
| 14 | <ul style="list-style-type: none"> List and define causes of intracellular accumulation Discuss the role of Intracellular Accumulations in metabolic derangements of the cell. | Fnd-S2-Path-14 Intracellular Accumulations | Practical | OSPE & OSVE |
| Pharmacology | | | | |

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| | <ul style="list-style-type: none"> • Review of pharmacokinetics • Pharmacodynamics -1 • Pharmacodynamics -11 • Adverse drug reaction • Teratogenicity | | Interactive Lecture | SBQs & OSVE |
| Forensic Medicine | | | | |
| 15 | <ul style="list-style-type: none"> • Introduction to Personal Identity. <ul style="list-style-type: none"> ◦ Describe the parameters of identification. ◦ Discuss methods of identification • Describe Complete and partial identification. • Describe Identification in living and dead. • Discuss Locard's principle of exchange & its medico legal importanc | Fnd-S2-FM-5 Personal Identification | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Intro of Qisas & Diyat Ordinance. • Define & classify Qisas & Diyat • Discuss the law regarding wounding of a person | Fnd-S2-FM-6 Qisas & Diyat Ordinance-1 | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Discuss Shajjah & Jurh • Discuss the interpretation of injuries accordingly. | Fnd-S2-FM-7 Qisas & Diyat Ordinance-2 | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Discuss Toxicology, Forensic Toxicology (Intro) • Define poison & Its Classification • Explain routes of administration and elimination of poisons from the body. • Describe the factors modifying action of poisons. • Discuss the diagnosis of poisoning in living & dead. | Fnd-S2-FM-8 General Toxicology-1 | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Enlist the common household poisons • Discuss the duties of doctor in a case of poisoning. • Discuss Law to be related toxicology. • Discuss the forensic aspects of poisons | Fnd-S2-FM-9 General Toxicology-2 | Interactive Lecture | SBQs & OSVE |

INFECTIOUS DISEASES MODULE II

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.¹ Worst of all, Pakistan is one of the two remaining countries where polio is still endemic. 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 3rd year medical students to enhance your existing knowledge of prevalent infectious diseases and build a greater understanding and ability to recognize signs and symptoms, relate to appropriate investigations, and therapeutics.

Rationale

Infectious diseases are the most common problem of our community. In the underdeveloped 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. Medical graduates need to have a sound understanding of the 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 diseases and the rationale to treat the common diseases.

Duration: 06 weeks

Learning Outcomes After completion of this module, students should be able to:

- Describe pathogenesis & clinical presentations of common bacterial, viral, fungal & microbial infections.
- Recognize the clinical presentation of common infectious diseases in the community.
- Take history & formulate an 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.
- Understand the basics of communicable diseases and its epidemiology
- Discuss the emerging and re-emerging diseases and provide examples.
- Explain the differences among outbreak, epidemics, endemics and pandemics with examples.
- know the different infectious disease control programs in Pakistan
- Understand the chain of transmission of infection and its role in infectious disease control.
- Understand the different infectious agent and their mode of transmission and the disease that they cause.
- Differentiate winged and winless insects
- Apply the control and prevention measures of specific infections

Themes

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| 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 | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 1 | Enlist essential and non-essential components of a typical bacterial cell with their function | ID-S2-Path-1 Bacterial Structure | | |
| 2 | <ul style="list-style-type: none"> Classify bacteria on the basis of Gram staining. Differentiate characteristics of gram-positive and gram-negative bacteria Define normal flora. Describe colonization of normal flora. Name the members of normal flora with their appropriate anatomical locations | ID-S2-Path-2 Classification of bacteria & normal flora (human microbiota) | Interactive Lecture | SBQs & OSVE |
| 3 | <ul style="list-style-type: none"> Define acute inflammation Describe the sequence of vascular changes Define exudates and transudate and their mechanism of formation | ID-S2-Path-3 General features of inflammation & vascular changes | | |
| 4 | <ul style="list-style-type: none"> Describe the acute inflammatory cells and their functions. Name the various types of chemical mediators & their role Describe the local and general clinical features of acute inflammation | ID-S2-Path-4 Cellular events of Chemotaxis, phagocytosis | | |
| 5 | <ul style="list-style-type: none"> Define chronic Inflammation Describe the characteristic features and types of chronic Inflammation Define granuloma, mention an etiological classification of granuloma with examples | ID-S2-Path-5 Chronic inflammation | | |
| Microbiology | | | | |
| 6 | <ul style="list-style-type: none"> Outline various methods for transfer of genetic information in bacteria. Describe the phases of bacterial growth. | ID-S2-Micb-1 Bacterial genetics & bacterial growth | Interactive Lecture | SBQs & OSVE |
| 7 | <ul style="list-style-type: none"> State the criteria used in viral classification Describe the characteristics of DNA and RNA viruses Describe the structure of the virus | ID-S2-Micb-2 Classification & structure of viruses | | |

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| 8 | <ul style="list-style-type: none"> To demonstrate the principle & procedure of Gram's staining | ID-S2-Micb-3 Gram's staining | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 9 | <ul style="list-style-type: none"> Pharmacology of common infectious diseases Drugs used for relevant infectious diseases | ID-S2-Pharm-1 Introduction to antibiotics | Interactive Lecture | SBQs & OSVE |
| 10 | <ul style="list-style-type: none"> Describe the classification, mechanism of action & side effects of penicillin's | ID-S2-Pharm-2 penicillin's | | |
| 11 | <ul style="list-style-type: none"> Describe the classification, mechanism of action & side effects of cephalosporin's & other cell wall synthesis inhibitors | ID-S2-Pharm-3 cephalosporin's | | |
| Community Medicine | | | | |
| 1 | <ul style="list-style-type: none"> To define communicable disease and other basic definitions Regarding the infectious disease To differentiate between infection, contamination, pollution, infestation To classify the communicable disease To discuss the infectious disease control programs in Pakistan | ID-S2-CM-1 Introduction to communicable disease and basic concept and infectious disease control program in Pakistan | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> To understand the chain of infection To describe the various route of transmission of infectious diseases To describe the preventive and control measures of infectious diseases | ID-S2-CM-2 Chain of transmission & Its role in infectious disease control | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> To discuss the steps of investigation of epidemics (Epidemic endemic, pandemic and steps of investigation of epidemics, explain with examples) | ID-S2-CM-3 Steps of investigation of epidemics | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> To discuss the problem statement of malaria To define the malaria and vectors of malaria To describe the epidemiology of Malaria To discuss the preventive and control measures of malaria | ID-S2-CM-4 Epidemiology & control measure of Malaria | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| 1 | <ul style="list-style-type: none"> Define important legal terms such as Summons, warrant, perjury, deposition, exhibit, offence, cognizable offence, noncognizable offence, oath, conduct money, summons case, warrant case, bail & FIR. Differentiate between dying declaration and dying deposition | ID-S2-FM-1 Legal Terminology | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> Define the types of witnesses, types of examination in the court Describe the recording of evidence and procedure of court attendance with special emphasis on the guidelines for | ID-S2-FM-2 Court Evidence | Interactive Lecture | MCQs & OSPE |

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| | <ul style="list-style-type: none"> doctor in the witness box Explain Professional secrecy and Privileged communication Describe Medical evidence, types of evidence (oral, documentary, hearsay, circumstantial) | | | |
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| Theme 1: Immuno-Pathogenesis | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Microbiology | | | | |
| 12 | <ul style="list-style-type: none"> Differentiate b/w true pathogens, opportunists and commensals List the routes of transmission of infection Describe colonization, pathogenesis, spread and excretion of infectious agents. | ID-S2-Micb-4 Bacterial pathogenesis-I | | |
| 13 | <ul style="list-style-type: none"> Differentiate b/w true pathogens, opportunists, and commensals List the routes of transmission of infection Describe colonization, pathogenesis, spread, and excretion of infectious agents. | ID-S2-Micb-5 Bacterial pathogenesis-II | | |
| 14 | <ul style="list-style-type: none"> Define viral pathogenesis. Describe the effect of virus infection on host cell. Explain specific and non-specific defense mechanisms against viral infection. | ID-S2-Micb-6 Viral pathogenesis | | SBQs & OSVE |
| 15 | <ul style="list-style-type: none"> Describe the host defense mechanism against bacteria. Distinguish between passive & active adaptive immunity. To discuss the failure of host defense against infections. | ID-S2-Micb-7 Host defense against bacterial infection | Interactive Lecture | |
| 16 | <ul style="list-style-type: none"> Distinguish between innate and acquired immunity Describe the role of interferons, natural killer cells, and cytotoxic T cell in viral diseases Explain how interferons limit cell-to-cell spread of viruses. | ID-S2-Micb-8 Host defense against viral infection | | |
| 17 | <ul style="list-style-type: none"> Describe the steps of viral replication Explain the mode of replication of various RNA and DNA viruses. | ID-S2-Micb-9 Viral Replication | | |
| 18 | <ul style="list-style-type: none"> Define sterilization and disinfection Enlist various methods used for sterilization and disinfection | ID-S2-Micb-10 Sterilization and disinfection | | |
| 19 | <ul style="list-style-type: none"> To demonstrate the principle & Procedure of Acid-fast staining. | ID-S2-Micb-11 Acid-fast staining | Practical | OSPE & OSVE |

| Community Medicine | | | | |
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| | <ul style="list-style-type: none"> • To define Leishmaniasis and its types • To understand the epidemiology of Leishmaniasis • To discuss the preventive and control measures of Leishmaniasis | ID-S2-CM-5 Epidemiology & control measure of Leishmaniasis | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| 1 | <ul style="list-style-type: none"> • Describe the Documents prepared by a medical man • Discuss Medico Legal Reports • Discuss Post-Mortem Reports | ID-S2-FM-3 Medicolegal Documents | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> • Define Autopsy, • Discuss Aims, objects & Autopsy protocol • Classify Types of Autopsies • Discuss the establishment of the autopsy suit | ID-S2-FM-4 Autopsy-1 | Interactive Lecture | MCQs & OSPE |

| Theme 2: Diagnostic Approach to Infection | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Microbiology | | | | |
| 20 | <ul style="list-style-type: none"> • Compare and contrast the various methods used to diagnose bacterial diseases • Describe various microscopic and culture techniques used for diagnosis • Discuss molecular techniques in the diagnosis of infectious diseases. | ID-S2-Micb-12 Laboratory diagnosis of bacterial diseases | | |
| 21 | <ul style="list-style-type: none"> • Compare and contrast the various methods used to diagnose viral diseases • Describe various microscopic and culture techniques used for diagnosis • Discuss molecular techniques in the diagnosis of infectious diseases. | ID-S2-Micb-13 Laboratory diagnosis of viral diseases | Interactive Lecture | SBQs & OSVE |
| 22 | <ul style="list-style-type: none"> • Distinguish between fungal & bacterial cell • Contrast sexual & asexual reproduction of fungi. • Define dimorphism • Describe pathogenesis, fungal toxins, and lab diagnosis of fungi | ID-S2-Micb-14 Basic Mycology | | |
| 23 | <ul style="list-style-type: none"> • 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 | | |

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| 24 | <ul style="list-style-type: none"> Classify culture media Enlist various ingredients used for making culture media Demonstrate selective and biochemical test media | ID-S2-Micb-16 Culture Media | Practical | OSPE & OSVE |
| Pathology | | | | |
| 25 | <ul style="list-style-type: none"> Define healing, repair, and regeneration Describe the mechanisms of primary and secondary wound healing Distinguish the differences between healing by first and secondary intention List the local and general factors influencing healing List the complications of wound healing | ID-S2-Path-06 Healing & Repair | Interactive Lecture | SBQs & OSVE |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> To discuss the problem statement of influenza <ul style="list-style-type: none"> To understand the epidemiology of influenza To define and describe the mode of transmission of influenza To discuss the preventive and control measures of influenza | ID-S2-CM-6 Epidemiology & control measure of Influenza | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> To define the yellow fever To understand the epidemiology of yellow fever To discuss the importance of yellow fever to Pakistan To discuss the preventive and control measures of yellow fever | ID-S2-CM-7 Epidemiology & control measure of yellow fever | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| | <ul style="list-style-type: none"> Discuss the autopsy protocol Describe Types of Incisions Describe the techniques of autopsy Discuss the Negative and Obscure Autopsy | ID-S2-FM-5 Autopsy-2 | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> Describe the Documents prepared by a medical man (Certificates such as birth certificates, death certificates, prescription writing, sickness certificates, consent form, certificates of Physical fitness to drive a vehicle & Medical certificate for estimation of age) | ID-S2-FM-6 Medical Certificates | Interactive Lecture | MCQs & OSPE |

| Theme 3: Pyogenic Bacteria | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Microbiology | | | | |
| 26 | <ul style="list-style-type: none"> Enlist the species of Staphylococci Enlist the virulence factors & toxins. Describe pyogenic and toxin-mediated diseases caused by <i>Staphylococcus aureus</i>. Discuss the lab diagnosis of staphylococci | ID-S2-Micb-17 Staphylococci | | |

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| 27 | <ul style="list-style-type: none"> Classify medically important streptococci Describe toxins, enzymes & hemolysins produced by streptococci. Discuss their pyogenic, toxicogenic, & post streptococcal diseases. Describe the lab diagnosis of streptococci. | ID-S2-Micb-18 Streptococci | Interactive Lecture | SBQs & OSVE |
| 28 | <ul style="list-style-type: none"> Describe morphology, pathogenesis, clinical features, and lab diagnosis of <i>Pneumococcus</i>. | ID-S2-Micb-19 Pneumococci | | |
| 29 | <ul style="list-style-type: none"> Enlist species of <i>Neisseria</i>. Describe their morphology, pathogenesis and laboratory diagnosis. | ID-S2-Micb-20 <i>Neisseria</i> | | |
| 30 | <ul style="list-style-type: none"> Define Diphtheria & Listeriosis. Describe important properties, transmission, pathogenesis of diphtheria & Listeria. Discuss the laboratory diagnosis of <i>Corynebacterium diphtheriae</i> & <i>Listeria monocytogenes</i>. | ID-S2-Micb-21 <i>Corynebacterium diphtheriae</i> & <i>Listeria monocytogenes</i> | | |
| 31 | <ul style="list-style-type: none"> Describe various microscopic and culture techniques used for diagnosis | ID-S2-Micb-22 Lab diagnosis of gram-positive & negative cocci. | Practical | OSPE & OSVE |

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| 32 | <ul style="list-style-type: none"> Describe classification, the mechanism of action & side effects of Aminoglycosides | ID-S2-Pharm-5 Aminoglycosides | Interactive Lecture | SBQs & OSVE |
| 33 | <ul style="list-style-type: none"> Describe classification, mechanism of action & side effects of tetracyclines | ID-S2-Pharm-6 Tetracyclines | | |
| 34 | <ul style="list-style-type: none"> Describe the classification, mechanism of action & side effects of macrolides | ID-S2-Pharm-7 Macrolides | | |
| 35 | <ul style="list-style-type: none"> Describe classification, mechanism of action & side effects of chloromphenicol | ID-S2-Pharm-8 Chloromphenicol | | |
| 36 | <ul style="list-style-type: none"> Describe classification, mechanism of action & side effects of sulfonamides | ID-S2-Pharm-9 Sulfonamides | | |
| 37 | <ul style="list-style-type: none"> Describe classification, mechanism of action & side effects flouroquinolones | ID-S2-Pharm-10 Flouroquinolones | | |

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| | <ul style="list-style-type: none"> Describe the Criminal Justice system in Pakistan, Describe the Pakistan Penal Code, Criminal Procedure Code, and its execution and delivery List the general presumptions and exemptions of law | ID-S2-FM-7 Criminal Justice System | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> Define death Explain Scientific concepts regarding death Discuss WHO criteria of death Explain the medico-legal aspects of brain death, sudden & unexpected deaths | ID-S2-FM-8 Death | Interactive Lecture | MCQs & OSPE |

Theme 4: Pyogenic Bacteria

| S. # | LEANING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
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| Microbiology | | | | |
| 38 | <ul style="list-style-type: none"> Outline the morphology, pathogenesis, clinical features, and lab diagnosis of Bacillus | ID-S2-Micb-23 Bacillus | Interactive Lecture | SBQs & OSVE |
| 39 | <ul style="list-style-type: none"> Classify clostridia Describe morphology, pathogenesis, clinical features and lab diagnosis of Clostridia | ID-S2-Micb-24 Clostridia | | |
| 40 | <ul style="list-style-type: none"> Enlist pathogenic strains of E. coli Describe morphology, virulence factors, cultural characteristics and Lab diagnosis of E.coli and Klebsiella | ID-S2-Micb-25 E.coli & Klebsiella | | |
| 41 | <ul style="list-style-type: none"> Classify different strains of Salmonella & Shigella Describe antigenic structure and virulence factor of Salmonella & Shigella Discuss lab diagnosis of Salmonella & shigella | ID-S2-Micb-26 Salmonella &Shigella | | |
| 42 | <ul style="list-style-type: none"> Enlist various species of proteus and pseudomonas Describe pathogenesis and lab diagnosis | ID-S2-Micb-27 Proteus & Pseudomonas | | |
| 43 | Describe various microscopic and cultural characteristics used for diagnosis | ID-S2-Micb-28 Lab diagnosis of gram positivebacilli (rods) | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 44 | <ul style="list-style-type: none"> To treat the infection in the intestines to stop the passing of cysts from the intestine | ID-S2-Phar-11 Treatment of amoebiasis | Interactive Lecture | SBQs & OSVE |
| 45 | <ul style="list-style-type: none"> Classify anti-helminth drugs with their mechanism and side effects | ID-S2-Phar-12 Anti-parasitic drugs/ anti helminths drugs | | |
| 46 | <ul style="list-style-type: none"> To treat fungal infections that affect the skin, hair and nails Treating yeast infections | ID-S2-Phar-13 Anti-Fungal Drugs | | |
| Forensic Medicine | | | | |
| | <ul style="list-style-type: none"> Discuss Cause, manner, mode, and mechanism of death | ID-S2-FM-9 Cause, Manner, Mode & Mechanism of Death | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> Describe the immediate signs of death with special stress on Somatic or clinical death Define suspended animation Discuss Early changes after death, such as Changes in the eye, Algor Mortis, Rigor Mortis & Livor Mortis. | ID-S2-FM-10 Immediate & Early Signs of Death | Interactive Lecture | MCQs & OSPE |

| Theme 5: Pyrexia of Unknown Origin | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Microbiology | | | | |
| 47 | <ul style="list-style-type: none"> Classify the etiologically important Spirochetes. Describe the important properties, transmission & clinical findings. Discuss the lab diagnosis of Syphilis | ID-S2-Micb-29 Spirochetes (Treponema, Borrelia, Leptospira) | | |
| 48 | <ul style="list-style-type: none"> Define Dengue fever Describe the vector, life cycle, and clinical manifestation of the dengue virus Discuss the mode of transmission, pathogenesis, and clinical features polio virus | ID-S2-Micb-30 Dengue & polio virus | Interactive Lecture | SBQs & OSVE |
| 49 | <ul style="list-style-type: none"> Describe the structure of HIV Discuss clinical stages of Infection Outline opportunistic infection in late stage of AIDS | ID-S2-Micb-31 HIV | | |
| 50 | <ul style="list-style-type: none"> Classify medically important Trematodes Describe the life cycle clinical feature and lab. diagnosis | ID-S2-Micb-32 Trematodes (Flukes) | | |
| 51 | <ul style="list-style-type: none"> Classify medically important Tissue Nematodes Describe their important properties, clinical findings and lab. diagnosis | ID-S2-Micb-33 Tissue Nematodes (Wuchereria, Onchocerca, Loa, Dracunculus) | | |
| 52 | <ul style="list-style-type: none"> Describe various microscopic and culture techniques used for diagnosis | ID-S2-Micb-34 Lab diagnosis of Gram-negative bacilli (rods) | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 53 | <ul style="list-style-type: none"> Describe the different drug options for the treatment of dengue fever | ID-S2-Pharm-14 Anti-viral drugs for dengue fever | | |
| 54 | Describe the antiviral drugs used for the treatment of HIV with their mechanisms and side effects. | ID-S2-Pharm-15 Antiretroviral drugs | Interactive Lecture | SBQs & OSVE |
| 55 | | ID-S2-Pharm-16 Immune stimulants | | |
| 56 | | ID-S2-Pharm-17 Immune suppressant | | |
| Clinical Lectures | | | | |
| 57 | Discuss clinical presentations and Management of Syphilis | ID-S2-Med-1 Syphilis | | SBQs & OSVE |

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| 58 | Discuss clinical presentations & management of Dengue fever | ID-S2-Med-2 Dengue Fever | Interactive Lecture | |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> • To discuss the problem statement of chicken pox • To define chickenpox and describe the mode of transmission of chickenpox • To understand the epidemiology of chickenpox • To discuss the preventive and control measures of chickenpox | ID-S2-CM-8 Epidemiology & control measure of Chickenpox | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> • To discuss the problem statement of Measles, Mumps, Rubella • To understand the epidemiology of Measles, Mumps, Rubella • To define and describe the modes of transmission of Measles, Mumps, Rubella • To describe the diagnosis of mumps. • To discuss the preventive and control measures of Measles, Mumps, Rubella | ID-S2-CM-9 Epidemiology & control measure of Measles, Mumps, Rubella | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> • To discuss the problem statement of dengue fever • To discuss the type of dengue fever • To understand the epidemiology of dengue fever • To discuss the preventive and control measures of dengue fever | ID-S2-CM-10 Epidemiology & control measure of Dengue Fever | Interactive Lecture | MCQs & OSPE |
| 59 | Discuss clinical presentations and management of AIDS | ID-S2-Med-3 AIDS | | |

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 3rd 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 cancer 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 newborn (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 Immuno suppressants, immune modulators 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 the patient.
Interpretation of diagnostic cancer tests.
- 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.
- To give and receive feedback, Respect for self and peers. To give sympathy and care to patients.
- Counseling patients and family members for inherited anemias. Counseling of families for prenatal diagnosis of Thalassemia.
- Counseling 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 | | | | |
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| THEME 1: ONCOLOGY | | | | |
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 1 | <ul style="list-style-type: none"> • Describe the definition of neoplasia. • Describe the nomenclature of neoplasia. | Hem-S2-Path-1 Neoplasia | | |
| | <ul style="list-style-type: none"> • To describe the Characteristic of benign & Malignant tumor • To know Pathways of spread, seeding, lymphatic and Hematogenous spread | Hem-S2-Path-2 Characteristic Features of Tumor | | |

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| 3 | <ul style="list-style-type: none"> Normal cell cycles and fundamental principle of cancer regarding cycle Essential alterations in malignant transformation Steps of cell proliferation Proto-oncogenes and growth factors and their receptors | Hem-S2-Path-3 Molecular Basis of Cancer –I | Interactive Lecture | SBQs & OSVE |
| 4 | <ul style="list-style-type: none"> Two-hit hypothesis of Knudsen Tumor suppressor genes Cellular changes in tumor cells DNA repair defects Homing of tumor cells Development of sustained angiogenesis | Hem-S2-Path-4 Molecular Basis of Cancer -II | | |
| 5 | <ul style="list-style-type: none"> To discuss the epidemiology of cancers To discuss different types of carcinogens To discuss the Mechanism of action of radiation carcinogen | Hem-S2-Path-5 Carcinogenic Agents (Radiation Carcinogenesis) | | |
| 6 | <ul style="list-style-type: none"> To discuss the Mechanism of action of chemical & viral carcinogen. | Hem-S2-Path-6 Carcinogenic Agents (Chemical & Viral Carcinogenesis) | | |
| 7 | <ul style="list-style-type: none"> To discuss Clinical features of cancer. To discuss Grading and Staging of cancer. To discuss diagnostic methods used for Cancer. | Hem-S2-Path-7 Diagnostic approach of Neoplasia | Practical | OSPE & OSVE |
| Microbiology | | | | |
| 8 | <ul style="list-style-type: none"> Classify the tumor Viruses Describe the role of tumor viruses in malignant transformation. Discuss the mechanism involved in carcinogenesis. | Hem-S2-Micb-1 Tumor Viruses | Interactive Lecture | SBQs & OSVE |
| Pharmacology | | | | |
| 9 | <ul style="list-style-type: none"> • | Hem2-S2-Phar-1 Introduction to Anti-Cancer Drugs | | |
| 10 | <ul style="list-style-type: none"> Classify the Anticancer Drugs. Describe the mechanism of action, indication, adverse effects, drug-drug interactions. | Hem2-S2-Phar-2 Anti-cancer Drugs- I | Interactive Lecture | SBQs & OSVE |
| 11 | <ul style="list-style-type: none"> Describe the mechanism of resistance of Anticancer Drugs. Describe the general principles of combination chemotherapy in treatment of cancer | Hem2-S2-Phar-3 Anti-cancer Drugs-II | | |

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| Community Medicine | | | | |
| 12 | <ul style="list-style-type: none"> Define the measures of central tendency. Define and compute Mean, Mode, and Median Construct data tables that facilitate the calculation of mean, mode, and median. | Hem2-S2-CM-1 Measures of Central Tendency | Interactive Lecture | MCQs & OSPE |

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| | <ul style="list-style-type: none"> • Apply the concept of central tendency measures in raw data | | | |
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| THEME 2: PALLORNESS (ANAEMIA) | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 12 | <ul style="list-style-type: none"> • To enlist the causes, clinical features and laboratory diagnosis of iron deficiency & Megaloblastic anemias. | Hem-S2-Path-8 Nutritional Anemias | Interactive Lecture | SBQs & OSVE |
| 13 | <ul style="list-style-type: none"> • To Enlist the causes, pathogenesis, clinical features and laboratory diagnosis of Aplastic anemia. | Hem-S2-Path-9 Aplastic anemia | | |
| 14 | <ul style="list-style-type: none"> • To discuss the pathogenesis, clinical features and laboratory diagnosis of Hereditary spherocytosis & G6PD deficiency | Hem-S2-Path-10 Hemolytic Anemia | | |
| 15 | <ul style="list-style-type: none"> • To explain pathogenesis of Hemoglobinopathies. • To identify morphological features on peripheral blood smear. | Hem-S2-Path-11 Hemoglobinopathies | | |
| 16 | <ul style="list-style-type: none"> • Define Malaria and classify malarial parasites. • Describe life cycle of malarial parasites. • Differentiate between Benign and Malignant Tertian malaria. • Discuss complications of Plasmodium Falciparum. | Hem-S2-Micb-2 Plasmodium | | |
| 17 | <ul style="list-style-type: none"> • Interpretation of CBC. • To discuss the Peripheral film findings of different types of anemia. • To discuss the different tests used for the diagnosis of Anemia. | Hem-S2-Path-12 Laboratory diagnosis of Anemia | Practical | OSPE & OSVE |
| 18 | <ul style="list-style-type: none"> • Classify anti-malarial drugs with their mechanism and side effects | Hem-S2-Pharm-4 Anti-malarial drugs | | |
| Clinical lecture | | | | |
| 19 | <ul style="list-style-type: none"> • Assess, classify and manage a child with anemia | Hem-S2-Paeds-1 Anemia in children | Interactive Lecture | SBQs & OSVE |
| Community Medicine | | | | |

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| 20 | <ul style="list-style-type: none"> Define the statistical tests Describe the different statistical tests. Distinguish between categorical and continuous measures. Describe the interpretation of data analyzed through t-test and Chisquare test | Hem2-S2-CM-2 Statistical tests interpretations | Interactive Lecture | MCQs & OSPE |
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Forensic Medicine

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| | <ul style="list-style-type: none"> Describe general principles & basic methodology Define the procedure of enhanced elimination of poisoning regarding arsenic, lead, mercury & copper. Discuss treatment of poisoning Enumerate supportive & antidote therapy Enlist of Medicolegal aspects of Metallic poisoning Discuss post mortem finding | Hem2-S2-FM-1 Metallic Poisoning (Lead, Arsenic, Mercury & Copper poisoning) | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> Discuss the mechanism of medicinal poisoning Discuss symptoms, signs & management of poisoning. Discuss postmortem appearance and Medicolegal aspects of medicinal poisoning. | Hem2-S2-FM-2 Medicinal Poisoning (Paracetamol & Salicylic Acid) | Interactive Lecture | MCQs & OSPE |

| Theme 3: Hemostatic Abnormalities | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 20 | <ul style="list-style-type: none"> Overview of normal Hemostasis Discuss Quantitative & Qualitative platelet disorders. To discuss ITP and diagnosis. | Hem-S2-Path-13 Platelets disorders | | |
| 21 | <ul style="list-style-type: none"> Define & enlist the causes of microangiopathic hemolytic anemias Define & explain Thrombotic Thrombocytopenic Purpura (TTP) and Hemolytic Uremic Syndrome (HUS) Define Disseminated Intravascular Coagulopathy (DIC) | Hem-S2-Path-14 MAHA (Micro angiopathic hemolytic anemia) | | |

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| 22 | <ul style="list-style-type: none"> • Overview of inherited & acquired coagulation disorders • Discuss the pathogenesis and pathophysiology of hemophilia A &B, VWD. • Diagnose hemophilia based on clinical features and laboratory findings | Hem-S2-Path-15 Coagulation disorders (Hemophilia, vWD) | Interactive Lecture | SBQs & OSVE |
| 23 | <ul style="list-style-type: none"> • To discuss the thrombosis, pathogenesis, types and fate of thrombosis. • To Define Embolism, its types and morphological features of Embolism. | Hem-S2-Path-16 Thromboembolism | | |
| 24 | <ul style="list-style-type: none"> • Discuss and perform different laboratory tests for the diagnosis of bleeding disorders | Hem-S2-Path-17 Laboratory diagnosis of Bleeding disorders | Practical | OSPE & OSVE |
| 25 | <ul style="list-style-type: none"> • Classify the coagulant drugs. • Describe the mechanism of action, clinical uses, adverse effects, drug interactions and contraindications of the coagulant drugs. | Hem-S2-Pharm-5 The Coagulants | Interactive Lecture | SBQs & OSVE |
| 26 | <ul style="list-style-type: none"> • Classify the Anticoagulant drugs. • Describe the mechanism of action, clinical uses, adverse effects, drug interactions and contraindications of the Anticoagulant drugs. | Hem-S2-Pharm-6 Oral Anti-Coagulants Hem-S2-Pharm-7 Parenteral Anti-Coagulants | | |
| 27 | <ul style="list-style-type: none"> • Classify the thrombolytic drugs. • Describe the mechanism of action, clinical uses, adverse effects, drug interactions and contraindications of the Thrombolytic drugs. | Hem-S2-Pharm-8 Fibrinolytic and Anti-fibrinolytic Drugs | | |
| Clinical Lectures | | | | |
| 28 | <ul style="list-style-type: none"> • Discuss approach to a patient with Thrombotic disorders | Hem-S2-Med-1 Approach to a patient with Thrombotic disorders | Interactive Lecture | SBQs & OSVE |
| 29 | <ul style="list-style-type: none"> • Discuss approach to a patient with inherited bleeding disorders | Hem-S2-Paeds-2 Bleeding disorders | | |
| 30 | <ul style="list-style-type: none"> • Discuss approach to a patient with deep vein thrombosis | Hem-S2-Surg-1 Deep Venous Thrombosis | | |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> • To know how to organize a Health Education Program • To understand the Terms of IEC, KAP and BCC, through an example • To know the Steps of: Planning, Organizing and Evaluating the health education program | Hem2-S2-CM-3 Organizing and evaluating a Health Education Program | Interactive Lecture | MCQs & OSPE |

| • Forensic Medicine | | | |
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| <ul style="list-style-type: none"> • Discuss application of Blood groups in forensic work & DNA profiling • Discuss disputed paternity & maternity. • Discuss Laboratory tests for examination of a blood staining. | Hem2-S2-FM- Forensic Serology-1 | Interactive Lecture | MCQs & OSPE |
| <ul style="list-style-type: none"> • Appraise the forensic importance of biological specimens (Semen, Saliva, Vomitus, Urine & Hair) • Discuss trace evidence | Hem2-S2-FM- Forensic Serology-2 and trace evidence | Interactive Lecture | MCQs & OSPE |

| Theme 4: Lymphadenopathy | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 31 | <ul style="list-style-type: none"> • Describe lymphoma, its etiology & classification. • Discuss the pathogenesis, types & morphological features of Hodgkin's lymphoma | Hem-S2-Path-18 Hodgkin Lymphoma | Interactive Lecture | |
| 32 | <ul style="list-style-type: none"> • Describe Non-Hodgkin's lymphoma • The classification and staging of non Hodgkin's lymphomas. • Discuss the pathogenesis, clinical features and diagnosis of Chronic lymphocytic leukemia | Hem-S2-Path-19 Non-Hodgkin Lymphoma-I | Interactive Lecture | SBQs & OSVE |
| 33 | <ul style="list-style-type: none"> • Brief Discussion of Burkitt, follicular and DLBCL lymphoma. | Hem-S2-Path-20 Non-Hodgkin Lymphoma-II | | |
| 34 | <ul style="list-style-type: none"> • Discuss the pathogenesis, clinical features and laboratory diagnosis of Multiple Myeloma | Hem-S2-Path-21 Multiple Myeloma | | |
| 35 | <ul style="list-style-type: none"> • To see the Morphological features and Immuno-histochemical findings of Lymphoma | Hem-S2-Path-22 Practical Approach towards lymphoma | Practical | OSPE & OSVE |
| Clinical lectures | | | | |

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| 36 | Discuss approach to a patient with lymphadenopathy with or without Splenomegaly | Hem-S2-Med-2 Approach to patient with lymphadenopathy with or without splenomegaly | Interactive Lecture | |
| 37 | Discuss approach to Lymphedema | Hem-S2-Med-3 Lymphedema | SBQs & OSVE | |

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| 38 | Discuss approach to Disorders of Spleen & Splenectomy | Hem-S2-Surg-2 Disorders of Spleen & Splenectomy | | |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> • To define Family • To discuss various types of Families • To discuss the social evils and its consequences on Health | Hem2-S2-CM-4 Types of Families, Social evils including Juvenile delinquency | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| | <ul style="list-style-type: none"> • Discuss Mode of Poisoning, Sign & Symptoms, Fatal Dose & fatal period, Management, Postmortem Appearances & Medicolegal importance of Aluminum Phosphide | Hem2-S2-FM-3 Aluminium Phosphide | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> • Discuss Introduction, source, mode of action, S/S, fatal dose, fatal period and management of Amphetamine, • Discuss Postmortem appearance | Hem2-S2-FM-4 Amphetamine | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> • Enlist the other names of Naphthalene • Discuss routes of transmission of Naphthalene in body • Describe the clinical features, fatal dose and fatal period & management of Naphthalene toxicity. • Enlist the uses of Naphthalene. • Describe Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to cyanides. • Discuss medicolegal importance | Hem2-S2-FM-5 Naphthalene & Cyanides | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> • Define Paraphenylenediamine poisoning • Explain clinical features, laboratory findings and outcomes of PPD poisoning. • Discuss post mortem findings & Medicolegal importance of Kala pathar. | Hem2-S2-FM-6 Paraphenylenediamine (Kala Pathar) | Interactive Lecture | MCQs & OSPE |

Theme 5: Hematological Malignancies

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | Assessment |
|------------------|--|---|---------------------|-------------|
| Pathology | | | | |
| 39 | <ul style="list-style-type: none"> • Overview & classification of acute leukemias • Describe the pathogenesis, clinical features and laboratory diagnosis of Acute Myeloid leukemia. | Hem-S2-Path-23 Acute Myeloid leukemia | Interactive Lecture | SBQs & OSVE |
| 40 | <ul style="list-style-type: none"> • Describe the pathogenesis, clinical features and laboratory diagnosis of Acute Lymphoblastic leukemia. | Hem-S2-Path-24 Acute Lymphoblastic Leukemia | | |

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| 41 | <ul style="list-style-type: none"> The classification of Myeloproliferative disorders Discuss the pathogenesis, clinical features and laboratory diagnosis of Chronic myeloid Leukemia. | Hem-S2-Path-25 Myeloproliferative disorders | | |
| 42 | <ul style="list-style-type: none"> Morphological features of acute & chronic leukemia. | Hem-S2-Path-26 Laboratory diagnosis of Acute & Chronic leukemia | Practical | OSPE & OSVE |
| Medicine | | | | |
| 43 | Describe the clinical features, laboratory investigations of acute & chronic leukemia. | Hem-S2-Med-4 Approach to patient with Acute & Chronic leukemia | Interactive Lecture | SBQs & OSVE |

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| Community Medicine | | | | |
| <ul style="list-style-type: none"> Types of snakes according to toxin production: hemolytic toxins, musculotoxins and neuro-toxin Differentiate between signs and symptoms of different snake-bites Discuss preventive measures against snake bites. | Hem2-S2-CM-5 Snake bite | Interactive Lecture | | MCQs & OSPE |

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| Forensic Medicine | | | | |
| <ul style="list-style-type: none"> Discuss Diagnosis, Clinical features & Management of a snake bite Discuss PM appearance and ML importance | Hem2-S2-FM-3 Animal Poison(s) (Snake Bites) | Interactive Lecture | | MCQs & OSPE |
| <ul style="list-style-type: none"> Describe Physio-chemical changes in various body tissues and organs under various environmental conditions, such as changes in muscular system after death. Describe Changes in the blood, CSF, Vitreous humor & Bone marrow | Hem2-S2-FM-4 Changes of Death Death Changes in Blood, CSF, Vitreous Humour & Bone Marrow | Interactive Lecture | | MCQs & OSPE |
| Theme 6: Immunological Disorders | | | | |
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 44 | <ul style="list-style-type: none"> Define hypersensitivity reaction Describe Pathogenesis of four types of hypersensitivity reactions with examples. | Hem-S2-Path-27 Hypersensitivity Reactions | | |

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| 45 | <ul style="list-style-type: none"> Discuss immunodeficiency and its causes and clinical features. | Hem-S2-Path-28 Immunodeficiency disorders | | |
| 46 | <ul style="list-style-type: none"> Discuss tolerance. Define Autoimmune disorders Describe etiology, Pathogenesis and clinical features of autoimmune disorders. | Hem-S2-Path-29 Autoimmune Disorders | | |
| 47 | <ul style="list-style-type: none"> Definition of Transplantation Types of transplantation Sources of bone marrow transplantation Define Rejection & mechanism Of different types of rejections. | Hem-S2-Path-30 Transplantation & Rejection | Interactive Lecture | SBQs & OSVE |
| 48 | <ul style="list-style-type: none"> Define hemo flagellates. Enumerate the medically important species of Leishmania & Trypanosoma. Describe vector, life cycle, pathogenesis clinical manifestation and lab diagnosis Of Leishmaniasis & Trypanosomiasis. | Hem-S2-Micb-3 Trypanosoma & Leishmania | | |
| 49 | <ul style="list-style-type: none"> Discuss the immunoassay techniques | Hem-S2-Path-31 Immunoassay technique | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 50 | <ul style="list-style-type: none"> Classify Antihistamine agents. Describe the Mechanism of Action, Indications, Adverse Effects And Drug Interactions of Antihistamines | Hem-S2-Pharm-9 Anti-Histamine | Interactive Lecture | SBQs & OSVE |
| Clinical Lecture | | | | |
| 51 | <ul style="list-style-type: none"> Describe the clinical features, laboratory investigations of autoimmune disorders | Hem-S2-Med-5 Approach to patient with Autoimmune disorders | Interactive Lecture | SBQs & OSVE |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> To define radiation and its hazards To describe the relative hazards to humans when exposed to alpha, beta and gamma rays To discuss the preventive measures of radiation hazard | Hem2-S2-CM-6 Radiation Hazards | Interactive Lecture | MCQs & OSPE |
| • Forensic Medicine | | | | |

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| | <ul style="list-style-type: none"> • Discuss Internal examination of Cranial, thoracic and abdominal cavities & • Dissection of viscera' | Hem2-S2-FM- Internal Examinations of Dead body | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> • Explain the exhumation procedure • Explain the preservation of viscera for Chemical and Histo pathological examination • Explain Preservatives used in mortuary | Hem2-S2-FM- Exhumation | Interactive Lecture | MCQs & OSPE |

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 respiratory 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.
- 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 TEACHINGSTRATEGIES | | | | |
|--|--|--|---------------------|-------------|
| Theme 1: Lung Injury, Edema, Collapse & Obstructive Pulmonary Diseases | | | | |
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 1 | <ul style="list-style-type: none"> • Types & causes of Atelectasis • Types & causes of pulmonary edema • Define acute lung injury • Describe the causes of ARDS • Discuss the characteristic features, morphology and pathogenesis of ARDS • Describe its consequences and clinical course | RESP-S2-Path-1 Pulmonary Edema, ARDS & Atelectasis | | |
| 2 | <ul style="list-style-type: none"> • Define Obstructive lung disease (OPD) • Classify types of OPD • Describe etiologypathogenesis & clinical features of chronic bronchitis + emphysema | RESP-S2-Path-2 Obstructive lung diseases-I | Interactive Lecture | SBQs & OSVE |
| 3 | <ul style="list-style-type: none"> • Describe categories of Asthma • Explain pathogenesis • Discuss the immunological mechanisms of bronchial asthma and its triggering factors -Gross features & morphological Features • Define BRONCHIECTASIS • Describe its causes, Pathogenesis and Gross & morphological features | RESP-S2-Path-3 Obstructive lung diseases- II | | |
| | <ul style="list-style-type: none"> • Describe major categories • Explain the pathogenesis, morphology and clinical course of its important types | RESP-S2-Path-4 Restrictive lung diseases Chronic | | |

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| 4 | <ul style="list-style-type: none"> • Idiopathic pulmonary fibrosis • Non-specific Interstitial • Pneumonia • Cryptogenic organizing • Pneumonia | diffuse interstitial lung diseases | | |
| 5 | <ul style="list-style-type: none"> • Describe the microscopic features | RESP-S2-Path-5 Pleural fluid for DR | Practical | OSPE & OSVE |

| Pharmacology | | | | |
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| 06 | <ul style="list-style-type: none"> • Classify the drugs used in Asthma and COPD. • Describe the mechanism of action, side effects of beta-2 • receptor Agonists, Phosphodiesterase inhibitors Leukotrienes Pathway Inhibitors and <ul style="list-style-type: none"> • Discuss the role of corticosteroids in asthma. | RESP-S2-Pharm-1 Drugs used in Asthma and COPD | Interactive Lecture | SBQs & OSVE |

| Community Medicine | | | | |
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| 07 | <ul style="list-style-type: none"> • To define occupational health. • To discuss the occupational health hazard • To discuss the occupational health services in Pakistan • To describe the legislation of occupational health in Pakistan. | RESP-S2-CM-1 Introduction to occupational health and safety | Interactive Lecture | MCQs & OSPE |

| Forensic Medicine | | | | |
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| • | <ul style="list-style-type: none"> • Discuss etiology, pathophysiology of asphyxia & stages of asphyxia. • Describe Hanging, types of hanging • Describe postmortem findings of hanging & Throttling | RESP-S2-FM-1 Asphyxia-1 (Intro, Hanging & Throttling) | Interactive Lecture | SBQs & OSVE |
| • | <ul style="list-style-type: none"> • Describe death from asphyxia and postmortem appearance of Suffocation, Smothering, choking & Strangulation | RESP-S2-FM-2 (Suffocation, Smothering, Choking & Strangulation) | Interactive Lecture | SBQs & OSVE |
| • | <ul style="list-style-type: none"> • Define Drowning, its types • Discuss Mechanism of drowning • Describe Causes of death in drowning • Discuss Postmortem finding of drowning • Define Diatoms and their medico legal significance | RESP-S2-FM-3 Drowning | Interactive Lecture | SBQs & OSVE |

Theme 2: Chronic Diffuse Interstitial/ Restrictive Lung Diseases

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|---------------------------|---|--|---------------------|-------------|
| Pathology | | | | |
| 7 | <ul style="list-style-type: none"> • Describe major categories • Explain the etiology, pathogenesis, gross, histological features of its important types like Coal worker, Pneumoconiosis Silicosis. Asbestos-related diseases | RESP-S2-Path-6 Chronic diffuse interstitial lung diseases II- Pneumoconiosis | | |
| 8 | <ul style="list-style-type: none"> • Explain the etiology, pathogenesis, gross, histological features of • Sarcoidosis • Hypersensitivity Pneumonitis • Pulmonary Eosinophilia | RESP-S2-Path-7 Chronic diffuse interstitial lung diseases III: Granulomatous Diseases | | |
| 9 | <ul style="list-style-type: none"> • Smoking-related • Desquamative Interstitial Pneumonia • PAP (Pulmonary Alveolar Proteinosis) • Respiratory bronchiolitis-associated ILD | RESP-S2-Path-8 Chronic diffuse interstitial lung diseases IV & smoking- related | Interactive Lecture | SBQs & OSVE |
| 10 | <ul style="list-style-type: none"> • Explain the etiology, Pathogenesis & histological features of - Pulmonary Thromboembolism, HTN Good pasture syndrome | RESP-S2-Path-9 Pulmonary Thromboembolism, HTN & important Hemorrhagic Syndromes | Interactive Lecture | SBQs & OSVE |
| 11 | <ul style="list-style-type: none"> • Explain the etiology, Pathogenesis and Clinical features of Pleural effusion Pneumothorax • Explain the etiology, Pathogenesis and microscopic features of • Benign Tumors Solitary fibrous tumor • Malignant Tumors • Mesothelioma | RESP-S2-Path-10 Pleural diseases | | |
| 12 | <ul style="list-style-type: none"> • Describe histopathological features | RESP-S2-Path-11 Inflammatory diseases of lung | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 13 | <p>To get rid of the infection and prevent complications</p> | RESP-S2-Pharm-2 Drugs used in the treatment of Pneumonia | Interactive Lecture | SBQs & OSVE |
| Community Medicine | | | | |

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| 14 | <ul style="list-style-type: none"> • To discuss the agriculture health hazards • To define pneumoconiosis • To differentiate the types of pneumoconiosis on basis of dust • To discuss the preventative and control measures of pneumoconiosis. | RESP-S2-CM-2 Occupational health hazards in agricultural workers | Interactive Lecture | MCQs & OSPE |
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Theme 3: Vascular, Infectious & Pleural Diseases

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
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| Pathology | | | | |
| 14 | <ul style="list-style-type: none"> • Explain the pathogenesis of granuloma formation • Describe the five different clinical patterns of tuberculosis • Define primary and secondary tuberculosis • Describe lab diagnosis and complications | RESP-S2-Path-12 Tuberculosis | | |
| 15 | <ul style="list-style-type: none"> • Explain the etiology, Pathogenesis and Clinical features of • Pleural effusion • Pneumothorax • Explain the etiology, Pathogenesis and Microscopic features of • Benign Tumors <ul style="list-style-type: none"> □ Solitary fibrous tumor • Malignant Tumors <ul style="list-style-type: none"> □ Mesothelioma | RESP-S2-Path-13 Pleural diseases | Interactive Lecture | SBQs & OSVE |
| Microbiology | | | | |
| 16 | <ul style="list-style-type: none"> • Classify the medically important mycobacteria. • Describe the important properties, virulence factors pathogenesis, clinical findings and lab diagnosis | RESP-S2-Micb-1 Mycobacterium tuberculosis & laprae (Microbiology) | Interactive Lecture | SBQs & OSVE |
| 17 | <ul style="list-style-type: none"> • Classify the gram-negative rods related to the Respiratory tract. • Describe the important properties, pathogenesis, clinical findings and lab diagnosis of <i>Hemophilus influenzae</i> & <i>Bordetella pertussis</i> | RESP-S2-Micb-2 <i>Hemophilus influenzae</i> & <i>Bordetella pertussis</i> (Microbiology) | | |
| 18 | <ul style="list-style-type: none"> • Describe the clinical & microscopic features. | RESP-S2-Path-14 Obstructive diseases of the lung | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 19 | | RESP-S2-Pharm-2 Drugs used in the treatment of Tuberculosis | Interactive Lecture | SBQs & OSVE |

Community Medicine

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| 20 | <ul style="list-style-type: none"> • To discuss the industrial health hazards. • To define lead poisoning • To discuss the preventive and control measures of lead poisoning | RESP-S2-CM-3 Occupational health hazards in industrial workers. Lead poisoning | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> • To discuss the problem statement of Whooping Cough • To understand the epidemiology of Whooping Cough • To define Whooping Cough and describe the mode of transmission of Whooping Cough • To discuss the preventive and control measures of Whooping Cough | RESP-S2-CM-4 Epidemiology & control measure of Whooping Cough | Interactive Lecture | MCQs & OSPE |
| • Forensic Medicine | | | | |
| 20 | <ul style="list-style-type: none"> • Discuss the mode of action. • Describe common uses of organophosphorus. • Discuss the clinical feature & evaluation of a patient with suspected organophosphorus toxicity. • Explain management of organophosphorus poisoning & medicolegal importance of it. • Discuss postmortem appearance and medicolegal importance. | RESP-S2-FM-3 Organophosphorus Poisoning | Interactive Lecture | MCQs & OSPE |

Theme 4: Lung Tumors

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|--------------------|--|---|---------------------|-------------|
| Pathology | | | | |
| 20 | <ul style="list-style-type: none"> • Explain histological features of <ul style="list-style-type: none"> - Squamous dysplasia & Carcinoma in situ • Atypical adenomatous hyperplasia • Adenocarcinoma in situ • Diffuse idiopathic pulmonary neuroendocrine cell hyperplasia (DIPNECH) | RESP-S2-Path-15 Tumours of Lung-I | Interactive Lecture | SBQs & OSVE |
| 21 | <ul style="list-style-type: none"> • Explain the etiology, pathogenesis, gross, histological features of Squamous cell carcinoma, Adenocarcinoma, Neuroendocrine carcinomas | RESP-S2-Path-16 Tumours of Lung-II | | |
| 22 | <ul style="list-style-type: none"> • Morphological features & immunohistochemistry | RESP-S2-Path-17 Tumours of the lung | Practical | OSPE & OSVE |
| Community Medicine | | | | |

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| 23 | <ul style="list-style-type: none"> To discuss the medical methods of prevention of occupational hazards. To discuss the engineering methods of prevention of occupational hazards | RESP-S2-CM-5 Preventive measures of occupational health hazards | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| 24 | <ul style="list-style-type: none"> Define Properties, Common sources, common features for absorption, Clinical Features, methods for the detection of Carbon Monoxide & its management. Discuss Postmortem changes & Medicolegal aspects of Carbon Monoxide Poisoning | RESP-S2-FM-Carbon Monoxide | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> Define fumigants Enlist most common fumigants. Discuss procedure of fumigation. Describe types of fumigation methods. Discuss factors affecting fumigation efficacy. Discuss the advantages and disadvantages of fumigation | RESP-S2-FM-Fumigants | Interactive Lecture | MCQs & OSPE |

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

| Theme 2: Atherosclerosis | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |

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

| Theme 3: Myocardial Diseases | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 11 | <ul style="list-style-type: none"> Define Cardiomyopathy and classify it. Describe the pathogenesis, patterns, morphological changes, clinical features, and complications of various cardiomyopathies. | CVS-S2-Path-6 Cardiomyopathies | Interactive Lecture | SBQs & OSVE |

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| 12 | <ul style="list-style-type: none"> Define valvular stenosis and insufficiency. Describe the causes of the major valvular lesions. Describe the natural history of | CVS-S2-Path-7 Valvular Heart Disease and Rheumatic Heart Disease | | |
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| | <p>Rheumatic Fever.</p> <ul style="list-style-type: none"> Describe Calcific Valvular Degeneration and characterize it. Discuss the morphology and clinical features. | | | |
| Pharmacology | | | | |
| 13 | <ul style="list-style-type: none"> List the major classes of anti-arrhythmic drugs based on their mechanism of action. Describe the clinical use, drug interactions, and adverse effects of anti-arrhythmic drugs. | CVS-S2-Pharm-6 Drugs used to treat Cardiac Arrhythmias (anti-arrhythmic drugs) | | |
| 14 | <ul style="list-style-type: none"> Classify the major classes of drugs used to treat congestive cardiac failure based on their mechanism of action. Describe the pharmacokinetics, mechanism of action, indications, and adverse effects of drugs used in acute and chronic heart failure. Describe the clinical use, drug interactions, and adverse effects of drugs used in CCF. | CVS-S2-Pharm-7 Drugs used to treat Congestive Cardiac Failure (CCF) | Interactive Lecture | SBQs & OSVE |
| Clinical Lecture | | | | |
| 15 | <ul style="list-style-type: none"> Describe the signs and symptoms of RF and RHD Describe the drugs used to treat RHD and their adverse effects | CVS-S2-Cardio-1 Rheumatic Fever and Rheumatic Heart Disease (RHD) | | |
| 16 | <ul style="list-style-type: none"> Describe the signs and symptoms of pericarditis, myocarditis, and infective endocarditis. Describe the treatment of pericarditis, myocarditis, and infective endocarditis. | CVS-S2-Cardio-2 Cardiac inflammation | Interactive Lecture | SBQs & OSVE |

| Theme 4: Diseases of Vessels | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 17 | <ul style="list-style-type: none"> Define vasculitis and classify primary forms. Describe causes and mechanisms. Describe the typically involved vascular sites. Describe the following and characterize them: Giant Cell (Temporal) Arteritis, Thromboangiitis Obliterans (Buerger Disease) | CVS-S2-Path-8 Vasculitis | Interactive Lecture | SBQs & OSVE |
| 18 | <ul style="list-style-type: none"> Describe varicose veins and their clinical features. | CVS-S2-Path-9 Diseases of Veins and Lymphatics | | |
| 19 | <ul style="list-style-type: none"> Differentiate between Thrombophlebitis and Phlebothrombosis based on pathogenesis and clinical features. Describe Lymphangitis and Lymphedema. | | | |

Forensic medicine

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| | <ul style="list-style-type: none"> • Define Ballistics, types of ballistics • Discuss Parts of a firearm weapon • Describe Cartridges of different firearms and types of projectiles i.e., pellets, bullets | CVS-S2-FM-1 Firearm/Ballistics-1 | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Define Types of gun powder • Discuss Mechanism of fire in firearm weapons | CVS-S2-FM-2 Firearm/Ballistics-2 | Interactive Lecture | SBQs & OSVE |

| Theme 5: Pericardial and Endocardial Diseases, and Cardiac Tumors | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 20 | <ul style="list-style-type: none"> • Classify vascular tumors and tumor-like conditions. • Describe the pathogenesis, morphology, and clinical characteristics of the following: <ul style="list-style-type: none"> • Hemangiomas • Lymphangiomas • Intermediate-Grade (Borderline) Tumors • Malignant Tumors | CVS-S2-Path-10 Vascular Tumors | Interactive Lecture | SBQs & OSVE |
| 21 | <ul style="list-style-type: none"> • Describe the pathogenesis, morphology, and clinical characteristics of IE, Pericarditis, and cardiac tumors. | CVS-S2-Path-11 Infective Endocarditis (IE), Pericarditis, and Tumors of the Heart | Interactive Lecture | SBQs & OSVE |
| 22 | <ul style="list-style-type: none"> • Interpret the gross and microscopic features of the following on given histopathology report: | CVS-S2-Path-12 Hemangiomas Cardiac Myxoma | Practical | OSPE & OSVE |
| Forensic Medicine | | | | |
| | <ul style="list-style-type: none"> ○ Describe chest injuries, including traumatic asphyxia, injuries to ribs, lungs, heart, with special emphasis on penetrating injuries and Commotio Cordis. ○ Describe Abdominal injuries with medico-legal aspects of rupture of liver, spleen, Injuries of Chest & Abdomen, injuries to the abdominal aorta and intestines ○ Define Pelvic injuries & its medico legal significance. | CVS-S2-FM-3 Injuries Chest & Abdomen | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Discuss Characteristic features of wound of entry and exit of firearm • Describe the estimation of the distance of the fire | CVS-S2-FM-4 Firearm Injuries-1 | Interactive Lecture | SBQs & OSVE |

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| | <ul style="list-style-type: none"> • Discuss Fabricated firearm injuries • Discuss Postmortem findings in cases of firearm injuries | CVS-S2-FM-5 Firearm Injuries-2 | Interactive Lecture | SBQs & OSVE |
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GASTROINTESTINAL TRACT MODULE II

Introduction

Welcome to the GIT and Liver module. This exciting module will serve as a 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 interactive 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 the 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 the liver, Inflammatory Diseases and Tumors of Gall Bladder. All these diseases are very common in clinical practice and will help understand 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 their 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 on pathology related to the digestive and biliary system.

Learning Outcomes

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

1. Relate understanding of the pathological processes related to the gastrointestinal tract & Liver.
2. Comprehend the public health importance of Nutrition.
3. Understand the nutritional requirement for different ages and gender.

Duration: 04 weeks

Themes

- Theme 1: Disease of the oral cavity and esophagus
- Theme-2: Disease of the 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 the 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 |
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| | | Pathology | | |

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| 1 | <ul style="list-style-type: none"> Define leukoplakia and erythroplakia. Describe ulcer of the oral cavity and define dental caries, fungal infection and inflammatory condition of the oral cavity. Name the malignant tumors of oral mucosa & describe their etiopathology, morphology, and clinical features. | GIL-S2-Path-1 Ulcer/ inflammatory lesion and cancer of oral cavity | Interactive Lecture | BQs & OSVE |
| 2 | <ul style="list-style-type: none"> Mention the cause of sialadenitis, clinical features, and morphology. Name benign and malignant tumors of the salivary gland. Describe etiopathology, morphology, and clinical features. | GIL-S2-Path-2 Disease of salivary gland inflammation and tumor | | |
| 3 | <ul style="list-style-type: none"> Define achalasia, mention its causes and morphology. Describe causes of Hernia Describe pathogenesis, clinical features of GERD Mention causes of dysphagia. | GIL-S2-Path-3 Motor disorders. Esophageal varices, an inflammatory condition, and gastroesophageal reflux | | |
| 4 | <ul style="list-style-type: none"> Name benign and malignant tumors of esophagus. Describe etiopathology, clinical features and morphology of carcinoma of the esophagus. | GIL-S2-Path-4 Tumors of the esophagus | | |

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| 5 | <ul style="list-style-type: none"> Demonstrate Gross and microscopic features of oral cavity carcinoma, salivary gland tumor and carcinoma esophagus. | GIL-S2-Path-5 Gross and microscopic features of oral cavity carcinoma, salivary gland tumor, and carcinoma esophagus. | Practical | OSPE & OSVE |
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Clinical Lectures

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| 7 | <ul style="list-style-type: none"> Discuss Gastroesophageal reflux, esophagitis, Barrett's esophagus, and hiatal hernia | GIL-S2-Med-1 Gastroesophageal reflux, esophagitis, Barrett's esophagus and hiatal hernia | Interactive Lecture | SBQs & OSVE |
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| | Discuss Surgical causes, presentation and management of hematemesis, dysphagia and carcinoma esophagus | GIL-S2-Surg-1 Surgical causes, presentation, and management of hematemesis, dysphagia, and carcinoma esophagus | Interactive Lecture | SBQs & OSVE |
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Community Medicine

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| 9 | <ul style="list-style-type: none"> To define water purification To learn the methods of water purification To understand the best method in different situations | GIL-S2-CM-1 Methods of purification of water | Interactive Lecture | MCQs & OSPE |
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| | <ul style="list-style-type: none"> • To describe the advantages and disadvantages of each method | | | |
| Forensic Medicine | | | | |
| 10 | <ul style="list-style-type: none"> • Define Corrosive & classify. • Discuss mode of action, signs & symptoms, effects on different parts of body, different test and its management. • Discuss postmortem appearance(s) and medicolegal importance. • Define vitriolage and discuss its features, effect & punishment | GIL-S2-FM-1 Corrosive Poisoning (Oxalic Acid, Carbolic Acid [Phenol], Sulphuric Acid & Hydrochloric Acid) | Interactive Lecture | MCQs & OSPE |

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

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| 14 | <ul style="list-style-type: none"> Surgical management in Acid peptic disease and carcinoma of stomach. | GIL-S2-Surg-2 Surgical management in Acid peptic disease & carcinoma of stomach. | | |
| Community Medicine | | | | |
| 15 | <ul style="list-style-type: none"> To define WHO criteria for purification of water To learn about different pathogens causing water pollution as per WHO criteria To Discuss water surveillance To describe the physical, chemical, biological and bacteriological quality of water | GIL-S2-CM-2 World Health Organization (WHO) criteria for purification of water | Interactive Lecture | MCQs & OSPE |

• Forensic Medicine

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| 10 | <ul style="list-style-type: none"> Define food poisoning Differentiate b/w food infection and food intoxication Enlist the bacteria causing food poisoning Discuss S/S, Diagnosis & Mgt of food poisoning Describe the measure how to prevent food poisoning | GIL-S2-FM-2 Food Poisoning | Interactive Lecture | MCQs & OSPE |
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| Theme 3: Diarrheal Diseases and Malabsorption Syndromes | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 15 | <ul style="list-style-type: none"> Name various cases of enterocolitis. Mention various causes of diarrhea and dysentery (Microbiology). Describe clinical features. Mention etiopathogenesis and clinical features. | GIL-S2-Path-9 Enterocolitis and ischemic colitis, Hemorrhoids | | |
| 16 | <ul style="list-style-type: none"> Define malabsorption and name various causes. Describe clinical features, etiopathology, morphology and diagnosis of coeliac disease. | GIL-S2-Path-10 Malabsorption syndrome (Coeliac disease) | Interactive Lecture | SBQs & OSVE |
| 17 | <ul style="list-style-type: none"> Name inflammatory bowel disease. Describe etiopathology, clinical features, and morphological features of Crohn's disease and ulcerative colitis. | GIL-S2-Path-11 Inflammatory bowel diseases | | |
| 18 | <ul style="list-style-type: none"> Describe various microbial agents causing diarrhea and dysentery and mention their lab diagnosis. | GIL-S2-Path-12 Various microbial agents causing diarrhea and dysentery, and mention their lab diagnosis. | Practical | SBQs & OSVE |

| Pharmacology | | | | |
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| 19 | Describe Anti-Diarrheal Drugs | GIL-S2-Pharm-3 Anti-Diarrheal Drugs | Interactive Lecture | SBQs & OSVE |
| Clinical lecture | | | | |
| 20 | Explain Causes and, clinical presentation and management of malabsorption syndrome / Coeliac disease. Irritable bowel syndrome. | GIL-S2-Med-3 Causes and clinical presentation and management of malabsorption syndrome / Coeliac disease. Irritable bowel syndrome. | | |
| 21 | Discuss Clinical presentation and surgical management of inflammatory bowel disease. | GIL-S2-Surg-3 Clinical presentation and surgical management of inflammatory bowel disease. | Interactive Lecture | SBQs & OSVE |
| 22 | Discuss causes and clinical presentation and management of acute diarrhea. | GIL-S2-Paeds-1 Causes and clinical presentation and management of acute diarrhea. | | |
| Community Medicine | | | | |
| 23 | <ul style="list-style-type: none"> ② To learn about hydrological cycle <ul style="list-style-type: none"> • To define water pollution • To understand sources of water pollution and types | GIL-S2-CM-3 Hydrological cycle & sources of water pollution | Interactive Lecture | MCQs & OSPE |

| Theme 4: Intestinal Disorders | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 23 | <ul style="list-style-type: none"> • Mention various causes of intussusception, hernias and adhesions. • Discuss etio-pathogenesis, clinical features and morphology of Hirschsprung disease. | GIL-S2-Path-13 Intestinal obstruction | | |
| 24 | <ul style="list-style-type: none"> • Define acute appendicitis. • Describe causes, clinical features and morphology of acute appendicitis. • Mention clinical features and morphology of Meckel's diverticulitis. • Define diverticulosis, describe etiopathology, and morphology. | GIL-S2-Path-14 Inflammatory condition of abdomen | Interactive Lecture | SBQs & OSVE |
| | • Name benign polypoidal lesion of intestine. | GIL-S2-Path-15 | | |

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| 25 | <ul style="list-style-type: none"> Describe etiopathology, clinical features and morphology of benign polyp. Define familial adenomatous polyposis syndrome. Describe etiopathology and morphology of FAP syndrome. | Benign tumors of small intestine and large intestine-1 | | |
| 26 | <ul style="list-style-type: none"> Name malignant tumor of large intestine. Describe etiopathology, clinical features and morphological features. | GIL-S2-Path-16 Malignant tumors of small intestine and large intestine-2 | | |
| 27 | <ul style="list-style-type: none"> Describe gross and microscopic features of benign and malignant tumors of intestine. | GIL-S2-Path-17 Benign and malignant tumors of intestine. | Practical | OSPE & OSVE |

| Pharmacology | | | | |
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| 28 | <ul style="list-style-type: none"> Describe drugs used in constipation. Explain management of diarrhea and inflammatory bowel syndrome. | GIL-S2-Pharm-4 Drugs used for constipation. | Interactive Lecture | SBQs & OSVE |
| Clinical Lecture | | | | |
| 29 | <ul style="list-style-type: none"> Discuss causes and management of intestinal obstruction | GIL-S2-Surg-4 Causes and management of intestinal obstruction. | Interactive Lecture | SBQs & OSVE |
| Community Medicine | | | | |
| 30 | <ul style="list-style-type: none"> To describe different types of health hazards arising from consuming polluted water To understand various water borne diseases caused due to consuming polluted water | GIL-S2-CM-4 Health Hazards arising from consuming polluted water; water borne disease | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> To discuss the problem statement of typhoid fever To define typhoid fever To understand the epidemiology of typhoid fever To discuss the preventive and control measures of Typhoid fever | GIL-S2-CM-5 Epidemiology & control measure of Typhoid | Interactive Lecture | MCQs & OSPE |

| Theme 5: Jaundice & Cholestasis | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 30 | <p>Describe</p> <ul style="list-style-type: none"> Bile Formation and Secretion Pathophysiology of Hyperbilirubinemia Explain etiology & clinical diagnosis of Pre-Hepatic Jaundice Hepatic Jaundice Post-Hepatic Jaundice | GIL-S2-Path-18 Jaundice and cholestasis | | |

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| | <ul style="list-style-type: none"> • Hereditary Hyperbilirubinemia • Gilbert's syndrome • Crigler–Najjar syndrome type I &II • Dubin-Johnson syndrome (DJS) • Rotor's syndrome (DJS) | | Interactive Lecture | SBQs & OSVE |
| 31 | <p>Explain etiology, pathogenesis & clinical features & Diagnostic criteria of</p> <ul style="list-style-type: none"> • Type I Autoimmune liver diseases • Type II Autoimmune liver diseases • Primary Biliary Cholangitis (PBC) • Primary Sclerosing Cholangitis (PSC) | GIL-S2-Path-19 Autoimmune liver diseases & Cholangiopathies | | |

| Community Medicine | | | | |
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| 32 | <ul style="list-style-type: none"> • To describe rapid and slow sand filters • To understand the role of rapid and slow sand filtration in water purification | GIL-S2-CM-6 Slow sand & rapid sand filters | Interactive Lecture | MCQs & OSPE |
| | <ul style="list-style-type: none"> • To discuss the problem statement of amoebiasis • To Know public health importance of Amoebiasis • To discuss the Important factors of Agent/Host/Environment responsible for occurrence of amoebiasis • To discuss the preventive and control measures of amoebiasis | GIL-S2-CM-7 Epidemiology and control measure of Amoebiasis | Interactive Lecture | MCQs & OSPE |

| Theme 6: Metabolic & Drug/Toxin Related Liver Diseases | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 32 | <p>Explain etiology, pathogenesis & clinical features & Diagnostic criteria of</p> <ul style="list-style-type: none"> • Hemochromatosis • Wilson Disease • α_1-Antitrypsin Deficiency | GIL-S2-Path-20 Metabolic Liver Diseases-1 | Interactive Lecture | SBQs & OSVE |
| 33 | <p>Explain etiology, pathogenesis & clinical features & Diagnostic criteria of Alcoholic Liver Disease, Non-alcoholic Fatty liver</p> | GIL-S2-Path-21 Drug- and Toxin-Induced Liver Injury & Fatty Liver Disease | | |
| | Community Medicine | | | |

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| 34 | <ul style="list-style-type: none"> Define a balanced diet Understand the importance of a balanced diet Explain the food pyramid Describe the different focus groups in a balanced diet Enumerate the routine dietary requirements and nutritional values at different age groups | <ul style="list-style-type: none"> S2-CM-8 Balanced Diet and Nutritional status assessment | Interactive Lecture MCQs & OSPE | MCQs & OSPE |
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Forensic Medicine

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| | <ul style="list-style-type: none"> Define alcohol & its metabolism Discuss acute & chronic alcohol poisoning Discuss diagnostic methods of alcohol poisoning, sample collection for examination and management. Discuss postmortem appearances and medicolegal importance's. | GIL-S2-FM-3 Alcohol and Its Poisoning | Interactive Lecture | MCQs & OSPE |
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Theme 7: Cirrhosis

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

Community Medicine

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| 35 | <ul style="list-style-type: none"> Describe micro and macronutrient components. Comprehend the importance of micro and macro nutrient | GIL-S2-CM-9 Micro and macro nutritional Deficiencies And | Interactive Lecture | MCQs & OSPE |
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| | <p>components.</p> <ul style="list-style-type: none"> • Enumerate the different factors of micro and macronutrient deficiencies. • Describe the burden of micro and macronutrient deficiency in Pakistan. • Describe the malnutrition • Classify the types of malnutrition among children under and over 5 years. • Discriminate between the risk factors responsible for malnutrition among | <p>Malnutrition in under and over five years age children</p> | | |
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| Theme 8: Tumors of Liver and Gall Bladder | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 40 | <ul style="list-style-type: none"> • Describe Etiology, pathogenesis, gross & histologic Features of Focal Nodular Hyperplasia, cavernous Hemangioma Hepatocellular Adenoma Hepatoblastoma Hepatocellular Carcinoma Malignant Biliary Tumors | <p>GIL-S2-Path-24 Tumors of the liver</p> | Interactive Lecture | SBQs & OSVE |
| 41 | <ul style="list-style-type: none"> • State congenital anomalies etiology, pathogenesis, gross & histologic Features of • Cholelithiasis (Gallstones) • Acute & Chronic Cholecystitis • Gall bladder Carcinoma | <p>GIL-S2-Path-25 Diseases & Tumors of gall bladder</p> | | |
| 42 | <ul style="list-style-type: none"> • Demonstrate gross and microscopic features of hepatocellular carcinoma and carcinoma gall bladder | <p>GIL-S2-Path-26 Ca liver and Gall Bladder</p> | Practical | SBQs & OSVE |
| Clinical Lecture | | | | |
| 43 | Describe Cirrhosis, partial hypertension, variceal bleeding, medical and endoscopic management. | <p>GIL-S2-Med-6 Cirrhosis, partial hypertension, variceal bleeding, medical and endoscopic management.</p> | | |
| 44 | Describe Ascites, Hepatic encephalopathy, and hepatorenal syndrome | <p>GIL-S2-Med-7 Ascites, Hepatic encephalopathy, and</p> | Interactive Lecture | SBQs & OSVE |

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| | | hepato-renal syndrome | | |
| 45 | Describe the clinical presentation and management of cholelithiasis | GIL-S2-Surg-6 Clinical presentation and management of cholelithiasis | | |
| Community Medicine | | | | |
| 46 | <ul style="list-style-type: none"> Define food preservation, fortification, and adulteration. Describe the public health importance of food preservation and fortification. Discriminate between food adulteration and fortification. Define food poisoning Describe what causes food poisoning Explain the effects of food poisoning | GIL-S2-CM-10 Food preservation, fortification and adulteration/ Food Poisoning | Interactive Lecture | MCQs & OSPE |

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 3rd 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 the Pituitary Gland
 Theme 2: Non-neoplastic & neoplastic diseases of Thyroid & Parathyroid
 Theme 3: Non-neoplastic & neoplastic diseases of the 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 |
| Pathology | | | | |
| 1 | <ul style="list-style-type: none"> • Describe clinical manifestations of Anterior Pituitary gland disorders & Syndromes • Describe the pathophysiology and Histologic features of <ul style="list-style-type: none"> i. Lactotroph Adenoma ii. Somatotroph Adenoma iii. Corticotroph Adenoma iv. Other Anterior Pituitary Tumors • Explain histologic features of Hypothalamic Suprasellar Tumors | End-S2-Path-1 Disorders and neoplasms of Pituitary gland. | Interactive Lecture | SBQs & OSVE |
| Pharmacology | | | | |
| 2 | <ul style="list-style-type: none"> • Discuss the pharmacology of anterior pituitary growth hormone (Somatotropin) | End-S2 Pharm-1 Anterior pituitary hormones | Interactive Lecture | SBQs & OSVE |
| Clinical Lecture | | | | |
| 3 | <ul style="list-style-type: none"> • Describe clinical manifestations of the anterior & posterior pituitary gland. | End-S2 Med-1 Hypopituitarism/ Pan hypopituitarism, GHD, Sheehan Syndrome. Diabetes Insipidus | | |

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| 4 | <ul style="list-style-type: none"> Describe the clinical features of pituitary tumors + Hypothalamic suprasellar tumors. Clinical features of hyperfunction tumors + Mass effects | End-S2 Med-2 Pituitary tumors + Hypothalamic suprasellar tumors | Interactive Lecture | SBQs & OSVE |
| 5 | <ul style="list-style-type: none"> Identify the indications for trans sphenoidal Hypophysectomy Describe the technique in regards to trans sphenoidal Hypophysectomy Outline the appropriate evaluation of the potential complications of trans sphenoidal Hypophysectomy Review some interprofessional team strategies for improving care, coordination , and communication to advance transsphenoidal Hypophysectomy and improve outcomes | Endo-S2-Surgery-1 Hypophysectomy | | |

| Community Medicine | | | | |
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| | <ul style="list-style-type: none"> • Describe the major components of the research proposal. • Describe the SMART objectives in writing a research proposal. • Design a research questionnaire. | End-S2-CM-1 How to write a Research proposal and develop the research questionnaire | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| | <ul style="list-style-type: none"> • Determine Age estimation in medico legal cases by General examination • Discuss Medico legal importance of age | End-S2-FM-1 Age Determination | Interactive Lecture | SBQs & OSVE |

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

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| 12 | <ul style="list-style-type: none"> Causes, pathogenesis, morphological features, and laboratory diagnosis of follicular carcinoma, medullary carcinoma, and anaplastic carcinoma. | End-S2-Path-8 Thyroid Neoplasms-II | | |
| 13 | <ul style="list-style-type: none"> Laboratory interpretation of parathyroid gland diseases | End-S2-Path-9 Parathyroid gland Lab interpretation | Practical | OSPE & OSVE |
| 14 | <ul style="list-style-type: none"> Thyroid function test and its interpretation according to the disease | End-S2-Path-10 Thyroid function tests | | |
| 15 | <ul style="list-style-type: none"> Neoplastic lesions of the thyroid gland | End-S2-Path-11 Benign and malignant tumors of the thyroid gland | | |

Pharmacology

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| 16 | <ul style="list-style-type: none"> Classify the drugs used in Thyroid disorders Pharmacological effects of anti-thyroid drugs Discuss the drugs used for hypothyroidism Drugs used in parathyroid disorders (Tetany) | End-S2-Pharm-2+3 Thyroid and Parathyroid hormones | Interactive Lecture | SBQs & OSVE |
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Clinical Lecture

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| 18 | <ul style="list-style-type: none"> Describe the clinical features & management of & Hyperparathyroidism | End-S2-Med-3 Primary+ Secondary+ tertiary. Hyperparathyroidism | Interactive Lecture | SBQs & OSVE |
| 19 | <ul style="list-style-type: none"> Describe the clinical features & management of hypoparathyroidism | End-S2-Med-4 Primary+ Secondary+ tertiary. Hypoparathyroidism + Pseudo- hypoparathyroidism | | |
| 20 | <ul style="list-style-type: none"> Discuss Clinical features of inflammatory thyroid disorders | End-S2-Med-5 Thyroiditis. Hypothyroidism (Hashimoto thyroid disease, Myxedema and cretinism) | Interactive Lecture | SBQs & OSVE |
| 21 | <ul style="list-style-type: none"> Discuss Clinical features of inflammatory thyroid disorders | End-S2-Med-6 Hyperthyroidism (Graves' disease) | | |
| 22 | <ul style="list-style-type: none"> Discuss Toxic adenoma. Multinodular Goiter Simple Nontoxic goiter Types of thyroid carcinomas. | End-S2-Med-7 Goiter + Adenoma +Thyroid Malignancies. | Interactive Lecture | |
| 23 | <ul style="list-style-type: none"> Identify the indications of Parathyroidectomy Describe the technique of Parathyroidectomy. Review the clinical significance of Parathyroidectomy. Summarize the potential complications of Parathyroidectomy | End-S2-Surg-2 Parathyroidectomy. | | |

Community Medicine

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| 20 | <ul style="list-style-type: none"> Determine the steps of data entry using statistical software. Understand the basics of operating SPSS. Describe how to analyze data using SPSS | End-S2-CM-2 Data entry and Statistical analysis | Interactive Lecture | MCQs & OSPE |
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Forensic Medicine

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| • | <ul style="list-style-type: none"> Define negligence, & its types. Define Professional negligence Discuss Res-Ipsa-Liquor, Novus Actus Inter venus & Vicarious Liability | End-S2-FM-2 Medical Negligence | Interactive Lecture | SBQs & OSVE |
| • | <ul style="list-style-type: none"> Discuss Professional Secrecy & misconduct (Infamous conduct | End-S2-FM-3 Professional Misconduct | Interactive Lecture | SBQs & OSVE |

Pathology

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|------|--|---|---------------------|-------------|
| 24 | <ul style="list-style-type: none"> 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 | End-S2-Path-12 Disorder of Endocrine Pancreas Diabetes Mellitus-1 | Interactive Lecture | SBQs & OSVE |
| 25 | <ul style="list-style-type: none"> Pathogenesis of type-I and type-II diabetes mellitus, clinical presentation and complications of diabetes mellitus. | End-S2-Path-13 Disorder of Endocrine Pancreas Diabetes mellitus-II | | |
| 26 | <ul style="list-style-type: none"> Discuss clinical presentation, pathogenesis and histologic features of Common Pancreatic Endocrine Neoplasms Hyperinsulinism (Insulinoma) Zollinger-Ellison Syndrome (Gastrinoma) Pancreatic carcinoid tumors | End-S2-Path-14 Pancreatic tumors | | |
| 27 | <ul style="list-style-type: none"> Diabetes mellitus its type and laboratory interpretation | End-S2-Path-15 Diabetes mellitus Lab interpretation | | |

Pharmacology

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| 28 | <ul style="list-style-type: none"> Describe the pharmacology of insulin and benefits of glycemic control in diabetes mellitus type-I | End-S2-Pharm-4 Anti-Diabetic Drugs Pancreas (Insulin) | Interactive Lecture | SBQs & OSVE |
| 29 | <ul style="list-style-type: none"> Describe the drugs used in type II diabetes mellitus. | End-S2-Pharm-5 Non-Insulin antidiabetic agents | | |

Clinical Lecture

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| 30 | <ul style="list-style-type: none"> Describe Diabetes (Definition +WHO Classification). Management of diabetes. | End-S2-Med-8 Diabetes Mellitus-I | Interactive Lecture | SBQs & OSVE |
| 31 | <ul style="list-style-type: none"> Discuss Acute & chronic complications of diabetes. | End-S2-Med-9 Diabetes Mellitus-II | | |

Theme 4: Non-Neoplastic & Neoplastic Diseases of the Adrenal Gland Theme 5: Multiple Endocrine Neoplasia Syndromes

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|---------------------|--|--|---------------------|-------------|
| Pathology | | | | |
| 32 | <ul style="list-style-type: none"> • Describe the hyper-secretory & hypo-secretory disorders of adrenal cortex • Adrenocortical Hyperfunction Hypercortisolism (Cushing Syndrome) • Primary Hyperaldosteronism Adrenogenital Syndromes • Adrenocortical Insufficiency Primary Acute Adrenocortical Insufficiency • Primary Chronic Adrenocortical Insufficiency (Addison Disease) • Discuss clinical presentation, pathogenesis, and histologic features of Adrenocortical Neoplasms, Adrenocortical adenomas, and Pheochromocytoma. | End-S2-Path-16 non-neoplastic diseases of the adrenal cortex Neoplastic diseases of adrenal cortex & Medulla MEN-I & MEN-II | Interactive Lecture | SBQs & OSVE |
| Pharmacology | | | | |
| 33 | <ul style="list-style-type: none"> • Describe the pharmacokinetic, pharmacodynamics clinical uses and the toxicity of glucocorticoids | End-S2-Pharma-6 Corticosteroids (Glucocorticoids). | Interactive Lecture | SBQs & OSVE |
| 34 | <ul style="list-style-type: none"> • Discuss the pharmacology of Mineralo corticoids. | End-S2-Pharm-7 Minalo corticoids | | |
| 35 | <ul style="list-style-type: none"> • Discuss the corticosteroid antagonists | End-S2-Pharm-8 Corticosteroid antagonists | | |

| Community Medicine | | | | |
|---------------------------|---|---|---------------------|-------------|
| | <ul style="list-style-type: none"> • To understand Health Education • To discuss the importance of Health • To describe the Aims and Objectives of Health Education • To discuss various Principles of Health Education • To describe the Stages of Health Education | End-S2-CM-3 Health Education: Concept, Aims and Objectives, Principles and Stages of Health Education | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| • | <ul style="list-style-type: none"> • Discuss Acquired and congenital deformities. • Define Tattoo marks. • Medicolegal Importance of • Name, Age, Sex & Race | End-S2-FM-4 Methods of Identification | Interactive Lecture | SBQs & OSVE |
| Medicine | | | | |
| 36 | <ul style="list-style-type: none"> • Describe Diabetes (Definition + WHO Classification). • Management of diabetes. | End-S2-Med-8 Diabetes Mellitus-I | | |
| 37 | <ul style="list-style-type: none"> • Discuss Acute & chronic • complications of diabetes. | End-S2-Med-9 Diabetes Mellitus-II | | |

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|---------------------------|---|--|---------------------|-------------|
| 38 | <ul style="list-style-type: none"> Describe the clinical manifestations of hyperfunctioning of the Adrenal gland. (Cortex) | End-S2-Med-10 Cushing Syndrome | Interactive Lecture | SBQs & OSVE |
| 39 | <ul style="list-style-type: none"> Describe the clinical manifestations of hypo functioning of the Adrenal gland. (Cortex) | End-S2-Med-11 Adrenal insufficiencies (Addison disease) | | |
| 40 | <ul style="list-style-type: none"> Describe the clinical features of. Corticotropin adenoma. | End-S2-Med-12 Corticotrophin adenoma. (Cushing Syndrome of pituitary origin) | | |
| 41 | <ul style="list-style-type: none"> Discuss the Clinical manifestation of Adrenal Medullary tumors + paragangliomas | End-S2-Med-13 Pheochromocytoma + paragangliomas | | |
| 42 | <ul style="list-style-type: none"> Discuss the genetic mutation in Endocrinology | End-S2-Med-14 MEN-I, MEN-II, A&B | | |
| Surgery | | | | |
| 43 | <ul style="list-style-type: none"> Identify the indications of adrenalectomy Describe the management of adrenalectomy Outline the complications of adrenalectomy | End-S2-Surg-3 Adrenalectomy | Interactive Lecture | SBQs & OSVE |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> To describe the term Communication and its various Methods To elaborate the Barriers of communication and discuss how to overcome it. | End-S2-CM-4 Communication Methods, Barriers and skills in Health Education | Interactive Lecture | MCQs & OSPE |

RENAL & EXCRETORY MODULE II

Introduction

Welcome to the Renal & excretory module. This exciting module will serve as a 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 interactive activities.

This module covers 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: 02 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 the 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 |
| Pathology | | | | |
| 1 | <ul style="list-style-type: none"> • Classify glomerular disease. • Define glomerular syndrome • Discuss pathogenesis of glomerular injury and mediators of glomerular injury. | EXC-S2-Path-1 Glomerular diseases | | |
| 2 | <ul style="list-style-type: none"> • Describe various glomerular syndromes • Define nephritic syndrome • Describe pathophysiology and clinical features of nephritic syndrome • Differentiate between nephritic and nephrotic syndrome. | EXC-S2-Path-2 Nephritic Syndrome | | |
| 3 | <ul style="list-style-type: none"> • Define and describe causes: • Pathophysiology and clinical features of nephrotic syndrome. • Differentiate between nephritic and nephrotic syndrome. | EXC-S2-Path-3 Nephrotic Syndrome | Interactive Lecture | SBQs & OSVE |
| 4 | <ul style="list-style-type: none"> • Discuss the pathophysiology, morphology, and clinical features in glomerular conditions associated with systemic disease e.g., Diabetic nephropathy, Lupus nephritis, Henoch-Schönlein-Purpura. • Explain isolated glomerular abnormalities, including IGA nephropathy, Hereditary nephritis, Alport syndrome. | EXC-S2-Path-4 Glomerular conditions associated with systemic disorders and Isolated glomerular abnormalities | | |
| 5 | <ul style="list-style-type: none"> • Name the kidney function test • Mention clinical interpretation of serum urea, creatinine, BUN and creatinine clearance test. | EXC-S2-Path-5 Kidney function tests | Practical | OSPE & OSVE |

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|--|---|--|---------------------|-------------|
| | <ul style="list-style-type: none"> • To define waste and its types • To understand the public health importance of various types of wastes • To learn about different sources of wastes • To learn about different methods of collection and disposal of refuse | EXC-S2-CM-1 Introduction, Public Health importance of waste management. methods of collection & disposal of refuse | Interactive Lecture | MCQs & OSPE |
|--|---|--|---------------------|-------------|

| Theme 2: Kidney/ Excretory Infections and Renal Vascular Disorders | | | | |
|---|---|---|--------------------------|-------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 6 | <ul style="list-style-type: none"> • Describe causes and pathogenic mechanism of tubulointerstitial injury • Etiology, pathogenesis and morphology of acute tubular necrosis. • Describe etiopathogenesis and morphology of tubulointerstitial nephritis. | EXC-S2-Path-6 Tubulo insterstitial Injury | | |
| 7 | <ul style="list-style-type: none"> • Identify predisposing factors of pyelonephritis • Describe causes, pathogenic mechanisms and morphology of acute pyelonephritis. • Describe clinical course and complications of acute pyelonephritis. | EXC-S2-Path-7 Pyelonephritis | Interactive Lecture | SBQs & OSVE |
| 8 | <ul style="list-style-type: none"> • Define chronic pyelonephritis • Enumerate causes and morphological features of chronic pyelonephritis. | EXC-S2-Path-8 Chronic Pyelonephritis | | |
| 9 | <ul style="list-style-type: none"> • Identify the causes of UTI. • Describe predisposing factors and clinical presentation. | EXC-S2-Path-9 Urinary tract infections | | |
| 10 | <ul style="list-style-type: none"> • Classify renal vascular disease. • Discuss etiology, pathogenesis, morphology, and clinical features of benign and malignant nephrosclerosis. • Define renal artery stenosis, mention its causes, and clinical features. Describe thrombotic microangiopathy and other vascular disorders | EXC-S2-Path-10 Renal Vascular Disease | | |
| 11 | <ul style="list-style-type: none"> • Describe the urine detail report and different methods of urine culture | EXC-S2-Path-11 Urine Analysis andUrine Culture | Practical | OSPE & OSVE |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> • To understand the methods of human excreta disposal | EXC-S2-CM-2 Methods of | Interactive Lecture | MCQs & OSPE |

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| | <ul style="list-style-type: none"> • To describe the hazards of improper excreta disposal • To understand different methods of sewage disposal | disposal of human excreta & sewage | | |
|--|--|------------------------------------|--|--|

| Theme 3: Obstructive Uropathy (Urolithiasis, Hydronephrosis) | | | | |
|---|--|---|--------------------------|-------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 12 | <ul style="list-style-type: none"> • Name various types of renalcalculi. • Describe etiopathology causes and complication. | EXC-S2-Path-12 Kidney stones | Interactive Lecture | SBQs & OSVE |
| 13 | <ul style="list-style-type: none"> • Identify causes, Pathophysiology, gross and microscopic features & clinical features of hydronephrosis. | EXC-S2-Path-13 Hydronephrosis | | |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> • To learn about sources of hospital wastes • To understand different types of hospital waste • To learn about different methods for prevention and control of hospital wastes and treatment of hospital waste | EXC-S2-CM-3 Hospital Waste management | Interactive Lecture | MCQs & OSPE |

| Theme 4: Tumors of the Renal/ excretory System | | | | |
|---|---|--|--------------------------|-------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 14 | <ul style="list-style-type: none"> • Name the benign and malignant tumors of the kidney. • Describe etiopathology, risk factor and, morphology and clinical features of Renal Cell Carcinoma. | EXC-S2-Path-14 Tumors of Kidney-I | Interactive Lecture | SBQs & OSVE |
| 15 | <ul style="list-style-type: none"> • Classify urothelial tumor. • Discuss etiology, pathogenesis, morphology, clinical features and diagnosis of urothelial tumors. | EXC-S2-Path-15 Tumor of Urinary System-II | | |
| 16 | <ul style="list-style-type: none"> • Describe gross and microscopic features of benign & malignant kidney and urinary bladder tumors | EXC-S2-Path-16 Kidney and urinary bladder tumors | Practical | OSPE & OSVE |
| Pharmacology | | | | |
| 17 | <ul style="list-style-type: none"> • Classify different types of Diuretics. • Describe the mechanism of action of Diuretics, • Identify the clinical uses and adverse effects of Diuretics | EXC-S2-Pharm-01 Diuretics | Interactive Lecture | SBQs & OSVE |

REPRODUCTIVE 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 interactive 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 an 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 the 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 2: Lesions of Breast

Theme 3: Lesions of Male Genital Tract

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

Theme 1: Lesions of Female Genital Tract Theme 2: Lesions of Breast

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|------|---|---|-------------------|------------|
| 1 | <ul style="list-style-type: none">• Discuss congenital anomalies of female genital tract• Define sexually transmitted infections• Define Pelvic Inflammatory Disease• List the organism causing genital tract infection• Discuss complications of PID | Rep-S2-Path-1 Congenital anomalies & Infections of female genital tract | | |

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| 2 | <ul style="list-style-type: none"> Discuss the morphology, pathogenesis and clinical presentation of non-neoplastic & neoplastic vulvar conditions. Explain the pathogenesis and morphology of vaginal intraepithelial neoplasia and squamous cell carcinoma | Rep-S2-Path-2 Non-neoplastic and neoplastic conditions of vulva and vagina | | |
| 3 | <ul style="list-style-type: none"> Explain the infections of cervix including acute & chronic cervicitis and Endocervical Polyps Discuss risk factors, pathogenesis and morphology of cervical intraepithelial lesions and cervical carcinoma | Rep-S2-Path-3 Non-neoplastic and neoplastic conditions of the cervix | Interactive Lecture | |
| 4 | <ul style="list-style-type: none"> Discuss the etiology, pathogenesis, morphology and clinical features of Abnormal uterine bleeding and Anovulatory Cycle Explain the etiology, pathogenesis, morphology and clinical features of acute and chronic Endometritis, Endometriosis and Adenomyosis and Endometrial Polyps Define Endometrial hyperplasia and explain its etiology and morphology | Rep-S2-Path-4 Functional Endometrial Disorders & Endometrial Hyperplasia | | SBQs & OSVE |
| 5 | <ul style="list-style-type: none"> Explain the procedure of pap smear Differentiate the normal and abnormal pap smear | Rep-S2-Path-5 Pap smear | Practical | OSPE & OSVE |
| 6 | <ul style="list-style-type: none"> Discuss the etiology, pathogenesis, morphology and clinical features of Carcinoma of the Endometrium Describe benign and malignant tumors of myometrium | Rep-S2-Path-6 Tumors of Uterus | Interactive Lecture | |
| 7 | <ul style="list-style-type: none"> Describe non neoplastic and functional cyst of ovary Explain etiology, morphology and clinical presentation of polycystic ovarian disease | Rep-S2-Path-7 Diseases of ovary | | |
| 8 | <ul style="list-style-type: none"> Classify tumors of ovary Discuss the etiology, pathogenesis, morphology and clinical features of ovarian tumors | Rep-S2-Path-8 Tumors of the ovary | | SBQs & OSVE |
| 9 | <ul style="list-style-type: none"> Discuss the etiology, pathogenesis and morphology of hydatidiform mole including complete mole, partial mole and invasive mole Explain the pathogenesis and morphology of choriocarcinoma and placental site trophoblastic tumor | Rep-S2-Path-9 Gestational Trophoblastic Diseases | | |
| 10 | <ul style="list-style-type: none"> Describe the morphology, gross and microscopic features of gestational tumors | Rep-S2-Path-10 Gestational Tumor | Practical | OSPE & OSVE |

| THEME 2: LESIONS OF THE BREAST | | | | |
|--------------------------------|--|---|---------------------|---------------------|
| 11 | <ul style="list-style-type: none"> • Name non-proliferative and proliferative breast lesions • Discuss the etiology, pathogenesis, morphology and clinical features of all non- proliferative and proliferative breast diseases | Rep-S2-Path-11 Non-proliferative & proliferative breast diseases | Interactive Lecture | BCQ SAQs OSPE |
| 12 | <ul style="list-style-type: none"> • Classify Breast tumors • Discuss the etiology, pathogenesis, morphology, and clinical features of various types of breast cancer | Rep-S2-Path-12 Carcinoma of Breast | | |
| 13 | <ul style="list-style-type: none"> • Describe the gross & microscopic features of benign and malignant breast tumor | Rep-S2-Path-13 Benign and malignant tumor of breast | Practical | OSPE |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> • To discuss the problem statement of Sexually Transmitted disease & HIV/AIDS • To define Sexually Transmitted disease & HIV/AIDS • To understand the epidemiology of Sexually Transmitted disease & HIV/AIDS • To discuss the preventive and control measures of Sexually Transmitted disease & HIV/AIDS | Rep-S2-CM-1 Epidemiology & control measure of Sexually Transmitted disease (STDs) & HIV/AIDS | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| 15 | <ul style="list-style-type: none"> • Discuss Locard's principle of exchange & its medico legal importance • Describe Determination of race • Discuss Osteometric indices • Determine Sex and intersex states | Rep-S2-FM-1 Race & Sex Determination | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Discuss Traumatic Asphyxia • Discuss Sexual asphyxia (auto-erotic asphyxia) | Rep-S2-FM-2 Traumatic & Sexual Asphyxia | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Define & Classify Sexual offences • Define the legal definition of Rape • Describe Procedure of examination a victim & accused person of rape and the collection of specimens during examination • Define Rape in children • Define Incest and its legal aspects | Rep-S2-FM-3 Sexual Offences (Intro) & Natural Sexual Offences and Its Legal Aspects | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Define Legal definition of sodomy and its types • Describe the examination of a victim of Sodomy • Describe Examination of a habitual passive agent (Catamite) and habitual active agent (Sodomite) • Describe the collection of samples from passive and active agents • Define Bestiality with examination • Define Tribadism or female <ul style="list-style-type: none"> • homosexuality and its legal aspects • Define Buccal coitus Unnatural <ul style="list-style-type: none"> • Sexual Offences and Its Legal Aspects | Rep-S2-FM-4 Unnatural Sexual Offences and Its Legal Aspects | Interactive Lecture | SBQs & OSVE |

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| | <ul style="list-style-type: none"> • Define Sexual perversions • Classify Sexual perversions <ul style="list-style-type: none"> • Discuss Sexual perversions | Rep-S2-FM-5 Sexual Perversions | Interactive Lecture | SBQs & OSVE |
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| Theme-3: Lesions of the Male Genital Tract | | | | |
|--|--|--|---------------------|-------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 11 | <ul style="list-style-type: none"> • Discuss congenital anomalies of male genital tract • Describe inflammatory conditions of testis and epididymis | Rep-S2-Path-14 Congenital anomalies and inflammation of testis and epididymis | Interactive Lecture | SBQs & OSVE |
| 12 | <ul style="list-style-type: none"> • Classify testicular tumors • Discuss the etiology, pathogenesis, morphology and clinical features of various types of testicular tumors | Rep-S2-Path-15 Testicular Tumors | Interactive Lecture | SBQs & OSVE |
| 13 | <ul style="list-style-type: none"> • Explain the etiology and morphology of prostatitis • Describe gross and microscopic features and complications of BPH | Rep-S2-Path-16 Prostatitis & benign prostatic hyperplasia | Interactive Lecture | SBQs & OSVE |
| 14 | <ul style="list-style-type: none"> • Describe etiology, morphology, type, and staging of carcinoma of the prostate | Rep-S2-Path-17 Carcinoma of the prostate | Interactive Lecture | SBQs & OSVE |
| 15 | <ul style="list-style-type: none"> • Explain the sample collection, gross, microscopic, and chemical examination of semen | Rep-S2-Path-18 Semen D/R | Practical | OSPE & OSVE |

| FORENSIC MEDICINE | | | | |
|-------------------|--|--------------------------------------|---------------------|-------------|
| | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| | <ul style="list-style-type: none"> • Describe Virginity and its medico-legal perspectives • Describe the signs of virginity on medico-legal examination • Differentiate between a true and false virgin on examination. | Rep-S2-FM-6 Virginity & Pregnancy | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Define Abortion, types of abortion & its medico-legal aspects • Define Criminal abortion and its types according to the Pakistan Penal Code • Describe the causes of death in criminal abortion and autopsy findings • Describe Delivery and its medico legal aspects • Describe Signs of recent delivery in living & dead • Describe the signs of remote delivery in living & dead | Rep-S2-FM-7 Abortion & Delivery | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Define Impotence, Sterility, and Artificial insemination, along with causes • Describe Consummation of marriage, causes of nullity of marriage, and divorce from legal aspects • Discuss the examination of a case of | Rep-S2-FM-8 Impotence | Interactive Lecture | SBQs & OSVE |

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| | impotency and how to give an opinion in such a case | | | |
| | <ul style="list-style-type: none"> • Define Infanticide & Feticide. • Differentiate Still born & Dead born baby • Describe Signs of live birth • Discuss the criminal causes of death of newborn babies, i.e., Acts of commission and acts of omission • Explain Autopsy on the bodies of newborn babies | Rep-S2-FM-9 Infanticide | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Define Battered Baby Syndrome, Shaken Baby Syndrome • Discuss Etiology & Clinical Features of a battered baby. • Describe Injuries seen in Shaken Baby Syndrome with mechanism & legal importance of SIDS. | Rep-S2-FM-10 Battered Baby Syndrome & Sudden Infant death syndrome (SIDS) | Interactive Lecture | SBQs & OSVE |
| | | | | |
| 16 | <ul style="list-style-type: none"> • Enlist different estrogen and antiestrogen preparations • Describe the pharmacological effects, clinical uses and side effects of these agents | Rep-S2-Pharm-1 Estrogen And Antiestrogen | Lecture | SBQs & OSVE |
| 17 | <ul style="list-style-type: none"> • Enlist different types of hormonal contraceptives. • Describe the mechanism of action of hormonal contraceptives, their clinical uses and adverse effects of hormonal contraceptives. | Rep-S2-Pharm-2 Androgen and Anti-Androgen | | |
| 18 | <ul style="list-style-type: none"> • Describe the role of endogenous oxytocin in labour • Describe the clinical conditions that may require the exogenous oxytocin • Discuss the unwanted effects of Oxytocin. | Rep-S2-Pharm-3 Oxytocin | | |

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 interactive 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 TEACHINGSTRATEGIES | | | | |
|--|--|---|---------------------|-------------|
| Theme 1: Developmental Disorders of Bone & Cartilage, Basic Structure & Function of Bone | | | | |
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 1 | <ul style="list-style-type: none"> • Functions of Bone • Matrix • Cells • Development • Homeostasis and Remodeling | MSK-S2-Path-1 Basic Structure and Function of Bone | | |
| 2 | <ul style="list-style-type: none"> • Diseases Associated with Defects in Nuclear Proteins and Transcription Factors • Diseases Associated with defects in Hormones and Signal Transduction Proteins • Diseases Associated with Defects in Metabolic Pathways (Enzymes, Ion Channels, and Transporters) • Diseases Associated With Defects in the Degradation of Macromolecules | MSK-S2-Path-2 Developmental Disorders Of Bone And Cartilage | Interactive Lecture | SBQs & OSVE |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> ② To learn about the relationship between health and housing ② To learn about the criteria of healthful housing | MSK-S2-CM-1 Healthful housing | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| | <ul style="list-style-type: none"> ② Define dactylography & its types ② Discuss medicolegal importance of fingerprint | MSK-S2-FM-1 Dactylography | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> ② Define electrical burn and its types ② Enlist the body tissues that are resistant to electrical burn & factors on which injury of electrical burn depends. | MSK-S2-FM-2 Thermal Injury & Burn | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> ② Describe the mortality of electrical burn <ul style="list-style-type: none"> • Define Features of injuries due to various types of electrical current • Describe Causes of death due to electrocution. • Discuss Lightning injuries and lightning deaths | MSK-S2-FM-3 Electrocution/ Lighting | Interactive Lecture | SBQs & OSVE |

Theme 2: Fracture, Osteomyelitis and Arthritis

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|------|---|--|---------------------|-------------|
| 3 | <ul style="list-style-type: none"> Define terms related to fracture Describe mechanism of bone healing Complications of fracture Pathophysiology of bone infection (osteomyelitis) | MSK-S2-Path-3 Fractures, bone repair and osteomyelitis | Interactive Lecture | SBQs & OSVE |
| 4 | <ul style="list-style-type: none"> What is arthritis Define Osteoarthritis and Rheumatoid Arthritis Explain pathophysiology of osteoarthritis and Rheumatoid Arthritis. Describe the clinical features of osteoarthritis and Rheumatoid Arthritis Treatment of osteoarthritis and Rheumatoid Arthritis Crystal-Induced Arthritis. | MSK-S2-Path-4 Arthritis | | |
| | <ul style="list-style-type: none"> To treat non-inflammatory conditions The main mechanism of action of NSAIDs is the inhibition of the enzymes COX | MSK-S2-Pharma-1 NSAIDs | | |
| | <ul style="list-style-type: none"> To alleviate the pain and inflammation To reduce uric acid level in the blood | MSK-S2-Pharma-2 | | |

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| | <ul style="list-style-type: none"> To minimize joint inflammation To prevent further joint damage To improve joint function to improve quality of life | MSK-S2-Pharma-3 Treatment of Rheumatoid Arthritis | | |
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Community Medicine

| | | | | |
|--|---|---------------------------------------|---------------------|-------------|
| | <ul style="list-style-type: none"> To define noise and noise pollution To understand types and sources of noise pollution To describe preventive and control measures of noise pollution | MSK-S2-CM-2 Noise pollution | Interactive Lecture | MCQs & OSPE |
|--|---|---------------------------------------|---------------------|-------------|

Forensic Medicine

| | | | | |
|--|---|---|---------------------|-------------|
| | <ul style="list-style-type: none"> Define Forensic Odontology & Radiology Discuss the medicolegal importance of Forensic Odontology & Radiology | MSK-S2-FM-2 Forensic Odontology & Radiology | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Discuss the mechanism of mechanical Injury Classify Mechanical Injuries Define Injury, Hurt, Wound, Assault and Battery Describe Blunt weapon injuries, Abrasions, and bruises with medico-legal significance. | MSK-S2-FM-3 Mechanical Injuries-1 | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Describe Lacerated wounds, types, mechanism of production and medico-legal significance | MSK-S2-FM-4 Mechanical Injuries-2 | Interactive Lecture | SBQs & OSVE |

| | | | | |
|--|---|---|---------------------|-------------|
| | <ul style="list-style-type: none"> • Describe Sharp weapon injuries • Describe incised wounds with medico-legal significance. | MSK-S2-FM-5 Mechanical Injuries-3 | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> • Describe Stab wounds with medico-legal significance. | MSK-S2-FM-6 Mechanical Injuries-4 | Interactive Lecture | SBQs & OSVE |

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 |
|------|---|---|---------------------|-------------|
| 5 | <ul style="list-style-type: none"> • Osteoid Osteoma • Osteoblastoma • Osteochondroma • Chondroma | MSK-S2-Path-5 Benign Bone and cartilage FormingTumors | | SBQs & OSVE |
| 6 | Gross and Microscopic Features | MSK-S2-Path-6 Cartilage And Bone Forming Tumors | Interactive Lecture | |
| 7 | <ul style="list-style-type: none"> • Osteosarcoma • Chondrosarcoma • Tumors of Unknown Origin • Ewing Sarcoma • Giant Cell Tumor • Aneurysmal Bone Cyst | MSK-S2-Path-7 Malignant Bone and cartilage Forming Tumors Tumors of Unknown Origin | | |

Community Medicine

| | | | | |
|--|---|--|---------------------|-------------|
| | <ul style="list-style-type: none"> • To describe the effects of extreme heat and extreme cold on human body • To describe how to manage the effects of heat and cold extremes | MSK-S2-CM-3 Effect of heat and cold extremes | Interactive Lecture | MCQs & OSPE |
|--|---|--|---------------------|-------------|

• Forensic Medicine

| | | | | |
|--|--|--|---------------------|-------------|
| | <ul style="list-style-type: none"> • Discuss Identification of a dead, decomposed body. • Discuss Mutilated & burnt bodies, Skeletal & Fragmentary remains | MSK-S2-FM-5 Mass Disaster Identification | Interactive Lecture | MCQs & OSPE |
|--|--|--|---------------------|-------------|

Theme 4: Soft Tissue Tumors

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|------|---------------------|-------|-------------------|------------|
| . | | | | |

| | | | | |
|---------------------------|---|---|---------------------|-------------|
| 8 | <ul style="list-style-type: none"> • Tumors of Adipose Tissue • Lipoma • Liposarcoma • Fibrous Tumors • Nodular Fasciitis • Fibromatoses • Superficial Fibromatosis • Deep Fibromatosis (Desmoid Tumors) • Skeletal Muscle Tumors • Rhabdomyosarcoma • Smooth Muscle Tumors • Leiomyoma • Leiomyosarcoma | MSK-S2-Path-8 Soft Tissue Tumors | Interactive Lecture | SBQs & OSVE |
| 9 | Gross and Microscopic Features | MSK-S2-Path-9 Soft Tissue Tumors | Practical | OSPE & OSVE |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> • To understand the magnitude of cancer problem in Pakistan. • To understand the epidemiological features of cancer. • To describe different causes of cancer • To explain screening of cancer. • To describe risk factors of cancer. • To explain the control measures and prevention of cancer | MSK-S2-CM-4 Epidemiology & control measures of cancer | Interactive Lecture | MCQs & OSPE |

| Theme 5: Skin Module | | | | |
|--|--|--|-------------------|-------------|
| Learning objectives of Skin Module: Describe the pathophysiology, clinical features, laboratory diagnosis, and treatment of skin tumors, acute and chronic inflammatory disorders, bullous disorders and common infections. | | | | |
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 10 | Explain the pathophysiology, clinical features, laboratory diagnosis and treatment of acute and chronic inflammatory dermatosis. | MSK-S2-Path-10 Acute and Chronic Inflammatory Dermatoses (Urticaria, Psoriasis, Lichen Planus) | | |
| 11 | Explain the pathophysiology, clinical features, laboratory diagnosis and treatment of common skin tumors. | MSK-S2-Path-11 Common Skin Tumors (BCC, SCC, Melanoma) | Interactive | SBQs & OSVE |

| | | | | |
|--------------------------|--|--|---------------------|-------------|
| 12 | To Explain the pathophysiology, clinical features, laboratory diagnosis and treatment of Bullous disorders. | MSK-S2-Path-12 Blistering (Bullous) Disorders (Pemphigus, Pemphigoid) | Lecture | |
| 13 | To explain the pathophysiology, clinical features, laboratory diagnosis and treatment of common infections. | MSK-S2-Path-13 Infections (Viral, Bacterial & Fungal Infections) | | |
| Forensic Medicine | | | | |
| | <ul style="list-style-type: none"> • Describe Late signs of death i.e., • Putrefaction, mechanism, changes, gases of decomposition • Explain Adipocere formation & • Mummification | MSK-S2-FM-4 Decomposition | Interactive Lecture | MCQs & OSPE |

NEUROSCIENCE MODULE 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 interesting and productive by including several interactive 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 prevent 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 the pathophysiology of diseases in the neuroscience module-I, the students will be able to understand various infectious and tumorous conditions of the 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 the pathogenesis of diseases of the 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 the Central Nervous System
- Theme 3: Autonomic 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 |

| Pathology | | | | |
|--------------------|---|--|---|-------------------------------------|
| 1 | <ul style="list-style-type: none"> Define meningitis and encephalitis Discuss common Central Nervous System infections including acute (pyogenic) bacterial infections, acute aseptic viral infections, chronic bacterial meningo-encephalitis, and fungal meningo-encephalitis | NS-S2-Path-1 Inflammation and infections of CNS-1 | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 2 | <ul style="list-style-type: none"> Viral pathogens causing meningitis, Enteroviruses, HSV-2, Arboviruses | NS-S2-Path-2 Inflammation and infections of CNS-2 | | |
| | <ul style="list-style-type: none"> Discuss pathogenesis of cerebral malaria, <i>Naegleria fowleri</i> and Cysticercosis | NS-S2-Path-3 Inflammation and infections of CNS-3 | | |
| | <ul style="list-style-type: none"> Infection of Brain & Meninges &CSF interpretation | NS-S2-Path-4 Inflammation and infections of CNS-4 | | |
| | <ul style="list-style-type: none"> List the most common organisms that cause CNS infection in different age groups | NS-S2-Path-5 Inflammation and infections of CNS-5 | | |
| | <ul style="list-style-type: none"> Discuss CSF findings of bacterial, tuberculous, viral, and fungal meningitis | NS-S2-Path-6 Inflammation and infections of CNS-6 | | |
| Community Medicine | | | | |
| | <ul style="list-style-type: none"> To discuss the problem statement of Meningitis To understand the epidemiology of Meningitis To define Meningitis and describe the mode of transmission of Meningitis To discuss the preventive and control measures of Meningitis | NS-S2-CM-1 Epidemiology & control measure of Meningitis | Interactive Lecture | MCQs & OSPE |
| Forensic Medicine | | | | |
| | <ul style="list-style-type: none"> Describe Head injuries to scalp & Fractures of Skull and their medico legal significance. Classify types of injuries to the brain, spine & their medico-legal importance. Discuss Face & Neck, including different cervical fractures, whiplash injuries, homicidal and suicidal cutthroat. | NS-S2-FM-1 Injuries Head & Neck | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Describe the Mental Health ordinance 2001 with special reference to admission, care, and discharge of a mentally ill person | NS-S2-FM-2 Mental Health Ordinance | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Describe Civil and criminal Responsibilities of a mentally ill person. Discuss Testamentary capacity. Discuss McNaughten rules, Durham rule and Currens rule. Define insanity & differentiate between true insanity from feigned insanity. | NS-S2-FM-3 Civil/ Criminal responsibilities of a mentally ill & Insanity | Interactive Lecture | SBQs & OSVE |

| THEME 2: TUMORS OF THE CENTRAL NERVOUS SYSTEM | | | | |
|---|--|---|--|-------------------------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 3 | <ul style="list-style-type: none"> Classify CNS tumors according to the WHO classification List genetic mutations, pathogenesis, morphology, and clinical features of brain tumors Including all types of Glioma, Ependymoma, Medulloblastoma, and Meningioma Discuss the metastatic tumors to the brain | NS-S2-Path-7 Brain tumors | Lecture/ Demonstration, SGD, Practical, CBL/PBL | SBQs & OSVE, OSCE, Clinical Exam |
| Pharmacology | | | | |
| 1 | <ul style="list-style-type: none"> Classify different types of antiepileptic agents. Describe the mechanism of action, and clinical uses and side effects of Anti-Epileptics. | NS-S2-Pharm-1 Anti-epileptics drugs | | |
| 2 | <ul style="list-style-type: none"> Classify the Anti-Psychotics Difference between typical and Atypical Anti-Psychotics Discuss the clinical uses and side effects of typical and Atypical Anti-Psychotics | NS-S2-Pharm-2 Antipsychotics | | |
| 3 | <ul style="list-style-type: none"> Classify the Anti-Parkinson drugs Discuss the clinical uses and side effects of Anti-Parkinson drugs | NS-S2-Pharm-3 Drugs used in Parkinson Disease | | |
| 4 | <ul style="list-style-type: none"> Discuss the pathophysiology of migraine headaches Discuss both pharmacologic and non-pharmacologic treatment strategies for migraine. | NS-S2-Pharm-4 Treatment of Migraine | | |
| 5 | <ul style="list-style-type: none"> Classify the Anti-Depressants Discuss the clinical uses and side effects of MAO's inhibitors Discuss the clinical uses and side effects of TCA's Discuss the clinical uses and side effects of SSRI'S AND SNRI'S | NS-S2-Pharm-5 Anti-Depressants | | |
| 6 | <ul style="list-style-type: none"> Classify the Sedative Hypnotics Discuss the mechanism of action, clinical uses and side effects of benzodiazepam Discuss the mechanism of action, clinical uses and side effects of Barbiturates | NS-S2-Pharm-6 Sedatives and Hypnotics | | |
| 7 | <ul style="list-style-type: none"> Classify the General Anesthetic Agents Discuss the mechanism of action, clinical uses and side effects of Inhaled Anesthetic Agents Discuss the mechanism of action, clinical uses and side effects of Intravenous Anesthetic Agents | NS-S2-Pharm-7 General anesthesia - 1 (inhaled) | | |
| 8 | | NS-S2-Pharm-8 General anesthesia - 2 (I.V) | | |
| 9 | <ul style="list-style-type: none"> Classify the Local Anesthetic Agents Discuss the mechanism of action, clinical uses and side effects of local Anesthetic Agents | NS-S2-Pharm-9 Local Anesthetic Agents | | |
| 10 | <ul style="list-style-type: none"> To treat acute pain Give in palliative care and end of life care | NS-S2-Pharm-10 Opioids | | |

| Forensic Medicine | | | | |
|-------------------|--|--|---------------------|-------------|
| S. | Learning Objectives | Topic | Teaching Strategy | Assessment |
| • | <ul style="list-style-type: none"> Define drug, drug dependence, & drug addiction. Enlist addictive drugs. Define drug abuse, habituation, hypnotics, & narcotics. Discuss different terminologies, i.e. physical & psychological dependence, psychotropic drugs, sedatives, stimulants, and tolerance. Discuss the law related to drugs Addiction/Abuse. Discuss the management of drug Addiction /Abuse. | NS-S2-FM-4 Dependence/ Drug addiction | Interactive Lecture | SBQs & OSVE |
| • | <ul style="list-style-type: none"> Introduction (Definition, Pathophysiology) Discuss sources, S/S, fatal dose and fatal period and Management. Discuss postmortem appearances and medicolegal importances | NS-S2-FM-5 Narcotics & Nicotine | Interactive Lecture | SBQs & OSVE |
| • | <ul style="list-style-type: none"> Discuss Introduction, source, mode of action, S/S, fatal dose, fatal period and management of Hallucinogens. Discuss Postmortem appearance. Describe the medicolegal importance | NS-S2-FM-6 Hallucinogens | Interactive Lecture | SBQs & OSVE |

| THEME 3: AUTONOMIC NERVOUS SYSTEM | | | | |
|-----------------------------------|---|--|--|-------------------------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 1 | • | ANS-S2-Pharm-1 Introduction To ANS | Lecture/ Demonstration, SGD, Practical, CBL/PBL | |
| 2 | <ul style="list-style-type: none"> Receptor distribution of the Cholinergic Nervous System Classify the Cholinergic agonists Describe the mechanism of direct and indirect Cholinergic agonists Discuss the clinical uses of Cholinergic agonists Discuss the side effects of Cholinergic agonists | ANS-S2-Pharm-2 Cholinergic agonists | | |
| 3 | <ul style="list-style-type: none"> Classify the Cholinergic antagonists Discuss the clinical uses of Cholinergic antagonists Discuss the side effects of Cholinergic antagonists | ANS-S2-Pharm-3 Cholinergic antagonists | | |
| 4 | <ul style="list-style-type: none"> Receptor distribution of adrenergic Nervous System Classify the adrenergic agonists Describe the mechanism of direct and indirect adrenergic agonists Discuss the clinical uses of adrenergic agonists Discuss the side effects of adrenergic agonists | ANS-S2-Pharm-4 Adrenergic agonists-1 | | SBQs & OSVE, OSCE, Clinical Exam |

| | | | | |
|---|---|---|--|--|
| 5 | <ul style="list-style-type: none"> Classify the adrenergic antagonists Discuss the clinical uses and side effects of Alpha Blockers Discuss the clinical uses and sideEffects of Beta Blockers | ANS-S2-Pharm-5 Adrenergic antagonists-2 | | |
| 6 | • | ANS-S2-Pharm-6 Alpha Blockers | | |
| 7 | • | ANS-S2-Pharm-7 Beta blockers | | |

Forensic Medicine

| | | | | |
|--|--|---|---------------------|-------------|
| | <ul style="list-style-type: none"> Define Narcotics (Opium & Heroin). Discuss S/S of acute & chronic opium poisoning. Discuss fatal dose & fatal period and management of narcotics. Define heroin addiction Discuss causes, symptoms and withdrawal of heroin addiction. Discuss prevention to avoid side effects Discuss postmortem appearance and medico legal aspect of Narcotics | NS-S2-FM-7 Opium & Heroin | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Introduction & Classify types of Deliriant poisons. Discuss Clinical Features of Acute & Chronic Poisoning, investigation techniques for the detection. Discuss Mode of action, Metabolism, Fatal doses, antidote and management Discuss P/M appearances & medicolegal importance of deliriant poisons. | NS-S2-FM-8 Deliriant Poisons (Cannabis Indica, Cocaine & Dhatura) | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Define Properties, Pharmacological Action, Absorption, Distribution & Elimination of Barbiturates. Explain Classification, Features of Acute & Chronic Toxicity & the Methods used for the Detection, Management & Postmortem changes in a Victim of Barbiturate Toxicity. Discuss Fatal & Lethal Doses, Medico-legal Aspects of Barbiturates. | NS-S2-FM-9 Sedative Poisons (Barbiturates) | Interactive Lecture | SBQs & OSVE |



TABLE OF SPECIFICATION
THIRD PROFESSIONAL MBBS EXAMAINATION
(Single Best Question & OSPE)
PAPER-II Foundation-II, Infectious, Blood=II + Skin

| MODULE | Pathology | Pharmacology | Community Medicine | Total | OSPE |
|----------------------|-----------|--------------|----------------------------|------------|--|
| Foundation-II | 9 | 8 | 2 (Demography) | 19 | Pathology=02 Pharmacology=02 C. Medicine=01 TOTAL=05 |
| Infectious | 27 | 13 | 12 (Communicable Diseases) | 52 | |
| Blood=II | 20 | 08 | - | 28 | |
| Skin | 01 | - | - | 01 | |
| Total | 57 | 29 | 14 | 100 | |

Paper-III Respiratory-II, CVS-II, GIT-Liver=II, Endocrinology-II

| MODULE | Pathology | Pharmacology | Community Medicine | Total | OSPE |
|-------------------------|-----------|--------------|----------------------------|------------|--|
| Respiratory-II | 13 | 04 | 12 (Environmental Health) | 29 | Pathology=02 Pharmacology=02 C. Medicine=01 TOTAL=05 |
| CVS-II | 10 | 06 | 06 (Occupational Health) | 22 | |
| GIT-Liver=II | 24 | 03 | 03 (Food & Nutrition) | 30 | |
| Endocrinology-II | 11 | 04 | 04 (Health Education) | 19 | |
| Total | 58 | 17 | 25 | 100 | |

Paper-IV (Renal & Excretory system-II, Reproductive-II [Female genital tract/Breast, Male genital tract], musculoskeletal system-II, CNS-II)

| MODULE | Pathology | Pharmacology | Community Medicine | Total | OSPE |
|--|-----------|--------------|-----------------------|------------|--|
| Renal & Excretory system-II | 11 | 04 | 18 (Epidemiology) | 33 | Pathology=02 Pharmacology=02 C. Medicine=01 TOTAL=05 |
| Reproductive system-II | 15 | 04 | 13 (Biostatistics) | 32 | |
| Musculoskeletal system-II | 05 | 02 | 04 (Research Methods) | 11 | |
| CNS-II | 04 | 20 | - | 24 | |
| Total | 35 | 30 | 35 | 100 | |



LIAQUAT UNIVERSITY
of Medical & Health Sciences, Jamshoro, Sindh, Pakistan

DOC.# LUMHS/DA/-
DATE: 10/09/2025

DIRECTORATE OF ACADEMICS

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DIRECTOR

"SAY NO TO CORRUPTION"



INSTITUTE OF FORENSIC SCIENCES
FORENSIC MEDICINE & TOXICOLOGY

LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES,
JAMSHORO SINDH Telephone No. 022-9213333

Doc.LUMHS/ FM/ 159 /25
Dated: 06-11-2025

To,

The Director Academic's
LUMHS, Jamshoro.

SUBJECT: MODIFIED FORMAT SUBJECT OF FORENSIC MEDICINE &
TOXICOLOGY 3RD YEAR MBBS EXAMINATION
UNDERGRADUATE.

R/Sir.

This is to inform that modified format subject of Forensic Medicine & Toxicology 3rd year MBBS examination undergraduate as under.

| DISTRIBUTION OF FORENSIC MEDICINE & TOXICOLOGY BCQS , OSPES / VIVA VOCE & INTERNAL EVALUATION MARKS | | | | | | | | |
|--|--------------|------------------------|--------------|-------------------------------|--------------|----------------------------|--------------------|--|
| THEORY | | OSPE/ VIVA VOCE | | | | | | |
| BCQ | Marks | OSPE | Marks | Interactive/ Viva Voce | Marks | Internal Evaluation | Total Marks | |
| 100 | 100 | 10 | 50 | 2/3 | 30 | 20 | 100 | |

PROF. DR. WAHEED ALI NAHYOON
CHAIRMAN
INSTITUTE OF FORENSIC SCIENCES FORENSIC
MEDICINE & TOXICOLOGY

COPY FOR INFORMATION:

1. Controller of Examination Undergraduate LUMHS, Jamshoro.

FIELD VISITS

| COMMUNITY MEDICINE | | FORENSIC MEDICINE VISITS AND PRACTICALS | |
|--------------------|---------------------------------------|---|--|
| Visit-1 | Industry and Social Security Hospital | Visit-1 | Forensic Museum |
| Visit-2 | Water Treatment Plant | Visit-2 | Sir Cowasjee Jehangir Institute of Psychiatry & Behavioral Sciences, Hyderabad |
| Visit-3 | Mental Hospital | Visit-3 | MLC Section |
| | | Visit-4 | Court |
| | | Practical-1 | Medical Certificate |
| | | Practical-2 | Medicolegal Examination/Certificate |
| | | Practical-3 | Application of Qisas & Diyat Laws in Medical Practice |
| | | Practical-4 | Clinical Examination in case of Sexual Offenses |
| | | Practical-5 | Collection, Preservation & dispatch of Biological & other evidentiary material |
| | | Practical-6 | Medicolegal Autopsies |
| | | Practical-7 | Exhumation Protocol & Autopsy Instruments |

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, and practicals, assignments) | 3% |
| | Block tests | 4% |
| | | 10% |
| TOTAL | | 20% |

Pathology:

TEXTBOOKS

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

Pharmacology:

TEXTBOOKS

- Lippincot Illustrated Pharmacology
- Basic and Clinical Pharmacology by Katzung

MicroBiology:

TEXTBOOKS

- Review of Medical Microbiology and Immunology, Seventeenth Edition 17th Edition 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:

TEXTBOOKS

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

COMMUNITY MEDICINE

- Parks Textbook of Preventive and Social Medicine – Latest Edition - Author: K. Park
- Public Health and Community Medicine – 8th Edition - Author: Ilyas, Ansari
- Textbook of Community Medicine and Public Health – 1st Edition, Edited by: Saira Afzal - Sabeen Jalal
- Fundamentals of Preventive Medicine – 5th Edition, Author: Dr. Zulfikar Ali Shaikh

FORENSIC MEDICINE & TOXICOLOGY

- Nasib R. Awan. Principles and Practice of Forensic Medicine, 1st ed. 2002.
- Parikh, C.K. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 6th ed.1999.
 - Knight B. Simpson's Forensic Medicine. 11th ed.1993.
 - Polson. Polson's Essentials of Forensic Medicine. 4th edition. 1985.
 - Taylor. Taylor's Principles and Practice of Medical Jurisprudence. 1984.
 - Gradwhol, R.B.H. Gradwhol's Legal Medicine. 3rd ed.1976.
 - Rao. Atlas of Forensic Medicine.
 - Govindiah. Color Atlas of Forensic Medicine. 1999.

CDs:

- Lectures on Forensic Medicine.
- Atlas of Forensic Medicine.

FOURTH YEAR MBBS PROGRAM

| CLINICAL ROTATION / POSTING FOURTH YEAR MBBS STUDENTS- MUHAMMAD MEDICAL COLLEGE, MIRPURHAS FROM DATE 20TH JANUARY 2025 TO 31ST OCTOBER 2025 | | | | | | |
|--|---------------------------------|---------------------------------|---------------------------------|--|---------------------------------|---------------------------------|
| Students Groups | 20-01-2025 TO 28-02-2025 | 03-03-2025 TO 11-04-2025 | 03-03-2025 TO 23-05-2025 | 26-05-2025 TO 06-06-2025+EID & 07-07-2025 TO 08-08-2025 | 11-08-2025 TO 19-09-2025 | 22-09-2025 TO 31-10-2025 |
| Group-A | ENT | GYNAE/OBS | PEDIATRICS | EYE | SURGERY | MEDICINE |
| Group-B | GYNAE/OBS | PEDIATRICS | EYE | SURGERY | MEDICINE | ENT |
| Group-C | PEDIATRICS | EYE | SURGERY | MEDICINE | ENT | GYNAE/OBS |
| Group-D | EYE | SURGERY | MEDICINE | ENT | GYNAE/OBS | PEDIATRICS |
| Group-E | SURGERY | MEDICINE | ENT | GYNAE/OBS | PEDIATRICS | EYE |
| Group-F | MEDICINE | ENT | GYNAE/OBS | PEDIATRICS | EYE | SURGERY |
| NOTE: Fourth-year MBBS medical students will complete their ophthalmology clinical rotation at Zainab Eye Hospital, Mirpurkhas, in addition to the ophthalmology department at MMCH | | | | | | |

The above-mentioned clinical rotation schedule is to be followed by every student throughout the year. Groups of students are decided by the Hospital Administration.

ATTENDANCE POLICY FOR STUDENTS

As per the PMDC rules for eligibility in annual examinations.

- Minimum attendance requirement is 75% in each subject: attendance is for lectures, demos, practicals, clinics, PBLs, SURVIVE, CPC, presentations, etc, indoor and outdoor.
- The attendance is not simply for lectures.

Attendance is maintained by the Department of Student Affairs at MMC.

FOURTH YEAR MBBS

| | | | | | | | |
|--------------------------------|---|--|---|-----------------|------------------|----------------------------------|------|
| 4TH YEAR | Total 12 Modules | Total Themes=55 | | 36 weeks | 1300 | 81.25 | |
| | Module-1 Eye | 1 | Foundation of ophthalmology Community Medicine | | 1 week | 35 | 2.18 |
| | | 2 | Lid abnormalities &bulging eyes Community Medicine | | | | |
| | | 3 | Red eye | | 1 week | 35 | 2.18 |
| | | 4 | Visual loss | | | | |
| | | 5 | Multiple endocrine neoplasia syndromes Community Medicine | | 1 week | 35 | 2.18 |
| | Total Contact Hours for 03-Weeks | | | 03-Weeks | 105 Hours | 6.56 Credit Hours | |
| | Module-2 ENT | 1 | Disorders of Ear and Audio-Vestibular System (Pain, Itching, Discharge, Facial Palsy, Tinnitus, Vertigo, Deafness) Community Medicine | | 1 week | 32.5 | 2.03 |
| | | 2 | Disorders of Nose & Para Nasal Sinuses (Nasal Obstruction, Rhinorrhea, Sneezing, Itching, Impaired Smell, Epistaxis, Headache), Community Medicine | | 1 week | 32.5 | 2.03 |
| | | 3 | Disorders of Oral Cavity, Pharynx and Oesophagus (Sore Throat, Difficulty in Swallowing, Change of Voice) Community Medicine | | 1 week | 32.5 | 2.03 |
| | | 4 | Disorders of Larynx Trachea and Bronchi (Cough, Hoarseness of Voice, Difficulty in Breathing) | | 1 week | 32.5 | 2.03 |
| | Total Contact Hours for 04-Weeks | | | 04-Weeks | 140 Hours | 8.75 Credit Hours | |
| Orthopae | 1 | Fractures & Dislocations Community Medicine | | 1 week | 35 | 2.18 | |
| | 2 | Infections | | 1 week | 35 | 2.18 | |
| | 3 | Metabolic Bone Disorders | | 1 week | 35 | 2.18 | |

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|---|--|--|-----------------|---------------------------|---------------------------|--|
| dic & Traumatology | 4 | Community Medicine | | | | |
| | | Bone Tumors | 1 week | 35 | 2.18 | |
| | | Community Medicine | | | | |
| | | Congenital Anomalies | 1 week | 35 | 2.18 | |
| | 6 | Degenerative Disorders | | | | |
| | Total Contact Hours for 5-Weeks | | | 05-Weeks | 175 Hours | |
| | | | | 10.93 Credit Hours | | |
| Module-4 Neurosurgery | 1 | Traumatic Brain Injury | 1 week | 35 | 2.18 | |
| | Community Medicine | | | | | |
| | 2 | Intracranial haemorrhage | 1 week | 35 | 2.18 | |
| | Community Medicine | | | | | |
| | 3 | Spinal cord trauma and myelopathy | 1 week | 35 | 2.18 | |
| | Community Medicine | | | | | |
| Module-5 Neuroscience & | 4 | Congenital Anomalies of CNS | 1 week | 35 | 2.18 | |
| | Community Medicine | | | | | |
| | 5 | Composition, Synthesis and Flow of CSF, Hydrocephalus and Its Management | 1 week | 35 | 2.18 | |
| | Community Medicine | | | | | |
| | 6 | Approaches and Management of CNS tumors at different ages | 1 week | 35 | 2.18 | |
| | Community Medicine | | | | | |
| Total Contact Hours for 06-Weeks | | | 06-Weeks | 210 Hours | 13.12 Credit Hours | |
| Module-5 Neuroscience & | 1 | Psychosis/ Schizophrenia Patho- Physiology, Classification Investigation/Management | 1 week | 35 | 2.18 | |
| | Community Medicine | | | | | |
| | 2 | Mood Disorders and Anxiety Disorders, Patho-Physiology, Classification Investigation | | | | |
| | 2 | Weakness (Monoplegia, Hemiplegia) | 1 week | 35 | 2.18 | |
| | 3 | Loss of Consciousness and Fits | | | | |
| | Community Medicine | | | | | |
| | 4 | Headache | | | | |
| | Community Medicine | | | | | |

| | | | | | |
|---|---|--|-----------------|-----------------|---------------------------|
| Psychiatry | 5 | Tremors and Difficulty in Walking / Loss of Balance (Ataxia) | 1 week | 35 | 2.18 |
| | 6 | Vertigo and Loss of Vision Community Medicine | 1 week | 35 | 2.18 |
| | 7 | Forgetfulness and Loss of Memory | | | |
| | 8 | Paraplegia, Quadriplegia | | | |
| | 9 | Loss of Vision Community Medicine | 1 week | 35 | 2.18 |
| | 10 | Numbness and Paresthesia (Tingling, Needling Sensation) | | | |
| | 11 | Inflammatory and Infective Diseases of CNS Community Medicine | | | |
| | 12 | Tumors of Central Nervous System Community Medicine | 1 week | 35 | 2.18 |
| | 13 | Autonomic Nervous System | | | |
| | Total Contact Hours for 06-Weeks | | | 06-Weeks | 210 Hours |
| | | | | | 13.12 Credit Hours |
| | | | | | |
| Module-6 Cardiology | 1 | Ischemia, Heart Failure, Congenital Heart Diseases and Vascular Diseases Community Medicine | 1 week | 35 | 2.18 |
| | 2 | Arrhythmias, Valvular Heart Disease and Heart Diseases and Pregnancy Community Medicine | 1 week | 35 | 2.18 |
| Total Contact Hours for 02-Weeks | | | 02-Weeks | 70 Hours | 4.37 Credit Hours |
| Module-7 Integumentary (Dermatology) | 1 | Introduction and Inflammatory Dermatoses Community Medicine | 1 week | 35 | 2.18 |
| | 2 | Infections of the Skin Community Medicine | 1 week | 35 | 2.18 |
| Total Contact Hours for 02-Weeks | | | 02-Weeks | 70 Hours | 4.37 Credit Hours |
| Module-8 Plastic Surgery/B | 1 | Burns and Wound Healing | 1 week | 35 | 2.18 |
| | 2 | Birth Defects | 1 week | 35 | 2.18 |

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|--|---|----------|--|-----------------|-----------|-------------|
| | URNS | 3 | Skin lesions/ tumours | | | |
| | Total Contact Hours for 02-Weeks | | | 02-Weeks | 65 | 4.06 |
| | Module-9 Paediatrics | 1 | Paediatric history, integrated approach & IMNCI Community Medicine | 1 week | 35 | 2.18 |
| | | 2 | Nutrition and Nutritional disorders Topics to be covered: Community Medicine | | | |
| | Total Contact Hours for 01-Weeks | | | 1 week | 35 | 2.18 |
| | Module-10 Renal & Excretory System | 1 | Glomerular Conditions Including Glomerular Syndromes, Conditions Associated with Systemic Disorders and Isolated Glomerular Abnormalities | 1 week | 35 | 2.18 |
| | | 2 | Kidney/ Excretory Infections and Renal Vascular Disorders Community Medicine | | | |
| | | 3 | Obstructive Uropathy (Urolithiasis, Hydronephrosis) Community Medicine | 1 week | 32.5 | 2.03 |
| | | 4 | Tumors of Renal/ Excretory System Community Medicine | | | |
| | Total Contact Hours for 02-Weeks | | | 02-Weeks | 70 | 4.37 |
| | Module-11 MSK-III | 1 | Developmental Disorders of Bone & Cartilage, Basic Structure & Function of Bone Community Medicine | 1 week | 35 | 2.18 |
| | | 2 | Fracture, Osteomyelitis and Arthritis | | | |
| | | 3 | Benign Bone and Cartilage Forming Tumors, Malignant Bone and Cartilage Forming Tumors and Tumors of Unknown Origin Community Medicine | | | |
| | | 4 | Soft Tissue Tumors | 1 week | 35 | 2.18 |
| | | 5 | Skin Module | | | |

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|--|----------|---|-----------------|-----------|-------------|
| | | Community Medicine | | | |
| Total Contact Hours for 02-Weeks | | | 02-Weeks | 70 | 4.37 |
| Module-12 Reproductive System-III | 1 | Lesions of Female Genital Tract Community Medicine | 1 week | 35 | 2.18 |
| | 2 | Lesions of Male Genital Tract Community Medicine | | | |

FOURTH YEAR MBBS

LIST OF SKILL-BASED WORKSHOPS AND COMPETENCIES ACCORDING TO MODULES

| S. No. | Procedure | Description | Level of competence | YEAR/MODULE | Subject |
|---------------|--|---|---|----------------------|----------------|
| 1 | Carry out abdominal and rectal examination and its interpretation. | Systemic approach in clinical examination: Completes all steps of examination and documents appropriately | Safe to practice under indirect supervision | 4 th Year | Surgery |
| 2 | Carry out Inguinoscrotal examination and its interpretation. | Systemic approach in clinical examination: Completes all steps of examination and documents appropriately | Safe to practice under indirect supervision | 4 th Year | Surgery |
| 3 | Carry out Neck examination and its interpretation. | Systemic approach in clinical examination: Completes all steps of examination and documents appropriately | Safe to practice under indirect supervision | 4 th Year | Surgery |

| | | | | | |
|-----------|---|--|---|----------------------|----------------|
| 4 | Carry out Breast examination and its interpretation. | Systemic approach in clinical examination: Completes all steps of examination and documents appropriately | Safe to practice under indirect supervision | 4 th Year | Surgery |
| 5 | Interpretation of radiological examination of surgery, including erect chest x-ray, erect & supine abdominal x-ray, contrast x-rays including IVU, Double contrast Barium Enema, CT scans, MRI, Isotope Scans | Systemic approach in radiological examination. | Safe to practice under indirect supervision | 4 th Year | Surgery |
| 6 | Interpretation of X-rays of upper and lower limbs | should be able to identify gross musculoskeletal pathology on X-rays including fractures & dislocations | safe to practice under indirect supervision | 4 th Year | Surgery |
| 7 | Interpretation of X-rays of the chest, abdomen, and pelvis | should be able to identify rib fractures, hemothorax, pneumothorax, free air under the diaphragm, and pelvic fractures | safe to practice under direct supervision | 4 th Year | Surgery |
| 8 | Carry out a respiratory examination and its interpretation. | | Safe to practice under direct supervision | 4 th Year | Medicine |
| 9 | Carry out a cardiovascular examination and its interpretation. | | safe to practice under direct supervision | 4 th Year | Medicine |
| 10 | Carry out a neurological examination and its interpretation. | | safe to practice under direct supervision | 4 th Year | Medicine |

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|----|--|--|---|---|--------------------------|
| 11 | Carry out intravenous cannulation | Insert a cannula into a patient's vein and apply an appropriate dressing. | Safe to practice under direct supervision | 4 th Year | Medicine |
| 12 | Carry out a safe and appropriate blood transfusion | Following the correct procedures, give a transfusion of blood (including correct identification of the patient and checking blood groups). Observe the patient for possible reactions do the transfusion, and take action if they occur. | Experienced in a simulated setting; further training required before direct Supervision | 4 th Year | Medicine |
| 13 | Carry out a 3- and 12- lead electrocardiogram | Set up a continuous recording of the electrical activity of the heart, ensuring that all leads are correctly placed. | Safe to practice under indirect supervision | 4 th Year (also in final year) | Medicine |
| 14 | History taking | Gynae/ Obs | Safe to practice under indirect supervision | 4 th Year | Gynae/ Obs |
| 15 | Obstetric & Gynecological Examination. | Perform Obstetric & Gynecological examination | Safe to practice under indirect supervision | 4 th Year | Gynae/ Obs |
| 16 | Ophthalmoscopy- Eye ward rotation | Perform basic ophthalmoscopy and identify common abnormalities | Safe to practice under direct supervision | 4 th Year | EYE WARD ROTATION |
| 17 | Otoscopy- ENT Ward | Perform basic otoscopy and identify common abnormalities | Safe to practice under indirect supervision | 4 th Year | ENT WARD ROTATION |
| 18 | Basic ENT Examination | Should be able to conduct an ENT Examination | safe to practice | 4 th year | ENT WARD ROTATION |

PROGRAM INTENDED LEARNING OUTCOMES AND RATIONALE OF VARIOUS SUBJECTS AND MODULES

OPHTHALMOLOGY MODULE

Introduction

- To feel more comfortable performing a basic eye examination
- To identify common eye conditions and be able to treat or triage these disorders. To expose students to the field of ophthalmology
- To identify potential longitudinal patients who could be followed in other clinics.

Rationale: The purpose of the Ophthalmology curriculum is to produce doctors with the generic professional and specialty-specific capabilities needed to understand and diagnose a wide range of medical conditions affecting the eyes, orbits, and visual pathways. Eye disorders are frequently seen in the practice of medicine in all age groups. The scope of medical ophthalmology is broad and includes refraction problems, ocular inflammatory diseases like conjunctivitis, cataracts, glaucoma, retina disorders, neuro-ophthalmic conditions, and urgent eye care in adults and children. A physician also has to understand the fundamentals of fundoscopy in order to evaluate common eye problems.

Duration 04 Weeks

Curriculum Goals

After completion of MBBS course the student should be able to:

- To feel more comfortable performing a basic eye examination
- To identify common eye conditions and be able to treat or triage these disorders.
- To expose students to the field of ophthalmology
- To identify potential longitudinal patients that could be followed in other clinics.

Learning Objectives At the end of the ophthalmology rotation the student should be able to:

1. **Perform the following skills:**
 - a) **History taking regarding**
 - Pain in and around the eye
 - Abnormal appearance of the eye and orbit
 - Discharge from the eye
 - Defect in visual activity, color vision, field of vision and diplopia.
 - b) **Physical examination**
 - Visual acuity test for distance and near
 - Pin Hole Examination
 - Color vision
 - Measure the IOP by palpation
 - External(pentorch)Adnexa anterior segment by examination by inspection and palpation,
 - upper lid eversion
 - Regurgitation test.

- Pupillary examination
- Ophthalmology (distant direct and direct)
- Ocular alignment and motility tests (corneal reflection test, cover test and motility test)
- Visual field test (confrontation method)

c) Management

- Ocular irrigation (chemical burns)
- Instillation of eye drops
- Patching (pressure patch and eye shield)

2. Diagnose and manage common eye problems such as:

- Blepharitis
- Hordeolum (styes)
- Periorbital cellulitis (mild)
- Conjunctivitis
- Ophthalmia neonatorum
- Trachoma
- Episcleritis
- Subconjunctival hemorrhage

3. Recognize / Evaluate and refer as appropriate:

- Acute red eyes
- Corneal ulceration and its complications
- Herpes simplex and Herpes zoster infections
- Orbital cellulitis
- Pterygium
- Diseases of lids: lumps, Trichiasis, entropion, ectropion, ptosis
- Disease of lacrimal passage: epiphora, acute and chronic dacryocystitis
- Acute visual loss
- Chronic visual loss
- Cataract
- Refractive error and presbyopia
- Glaucomas
- Childhood squint
- Childhood cataract (white pupil)
- Moderate to severe eye injuries, chemical burns
- Ocular manifestations of nervous diseases: papilloedema, nerve palsies
- Ocular manifestations of systemic diseases: diabetic retinopathy, thyroid eye disease

TOPICS WITH PMDC SYLLABUS

| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|---------|------------------------|-------|----------------------|------------|
| | | | | |

| | | | | |
|---|--|---|---|--|
| 1 | | <p>Anatomy of Eye – Review</p> <ul style="list-style-type: none"> • Orbit: Bones and Contents • Eyeball, • Extraocular muscles, • Adnexa (lid, conjunctiva & lacrimal system) • Vascular supply • Cranial nerves II, III, IV, VI & VII (cranial nerves) | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam SBQs & OSVE, OSCE, Clinical Exam |
| 2 | | <p>Physiology of Eye – Review</p> <ul style="list-style-type: none"> • Visual functions • Aqueous humour dynamics | | |
| 3 | | <p>Eyelid</p> <ul style="list-style-type: none"> • Styte • Chalazion • Blepharitis • Trichiasis • Entropion • Ectropion • Ptosis • Basal cell carcinoma • Squamous cell carcinoma | | |
| 4 | | <p>Conjunctiva</p> <ul style="list-style-type: none"> • Infective Conjunctivitis <ul style="list-style-type: none"> - Bacterial Conjunctivitis - Viral Conjunctivitis • Ophthalmia Neonatorum • Trachoma • Vernal keratoconjunctivitis (VKC) • Keratoconjunctivitis Sicca (Dry Eye) • Pterygium • Pinguecula • Vitamin A Deficiency | | |
| 5 | | <p>Nasolacrimal system</p> <ul style="list-style-type: none"> • Lacrimation & epiphora • Congenital Nasolacrimal Duct Block • Acute Dacryocystitis • Chronic Dacryocystitis | | |

| | | | |
|----|--|--|---|
| 6 | | <p>Cornea</p> <ul style="list-style-type: none"> • Infective keratitis (Corneal ulcer) <ul style="list-style-type: none"> - Viral - Bacterial - Fungal - Amoeba • Contact lens-related problems • Kerato-refractive surgeries | |
| 7 | | <p>Sclera</p> <ul style="list-style-type: none"> • Scleritis • Episcleritis | ecture/ Demonstration , SGD, Practical, CBL/ PBL |
| 8 | | <p>Lens</p> <ul style="list-style-type: none"> • Congenital cataract - Classification & Etiology - Clinical features - Differential diagnosis - Management • Acquired Cataract <p>Types & Etiology, Clinical features Management Complications of Cataract surgery</p> | |
| 9 | | <p>Glaucoma</p> <ul style="list-style-type: none"> • Classification • Primary open-angle glaucoma • Primary Angle Closure Glaucoma • Diagnostic Tools • Congenital Glaucoma • Secondary Glaucoma <ul style="list-style-type: none"> - Lens induced - Neovascular - Inflammatory | |
| 10 | | <p>Uveitis</p> <ul style="list-style-type: none"> • Classification • Clinical features of Acute and Chronic uveitis • Management of uveitis | |
| 11 | | <p>Medical Retina</p> <ul style="list-style-type: none"> • Diabetic retinopathy • Hypertensive retinopathy • Retinal vein occlusion • Retinal artery occlusion • Age-related macular degeneration • Retinoblastoma • Retinopathy of prematurity (ROP) | |

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|----|---|--|--|
| 12 | <p>Surgical Retina</p> <ul style="list-style-type: none"> • Retinal detachment – Rhegmatogenous, Exudative, and Tractional detachment • Management of retinal detachment • Vitreous hemorrhage | | |
| 13 | <p>Neuroophthalmology</p> <ul style="list-style-type: none"> • Pupillary & Visual pathway • Relative Afferent Pupillary Defect (RAPD) • Optic neuritis • Papilledema • Optic atrophy • Third, Fourth, Sixth & Seventh Cranial Nerves | | |
| 14 | <p>Orbit</p> <ul style="list-style-type: none"> • Proptosis • Orbital Infection and Inflammation <ul style="list-style-type: none"> - Preseptal Cellulitis - Orbital Cellulitis • Thyroid Eye Disease | | |
| 15 | <p>Ocular injuries</p> <ul style="list-style-type: none"> • Ocular Foreign Bodies • Blunt injuries • Penetrating injuries • Chemical injuries <ul style="list-style-type: none"> - Acid burns - Alkaline burns | | |
| 16 | <p>Strabismus</p> <ul style="list-style-type: none"> • Amblyopia • Non paralytic squint • Paralytic squint | | |
| 17 | <p>Refractive error</p> <ul style="list-style-type: none"> • Emetropia • Ametropia <ul style="list-style-type: none"> - Hypermetropia - Myopia - Astigmatism • Presbyopia | | |

Common Symptoms/ Signs of Ophthalmology

- i. **Red Eye:** Painful and Painless
- ii. Watery eye
- iii. **Visual Loss:** Gradual and Sudden
- iv. Causes of Diplopia

- v. Halos
- vi. Hyphema
- vii. Hypopyon
- viii. Distortion of images
- ix. White pupillary reflex (leukokoria)
- x. Dilated pupil
- xi. Small pupil
- xii. Proptosis
- xiii. Night blindness
- xiv. Eso deviation
- xv. Exo deviation

Assessment at the end of the posting

- MCQs and OSPE

| COMMUNITY MEDICINE | | | | |
|---------------------------|----------------------------|---|--------------------------|------------------------|
| S.NO | Content/Area | Learning Objectives | Teaching strategy | Assessment tool |
| 1. | Introduction to demography | <ul style="list-style-type: none"> • Define population and population studies • Comprehend the basic concepts and definition of Demography • Discuss the population doubling time • Describe the concept of population or demographic transition. • Describe and interpret the population pyramid • Compare the population pyramid of developing and developed countries. | Lecture | SBQs |
| 2. | Demographic indicators | <ul style="list-style-type: none"> • Define population and vital statistics. • Define fertility and mortality. • Describe the determinants of fertility and mortality. • Describe different indicators of population statistics. • Describe indicators of vital statistics • Determine the factors affecting fertility-related statistics. | Lecture | SBQs |

| | | | | |
|----|--------------------------------------|--|---------|------|
| 3. | Urbanization and social mobilization | <ul style="list-style-type: none"> • Define urbanization • Understand the importance of social mobilization • Determine the social implications of high population growth | Lecture | SBQs |
|----|--------------------------------------|--|---------|------|

OTOLARYNGOLOGY (ENT) MODULE

Introduction This module uses an integrated curriculum of basic science and clinical material to develop the student's knowledge and ability to describe and diagnose conditions related to the Ear, Nose, and Throat. It covers learning a wide range of areas using team-based and small-group learning exercises, lectures, anatomy labs, hands-on clinical skills labs, independent learning, clinical experiences, and radiological imaging. In addition, the students will learn the microbiology, physiology, and pharmacology of the upper respiratory region. The goal of this module is to provide medical students with a comprehensive pathophysiologic understanding of the Ear, Nose, and Throat and their diseases. Otorhinolaryngology is an important, interesting, and diverse specialty, and the study guide is carefully designed in such a manner that the students are able to better comprehend and analyze the objectives of their course in the ENT department.

Rationale: The knowledge and skills acquired in this module will enable students to appropriately evaluate, diagnose, treat, and manage a broad spectrum of common problems like hearing loss, earache and discharge, rhinorrhea, and sore throat. Students can order suitable investigations and diagnose common conditions, and be able to undertake adequate referral where appropriate. This module will act as a guide to identify various common ENT conditions and implement their knowledge in medical practices.

Duration 04 Weeks

Learning Outcomes

Knowledge: At the end of the course, the student should know of:

- Common problems affecting the Ear, Nose, and Throat.
- Principles of management of major ENT emergencies
- Effects of local and systemic diseases on the patient and the necessary action required to minimize the sequelae of such diseases;

Skills: At the end of the course, the student should be able to:

- Know how to remove the foreign bodies from the ear, nose and throat.
- know the indication for tracheostomy and explain its procedure, postoperative care and complications

- know the methods to control the Epistaxis

Attitude At the end of course, the student should have:

- **Patient-Centered Attitude:**
 - Cultivate respect and compassion for patients, actively listen to their concerns and involve them in their care.
- **Empathetic Understanding:**
 - Develop empathy for patients experiencing discomfort, acknowledging their emotional and physical challenges.
- **Cultural Sensitivity:**

- Appreciate the importance of culturally sensitive care, respecting diverse backgrounds of patients.
- **Ethical Commitment:**
 - Uphold ethical standards, maintaining patient confidentiality and informed consent.
- **Interdisciplinary Collaboration:**
 - Respect collaboration with other professionals for comprehensive patient care.

Themes:

Theme 1: Disorders of the Ear and Audio-Vestibular System

(Pain, Itching, Discharge, Facial Palsy, Tinnitus, Vertigo, Deafness)

Theme 2: Nose Disorders & Para Nasal Sinuses

(Nasal Obstruction, Rhinorhea, Sneezing, Itching, Impaired Smell, Epistaxis, Headache)

Theme 3: Disorders of Oral Cavity, Pharynx and Oesophagus (Sore Throat, Difficulty in Swallowing, Change of Voice)

Theme 4: Disorders of Larynx Trachea and Bronchi (Cough, Hoarseness of Voice, Difficulty in Breathing)

| Topics with Specific Learning Objectives and Teaching Strategies | | | | |
|---|---|--|---|----------------------------------|
| Theme 1: Disorders of Ear and Audio-Vestibular System (Pain, Itching, Discharge, Facial Palsy, Tinnitus, Vertigo, Deafness) | | | | |
| S # | LEARNING OBJECTIVES | THEME AND SUB-THEMES | TEACHING STRATEGY | ASSESSMENT |
| 1 | Explain Anatomy & Physiology of the Ear | ENT-S2-Ana-1 Clinical Basis of EAR | | |
| 2 | Discuss the Causes, clinical features, investigation & management | ENT-S2-ENT-1 PAIN A. D/D of Earache & referred earache B. Disorder of External Ear. 1. Traumatic- Frost Bite, Perichondritis and Aural Hematoma. 2. Inflammatory a. Bacterial- i. Acute Otitis Externa ii. Diffuse and Malignant Otitis Externa b. Viral-Herpes Zoster Oticus. C. Disorder of Middle Ear. i. Acute Otitis Media. ii. Otitis Media with Effusion iii. Otitis Baro-trauma | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 3 | Diagnosis & management | ENT-S2-ENT-2 ITCHING Wax and Foreign Bodies in Ear Fungus- Otomycosis | | |
| 4 | Discuss the Causes, clinical features, investigation & management | ENT-S2-ENT-3 DISCHARGE Disorder of Middle Ear. Chronic Suppurative Otitis Media, Cholesteatoma and Complications | | |
| 5 | Causes, Investigation & management | ENT-S2-ENT-4 FACIAL PALSY Facial Nerve Palsy, Middle Ear Surgery & its complications | | |

| | | | | |
|---|---|---|--|--|
| 6 | Describe the clinical features, investigation | ENT-S2-ENT-5 TINNITUS D/D of Tinnitus, Glomus tumor, Acoustic neuroma & Otosclerosis | | |
| | | ENT-S2-ENT-6 VERTIGO D/D of Vertigo, Labrynthitis, BPPV / Meinear's Disease. | | |
| 7 | Discuss causes, Clinical features, investigations/ assessment and Management of Congenital and Acquired conditions Causing Hearing Deficit. | ENT-S2-ENT-7 DEAFNESS Causes and assessments of hearing impairment. D/D of Conductive and Sensory neural hearing deficit, Disorder of the Inner Ear. Noise-Induced Hearing Loss / Ototoxicity/Presbyacusis. | | |

| Theme 2: Nose Disorders & Para Nasal Sinuses (Nasal Obstruction, Rhinorhea, Sneezing, Itching, Impaired Smell, Epistaxis, Headache) | | | | |
|--|---|--|---|---|
| S # | LEARNING OBJECTIVES | THEME AND SUB-THEMES | TEACHING STRATEGY | ASSESSMENT |
| 8 | Explain Anatomy & Physiology of Nose and Paranasal Sinuses | ENT-S2-Ana-2 Clinical Basis of Nose & Paranasal sinuses | | |
| 9 | Discuss the Causes, clinical features, investigation & management | ENT-S2-ENT-8 NASAL OBSTRUCTION <ul style="list-style-type: none"> • D/D of Nasal obstruction • Septal Deformities Adenoid Hypertrophy ENT-S2-ENT-9 RHINORHEA <ul style="list-style-type: none"> • D/D of Rhinorrhea • Rhinosinusitis ENT-S2-ENT-10 SNEEZING <ul style="list-style-type: none"> • Allergic Rhinitis Non-Allergic Rhinitis ENT-S2-ENT-11 ITCHING <ul style="list-style-type: none"> • Foreign Bodies & Rhinolith ENT-S2-ENT-12 IMPAIRED SMELL <ul style="list-style-type: none"> • Sino-Nasal Polyps ENT-S2-ENT-13 EPISTAXIS <ul style="list-style-type: none"> • D/D of Epistaxis • angiofibroma Hemangioma ENT-S2-ENT-14 HEADACHE <ul style="list-style-type: none"> • Sinusitis • Sino-Nasal Tumors | Lecture/ Demonstratio n , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |

Theme 3: Disorders of Oral Cavity, Pharynx and Oesophagus (Sore Throat, Difficulty in

Swallowing, Change of Voice)

| S # | LEARNING OBJECTIVES | THEME AND SUB-THEMES | TEACHING STRATEGY | ASSESSMENT |
|-----------|---|---|-------------------|------------|
| 10 | Explain Anatomy & Physiology of Digestive track | ENT-S2-Ana-3 Clinical Basis Digestive track | | |

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|----|---|---|---|--|
| 11 | Discuss the Causes, clinical features, investigation & management | <p>ENT-S2-ENT-15 SORE THROAT</p> <ul style="list-style-type: none"> • D/D of Sore throat • Mouth Ulcers • Pharyngitis & Tonsillitis • Infectious mononucleosis • Diphtheria/ Vincent Angina/ • Scarlet fever <p>ENT-S2-ENT-16 DIFFICULTY IN SWALLOWING</p> <ul style="list-style-type: none"> • Dysphagia • causes & management <p>ENT-S2-ENT-17 CHANGE OF VOICE</p> <ul style="list-style-type: none"> • Rhinolalia Clausa & Aperta • Tumors of Pharynx | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
|----|---|---|---|--|

| Theme 4: Disorders of Larynx, Trachea, and Bronchi (Cough, Hoarseness of Voice, Difficulty in Breathing) | | | | |
|---|---|--|---|---|
| S # | LEARNING OBJECTIVES | THEME AND SUB-THEMES | TEACHING STRATEGY | ASSESSMENT |
| 12 | Explain Anatomy & Physiology of Airway track | <p>ENT-S2-Ana-4 Clinical Basis of Airway track</p> | | |
| 13 | Discuss the Causes, clinical features, investigation & management | <p>ENT-S2-ENT-18 COUGH Airway Foreign Bodies</p> <p>ENT-S2-ENT-19 HOARSENESS OF VOICE</p> <ul style="list-style-type: none"> • Congenital Laryngeal web / Laryngocele • Inflammatory Acute Laryngo- trachea-bronchitis / Tuberculous Laryngitis • Non- Neoplastic • Vocal Nodule / Vocal polyps • Neoplastic Laryngeal papillomatosis / Malignant lesions <p>Recurrent laryngeal Palsy</p> <p>ENT-S2-ENT-20 DIFFICULTY IN BREATHING</p> <ul style="list-style-type: none"> • Laryngomalacia • Acute Epiglottitis • Subglottic/Tracheal stenosis | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |

ORTHOPAEDIC AND TRAUMATOLOGY MODULE

Introduction

Rationale

The integrated module on Orthopedic Surgery, Traumatology and musculoskeletal system is multi-fold, it provides the students with basic knowledge of bone and joint problems. Interdisciplinary learning is fostered, simulating real-world medical scenarios where collaborative care is crucial. The integration also cultivates a well-rounded skill set by comparing immediate emergency interventions with long-term therapeutic strategies. Including musculoskeletal trauma, fractures, infections, tumors, Degenerative and Metabolic disorders. Therefore, the module is designed to offer a balanced, resourceful, and interdisciplinary approach to medical education aimed at undergraduate level. The Orthopedics and Traumatology module in the basic cycle has already provided a sound basis of the related anatomy, physiology, surgical and pathological basis of bone diseases. In this 2nd clinical spiral, apart from basic revision of different subjects, students will be able to define and learn the clinical presentations, diagnoses and management of these diseases.

Duration 06 Weeks

Learning Outcomes:

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

- Demonstrate the principles and clinical considerations in orthopedics and Traumatology, including diagnoses and treatment.
- Develop immediate and long-term treatment strategies for orthopedic and traumatic conditions.
- Adopt a patient-centered approach, considering both immediate and long-term needs in treatment planning.
- Take and demonstrate history taking, and also able to perform physically examination.
- Make proper differential diagnoses and prescribe medicine accordingly.

Themes:

- Theme 1: Fractures & Dislocations
- Theme 2: Infections
- Theme 3: Metabolic Bone Disorders
- Theme 4: Bone Tumors
- Theme 5: Congenital Anomalies
- Theme 6: Degenerative Disorders

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

THEME 1: FRACTURE AND DISLOCATION

| S. # | LEARNING OBJECTIVE | TOPIC | LEARNIN G STRATEGY | ASSESSMEN T |
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| 1 | Discuss the structure of bone, joint movements and blood supply | ORTH-T-S2-Ana-1 Revisit of bone and joint | | |
| | Discuss the development of bone | ORTH-T-S2-Ana-2-E-1 Anatomy with blood supply Bone development | | |
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| | | ossification of bone & joint | | |
| 3 | <ul style="list-style-type: none"> Define fracture Classify types of fractures | ORTH-T-S2-Orth-1 Definition of fracture, types | | |
| 4 | Identify bone lesions in the imaging scans | ORTH-S2-Rad-1 X-Ray Definition X-ray reading &views | Lecture/ Demonstratio n ,SGD, Practical, CBL/ PBL | |
| 5 | Define different types of fractures based on clinical presentation | ORTH-T-S2-Orth-2 Sign & symptoms of fractures open & closed fractures | | |
| 6 | Define joint dislocations | ORTH-T-S2-Orth-3 Types of dislocations & subluxations | | |
| 7 | Assess the patient for fractures and bone disorders | ORTH-T-S2-Orth-4 History taking & bed side teaching | | SBQs & OSVE, OSCE, Clinical Exam |
| 8 | Identify different types of congenital bone defects | ORTH-T-S2-Ana-3 Developmental abnormalities and bone structures | | |
| 9 | Discuss management of open and closed type of fractures | ORTH-T-S2-Orth-6 Management of open and close fracture | | |
| 10 | Describe consequences of fractures & dislocations | ORTH-T-S2-Orth-7 Complications of Open fractures and dislocations | | |
| 11 | Discuss Imaging techniques | ORTH-T-S2-Rad-2 Imaging techniques X-ray CT-Scan and MRI | | |
| 12 | Discuss post-surgical complications | ORTH-S2-Orth-8 Complications of open fractures and post-surgical complications | | |
| 13 | Prevention and multidisciplinary approach | ORTH-S2-Orth-9 Rehabilitation and physiotherapy | | |
| 14 | Pathophysiological changes in fracture healing | ORTH-T-S2-Phy-1 Fracture healing, Remodeling functions of Osteoclasts & Osteoblasts | | |
| 15 | Types of bone union | ORTH-S2-Orth-10 Fracture union Primary and Secondary union | | |
| 16 | Bone findings on Imaging | ORTH-S2-Orth-11 X-ray Reading | | |
| 17 | Approach to patient with bone disorder, fracture | History taking and bedside teaching | | |

| Theme 2: Infections | | | | |
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| Theme 3: Metabolic Bone Diseases | | | | |
| S # | LEARNING OBJECTIVE | TOPIC | LEARNING STRATEGY | ASSESSMENT |
| 18 | Bone infections, pathophysiology | ORTH-T-S2-Path-1 Bone Infection Types of infection, Patho- Physiology of Osteomyelitis | Lecture/ Demonstratio n , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 19 | Define osteomyelitis and its types | ORTH-T-S2-Orth-1 Definition of Osteomyelitis Types of Osteomyelitis | | |
| 20 | Diagnosis and management of osteomyelitis | ORTH-T-S2-Orth-2 Investigations and treatment options | | |
| 21 | Assess findings of osteomyelitis by imaging techniques | ORTH-T-S2-Rad-1 Imaging and Osteomyelitis X-ray Ct-scan and MRI | | |
| 22 | Surgical management of osteomyelitis | ORTH-T-S2-Orth-3 Surgical Interventions and osteomyelitis | | |
| 23 | Prevention and multidisciplinary approach To management | ORTH-T-S2-Orth-4 Rehabilitation and Infection Prevention | | |
| 24 | Discuss Calcium and vitamin D metabolism | ORTH-T-S2-Bio-1 Calcium Metabolism Parathyroid hormone and vitamin D Metabolism | | |
| 25 | Definition, causes and bone changes in rickets | ORTH-T-S2-Orth-5 Definition of Rickets, effects of Calcium & Vitamin D on Bone | | |
| 26 | Discuss clinical features, treatment, and prevention of Rickets & osteomalacia | ORTH-T-S2-Orth-6 Clinical Features of Rickets and Osteomalacia Treatment and Prevention | | |
| 27 | Define osteoporosis and osteomalacia | ORTH-T-S2-Phy-1 Osteoporosis & Osteomalacia | | |
| 28 | Discuss hyperparathyroidism and its clinical presentation | ORTH-T-S2-Orth-7 Diagnosis, Clinical Features, and Management of Hyperparathyroidism | | |
| 29 | Discuss the management and prevention of Osteoporosis and Osteomalacia | ORTH-T-S2-Orth-8 Management and prevention of Osteoporosis and Osteomalacia | | |

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| 30 | Define the WHO Classification of bone tumors | ORTH-T-S2-Path-2 Bone Tumors and WHO Classification | |
| 31 | Define a management plan of trauma patients | ORTH-T-S2-Orth-9 Management of Upper Limb Trauma | |
| 32 | Discuss the approach to a trauma patient | ORTH-T-S2-Orth-10 Approach to Trauma patient | |
| 33 | Approach to patient | History taking and bedside teaching | |

| Theme 4: Bone Tumors | | | | |
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| Theme 5: Congenital Anomalies Theme 6: Degenerative Disorders | | | | |
| S # | LEARNING OBJECTIVE | TOPIC | LEARNING STRATEGY | ASSESSMENT |
| 34 | Common sites of benign and malignant tumors | ORTH-T-S2-Path-1 Benign & malignant bone Tumor | | |
| 35 | Radiographic features of bone tumors | ORTH-T-Rad-1 Imaging in Tumor X-ray Ct-Scan and MRI | | |
| 36 | Discuss Management protocols of bone tumors | ORTH-T-S2-Orth-1 Management of bone Tumors | | |
| 37 | <ul style="list-style-type: none"> Define Bone tumors diagnostic protocols Discuss Basic Principles of tumor biopsies | ORTH-T-S2-Orth-2 Tumor Protocol and Biopsy Principles | | |
| 38 | Discuss Surgical management of bone tumors | ORTH-T-S2-Orth-3 Surgical Interventions and Bone Tumors | | |
| 39 | Discuss Prosthetic management of bone disorders | ORTH-T-S2-Orth-4 Prostheses and Orthosis | | |
| 40 | Define types of joints, their structure and functions | ORTH-T-S2-Ana-1 Type of joints, joint Lining | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 41 | Define congenital anomalies of bone Discuss clinical features | ORTH-T-S2-Orth-5 Congenital Telepies Equino Varus, Developmental Dysplasia Hip, Sign & Symptoms & Clinical Features | | |
| 42 | Discuss treatment and prevention of CTEV and DDH | ORTH-T-S2-Orth H-6 Treatment of CTEV and DDH and its prevention | | |

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| 43 | Describe Metabolic pathway of uric acid production and accumulation | ORTH-T-S2-Pharm-1 Uric Acid pathway and metabolism | |
| 44 | Define the pathophysiology and clinical features of Osteo-Arthritis. Rheumatoid Arthritis, Gout | ORTH-T-S2-Orth-7 Degenerative Disorders: Osteo-Arthritis, Rheumatoid Arthritis, Gout | |
| 45 | Discuss the diagnostic and Management approach to OA, RA, and Gout | ORTH-T-S2-Orth-8 Diagnosis and Management of Osteo-Arthritis Rheumatoid Arthritis, Gout | |
| 46 | Define an appropriate pain management plan | ORTH-T-S2-Pharm-2 NSAIDs, DMRDs its Effects and Side Effects | |
| 47 | Discuss the surgical management of bone degenerative disorders | ORTH-T-S2-ORTH-9 Surgical Options in Degenerative Disorders | |
| 48 | Define post-surgical Complications | ORTH-T-S2-ORTH-10 Post- Surgical Complications | |
| 49 | Approach to patient | History taking & Bed Side teaching | |

NEUROSURGERY MODULE

Learning Objectives

By the end of the curriculum, the student shall be able to:

- Recall functional neuroanatomy of the brain and spinal cord.
- Revised embryology and histology of neuron, nerve, and neuroglia.
- Enlist the investigations for diagnosing a neurological disorder.
- History taking and examination of head injury and spinal cord pathology.
- Discuss the assessment and management of raised ICP, cerebral edema, and brain herniation.
- Classify brain tumors and evaluate management plan.
- Assess the vascular pathology of the brain.
- Know the approach for assessment and management of congenital disorder the brain and spine.

Themes

Theme 1: Traumatic Brain Injury
 Theme 2: Intracranial hemorrhage
 Theme 3: Spinal cord trauma and myelopathy

Topics with specific learning objectives and teaching strategies

Theme 1: Traumatic Brain Injury

| S # | LEARNING OBJECTIVE | TOPIC | LEARNING STRATEGY | ASSESSMENT |
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| 5 | Predict the general reaction of brain to various injurious processes in terms of brain edema or raised intracranial pressure and develop a management plan | ORTH-T-S2-NSUR-2 Assessment of causes and management of cerebral edema, raised intracranial pressure and brain herniation | Lecture/ Demonstration, , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| | | ORTH-T-S2-Rad-1 CT-scan & MRI Brain ORTH-T-S2-NSUR-3 <ol style="list-style-type: none"> 1. Skull fractures 2. Parenchymal injuries <ul style="list-style-type: none"> • Concussion • Direct parenchymal injuries • Diffuse axonal injuries 3. Traumatic vascular injuries <ul style="list-style-type: none"> • Epidural hematoma • Subdural hematoma • Parenchymal 4. Sequelae of brain trauma | | |

| Theme 2: Intracranial Hemorrhage | | | | |
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| S # | LEARNING OBJECTIVE | TOPIC | LEARNING STRATEGY | ASSESSMENT |
| | Manage ischemic or | ORTH-T-S2-Ana-4 | | SBQs & OSVE, OSCE, Clinical Exam |
| | hemorrhagic cerebrovascular events by knowing their effect on brain parenchyma | Circulation of brain and basal ganglion | Lecture/ Demonstration, , SGD, Practical, | |
| 6 | | ORTH-T-S2-NSUR-4 | | |
| and various clinical effects | Intracranial hemorrhage | CBL/ PBL | | |
| | along with radiological diagnosis | ORTH-T-S2-Rad-2 CT Scan & MRI | | |

| Theme 3: Spinal cord trauma and myelopathy | | | | |
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| S # | LEARNING OBJECTIVE | TOPIC | LEARNING STRATEGY | ASSESSMENT |
| 9 | To localizes the lesion of compressive spinal cord pathology including vascular, neoplastic, infective and traumatic | ORTH-T-S2-Ana-6 Brief View of the Spinal Cord | Lecture/ Demonstration, , SGD, | SBQs & OSVE, OSCE, Clinical |
| | | ORTH-T-S2-NSUR-7 Etiology, clinical presentation and management | | |

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| | | ORTH-T-S2-Rad-5 X-rays, CT-Scan & MRI | Practical, CBL/ PBL | Exam |
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NEUROSCIENCE II MODULE

Introduction Neuroscience is a multidisciplinary field that looks into the causes underlying neurological illness as well as the development and cellular operations of the nervous system. This module includes basic anatomical, physiological and biochemical concepts in relation to the nervous system and its link with clinical aspects related to the diseases of brain and nerves. This curriculum combines the chance to learn about the field broadly with in-depth knowledge in one of the three primary areas of neuroscience: clinical neuroscience, functional and integration neuroscience, and cellular and systems neuroscience.

Rationale The main goal of this module is to provide the foundation for understanding the impairments of sensation, action & cognition that accompany injury, disease or dysfunction in the central nervous system. This module will build upon the knowledge acquired through prior studies of cell molecular biology, general physiology & human anatomy with primary focus on the CNS. It will cover the important clinical aspects, pathological features, therapeutics & other common diseases of the CNS. Through this module student will develop an integrated, scientific knowledge and will be able to practice in a clinical setting and develop problem-solving skills helping to progress scientific discovery into neurological aspects of clinical and medical practice.

Duration 03 weeks

Learning Outcomes: By the end of this module, the students will be able to:

- Develop a well-rounded understanding of the neuroanatomy, neurophysiology, and neuropsychology that underlie both neurological and psychiatric disorders.
- Acquire the skills to correlate anatomy, pathology, and pharmacology with clinical presentations in both neurology and psychiatry.
- Demonstrate the utilization of diagnostic tests such as EEG, CT, MRI, and plain X-rays, along with psychiatric evaluation tools, for accurate diagnosis.
- Formulate holistic treatment plans incorporating pharmacological, psychological, and Neuro-rehabilitation strategies for managing both neurological and psychiatric disorders.

Themes

Neurology (3 Weeks)

Theme 1: Weakness (Monoplegia, Hemiplegia)
 Theme 2: Loss of Consciousness and Fits
 Theme 3: Headache
 Theme 4: Tremors and Difficulty in Walking / Loss of Balance (Ataxia)
 Theme 5: Vertigo and Loss of Vision
 Theme 6: Forgetfulness and Loss of Memory
 Theme 7: Paraplegia, Quadriplegia
 Theme 8: Loss of Vision
 Theme 9: Numbness and Parasthesias (Tingling, Needling Sensation)

PSYCHIATRY (3 weeks)

Theme 1: Psychosis/ Schizophrenia Patho-Physiology, Classification, Investigation/Management

Theme 2: Mood Disorders and Anxiety Disorders, Pathophysiology, Classification Investigation /

NEURO PATHOLOGY AND NEUROPHARMACOLOGY

Theme 10: Inflammatory and Infective Diseases of CNS

Theme 11: Tumors of the Central Nervous System

Theme 12: Autonomic Nervous System

NEUROSURGERY

Theme 13: Congenital Anomalies of CNS

Theme 14: Composition, Synthesis, and Flow of CSF, Hydrocephalus and Its Management

Theme 15: Approaches and Management of CNS tumors at different age

NEUROSURGERY MODULE

Theme 13: Congenital Anomalies of CN

| S # | LEARNING OBJECTIVE | TOPIC | LEARNING STRATEGY | ASSESSMENT |
|-----|---|--|--|---|
| 1 | Revisit the neuroanatomy of the brain | ORTH-T-S2-Ana-1 Functional Neuroanatomy of Brain | | |
| 2 | Revisit the development of the brain | ORTH-T-S2-Ana-2-E1 Development of the brain | | |
| 3 | Formulate the cases and consequences of various birth d e f e c t s and developmental disorders involving CNS | ORTH-T-S2-NSur-1 Neural tube defects, forebrain anomalies, and posterior fossa anomalies. | | |
| 4 | Revisit the histology of neurons and neuroglia | ORTH-T-S2-Ana-3-H-1 Neurons and neuroglia | | |
| 7 | Synthesis and flow of CSF along with its composition, hydrocephalus and its management | ORTH-T-S2-Phy-1 Flow and circulation of CSF ORTH-T-S2-Ana-5 Ventricular System ORTH-T-S2-NSUR-5 Presentation and management ORTH-T-S2-Rad-3 CT scan & MRI | Lecture/ Demonstration, SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |

NEUROANATOMY

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| 1 | Revisit the neuroanatomy of the brain, cranial nerves, and cerebellum(revisit) + Localize the lesion in CNS and PNS +Evaluation of ischemic or hemorrhagic cerebrovascular events and their clinical effect on brain parenchyma | NS-S2-Ana-1 Functional Neuroanatomy and the blood supply to the brain | Lecture/ Demonstration, SGD, Practical, CBL/ PBL | |
| | | NS-S2-Ana-2 Functional Neuroanatomy of the Spinal Cord | | |

| Theme 14: Composition, Synthesis, and Flow of CSF, Hydrocephalus, and Its Management | | | |
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| | <ul style="list-style-type: none"> Explain the neuroanatomical changes associated with mental and behavioral disorders. Identify specific brain regions affected in different disorders. Explain the relationship between brain structures and behavioral manifestations. | NS-S2-Ana-1 Neuroanatomical Changes in Mental and Behavioral Disorders | |
| | <ul style="list-style-type: none"> Define psychosis and its key characteristics. Classify different types of psychosis. Explain the clinical presentations of psychosis. Differentiate between positive and negative symptoms of psychosis. | NS-S2-PSY-1 Psychosis Concept and Classifications | SBQs & OSVE, OSCE, Clinical Exam |
| 2 | To learn about the pathological processes affecting the nervous system. And the correlation between clinical presentations and pathogenic mechanisms. | NS-S2-Path-1 Cerebral hypoxia and cerebral edema NS-S2-Path-2 Degenerative disorders of the brain and spinal cord pathological perspective NS-S2-Path-3 Pathological perspective/ classification of neuropathies | |
| | <ul style="list-style-type: none"> Investigations for Neurological Disorders + Correlate between clinical presentations and pathogenic mechanisms involved in CNS infections and infestations. Identify the involvement of isolated or multiple brain regions and structures in degenerative disorders | NS-S2-Neu-1 Cerebrovascular Disorders diagnosis NS-S2-Neu-2 Definition and classification of seizure disorders NS-S2-Neu-3 Cerebrovascular disorders management NS-S2-Neu-4 Diagnosis & management of epilepsy NS-S2-Neu-5 Meningitis | |

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| 3 | <p>and know the resulting clinical syndromes. + Localize the lesion in the various neuroaxis.</p> <ul style="list-style-type: none"> • To learn about clinical presentation and diagnosis, and investigation of stroke, headache, and epilepsy. • Differentiate between different types of anterior horn cell disorders, neuropathies, and Myopathies by knowing their pathology, clinical features, and investigations. lesions and their radiological appearance | <p>NS-S2-Neu-6 Encephalitis</p> <p>NS-S2-Neu-7 Brain abscess</p> <p>NS-S2-Neu-8 Migraine</p> <p>NS-S2-Neu-9 Loss of consciousness/coma (approach to diagnosis and management)</p> | |

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| | <ul style="list-style-type: none"> • Predict the general reaction of brain to various injurious processes in terms of brain edema or raised intracranial pressure and develop a management plan | <p>NS-S2-Neu-10 Parkinson disease</p> <p>NS-S2-Neu-11 Cerebellar dysfunctions diagnosis and management</p> <p>NS-S2-Neu-12 Chorea</p> <p>NS-S2-Neu-13 Friedreich's ataxia</p> <p>NS-S2-Neu-14 Wilson disease</p> <p>NS-S2-Neu-15 Normal pressure hydrocephalus</p> <p>NS-S2-Neu-16 Leuko dystrophies</p> <p>NS-S2-Neu-17 Alzheimer disease</p> <p>NS-S2-Neu-18 Multiples sclerosis</p> <p>NS-S2-Neu-19 Transverse myelitis</p> | |

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| NS-S2-Neu-20 Neuroelectric physiology (NCSEMG, VEP, BERA, EEG) |
| NS-S2-Neu-21 TB spine |
| NS-S2-Neu-22 Acute and chronic peripheral neuropathies |
| NS-S2-Neu-23 Sub-acute combine degeneration of cord |
| NS-S2-Neu-24 Myasthenia gravis |
| NS-S2-Neu-25 Muscular dystrophies |
| NS-S2-Neu-26 Approach to the visual loss |
| NS-S2-Neu-27 Metabolic and inflammatory Myopathies |

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| 4 | To learn the basic concepts about neuroimaging and its interpretation | NS-S2-Rad-1 Basics of neuroimaging (X -ray, CT scan, and MRI) |
| | | NS-S2-Rad-2 Neuroimaging of multiple sclerosis |
| | <ul style="list-style-type: none"> Describe the clinical features of schizophrenia. Identify the subtype of schizophrenia. Explain the course and prognosis of the disorder. Explain the challenges in managing schizophrenia. | NS-S2-PSY-2 Schizophrenia |
| | <ul style="list-style-type: none"> Explore disorders within the schizophrenia spectrum. Explain the similarities and differences between these disorders. | NS-S2-PSY-3 Schizophrenia Spectrum Disorders |

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| <ul style="list-style-type: none"> • Apply the bio psycho-social model in the management of schizophrenia. • Develop comprehensive treatment plans considering biological, psychological, and social factors. | <p style="text-align: center;">NS-S2-PSY-4 Management of Schizophrenia Bio-Psychosocial Model</p> | |
| NEUROSURGERY AND PSYCHOLOGY | | |
| <ul style="list-style-type: none"> • Define bipolar disorder and its diagnostic criteria. • Identify the different phases of bipolar disorder. • Explain the challenges in managing bipolar disorder. | <p style="text-align: center;">NS-S2-PSY-5 Bipolar Disorder</p> | |
| <ul style="list-style-type: none"> • Explore neurophysiological and biochemical changes associated with mental disorders. • Explain the role of neurotransmitters in psychiatric conditions. • Identify key biomarkers related to mental and behavioral disorders. | <p style="text-align: center;">NS-S2-Bio-1 Neurophysiological/ Biochemical Changes in Mental Disorders</p> | |
| <ul style="list-style-type: none"> • Define personality and personality disorders. • Identify different types of personality disorders. • Explain the diagnostic criteria for personality disorders. • Explore the impact of personality disorders on an individual's functioning. | <p style="text-align: center;">NS-S2-PSY-6 Personality and Personality Disorders</p> | |
| <ul style="list-style-type: none"> • Apply therapeutic approaches in the management of personality disorders. • Develop strategies for coping with challenging behaviors. | <p style="text-align: center;">NS-S2-PSY-7 Management of Personality Disorders</p> | |
| <ul style="list-style-type: none"> • Explain the applications of neuro-imaging in psychiatric conditions. Interpret neuro-imaging results in the context of mental health assessment. | <p style="text-align: center;">NS-S2-Rad-1 Basics of Neuro- imaging (CT Scan and MRI)</p> | |

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| <ul style="list-style-type: none"> Identify general medical conditions that may present with acute psychosis. Explain the relationship between Medical conditions and psychiatric symptoms. | <p>NS-S2-CM-1 General Medical Conditions Presented with Acute Psychosis</p> | |
| <ul style="list-style-type: none"> Implement appropriate intervention for the management of psychosis in the context of general medical conditions. Collaborate with medical professionals in addressing underlying medical issues. Explain the importance of a multidisciplinary approach in such cases. | <p>NS-S2-CM-2 Management of General Medical Conditions Presented with Psychosis</p> | |
| <ul style="list-style-type: none"> Define major depressive disorder and its diagnostic criteria. Recognize the symptoms and course of major depressive episodes. Explain the impact of major depressive disorder on individuals and society. | <p>NS-S2-PSY-8 Major Depressive Disorder</p> | |
| <ul style="list-style-type: none"> Apply the bio-psychosocial model in the management of major depressive disorder. Develop comprehensive treatment plans considering biological, psychological, and social factors. | <p>NS-S2-PSY-9 Management of Major Depressive Disorder Bio-Psychosocial Model</p> | |
| <ul style="list-style-type: none"> Explain the social factors influencing suicide. Identify risk and protective factors related to suicide. Discuss the impact of societal attitudes on individuals at risk of suicide. | <p>NS-S2-PSY-10 Social Perspective of Suicide</p> | |
| <ul style="list-style-type: none"> Identify risk factors associated with deliberate self-harm and suicide. Conduct a comprehensive assessment of suicide risk. Develop intervention strategies for individuals at risk. | <p>NS-S2-PSY-11 Deliberate Self- Harm / Suicide Risk Factors and Assessment</p> | |

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| <ul style="list-style-type: none"> • Define anxiety disorders and their key characteristics. • Classify different types of anxiety disorders. • Explain the clinical presentations of anxiety disorders. | <p>NS-S2-PSY-12 Anxiety Disorders Concept and Classification</p> | |
| <ul style="list-style-type: none"> • Apply the bio-psychosocial model in the management of anxiety disorders. • Develop comprehensive treatment plans considering biological, psychological, and social factors. • Implement strategies for coping with anxiety symptoms. | <p>NS-S2-PSY-13 Management of Anxiety Disorder Bio- Psychosocial Model</p> | |
| <ul style="list-style-type: none"> • Define acute stress disorder and post- traumatic stress disorder. • Identify the diagnostic criteria and symptoms associated with each disorder. • Explain the impact of trauma on mental health. • Develop strategies for managing acute stress and PTSD. | <p>NS-S2-PSY-14 Acute Stress Disorder & Post Traumatic Stress Disorder</p> | |
| <ul style="list-style-type: none"> • Explore the relationship between stress and physical/mental health. • Explain the physiological and psychological effects of stress. • Identify coping mechanisms for stress management. | <p>NS-S2-PSY-15 Stress and its Relationship with Illness</p> | |
| <ul style="list-style-type: none"> • Define adjustment disorder and its diagnostic criteria. • Identify common stressors leading to adjustment disorder. • Explain the impact of adjustment disorder on an individual's functioning. • Develop interventions for coping with adjustment difficulties. | <p>NS-S2-PSY-16 Adjustment Disorder</p> | |
| <ul style="list-style-type: none"> • Implement strategies for the management of acute stress disorder. • Provide psychoeducation on coping with acute stress. • Address immediate and long-term needs of individuals | <p>NS-S2-PSY-17 Management of Acute Stress Disorder</p> | |

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| | experiencing acute stress. | | |
| | <ul style="list-style-type: none"> Classify different types of sleep disorders. Explain the diagnostic criteria for common sleep disorders. Explore the impact of sleep disorders on mental and physical health. Develop management strategies for various sleep disorders. | NS-S2-PSY-18 Sleep Disorders: Classification and Management | |
| | <ul style="list-style-type: none"> Define somatoform and dissociative disorders. Classify different types of somatoform and dissociative disorders. Explain the clinical presentations of these disorders. Explore the relationship between psychological factors and somatic symptoms. | NS-S2-PSY-19 Somatoform & Dissociative Disorders Classification and Clinical Presentations | |
| | <ul style="list-style-type: none"> Apply therapeutic approaches in the management of somatoform and dissociative disorders. Develop strategies for addressing somatic symptoms in a holistic manner. Collaborate with healthcare professionals for comprehensive care. | NS-S2-PSY-20 Management of Somatoform & Dissociative Disorders | |
| | <ul style="list-style-type: none"> Explain the neurobiological basis of addiction. Identify the impact of substances on the brain's reward system. Explore the concept of tolerance, dependence, and withdrawal. Recognize the role of genetics in addiction susceptibility. | NS-S2-PSY-21 Neurobiological Basis of Addiction | |
| | <ul style="list-style-type: none"> Conduct a comprehensive assessment for substance use disorders. Identify diagnostic criteria for different substance use disorders. | NS-S2-PSY-22 Substance Use | |

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| <ul style="list-style-type: none"> • Explain the impact of substance use on mental and physical health. • Differentiate between substance abuse and dependence. | <p>Disorders: Assessment and Diagnosis</p> | |
| <ul style="list-style-type: none"> • Develop individualized treatment plans for substance use disorders. • Implement evidence-based interventions for substance use disorders. • Address co-occurring mental health issues in the context of substance use. | <p>NS-S2-PSY-23 Management of Substance Use Disorder</p> | |
| <ul style="list-style-type: none"> • Explain the stages of child development. • Identify key milestones in • Explore factors influencing child development. | <p>NS-S2-PSY-24 Child Development</p> | |
| <ul style="list-style-type: none"> • Define pervasive developmental disorders (autism spectrum disorders). • Identify diagnostic criteria for different disorders within the spectrum. • Explain the challenges faced by individuals with pervasive developmental disorders. | <p>NS-S2-PSY-25 Pervasive Developmental Disorders</p> | |
| <ul style="list-style-type: none"> • Conduct comprehensive assessments for developmental disorders. • Develop intervention plans tailored to the individual needs of children with developmental disorders. | <p>NS-S2-PSY-26 Assessment and Management of Developmental Disorders</p> | |
| <ul style="list-style-type: none"> • Differentiate between dementia and delirium. • Explain the clinical presentations of dementia and delirium. • Identify risk factors for these disorders. | <p>NS-S2-PSY-27 Dementia and Delirium</p> | |
| <ul style="list-style-type: none"> • Recognize the signs and symptoms of dementia and delirium. • Explain the progression of cognitive decline in dementia. • Identify reversible causes of | <p>NS-S2-PSY-28 Clinical Presentations of Dementia and Delirium</p> | |

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| | delirium. | |
| | <ul style="list-style-type: none"> • Implement strategies for managing behavioral and cognitive symptoms in dementia. • Provide support for individuals and caregivers coping with dementia | NS-S2-PSY-29 Management of Dementia and Delirium |
| | <ul style="list-style-type: none"> • Explain the concept of stigma in the context of mental health. • Explore the impact of stigma on individuals seeking mental health services. • Engage in mental health advocacy to reduce stigma. | NS-S2-PSY-29 Stigma & Mental Health Advocacy |
| | <ul style="list-style-type: none"> • Explain the legal framework surrounding mental health. • Identify the rights and responsibilities of individuals with mental health issues. • Navigate the legal processes related to involuntary commitment and treatment. | NS-S2-PSY-30 Legal Aspects of Mental Health |
| 5 | To learn about the indication contraindication of various drugs used for the management of common neurological disorders | NS-S2-Pharm-1 Anti-epileptic drugs + Drugs for migraine NS-S2-Pharm-2 Anti-tubercles and drugs for the CNS infections NS-S2-Pharm-3 Drugs for Parkinsonism |
| 6 | Recognize the importance of Community medicine in neurological disorders | NS-S2-CM-1 Overview on global burden of neurological Disorders NS-S2-CM-2 Public health principles and awareness about neurological disorders |
| 7 | To learn about the basic knowledge of neurorehabilitation | NS-S2-PMR-1 Neurorehabilitation of common UMN and LMN disorders |
| | <ul style="list-style-type: none"> • Explain the mechanisms of action of antipsychotic medications. • Identify common anti- | NS-S2-Pharm-1 Psycho-pharmacology of Antipsychotic |

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| | psychotic drugs and their side effects. | | |
| | <ul style="list-style-type: none"> Explain the role of mood stabilizers in psychiatric treatment. Identify common mood stabilizers and their mechanisms of action. Recognize indications and contraindications for mood stabilizer use. | NS-S2-Pharm-2 Psychopharmacology of Mood Stabilizers | |
| | <ul style="list-style-type: none"> Explain the mechanisms of action of antidepressant medications. Identify common antidepressant drugs and their side effects. | NS-S2-Pharm-3 Psycho-pharmacology of Antidepressants | |

| Theme 10: Inflammatory and Infective Diseases of the CNS | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| Pathology | | | | |
| 1 | <ul style="list-style-type: none"> Define meningitis and encephalitis Discuss common Central Nervous System infections including acute (pyogenic) bacterial infections, acute aseptic viral infections, chronic bacterial meningo-encephalitis, and fungal meningo-encephalitis | NS-S2-Path-1 Inflammation and infections of CNS-1 | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| | Viral pathogens causing meningitis, Enteroviruses, HSV-2, Arboviruses | NS-S2-Path-2 Inflammation and infections of CNS-2 | | |
| | Discuss pathogenesis of cerebral malaria, Naegleria fowleri and | NS-S2-Path-3 Inflammation and infections of | | |

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| 2 | Cysticercosis | CNS-3 | | |
| | Infection of the Brain & Meninges & CSF interpretation | NS-S2-Path-4 Inflammation and infections of CNS-4 | | |
| | List the most common organisms that cause CNS infection in different age groups | NS-S2-Path-5 Inflammation and infections of CNS-5 | | |
| | Discuss CSF findings of bacterial, tuberculous, viral and fungal meningitis | NS-S2-Path-6 Inflammation and infections of CNS-6 | | |

| Theme 11: Tumors of the Central Nervous System Theme 12: Approaches and Management of CNS tumors at different ages | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 3 | <ul style="list-style-type: none"> Classify CNS tumors according to WHO Classification List genetic mutations, pathogenesis, morphology and clinical features of brain tumors Including all types of Gliomas, Ependymoma, Medullo-blastoma and Meningioma Discuss the metastatic tumors to brain | NS-S2-Path-7 Brain tumors | Lecture/ Demonstration, SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 8 | Relate the neoplastic processes involving different parts of brain with their clinical presentations and differentages | ORTH-T-S2-Path-1 Brain tumor ORTH-T-S2-NSUR-6 Approach and management of CNS Tumors & different | Lecture/ Demonstration, SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |

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| | | ages | | |
| | | ORTH-T-S2- Rad-4 Radiological appearance of a brain tumor | | |

Pharmacology

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| 1 | <ul style="list-style-type: none"> Classify different types of antiepileptic drugs Describe the mechanism of action, and adverse effects. | NS-S2-Pharm-1 Anti-epileptics | | |
| 2 | <ul style="list-style-type: none"> Classify different types of antipsychotic drugs Describe the mechanism of action, and adverse effects. | NS-S2-Pharm-2 Antipsychotics | | |
| 3 | <ul style="list-style-type: none"> Enlist different drugs that are used for the treatment of Parkinson's disease. Describe their mechanism of action and adverse effects. | NS-S2-Pharm-3 Drugs used in Parkinson's Disease | | |
| 4 | <ul style="list-style-type: none"> Discuss the pathophysiology of migraine headaches Discuss both pharmacologic and non-pharmacologic treatment strategies for migraine. | NS-S2-Pharm-4 Treatment of Migraine | | |
| 5 | | NS-S2-Pharm-5 Anti-Depressants | | |
| 6 | | NS-S2-Pharm-6 Sedatives Hypnotics | | |
| 7 | | NS-S2-Pharm-7 General anesthesia -1 (inhaled) | | |
| 8 | | NS-S2-Pharm-8 General anesthesia -2 (I.V) | | |
| 9 | | NS-S2-Pharm-9 Local Anesthetic Agents | | |

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| 10 | | NS-S2-Pharm-10 Opioids | | |
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| Theme 13: Autonomic Nervous System | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 1 | • | ANS-S2-Pharm-1 Introduction To ANS | | |
| 2 | <ul style="list-style-type: none"> • Receptor distribution of Cholinergic Nervous System • Classify the Cholinergic agonists • Describe the mechanism of direct and indirect Cholinergic agonists • Discuss the clinical uses of Cholinergic agonists • Discuss the side effects of Cholinergic agonists | ANS-S2-Pharm-2 Cholinergic agonists | | |
| 3 | <ul style="list-style-type: none"> • Classify the Cholinergic antagonists • Discuss the clinical uses of Cholinergic antagonists • Discuss the side effects of Cholinergic antagonists | ANS-S2-Pharm-3 Cholinergic antagonists | | |
| 4 | <ul style="list-style-type: none"> • Receptor distribution of the adrenergic Nervous System • Classify the adrenergic agonists • Describe the mechanism of direct and indirect adrenergic agonists • Discuss the clinical uses of adrenergic agonists • Discuss the side effects of adrenergic agonists | ANS-S2-Pharm-4 Adrenergic agonists-1 | Lecture/ Demonstration, SGD, Practical, CBL/PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 5 | <ul style="list-style-type: none"> • Classify the adrenergic antagonists • Discuss the clinical uses and side effects of Alpha Blockers • Discuss the clinical uses and side effects Effects of Beta Blockers | ANS-S2-Pharm-5 Adrenergic agonists-2 | | |
| 6 | | ANS-S2-Pharm-6 | | |

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| | | Alpha Blockers | | |
| 7 | | ANS-S2-Pharm-7 Beta blockers | | |

COMMUNITY MEDICINE

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|----|--|---|-----------------------------------|------------------------------|
| 1. | Introduction to Epidemiology | <ul style="list-style-type: none"> • Define epidemiology • Describe the basic terminology and concept of epidemiology • Understand the objectives and approaches of epidemiology. • Understand the concept of descriptive epidemiology. • Describe the concept and importance of time place, and person. | Teaching Methodology • Lecture | Type of Assessment • SBQs |
| 2. | Measures of the occurrence of diseases | <ul style="list-style-type: none"> • Define the measure of occurrences and effects of diseases. • Describe Proportions, Risk, Rate, Ratio, and Odds • Understand the concept of prevalence and incidence. • Describe the concept of Crude, specific and standardized rates | Teaching Methodology • Lecture | Type of Assessment • SBQs |

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| 3. | Causation in Epidemiology | <ul style="list-style-type: none"> • Define the principles of causation. • Determine the concept of necessity and sufficiency. • Describe the different models of causation. • Discuss Bradford Hill's criteria of causation. | Teaching Methodology • Lecture | Type of Assessment • SBQs |
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CARDIOLOGY MODULE

Introduction:

Welcome to the Cardiology module. This interesting module is essential for building your foundation in medicine and allied fields. This module is designed to make your learning both interesting and productive by including several interactive activities.

This module comprehensively covers the clinical applications that we encounter in everyday life as cardiologists. All these topics are interactive and helpful in understanding both the disease process and its

management.

Rationale:

Heart is one of if not the most, essential organ of the body, it has a complex interaction with other essential organs of the body, its importance in human life is critical for survival of human being to understand the complex functioning as well as the common disease process is critical for every medical student to learn and by understanding it one can truly excel in medicine.

Duration 02 Weeks

Learning Outcomes After completion of the MBBS course, the student should be able to:

- Recognize the clinical presentations of common cardiovascular diseases in the community.
- Diagnosing these diseases based on history, examination, and clinical investigations.
- Identify the preventive measures for counseling their patients.
- Practice basic principles of management of common diseases and make appropriate referrals.
- Recognition of the prognosis to counsel their patients.
- Be aware of the specific diagnostic tools for cardiovascular diseases and their interpretation.

| Topics with specific learning objectives and teaching strategies | | | | |
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| Theme 1: Ischemia, Heart Failure, Congenital Heart Diseases and Vascular Diseases | | | | |
| S # | LEARNING OBJECTIVE | TOPIC | LEARNING STRATEGY | ASSESSMENT |
| 1 | <ul style="list-style-type: none">• NSTE-ACS:<ul style="list-style-type: none">○ Unstable Angina○ NSTEMI• STEMI | CAR-S2-Cardio-1 Acute Coronary Syndrome | | |
| 2 | <ul style="list-style-type: none">• Introduction• Clinical Presentation• Diagnostic testing• Therapy | CAR-S2-Cardio-2 Chronic Coronary Syndrome | | |
| 3 | <ul style="list-style-type: none">• Heart Failure with systolic Dysfunction• Heart Failure with preserved ejection fraction | CAR-S2-Cardio-3 Heart Failure | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 4 | <ul style="list-style-type: none">• ASD• VSD• PDA• Coarctation of Aorta\• Tetralogy of Fallot | CAR-S2-Cardio-4 Congenital Heart Diseases | | |
| 5 | <ul style="list-style-type: none">• Venous thromboembolism• Peripheral Arterial disease• Carotid artery disease. | CAR-S2-Cardio-5 Vascular Diseases | | |

| Theme 2: Arrhythmias, Valvular Heart Disease and Heart Disease and Pregnancy | | | | |
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| S | LEARNING OBJECTIVE | TOPIC | LEARNING STRATEGY | ASSESSMENT |

| # | | | | |
|---|--|--|---|--|
| 1 | <ul style="list-style-type: none"> • Supraventricular arrhythmias • Ventricular arrhythmias | CAR-S2-Cardio-6 Taccharrythmia | | |
| 2 | <ul style="list-style-type: none"> • Sinus Node Dysfunction • 1st degree AV Blocks • 2nd degree AV Block • 3rd degree AV Block | CAR-S2-Cardio-7 Bradyarrythmias | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 3 | <ul style="list-style-type: none"> • Mitral Valve Disease • Mitral stenosis • Mitral Regurgitation | CAR-S2-Cardio-8 Valvular He art Disease | | |
| 4 | <ul style="list-style-type: none"> • Aortic Valve Disease • Aortic stenosis • Aortic Regurgitation | CAR-S2-Cardio-9 Valvular He art Disease | | |
| 5 | <ul style="list-style-type: none"> • Introduction • Normal Physiologic changes during pregnancy • Cardiovascular evaluation during pregnancy • Pregnancy in women with CHD • VHD and pregnancy • Hypertensive disorders in Pregnancy | CAR-S2-Cardio-10 HeartDiseasesand Pregnancy | | |

COMMUNITY MEDICINE

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| 4. | Introduction to epidemiological study design | <ul style="list-style-type: none"> • Discuss the epidemiological study design. • Differentiate between observational and experimental studies. • Identify the key concept of descriptive epidemiology. • Differentiate between Descriptive and analytical studies. • Determine how and when to select the appropriate study design | Lecture | SBQs |
| 5. | Case-report, Case series, and Cross-sectional study | <ul style="list-style-type: none"> • Describe case reports and case series. • Define cross-sectional study • Discuss the uses of the cross-sectional study. • Compare the relative strengths and weaknesses of Cross-sectional studies | Lecture | SBQs |

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| 6. | Case-control study | <ul style="list-style-type: none"> Define the case-control study. Describe the advantages and limitations of case-control studies. Analyze and interpret the Odd ratio. | <ul style="list-style-type: none"> Lecture | <ul style="list-style-type: none"> SBQs |
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INTEGUMENTARY MODULE

Introduction:

Welcome to the Integumentary module. This interesting module is essential for building your foundation in medicine and allied fields. This module is designed to make your learning both interesting and productive by including several interactive activities.

This module covers the structural anatomy and physiology of the skin as well as common skin disorders encountered in our society. All these topics are interactive and helpful in understanding skin diseases.

Rationale: Skin is the largest organ of the body. Its exposed position makes it susceptible to a large number of disorders which include allergic conditions, infections, and involvement in metabolic disorders. In this dermatology module the student shall gain an understanding of skin diseases, their clinical presentation, diagnosis, and their management.

Learning Outcomes After completion of the MBBS course, the student should be able to:

- Recognize the clinical presentations of common Skin diseases in the community.
- Diagnosing these diseases based on history, examination, and clinical investigations.
- Identify the preventive measures for counseling their patients.
- Practice basic principles of management of common diseases and make appropriate referral.
- Recognition of the prognosis to counsel their patients.
- Be aware of the specific diagnostic tools for Skin diseases, and their interpretation.

Duration 02 Weeks

| Topics with specific learning objectives and teaching strategies | | | | |
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| Theme 1: Introduction and Inflammatory Dermatoses | | | | |
| S. # | LEARNING OBJECTIVES | TOPICS | TEACHING STRATEGY | ASSESSMENT |
| 1 | <ul style="list-style-type: none"> Recognize the Layers of the epidermis & Dermis Recognize the appendages Explore the functions of epidermis and dermis | IM-S2-Derm-1 Anatomy and physiology of the skin | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 2 | Recognize primary and secondary cutaneous lesions | IM-S2-Derm-2 Primary and secondary skin lesions | | |

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| 3 | To diagnose different types of psoriasis & their management | IM-S2-Derm-3 Psoriasis | | |
| 4 | To diagnose acne vulgaris & its management | IM-S2-Derm-4 Acne vulgaris | | |
| 5 | To diagnose atopic Eczema & study its management | IM-S2-Derm-5 Atopic dermatitis | | |

| Theme 2: Infections of the Skin | | | | |
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| S # | LEARNING OBJECTIVES | TOPICS | TEACHING STRATEGY | ASSESSMENT |
| 6 | To diagnose superficial cutaneous bacterial infections, and their management | IM-S2-Derm-6 Bacterial Infection | | |
| 7 | To diagnose different types of superficial fungal infections and their management | IM-S2-Derm-7 Fungal | Lecture/ Demonstration, SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 8 | To diagnose common cutaneous viral infections and their management | IM-S2-Derm-8 Viral Infections | | |
| 9 | To diagnose the Leishmaniasis and their management | IM-S2-Derm-9 Parasitic Infections | | |
| 10 | To diagnose scabies and its management. | IM-S2-Derm-10 Parasitic Infections | | |

PLASTIC SURGERY BURN

By the end of this module, 4th-year undergraduate medical students should be able to:

- Enlist the type of skin and its behavior after injuries like pigmentation, hypertrophic scar, and Keloid.
- Enumerate the relevant investigations in a given scenario, including blood investigations, relevant X-ray, Echo, CT, and MRI scan.
- Diagnose the type of wound and its management.
- Enlist the different skin lesions and tumors and their management based on local and regional flaps.
- Discuss the axial pattern flap for distant area coverage.
- Explain the biological and artificial skin for coverage.
- Describe the acute burn care.
- Discuss how the graft applied

- Enumerate and identify various benign and malignant skin lesions.
- Enlist and describe various congenital anomalies dealt in Plastic surgery.
- Identify appropriate patient referral for further management

Duration 02 Weeks

Theme: Burns and Wound Healing

Theme: Birth Defects

Theme: Skin lesions/ tumors

| S # | LEARNING OBJECTIVES | TOPICS | TEACHING STRATEGY | ASSESSMENT |
|---------------------------|------------------------------------|---|--|---|
| COMMUNITY MEDICINE | | | | |
| 7. | Cohort Study | <ul style="list-style-type: none"> • Define the cohort study • Discuss the importance, uses, and limitations of the cohort study • Analysis and interpretation | Teaching Methodology <ul style="list-style-type: none"> • Lecture | Type Of Assessment <ul style="list-style-type: none"> • SBQs |
| 8. | Errors in epidemiological research | <ul style="list-style-type: none"> • Define different errors in research. • Define validity and reliability • Define confounder and its impact on research • Determine different biases in research | Teaching Methodology <ul style="list-style-type: none"> • Lecture | Type Of Assessment <ul style="list-style-type: none"> • SBQs |

Topics with specific learning objectives and teaching strategies

Theme: Basic

| S # | LEARNING OBJECTIVES | TOPICS | TEACHING STRATEGY | ASSESSMENT |
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| 11 | <p>The student will be able to:</p> <ul style="list-style-type: none"> • Define what is plastic surgery is. • Describe the history of plastic surgery • Define sub-specialties in plastic surgery • Describe factors involved in obtaining a fine line scar • Describe a step ladder in plastic surgical armamentarium | IM-S2-PSurg-1 Introduction to Plastic Surgery | Lecture/ Demonstration, SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 12 | <p>The student will be able to:</p> <ul style="list-style-type: none"> • Define and identify different types and degrees of burns • Describe management of acute burns • Enumerate complications of Burns • Describe measures for prevention of burns and its complications | IM-S2-PSurg-2 Burns | Lecture/ Demonstration, SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 13 | <p>The student will be able to:</p> <ul style="list-style-type: none"> • Define stages of wound healing • Describe mechanisms involved in wound healing • Describe aberrant wound healing • Identify factors causing delayed wound healing • Describe options for wound management • Describe recent advances in wound healing strategies | IM-S2-PSurg-3 Wound healing | | |
| 14 | <ul style="list-style-type: none"> • The student will be able to define: • What is skin graft? Types of skin graft, Mechanism of skin graft take, Uses of skin graft, Complications of skin grafts, The student is able to Define: | IM-S2-PSurg-4 Graft/ Flaps | | |

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| | What is a flap, Different types of flaps, Types of local flaps, Z-plasty. Uses of different flaps, Complications of different flaps | | | |
| 15 | The student will be able to describe: <ul style="list-style-type: none"> • Cleft lip deformity, Cleft palate deformity, Hypospadias, Hemangioma, Vascular malformations, Syndactyly | IM-S2-PSurg-5 Congenital anomalies | Lecture/ Demonstration ,, SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 16 | The student will be able to identify: <ul style="list-style-type: none"> • Benign skin lesion • Cutaneous malignancies • Squamous cell carcinoma • Basal cell carcinoma • Melanoma | IM-S2-PSurg-6 Skin lesion/tumors | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |

MISSION OF UNDERGRADUATE PEDIATRIC TRAINING:

To deliver excellence in teaching and learning and actively engage students to develop the minimum essential clinical knowledge, psychomotor skills, critical thinking decision making, and counseling and communication skills regarding the management of pediatric illnesses to ensure the delivery of safe patient care keeping in mind the contextual needs of the community and to effectively deal with global healthcare challenges.

PURPOSE OF STUDY GUIDE

To facilitate the student's learning by providing an outline of the modules, teaching methods, assessment process, and evaluation strategies in context to their themes and sub themes required to achieve the exit competencies in the field of Paediatrics. This study guide also contain details of the teaching schedule and assigns faculty members for each module, whom they can contact anytime for guidance or queries.

RULES AND REGULATIONS:

1. Daily timings for pediatric posting are 8:30 am to 3.00 pm, biometric (digital) and manual attendance both will be taken into account for this purpose.
2. 75% of class attendance is mandatory to appear in end of rotation test.
3. After 9.00 a.m. Students are considered to be late and three late arrivals will be counted as one absent.
4. Attendance at all three sessions will be mandatory for attendance of the day.
5. Formative assessment in the form of end-of-modular test/ TBL and WBA (Mini-Cex) will be taken multiple times throughout the rotation, while summative assessment will be arranged on the last day of rotation (clinical examination & OSCE).

Discipline-Specific Outcomes of Pediatric teaching (undergraduate).

At the end of the Pediatric clerkship, the students should be able to:

1. **Take the appropriate history** of patients, taking into consideration the age, birth history, development, socioeconomic status, family, nutritional, and immunization aspects.
2. **Demonstrate Physical examination skills** that reflect consideration of the clinical presentation and comfort according to the age and development of the child
3. **Formulate a problem list of active and chronic issues**, including a differential diagnosis of their pediatric presentations. A safe and patient-centered approach should be used for the diagnosis of major presenting problems encountered in pediatrics by using clinical reasoning skills based on the following:
 - a. Relevant basic and clinical science knowledge and Evidence-based medicine.
4. **Select the most appropriate investigation** relevant to each of the presenting clinical scenarios with justification for its selection.
5. **Develop a management plan** for each problem on the problem list, justify it, interpret data, and learn to identify critical and acute pediatric illnesses.
6. **Demonstrate proficiency in specific procedural skills.**
7. **Demonstrate practical communication skills with the patient's family.**
 - a. Establish rapport with children
 - b. Counseling of patients regarding common pediatric presentations

c. Communicate the results of pediatric history and physical examination in a well-organized, written, and oral report.

8. Able to demonstrate professionalism. Professional behavior in the form of:

- a. Punctuality
- b. Expresses awareness of emotional, personal, family, and cultural influences on patient well-being
- c. Respectable and professional dress, including wearing a white coat.
- d. Demonstration of respect and courtesy towards patients and classmates.

9. Ensure patient safety: The student should be aware of the principles of patient safety, which include.

- a. Understanding and learning from errors
- b. Engaging with patients and caregivers
- c. Improving medication safety

10. Identify and access information/resources on evidence-based pediatric practice.

- Demonstrate continuous learning
- Participate in departmental Continuing Medical Education activities to update their knowledge.

PROGRAM

4th-year MBBS Pediatric clinical posting comprises 02-weeks of clinical rotation in pediatric department. Students go through the pediatric outpatient clinic, the EPI clinics, pediatric ward, pediatric ICU, and Neonatal ICU.

TEACHING/LEARNING STRATEGY: During rotation, students will learn through

-  Case-based learning
-  Bedside clinical teaching sessions
-  Outpatient-based teaching
-  Interactive lectures

Case base learning:

Students present the history and examination of a patient the then differential diagnosis, investigations and management is discussed in detail

Bedside teaching:

History taking, clinical examination, will be taught and practiced at the bedside or at OPD as task of the day

Seminar: Students will be taught by lead facilitator the critical aspects of assigned topic for the day. **EPI/OPD:**

Students go to OPD and EPI Center in small groups to learn Vaccination and practice clinical skills, mainly focusing on IMNCI.

Clinical skills: Students master their examination and procedural skills.

Interactive lectures: Small group discussions on specific topics, scenarios, or clinical cases to enhance the active participation of students.

ASSESSMENT:

Students go through formative and summative assessments in their (02) weeks of clinical rotation.

Formative assessment:

Formative assessment focuses on learning and improvement of students by giving them specific tasks and providing them constructive feedback.

End Modular test: That will be taken after end of each module. Though that will be formative, but we will

assign 5% weightage.

ii. Structured Bedside Assessment is a method of formative assessment in which groups of 4- 5 students are observed while they perform clinical skills, followed by structured feedback from the facilitator and co-facilitators.

iii. TBL Team-based learning taken after some cognitively rich modules. Though that will be formative because feedback will be given but we will assign 5% weightage as well.

Summative Assessment:

Summative assessment focuses on the cumulative evaluation of the student's learning. Its further divided into Continuous assessment and End of rotation test. 10% of the total marks are carried to the final year university-based assessment at the end of the course.

Marks assigned on Assessment:

Continuous assessment has 50% weight, and it has the following components

- End module assessment $15 \times 2 = 30$
- TBL $10 \times 2 = 20$

Mandatory requirement to appear in end rotation assessment

- Attendance/punctuality during clinical posting. (75% attendance)
- Logbook (history and daily work record)

End of rotation test: 50%

- Students should submit a clinical Logbook at the end of their rotation in Pediatrics.
- 75% attendance is required to be eligible for the end-of-rotation test.
- In summative assessment, students will be examined for
- Short case 20 marks
- Ten stations of OSCE (static and interactive) $6 \times 5 = 30$

Course Content: We have divided the course contents into 2 modules

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| Introduction module <ul style="list-style-type: none">• Overview of Pediatric Medicine• Overview of growth and development• Pediatric history taking (inpatient)• Pediatric history taking and examination (outpatient)• Physical examination. | Nutrition <ul style="list-style-type: none">• Normal Nutrition/ IYCF• CMAM/ SAM• Micronutrient deficiency• Wasting / Obesity |
|---|--|

Modular Integrated Teaching for the fourth year MBBS

First Module: Paediatric history, integrated approach & IMNCI Learning

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

- Take the pediatric history of indoor patients.
- Take Paediatric history of outdoor patients.
- Perform the general physical examination on admitted patients
- Perform the focused examination according to IMNCI guidelines

- Assess the growth and development of children under 5 years

Specific learning objectives:

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

- Comprehend the importance of paediatric history especially BIND (birth, immunization, nutritional, developmental history).
- Comprehend the importance of focused history and examination at outdoor area (integrated approach with 5 main symptoms and therapeutic and preventive aspect of IMNCl)
- Enlist the domains of growth and development in the child.
- Enlist the therapeutic and preventive aspects of IMNCl
- Write an assignment on importance of integrated / holistic Paediatric approach.

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

- Take Paediatric history and check for general danger signs and severe classification on admitted cases.
- Take Paediatric history of outdoor patients and able to fill the CRF (Both age groups)
- Perform the general physical examination on admitted patients.

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

- Able to counsel about when to return.
- Able to counsel about breast feeding and nutrition
- Able to counsel about immunization
- Able to counsel about mother's own health

Aligning LO with teaching methodology and assessment plan

| S. No | Learning Objectives | Teaching methodology | Assessment tool |
|--------------|---|---|--|
| 1 | Take the pediatric history of indoor patient. | Bed allotment will be done. Patients will be assigned to the group of students (3-4) who will take the history on the prescribed proforma given in their log books (direct supervision) Daily, 3 to 4 student subgroups will present the cases in the classroom followed by discussion and feedback. | Case presentation in the Long case presentation Mini-CEX (WPBA) |
| 2 | Take Paediatric history of outdoor patient. | Practical session on focused history and filling of CRF | Case presentation Filling of CRF in the log books |
| 3 | Perform the general physical examination on admitted patients | Demonstration on the patient in the class by the lead facilitator Followed by practice in small groups on identified patients | Mini-CEX (WPBA) Short case and long case |
| 4 | Perform the focused examination according to IMNCl guidelines | OPD posting at least once in week. Practical session on focused history and filling of CRF | TBL on IMNCl |

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| 5 | Enlist the domains of growth and development in the child Assess the growth and development of a child under 5 years | Demonstration of growth and developmental assessment on the patient by lead facilitator Followed by practice in small groups on identified patients | Growth and development assessment of the patients |
| 6. | Enlist the therapeutic and preventive aspects of IMNCl | Write an assignment on the importance of an integrated/holistic Pediatric approach. | Designing the rubric for that assignment. Score on the rubric on the assignment should be 6 out of 10 |

WEEK 1

| Day | 08.30 - 09.30 am | 09:30 11:00 am | 11.30-01:00 pm | 01:00-02:00 pm | 02:00-03:00pm |
|-----|---|--|---|---|--|
| 1. | Paediatric history with importance of BIND and systemic enquiry | Practice on history taking in small groups | Growth and development Assessment Practical demonstration on patient. | Practice on history taking with assessment of growth and development | Summarization of today's task Home assignment IMNCl an integrated and holistic approach |
| 2. | Introduction to IMNCl with demonstration on wall charts 02 months to 59 months | History taking by students in groups Integration of IMNCl | Practical demonstration by lead facilitator on general physical examination on patient. | Practice on general physical examination in small groups | Summarization of today's task Introduction to CRF 2month to 5 years (5 main symptoms) |
| 3. | Practice on filling of CRF (2month - 5 years) Check for general danger signs And 5 main symptoms | Practical demonstration on IMNCl strategy. | Practice on filling of CRF On five main symptoms at indoor (severe classification) | Brief introduction to sick young infant's module | Summarization of today's task Home assignment for check for possible bacterial infection (PBI). |
| 4. | Demonstration on neonatal examination Practice on filling of CRF 0-2 months | SGD and CBD on sick young infant and NNS | \SGD and CBD on NNJ Difference in physiological and pathological jaundice CBD | Practice on filling of CRF Demonstration and practice on whole process | |
| 5. | First TBL on IMNCl | First formative assessment on history taking / general physical examination and IMNCl approach/process | | | |

Second week: Module Two Nutrition and Nutritional disorders Topics to be covered:

- Normal nutrition
- IYCF (BFHI , nutrition during the first 1000 days)
- CMAM / SAM
- Micronutrient deficiency

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

- Enlist the objectives and components of CMAM
- Define hidden hunger (micronutrient deficiency)
- Assess and classify the nutritional status of children under 5 years
- Manage the case of SAM without complication (OPT management)
- Enlist the 10-step management protocol of SAM child (complication of SAM).
- Counsel the families about normal nutrition (IYCF key messages).
- Counsel the families about hygienic food preparation
- Counsel about responsive feeding and TLC

Specific learning objectives:

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

- Recall statistics about the nutritional parameters or indicators in the children of Pakistan (Sindh).
- Describe the five-star diet and role of normal nutrition in first 2 years (1000 days)
- Enlist the 4 components of CMAM and admission and discharge criteria for NSC and OTP
- Able to manage the case of SAM without complication
- Enlist the 10-step management of the SAM child admitted in NSC
- Able to enlist the ingredients for Preparing F 75 and F 100 (manually)
- Enumerate the difference in ORS and ReSoMal

Psychomotor Skills:

- Take the nutritional history and can estimate the caloric intake
- Screen the children for nutritional status by doing MUAC and checking for bilateral pitting edema.
- Perform Anthropometry of children under 5 and Plot on growth charts, and calculate Z score
- Filling of the CCP form and daily care forms

Affective Domain:

- Counselling for breastfeeding / normal nutrition
- Role plays of SAM
- Able to counsel the children for nutrition to MAM and underweight

| S. No | Learning Objective | Teaching methodology | Assessment tool |
|--------------|---|---|--|
| 1 | Enlist the objectives and components of CMAM | Tutorial/lead presentation to introduce the topic. | Written assessment (SBQ & SEQ) |
| 2 | Define hidden hunger (micronutrient deficiency) | Tutorial/lead presentation to introduce the topic, Assignment | Designing the rubric for that assignment. Score on the rubric on the assignment should be 6 out of 10 |

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| 3 | Assess and classify the nutritional status of children under 5 years | Demonstration on the patient in the class by the lead facilitator Followed by practice in small groups of identified patients | Short case and Mini CEX |
| 4 | Manage the case of SAM without complication (OTP management protocol) | Patients allotted in the OPD on the assigned | Screening done by students under direct supervision, Visit to the OTP |

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| 5 | Enlist the 10-step management protocol of SAM child (complication of SAM). | Case-based discussion in small groups | Mini-CEX (WPBA) During an indoor visit of NSC OSCE |
| 6 | Counsel the families about normal nutrition (IYCF key messages). | Lead a session by a facilitator on counseling Role plays | During OPD visit and while taking history in the ward posting (WPBA) |
| 7 | Counsel about responsive feeding and TLC | Live counseling session with The mothers at NSC / role plays | WPBA |
| 8 | Counsel the families about hygienic food preparation | Live counseling session with the mothers at NSC / role plays | WPBA |

WEEK 2

| Day | 08.30-09.30 am | 09:30 – 11:00am | 11.30 – 01:00 pm | 01:00- 02:00 pm | 02:00-03:00pm |
|-----|--|--|---|---|---|
| 06. | Introduction CMAM With brief description of Four components | Practice on Screening by MUAC and Anthropometry | Practical demonstration by lead facilitator on GPE at NSC | Practice on GPE in small groups on patient SAM child (Macro & micro nutrients | Summarization of today's task: Home task self- reading on 10 step management of SAM |
| 07. | 10 step management of SAM Demonstration on filling of CCP form | Case-based discussion on SAM with complications | Outdoor visit of OTP OPT protocol | Indoor visit of NSC Short case evaluation in NSC essential task to be assessed on each student's nutritional assessment and GPE on SAM child (Mini CEX) | Summarization of today's task BFHI / IYCF key messages: Responsive feeding and its importance |
| 08 | IYCF key messages: Responsive feeding and its importance | Practical session on Nutritional counselling with role plays | Role play on nutritional counselling | BFHI introduction | Revision of any concept required |
| 09 | Second formative assessment on CMAM, SAM, and BFHI / IYCF Management (TBL) | | | Student feedback | |

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| 10 | <p>Summative Assessment</p> <ul style="list-style-type: none">- OSCE- Short Case |
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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 interactive activities.

This module covers the topics which are Pathogenesis of glomerular disease, Glomerular conditions associated with systemic 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 systemic 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.

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.

Topics with specific learning objectives and teaching strategies

Theme 1: Glomerular Conditions Including Glomerular Syndromes,

| Conditions Associated with Systemic Disorders and Isolated Glomerular Abnormalities | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
|---|---|---|---------------------|-------------|
| S. # | | | | |
| 1 | <ul style="list-style-type: none"> Classify glomerular disease. Define glomerular syndrome Discuss the pathogenesis of glomerular injury and mediators of glomerular injury. | EXC-S2-Path-1 Glomerular diseases | | |
| 2 | <ul style="list-style-type: none"> Describe various glomerular syndromes Define nephritic syndrome Describe the pathophysiology and clinical features of nephritic syndrome Differentiate between nephritic and nephrotic syndrome. | EXC-S2-Path-2 Nephritic Syndrome | Interactive Lecture | SBQs & OSVE |

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| 3 | <ul style="list-style-type: none"> Define and describe causes: Pathophysiology and clinical features of nephrotic syndrome. Differentiate between nephritic and nephrotic syndrome. | EXC-S2-Path-3 Nephrotic Syndrome | | |
| 4 | nephropathy, Hereditary nephritis, Alport syndrome. | EXC-S2-Path-4 Glomerular conditions associated with systemic disorders and isolated glomerular conditions abnormalities | | |
| 5 | <ul style="list-style-type: none"> Name the kidney function test Mention clinical interpretation of serum urea, creatinine, BUN and creatinine clearance test. | EXC-S2-Path-5 Kidney function tests | | |
| 6 | <ul style="list-style-type: none"> Basic and advanced renal investigations When, how, which, and what type of investigation to be sent according to renal illness The basics of how such an investigation is interpreted The significance of test in disease, its prognosis, and monitoring. Basic case scenarios on various important investigations. | EXC-S2-Neph-1 Investigations in renal medicine | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Definition of terms Basic classification of glomerular diseases Proteinuria and its types Difference b/w nephritic and nephrotic syndrome Approach to a patient with glomerular diseases Management of nephritic and nephrotic syndrome Case-based scenarios on various glomerular diseases. | EXC-S2-Neph-2 Clinical presentation and basic management of glomerular diseases: nephritic & nephrotic syndrome | Lecture/ Demonstration, SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |

Theme 2: Kidney/ Excretory Infections and Renal Vascular Disorders

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

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| 12 | <ul style="list-style-type: none"> Describe an overview of the anatomy & physiology of the urinary system. Explain the classification of acute renal injury. Discuss the clinical picture and presentation of acute renal injury. Basic management case-based scenarios. | EXC-S2-Neph-3 Acute kidney injury | Lecture/ Demonstration, SGD, Practical, CBL/ PBL | OSPE & OSVE |
| | <ul style="list-style-type: none"> Identify the causes of chronic kidney disease Explain the pathogenesis of chronic kidney disease Describe the signs, symptoms, and presentation of CKD Management Clinical case-based scenarios | EXC-S2-Neph-4 Chronic kidney disease | | |
| | PUJO, PUV, VUR, cryptorchidism | EXC-S2-URO-10 Paediatrics Urology | | |
| | <ul style="list-style-type: none"> Different modalities of dialysis Overview of renal transplant: Common post-renal transplant medical complications. | EXC-S2-Neph-5 Renal replacement therapy | | |

| Theme 3: Obstructive Uropathy (Urolithiasis, Hydronephrosis) | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| | Pathogenesis of stone formation with different theories | EXC-S2-URO-1 Stone disease 1 | | |
| | Diagnosis with a brief introduction to Investigations | EXC-S2-URO-2 Stone disease 2 | | |
| 12 | Name various types of renal calculi. Describe etiopathology causes, and complications | EXC-S2-Path-12 Kidney stones | Lecture/ Demonstration , SGD, Practical, CBL/PBL | SBQs & OSVE, OSCE, Clinical Exam |
| | History, Clinical examination, Investigations, medical and surgical management | EXC-S2-URO-5 Urolithiasis | | |
| 13 | Identify causes, pathophysiology, gross and microscopic features & clinical features of hydronephrosis. | EXC-S2-Path-13 Hydronephrosis | | |
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| 1 | <ul style="list-style-type: none"> Describe the distribution of potassium in the body. Enlist the causes of hypokalemia and hyperkalemia. Discuss the diagnosis and management of these disorders | EXC-S2-Phy-1 Potassium Disorders | | |
| 2 | <ul style="list-style-type: none"> Describe the distribution of sodium in the body. Enlist the causes of hyponatremia and hypernatremia. Discuss the diagnosis and management of these disorders | EXC-S2-Phy-2 Sodium disorders | | |
| 3 | <ul style="list-style-type: none"> Physiology of acid-base homeostasis Metabolic acidosis: causes. Pathophysiology, case-based interpretation with compensation. Metabolic alkalosis: causes. Pathophysiology, case-based interpretation with compensation Respiratory acidosis: causes. Pathophysiology, case-based interpretation with compensation Respiratory acidosis: causes. Pathophysiology, case-based interpretation with compensation Mixed disorders, diagnosis | EXC-S2-Neph-6 Management of Acid-base disorders & Arterial blood Gases interpretation (two days) | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| | | | | |
| 1 | <ul style="list-style-type: none"> Describe the distribution of potassium in the body. Enlist the causes of hypokalemia and hyperkalemia. Discuss the diagnosis and management of these disorders | EXC-S2-Phy-1 Potassium Disorders | | |
| 2 | <ul style="list-style-type: none"> Describe the distribution of sodium in the body. Enlist the causes of hyponatremia and hypernatremia. Discuss the diagnosis and management of these disorders | EXC-S2-Phy-2 Sodium disorders | | |

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| 3 | <ul style="list-style-type: none"> • Physiology of acid-base homeostasis • Metabolic acidosis: causes. Pathophysiology, case-based Interpretation with compensation. • Metabolic alkalosis: causes. Pathophysiology, case-based Interpretation with compensation • Respiratory acidosis: causes. Pathophysiology, case-based Interpretation with compensation • Respiratory acidosis: causes. Pathophysiology, case-based Interpretation with compensation • Mixed disorders, diagnosis | EXC-S2-Neph-6 Management of Acid base disorders& Arterial blood Gases interpretation (two days) | Lecture/ Demonstration , SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
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| Theme 4: Tumors of Renal/ Excretory System | | | | |
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| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 14 | <ul style="list-style-type: none"> • Name the benign and malignant tumors of the kidney. • Describe etiopathology, risk factor and, morphology, and clinical features of Renal Cell Carcinoma. | EXC-S2-Path-14 Tumors of the Kidney- I | Interactive Lecture | SBQs & OSVE |
| 15 | <ul style="list-style-type: none"> • Classify urothelial tumor. • Discuss etiology, pathogenesis, morphology, clinical features, and diagnosis of urothelial tumors. | EXC-S2-Path-15 Tumor of the Urinary System-II | | |

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| 16 | Describe gross and microscopic features of benign & malignant kidney and urinary bladder tumors | EXC-S2-Path-16 Kidney and urinary bladder tumors | Practical | OSPE & OSVE |
| | History, Clinical examination, Investigations, management. History, clinical examination, diagnosis, Medical and surgical management, follow-up, and prognosis | EXC-S2-URO-9 Renal Neoplasms | Lecture/Demo nstration, SGD, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| | Types of bladder tumors, pathogenesis, and diagnosis | EXC-S2-URO-4 Urinary bladder Neoplasms | Lecture/Demo nstrations, Practical, CBL/ PBL | SBQs & OSVE, OSCE, Clinical Exam |
| 17 | Classify different types of Diuretics. Describe the mechanism of action of Diuretics Identify the clinical uses and adverse effects of Diuretics | EXC-S2-Pharm-1 Diuretics, | Interactive Lecture | SBQs & OSVE |

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| 9 | Experimental studies | <ul style="list-style-type: none"> • Define Experimental Studies. • Differentiate randomized control trail and non-randomized control trials. • Discuss the importance of randomized control trials. | Teaching Methodology Lecture | Type Of Assessment • SBQs |
| 10. | Screening | <ul style="list-style-type: none"> • Define screening • Discuss the type of screening • Understand the concept of sensitivity and specificity. • Describe the predictive values. | Lecture | SBQs |

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| 1. | Introduction to Biostatistics and Data | <ul style="list-style-type: none"> • Define basic concepts and uses of biostatistics • Define the data and its types • Define variables and their different types • Describe the different methods of data presentation | Lecture | <ul style="list-style-type: none"> • SBQs |
| 2. | Measures of Central Tendency | <ul style="list-style-type: none"> • Define the measures of central tendency. • Define and compute Mean, Mode, and Median • Construct data tables that facilitate the calculation of mean, mode, and median. • Apply the concept of central tendency measures in raw data. | Lecture | SBQs |

MUSCULOSKELETAL III MODULE

Introduction

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

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.

| 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 |
| 1 | <ul style="list-style-type: none"> • Functions of Bone • Matrix • Cells • Development • Homeostasis and Remodeling | MSK-S2-Path-1 Basic Structure and Function of Bone | | |
| 2 | <ul style="list-style-type: none"> • Diseases Associated with Defects in Nuclear Proteins and Transcription Factors • Diseases Associated with Defects in Hormones and Signal Transduction Proteins • Diseases Associated with Defects in Metabolic Pathways (Enzymes, Ion Channels, and Transporters) • Diseases Associated with Defects in the Degradation | MSK-S2-Path-2 Developmental Disorders Of Bone And Cartilage | Interactive Lecture | SBQs & OSVE |

| Theme 2: Fracture, Osteomyelitis, and Arthritis | | | | |
|---|---|---|---------------------|-------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 3 | <ul style="list-style-type: none"> Define terms related to fracture Describe the mechanism of bone healing Complications of fracture Pathophysiology of bone infection (osteomyelitis) | MSK-S2-Path-3 Fractures, bone repair, and osteomyelitis | | |
| 4 | <ul style="list-style-type: none"> What is arthritis Define Osteoarthritis and Rheumatoid Arthritis Explain pathophysiology of osteoarthritis and Rheumatoid Arthritis. Describe the clinical features of osteoarthritis and Rheumatoid Arthritis Treatment of osteoarthritis and Rheumatoid Arthritis Crystal-Induced Arthritis. | MSK-S2-Path-4 Arthritis | Interactive Lecture | SBQs & OSVE |
| | <ul style="list-style-type: none"> Drugs used in Gout | MSK-S2-Pharma-1 Gout | | |
| | <ul style="list-style-type: none"> | MSK-S2-Pharma-2 NSaids | | |

| 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 |
| 5 | <ul style="list-style-type: none"> Osteoid Osteoma Osteoblastoma Osteochondroma Chondroma | MSK-S2-Path-5 Benign Bone and Cartilage-Forming Tumors | | SBQs & OSVE |
| 6 | Gross and Microscopic Features | MSK-S2-Path-6 Cartilage And Bone Forming Tumors | Interactive Lecture | |

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| 7 | <ul style="list-style-type: none"> • Osteosarcoma • Chondrosarcoma • Tumors of Unknown Origin • Ewing Sarcoma • Giant Cell Tumor • Aneurysmal Bone Cyst | MSK-S2-Path-7 Malignant Bone and Cartilage-Forming Tumors Tumors of Unknown Origin | | |
|---|---|--|--|--|

| Theme 4: Soft Tissue Tumors | | | | |
|------------------------------------|---|--|--------------------------|-------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 8 | <ul style="list-style-type: none"> • Tumors of Adipose Tissue • Lipoma • Liposarcoma • Fibrous Tumors • Nodular Fasciitis • Fibromatoses • Superficial Fibromatosis • Deep Fibromatosis (Desmoid Tumors) • Skeletal Muscle Tumors • Rhabdomyosarcoma • Smooth Muscle Tumors • Leiomyoma • Leiomyosarcoma | MSK-S2-Path-8 Soft Tissue Tumors | Interactive Lecture | SBQs & OSVE |
| 9 | Gross and Microscopic Features | MSK-S2-Path-9 Soft Tissue Tumors | Practical | OSPE & OSVE |

| Theme 5: Skin Module | | | | |
|-----------------------------|---|--|--------------------------|-------------------|
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |
| 10 | Explain the pathophysiology, clinical features, laboratory diagnosis, and treatment of acute and chronic inflammatory dermatosis. | MSK-S2-Path-10 Acute and Chronic Inflammatory Dermatosis (Urticaria, Psoriasis, Lichen Planus) | Interactive Lecture | SBQs & OSVE |

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| 11 | Explain the pathophysiology, clinical features, laboratory diagnosis, and treatment of common skin tumors. | MSK-S2-Path-11 Common Skin Tumors (BCC, SCC, Melanoma) | e | |
| 12 | To explain the pathophysiology, clinical features, laboratory diagnosis, and treatment of Bullous disorders. | MSK-S2-Path-12 Blistering (Bullous) Disorders (Pemphigus, Pemphigoid) | | |
| 13 | To explain the pathophysiology, clinical features, laboratory diagnosis and treatment of common infections. | MSK-S2-Path-13 Infections (Viral, Bacterial & Fungal Infections) | | |

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| | Measure of Dispersion | <ul style="list-style-type: none"> Define the measures of dispersion Explain the purpose Define and compute Variance, standard deviation, range, and interquartile range Construct data tables that facilitate the calculation of Variance and standard deviation <p>Apply the concept of measure of dispersion in raw data.</p> | Teaching Methodology Lecture | |
| | Normal Distribution | <ul style="list-style-type: none"> Define the normal distribution. Describe the purpose and importance of normal distribution in biostatistics. Describe the normal distribution curve | Lecture | |
| 5 | Statistical tests interpretations | <ul style="list-style-type: none"> Define the statistical tests Describe the different statistical tests. Distinguish between categorical and continuous measures. Describe the interpretation of data analyzed through the t-test | Lecture | |

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| | | and the chi-square test | | |
| 6 | Sampling | <ul style="list-style-type: none"> • Define sampling • Describe the purpose and importance of sampling. • Describe different methods of sampling. • Differentiate between probability and non-probability sampling. | Lecture | |

Introduction

Welcome to the Reproductive module. This exciting module will serve as a building block and is essential to your future work as doctors. This module is designed to make your learning both interesting and productive including several interactive 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 people's 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 the 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 diagnosing these diseases.

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

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

- Recall the anatomy & physiology of the 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 of testicular tumors.
- Classify breast tumor and differentiate between non-proliferative and proliferative breast lesions

| Topics with specific learning objectives and teaching strategies | | | | |
|---|----------------------------|--------------|--------------------------|-------------------|
| Theme 1: Lesions of the Female Genital Tract | | | | |
| S. # | LEARNING OBJECTIVES | TOPIC | TEACHING STRATEGY | ASSESSMENT |

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

| | | | | |
|---|---|---|--|--|
| | tumors of myometrium | | | |
| 7 | <ul style="list-style-type: none"> Describe non-neoplastic and functional cysts of the ovary Explain etiology, morphology and clinical presentation of polycystic ovarian disease | Rep-S2-Path-7 Diseases of the ovary | | |

| | | | | |
|----|---|---|---------------------|---------------------|
| 8 | <ul style="list-style-type: none"> Classify tumors of the ovary Discuss the etiology, pathogenesis, morphology, and clinical features of ovarian tumors | Rep-S2-Path-8 Tumors of the ovary | Interactive Lecture | SBQs & OSVE |
| 9 | <ul style="list-style-type: none"> Discuss the etiology, pathogenesis, and morphology of hydatidiform mole, including complete mole, partial mole and invasive mole Explain the pathogenesis and morphology of choriocarcinoma and placental site trophoblastic tumor | Rep-S2-Path-9 Gestational Trophoblastic Diseases | | |
| 10 | <ul style="list-style-type: none"> Describe the morphology, gross and microscopic features of gestational tumors | Rep-S2-Path-10 Gestational Tumor | Practical | OSPE & OSVE |
| 11 | <ul style="list-style-type: none"> Name non-proliferative and proliferative breast lesions Discuss the etiology, pathogenesis, morphology and clinical features of all non-proliferative and proliferative breast diseases | Rep-S2-Path-11 non-proliferative & proliferative breast diseases | Interactive Lecture | BCQ SAQs OSPE |
| 12 | <ul style="list-style-type: none"> Classify Breast tumors Discuss the etiology, pathogenesis, morphology, and clinical features of various types of breast cancer | Rep-S2-Path-12 Carcinoma of Breast | Interactive Lecture | BCQ SAQs OSPE |
| 13 | <ul style="list-style-type: none"> Describe the gross & microscopic features of benign and malignant breast tumors | Rep-S2-Path-13 Benign and malignant tumors of the breast | Practical | OSPE |

| Theme 2: Lesions of the Male Genital Tract | | | | |
|--|---------------------|-------|----------|------------|
| S. | LEARNING OBJECTIVES | TOPIC | TEACHING | ASSESSMENT |

| # | | | STRATEGY | |
|----|---|---|---------------------|-------------|
| 11 | <ul style="list-style-type: none"> Discuss congenital anomalies of the male genital tract Describe the inflammatory conditions of the testis and epididymis | Rep-S2-Path-14 Congenital anomalies and inflammation of the testis and epididymis | Interactive Lecture | SBQs & OSVE |
| 12 | <ul style="list-style-type: none"> Classify testicular tumors Discuss the etiology, pathogenesis, morphology, and clinical features of various types of testicular tumors | Rep-S2-Path-15 Testicular Tumors | | |

| | | | | |
|----|--|---|-----------|-------------|
| 13 | <ul style="list-style-type: none"> Explain the etiology and morphology of prostatitis Describe gross and microscopic features and complications of BPH | Rep-S2-Path-16 Prostatitis & benign prostatic hyperplasia | | |
| 14 | Describe the etiology, morphology, type, and staging of Carcinoma of the prostate | Rep-S2-Path-17 Carcinoma of the prostate | | |
| 15 | Explain the sample collection, gross, Microscopic and chemical examination of semen | Rep-S2-Path-18 Semen D/R | Practical | OSPE & OSVE |

Pharmacology

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

COMMUNITY MEDICINE MODULE

| S.NO | Content/Area | Learning Objectives | Teaching strategy | Assessment tool |
|------|--------------|---------------------|-------------------|-----------------|
|------|--------------|---------------------|-------------------|-----------------|

| | | | | |
|--|--|--|--|--|
| | <ul style="list-style-type: none"> Pathogenesis of BPE and carcinoma of prostate, overview of investigative modalities.' | EXC-S2-URO-3 Prostate (benign And Malignant) | | |
| | History, Clinical examination, Investigations, medical and surgical management. | EXC-S2-URO-6 Benign prostatic enlargement | | |
| | <ul style="list-style-type: none"> History, Clinical examination, Investigations, medical and surgical management, prognosis, follow-up. | EXC-S2-URO-7 Prostatic neoplasms | | |
| | <ul style="list-style-type: none"> Renal, ureter, bladder, male genitals | EXC-S2-URO-11 Urological Trauma | | |
| | <ul style="list-style-type: none"> Hydrocele, varicocel, epididymal cyst. | EXC-S2-URO-12 Benign scrotal conditions | | |
| | <ul style="list-style-type: none"> History, Clinical examination, Investigations, management. History, clinical examination, diagnosis, Medical and surgical management, follow-up, and prognosis | EXC-S2-URO-13 Malignant scrotal conditions | | |

| | | | | |
|----|--------------------------|--|---------|------|
| 1. | Introduction to Research | <ul style="list-style-type: none"> Define research and research methods. Define the survey methodology | Lecture | SBQs |
|----|--------------------------|--|---------|------|



LIAQUAT UNIVERSITY
of Medical & Health Sciences, Jamshoro, Sindh, Pakistan

DOC.# LUMHS/DA/-
DATE: 10/09/2025

DIRECTORATE OF ACADEMICS

URL: www.lumhs.edu.pk Email: da@lumhs.edu.pk
Tel: +92-22-9213345, Fax: +92-22-9213346

DIRECTOR

"SAY NO TO CORRUPTION"

TABLE OF SPECIFICATION

FOURTH PROFESSIONAL MBBS ANNUAL EXAMINATION 2025

PAPER III: CNS + ANS (NEUROSCIENCE II). BONE AND SKIN (MSK II)

| SUBJECT | NO OF BCQ'S EACH 02 MARKS | NO OF STATIC OSPE EACH 04 MARKS | NO OF INTERACTIVE STATIONS/ OSPE EACH 16 MARKS |
|----------------------------|---------------------------|---------------------------------|--|
| PATHOLOGY | 10 | 02 | 01 |
| PHARMACOLOGY | 06 | 02 | 01 |
| COMMUNITY MEDICINE | 10 | 01 | 01 |
| PSYCHIATRY | 08 | 01 | 00 |
| NEUROLOGY | 08 | 01 | 00 |
| ORTHOPEDICS | 08 | 01 | 00 |
| TOTAL | 50 | 08 | 03 |
| | | 32 MARKS | 48 MARKS |
| | | | 80 MARKS |
| | | | INTERNAL EVALUATION = 20 MARKS |
| GRAND TOTAL (MARKS) | 100 MARKS | | 100 MARKS |

PAPER IV: KIDNEY/ RENAL II, MALE AND FEMALE REPRODUCTIVE II + BREAST

| SUBJECT | NO OF BCQ'S EACH 02 MARKS | NO OF STATIC OSPE EACH 04 MARKS | NO OF INTERACTIVE STATIONS/ OSPE EACH 16 MARKS |
|----------------------------|---------------------------|---------------------------------|--|
| PATHOLOGY | 25 | 03 | 01 |
| PHARMACOLOGY | 05 | 01 | 01 |
| COMMUNITY MEDICINE | 10 | 02 | 01 |
| UROLOGY | 07 | 01 | 00 |
| NEPHROLOGY | 03 | 01 | 00 |
| TOTAL | 50 | 08 | 03 |
| | | 32 MARKS | 48 MARKS |
| | | | 80 MARKS |
| | | | INTERNAL EVALUATION = 20 MARKS |
| GRAND TOTAL (MARKS) | 100 MARKS | | 100 MARKS |

ASSESSMENT

| ASSESSMENT PLAN FOR EACH PAPER | | END OF YEAR ASSESSMENT | INTERNAL EVALUATION | TOTAL %AGE | |
|---|---|------------------------|---------------------|------------|--|
| THEORY (SBQS) | | 80% | 20% | 100% | |
| PRACTICAL EXAM (OSVE; OSCE) | | 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, practical's, assignments) | | 3% | | |
| | Block tests | | 4% | | |
| | | | 10% | | |
| TOTAL | | | 20% | | |

ENT

LEARNING RESOURCES

1. Logan Turner's Diseases of the Nose, Throat, and Ear: Head and Neck Surgery" by Michael J. Gleeson, 12th Edition
2. Diseases of Ear, Nose, and Throat" by P. L. Dhingra and Shruti Dhingra, 7th Edition
3. Oto-Rhino-Laryngology A Problem Oriented Approach – 2nd Edition Iqbal Hussain Udaipurwala
4. Current Diagnosis & Treatment Otolaryngology—Head and Neck Surgery, 4th Edition

PLASTIC SURGERY

1. Plastic Surgery: Volume 1: Principles" and "Plastic Surgery: Volume 2: Aesthetic Surgery" By Peter C. Neligan
2. Essentials of Plastic Surgery" by Jeffrey E. Janis

DERMATOLOGY

1. ABC of Dermatology, Authors: Paul K. Buxton, Rachael Morris-Jones, 7th Edition
2. Rook's Textbook of Dermatology, Authors: Christopher Griffiths, Jonathan, 9th Edition

PATHOLOGY

1. Robbins Basic Pathology, Authors: Vinay Kumar, Abul K. Abbas, Jon C. Aster, 10th Edition
2. Rapid Review Pathology" Author: Edward F. Goljan MD, 4th Edition

PHARMACOLOGY

1. Lippincott Illustrated Reviews: Pharmacology. Authors: Richard A. Harvey, Pamela C. Champe, 7th Edition.
2. Basic and Clinical Pharmacology by Katzung. Authors: Bertram G. Katzung, Anthony J. Trevor. 14th Edition.

OPHTHALMOLOGY

1. Clinical Ophthalmology" by J. J. Kanski, 9th Edition
2. Clinical Ophthalmology by Shafi Muhammad Jatoi

NEPHROLOGY

1. Davidson's Principles and Practice of Medicine, Ian D Penman, Stuart H. Ralston, MD, 24th Edition
2. Current Medical Diagnosis and Treatment, Maxine A. Papadakis, Stephen J. McPhee, Michael W. Rabow, 5th Edition
3. Primer on Kidney Disease, Scott J. Daniel & Weiner, 8th Edition

UROLOGY

1. Bailey & Love's Short Practice of Surgery, 28th Edition.
2. Smith and Tanagho's General Urology, by Jack McAninch & Tom Lue, 19th Edition 19th Edition
3. Oxford Handbook of Urology, John Reynard, Simon F. Brewster, 4th Edition

ORTHOPAEDICS

1. Campbell's Operative Orthopedics, Frederick M. Azar & S. Terry Canale & James H. Beaty. 14th Edition
2. Miller's Review of Orthopedics, Mark D. Miller, Stephen R. Thompson, 8th Edition
3. Orthopedic Physical Assessment by David J Magee, 6th Edition

NEUROSURGERY

1. Neurology and Neurosurgery Illustrated, Kenneth W. Lindsay, Ian Bone, Geraint Fuller, 5th Edition
2. Greenberg's Handbook of Neurosurgery by Mark S. Greenberg, 10th Edition

PSYCHIATRY

1. Shorter Oxford Textbook of Psychiatry – 7th Edition
2. Behavioral Sciences by Mowadat H. Rana, 3rd Edition

NEUROLOGY

1. Davidson's principles and practice of Medicine
2. Hutchison's Clinical Methods: An Integrated Approach to Clinical Practice
3. Macleod's Clinical Examination – 14th Edition

PAEDIATRICS

Text Books:

1. Nelson textbook of pediatrics, 21st edition
2. Nelson Essentials of Pediatrics
3. Current Diagnosis & Treatment Pediatrics, 23rd edition
4. Pakistan Pediatric Association textbook
5. Illustrated Pediatrics by Tom Lissauer

WHO publications and society guidelines:

6. WHO publications on IMNCI
7. GINA Guidelines, Global Strategy for Asthma Management and Prevention.
8. WHO; Global Database on Child Growth and Malnutrition
9. WHO publication on Tuberculosis
10. Expanded Program on Immunization in Pakistan

Clinical Methods

11. Macleod's Clinical Examination
12. Hutchison's Clinical Methods

COMMUNITY MEDICINE

1. Parks Textbook of Preventive and Social Medicine – Author: K. Park
2. Public Health and Community Medicine – Author: Ilyas, Ansari
3. Textbook of Community Medicine and Public Health Edited by: Saira Afzal - Sabeen Jalal
4. Fundamentals of Preventive Medicine – Author: Dr. Zulfikar Ali Shaikh

Pathology:

TEXTBOOKS

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

Pharmacology:

TEXTBOOKS

- Lippincot Illustrated Pharmacology
- Basic and Clinical Pharmacology by Katzung

MICROBIOLOGY:

TEXTBOOKS

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

PARASITOLOGY:

TEXTBOOKS

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

COMMUNITY MEDICINE

- Parks Textbook of Preventive and Social Medicine – Latest Edition - Author: K. Park
- Public Health and Community Medicine – 8th Edition - Author: Ilyas, Ansari
- Textbook of Community Medicine and Public Health – 1st Edition, Edited by: Saira Afzal
- Sabeen Jalal
- Fundamentals of Preventive Medicine – 5th Edition, Author: Dr. Zulfikar Ali Shaikh

FORENSIC MEDICINE & TOXICOLOGY

- Nasib R. Awan. Principles and Practice of Forensic Medicine, 1st ed. 2002.
- Parikh, C.K. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 6th ed.1999.
- Knight B. Simpson's Forensic Medicine. 11th ed.1993.
- Polson. Polson's Essentials of Forensic Medicine. 4th edition. 1985.
- Taylor. Taylor's Principles and Practice of Medical Jurisprudence. 1984.
- Gradwhol, R.B.H. Gradwhol's Legal Medicine. 3rd ed.1976.
- Rao. Atlas of Forensic Medicine.
- Govindiah. Color Atlas of Forensic Medicine. 1999.

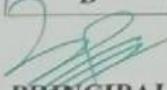
CDS:

- Lectures on Forensic Medicine. Atlas of Forensic Medicine.

FINAL YEAR MBBS PROGRAM

MUHAMMAD MEDICAL COLLEGE, MIRPURKHAS
CLINICAL POSTING, FINAL PROFESSIONAL MBBS (FINAL YEAR – 2025)
Date: 27-01-2025 to 05-12-2025

| Groups | 27-01-2025 To 11-04-2025 | 14-04-2025 To 18-07-2025 | 21-07-2025 To 26-09-2025 | 29-09-2025 To 05-12-2025 |
|--------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| A | Surgery | Medicine | Gynae/ Obs | Pediatrics |
| B | Medicine | Gynae/ Obs | Pediatrics | Surgery |
| C | Gynae/ Obs | Pediatrics | Surgery | Medicine |
| D | Pediatrics | Surgery | Medicine | Gynae/ Obs |


PRINCIPAL

Muhammad Medical College
 Mirpurkhas

PROF. DR. ZAFAR H. TANVEER
 MBBS, MPH, MPhil, PhD, MBA, LLB
 PRINCIPAL
 Muhammad Medical College Mirpurkhas

The above-mentioned clinical rotation schedule is to be followed by every student throughout the year. Groups of students are decided by the Hospital Administration.

ATTENDANCE POLICY FOR STUDENTS

As per the PMDC rules for eligibility in annual examinations.

Minimum attendance requirement is 75% in each subject: attendance is for lectures, demos, practical's, clinics, PBLs, SURVIVE, CPC, presentations, etc, indoor and outdoor.

The attendance is not simply for lectures.

Attendance is maintained by the Department of Student Affairs at MMC.

DEPARTMENT OF GENERAL SURGERY

ACADEMIC SESSION 2024-25

Integrated modular curriculum- Final year Syllabus for the Subject of Surgery

Introduction:

The integrated modular curriculum for the subject of General Surgery of final year MBBS is divided into 14 modules, distributed to each Professor and a senior doctor assisting the Professor.

Each module will be further broken into academic teaching utilizing the resources and considering the limitations. It includes lectures, ward teachings, OT and OPD attendance, skill lab teaching (Every Monday 2.30-4pm in skills lab), presentation by the students (Thursday 12-2pm), research (every Thursday by Prof. S.M. Tahir) and mentoring meeting (every Wednesday between 1-2pm).

An integrated curriculum is designed to enhance learning by connecting theoretical knowledge with practical application. In contrast to traditional method, an integrated approach promotes a meaningful understanding of

concepts by integrating basic science with clinical practice. An integrated approach is consistent with global trends in medical education, with an emphasis on systems-based and competency-based learning to prepare students for real-world healthcare.

Integrated curriculum allows students to relate principles of anatomy, physiology, pathology, and pharmacology to clinical scenarios. This comprehensive framework not only enhances understanding, but also improves clinical reasoning, decision-making, and problem-solving skills. By incorporating active learning methods, such as case-based discussions, simulation exercises, and interdisciplinary teamwork, students are equipped to address comprehensive patient care.

Curriculum also emphasizes professionalism, ethical consideration, and effective communication, preparing students to provide empathetic, patient-centred care. It also promotes self-directed learning, required for thriving in a rapidly changing medical education. Thus the integrated approach ensures that future doctors are competent, confident, and prepared to meet the challenges of healthcare delivery. Rationale:

Rationale:

Integrated curriculum in surgery for undergraduates (Final year MBBS) is essential as this is the critical phase in preparing students for their roles as competent medical professionals. By integrating anatomy, physiology, pathology, and radiology with clinical practice, students gain the ability to correlate theoretical knowledge with real-life patient management. This approach enhances their diagnostic decision-making skills while preparing them to address complex clinical scenarios in a multidisciplinary healthcare setting. Additionally, integrating procedural skills and evidence-based medicine ensures that students are equipped for the needs of surgical practice, from preoperative assessment to postoperative care.

Curriculum also emphasizes professionalism, ethical decision-making, and effective communication, which are critical components of patient-centered care. Teamwork and interdisciplinary collaboration exposure prepare students for real-world challenges, promoting holistic care. Curriculum not only enhances clinical competence but also instills lifelong learning habits. Ultimately, an integrated surgical curriculum ensures that graduating students are ready to transition into their roles as capable healthcare professionals.

Learning Objectives:

At the end of the Integrated Curriculum of Surgery, students will be able to:

Cognitive Objectives:

Demonstrate in-depth knowledge of anatomy, physiology, pathology, and clinical features of surgical diseases, and integrate this knowledge into patient care.

Conduct detailed histories and physical examinations, interpret relevant diagnostic tests, and make accurate diagnoses of common surgical conditions.

Demonstrate in-depth understanding of the indications and contraindications of common surgical procedures.

Integrate basic scientific and clinical knowledge for the management of surgical patients.

Identify and manage surgical emergencies, including trauma, shock, and acute abdominal conditions, with an emphasis on timely interventions and stabilization.

Anticipate, recognize, and manage postoperative complications, including infections, bleeding, and thromboembolic events.

Learn to engage in modern diagnostic tools, minimally invasive surgical techniques and surgical innovations to improve patient care.

Psychomotor Objectives:

Perform basic surgical skills under supervision, including basic procedures such as wound dressing, catheterization, passing nasogastric tubes, suturing, assisting in minor surgical procedures and basic life support.

Affective Domain Objectives:

Apply principles of patient safety, sterility, infection control, and surgical ethics to clinical practice.

Provide compassionate, respectful, and culturally appropriate care, and communicate effectively with patients and their families.

Work effectively within multidisciplinary teams, coordinating with anaesthesiologists, radiologists, and other healthcare professionals to improve patient outcomes.

Recognize the role of surgery in public health, and low-resource settings, emphasizing on preventive and cost-effective care.

Engage in self-directed learning and participate in clinical research to stay abreast of surgical advances.

Advocate professional values, ethical principles and commitment to continuous improvement in surgical care.

| MODULES | MODULES 1, 2 & 3 | MODULE 4, 5 & 6 | MODULES 7,8 & 9 | 10, 11 & 12 | 13, 14 & 15 | 16, 17 & 18 |
|----------|--|---|---|--|--|---|
| DAYS | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | AFTERNOON MON TO THURSDAY |
| Teachers | Team A. Prof. Aijaz A Memon, Dr. Samiullah Gill and Dr. Ghasia. Prof. Sheba, Prof. Raheem Sial | Team B. Prof. S M Tahir, Prof. Mahesh Kumar, and Prof. Pir Abdul Lateef | Team C. Prof. Mannan and Dr. Sohail | Team D. Prof. Noor M Khaskheli and Dr. Faiza | Team E. Prof. Javed Rajput and Dr. Anum | Team F. Prof. Syed Razi Muhammad and Prof. Jamshed Bashir |
| Modules | <u>Module 1:</u> Basic principles of Surgery, Global Health and Surgery, Transplantation <u>Module 2:</u> Diagnostic imaging (11- 2pm in alternative weeks 1,3,5,7 & 9 in Prof. AHM Institute of Radiology, in liaison with the radiologist), Interpretation of Lab results, Tissue and molecular | <u>Module 4:</u> Wound and its management Wound healing, Tissue engineering and regeneration, Surgical infections, Tropical infestations. <u>Module 5:</u> Trauma, Fracture (General) , Shock, Haemorrhage, blood transfusion, metabolic | <u>Module 7:</u> Vascular disorders Arterial disorders, venous disorders, lymphatic disorders <u>Module 8:</u> small bowel and its related disorders, disorders, | <u>Module 10:</u> Perioperative care: Pre-operative care, postoperative care, Anaesthesia and pain relief, fluid and Nutrition (8.30 am to 1pm). | <u>Module 13:</u> Breast and its related disorders Breast and its related disorders, surgical oncology. <u>Module 14:</u> Hepato Biliary system and pancreatic system: Upper GI Oesophagus, stomach, duodenum, Bariatric, GI endoscopy <u>Module 5:</u> Abdominal | <u>Module 16:</u> Surgical History, Clinical Examination <u>Module 17:</u> Affective Domain, Audit, Ethics <u>Module 18:</u> Surgical revision of 1-12 Modules, OT, (OPD-Wed-pm 2.30-5pm), Ward rounds. <u>Module 15:</u> |

| | | | | | |
|--|---|---|--|--|---|
| | <p>diagnosis (11-2pm in alternative weeks 2,4,6,8 & 10 in Patho Lab). The surgical tutor must accompany the students to the radiology or pathology.</p> <p>Module 3: Basic surgical skills workshop (2.30-4 pm at SDC), Weekly survive test-every Monday at 4 pm).</p> | <p>response to injury, patient care and safety.</p> <p>Module 6: Surgical Research, SPSS (students will be divided into a group of 4, will work on and prepare a project for the annual symposium). Surgical case presentation: 12-2pm. Prof. Tahir, Prof. Mahesh and Prof. Pir Abdul Lateef should be supervising and conducting this session every week.</p> | <p>bowel disease</p> <p>Module 9: Large bowel and Anal Canal Appendix, Large Gut, Rectum and anal canal</p> | <p>wall Hernia and Inguinoscrotal swelling.</p> <p>Module 12: Neck swelling and adrenal Thyroid, parathyroid, extra thyroidal neck swellings, adrenals.</p> <p>*Meeting with Mentors: 1 pm-2 pm</p> | <p>Abdominal wall Hernia and Inguinoscrotal swelling</p> <p>Abdominal Wall Hernias, Testis and scrotum, Day care surgery.</p> |
|--|---|---|--|--|---|

Distribution of topics to each Professor with the schedule of teaching per Module is distributed as under;

| NAME OF PROFESSOR | MODULE |
|---|--|
| Prof. Aijaz A Memon and Dr. (Monday) | <p>Module 1: Basic principles of Surgery, Global Health and Surgery, Transplantation</p> <p>Module 2: Diagnostic imaging (11-2pm in alternative weeks 1,3,5,7 & 9 in Prof. AHM Institute of Radiology, in liaison with the radiologist), Interpretation of Lab results, Tissue and molecular diagnosis (11-2pm in alternative weeks 2,4,6,8 & 10 in Patho Lab). The surgical tutor must accompany the students to the radiology or pathology.</p> <p>Module 3: Basic surgical skills workshop (at 2.30-4pm at SDC), Students will attend the weekly survive test every Monday at 4 pm).</p> |

| | |
|--|---|
| Prof. S M Tahir and Dr. (Tuesday) | <p>Module 4: Wound and its management Wound healing, Tissue engineering and regeneration, Surgical infections, Tropical infestations.</p> <p>Module 5: Trauma, Shock, Haemorrhage, blood transfusion, metabolic response to injury, Patient care and safety</p> <p>Module 6: Surgical Research, SPSS (students will be divided into a group of 4, will work on and prepare a project for the annual symposium).</p> <p>Surgical case presentation: 12-2 pm. Prof. Tahir & team should be supervising and conducting every session.</p> |
| Prof. Mannan and Dr. Sohail (Wednesday) | <p>Module 7: Vascular disorders Arterial disorders, venous disorders, lymphatic disorders</p> <p>Module 8: Small bowel and its related disorders, Small Intestine, Intestinal Obstruction, peritoneum and mesentery, inflammatory bowel disease.</p> <p>Module 9: Large bowel and Anal Canal Appendix, Large Gut, Rectum, and anal canal</p> |
| Prof. Noor M Khaskheli and Dr. (Thursday) | <p>Module 10: Perioperative care: pre-operative care, postoperative care, Anesthesia and pain relief, fluid and Nutrition (8.30 am to 1pm).</p> <p>Module 11: Upper GI Esophagus, stomach, duodenum, Bariatric, GI endoscopy.</p> <p>Module 12: Abdominal wall Hernia and Inguinoscrotal swelling Abdominal Wall Hernias, Testis and scrotum, Day care surgery.</p> <p>Module 13: Neck swelling and adrenal Thyroid, parathyroid, extra thyroidal neck swellings, adrenals</p> |
| Prof. Javed Rajput and Dr. (Friday) | <p>Module 14: Breast and its related disorders Breast and its related disorders, surgical oncology</p> <p>Module 15: Hepato Biliary system and pancreatic system: Biliary system, Liver, pancreas, Spleen, Minimal access surgery</p> <p>Module 16: Abdominal wall Hernia and Inguinoscrotal swelling Abdominal Wall Hernias, Testis and scrotum, Day care surgery</p> |
| Prof. Syed Razi Muhammad & Prof. Jamshed Mon to Thursday 2.30 to 5pm | <p>Mon to Thursday 2.30 to 5 pm (excluding the time for appointments like weekly survive tests and time for meetings with mentors)</p> <p>Module 17: Surgical History, Clinical Examination</p> <p>Module 18: Affective Domain in Surgery</p> <p>Module 19: Surgical revision of 1-12 Modules, OT, OPD (Wednesday 2.30-5 pm), Ward rounds.</p> |
| <p>Meeting with Mentors: 1 pm-2 pm (students will meet their mentors who are stationed and will fill in the Weekly report of mentoring). We will include a report of mentoring for 14 weeks. Each week will include students' attendance, academic performance, and survival results. The students' Progress book will include a section for 40 weeks of structured reporting of mentoring.</p> | |

***Students will visit and spend at least 1-2 days per week at Dr. Syed Ali Muhammad Hospital in the City to diversify their clinical experience.**

**** Students will visit and spend at least 1-2 days per week at Children Hospital to diversify their clinical experience.**

***** Timetable will include workshops and learning at skills lab.**

****** Daily first part of Modular teaching will extend from 8.30 to 2pm except on Wednesday when it will end by 1pm so students can attend mentorship from 1-2pm (Wednesday).**

******* Daily second part of Modular teaching will extend from 2.30 to 5pm.**

Challenge: Include the 986 clinical hours in the timetables.

Names of workshops conducted will be:

COMPREHENSIVE DISTRIBUTION OF CLINICAL SKILLS/ WORKSHOP AT SKILLS LAB MMC

64 CLINICAL SKILLS IN SKILLS LAB OF MMC

Competence-based medical education is being promoted by the World Federation of Medical Education and the Pakistan Medical and Dental Council (PM&DC). In its quest to be a national/international leader in producing quality doctors, Muhammad Medical College, Ibn-E-Sina University has developed a state-of-the-art Skills Lab/ Simulation Centre and a unique Program of teaching and training the 64 Clinical skills required by a doctor. Each skill will be taught at the skill/ simulation lab and will be strengthened in the wards. Following is the schedule of the program. Each session may be preceded by a brief introduction/video. A printed as well as an electronic logbook will be maintained by each student. This record will be automatically updated and kept in the student's e-file, and some marks will be awarded in each modular/ annual examination to the student.

Here, the skills have been divided according to

A. CLASS (64)

3rd Year (10)-Preferably by SRs/APs

4th Year (18) Preferably by SRs/APs

5th Year (36) Preferably by Professors

SUBJECT (64)

Surgery (20-2 workshops per week)

Medicine (20-2 workshops per week)

Gynae & OBS (9)

Paeds (6)

Pathology (6-all in 3rd year)

ENT (2-3rd year)

Eye (1-3rd year)

Competence (64)

Patient assessment by the medical students (22)

Procedural Skills (12)

Patient care (7)

Prescribing (5)

Therapeutic procedures (18)

FINAL YEAR MBBS**LIST OF SKILL-BASED WORKSHOPS AND COMPETENCIES ACCORDING TO MODULES**

| S. N | SKILLS | DESCRIPTION | LEVEL OF COMPETE NCE | SUBJE CT | LIN K | SKILLS LAB/W ARD |
|---------|--|--|---|----------------|----------------|------------------------|
| 1 | Carry out the removal of Sutures and surgical drains | Firmly grasp the drainage tube close to skin with dominant hand, and with a swift and steady motion, withdraw the drain and place it on the waterproof drape/pad (the other hand should stabilize the skin with 4 x 4 sterile gauze around the drain site). Remove sutures by following aseptic techniques | Safe to practice under direct supervision | Surgery | Surgery | |
| 2 | Application of POP | Apply the POP on top of the cotton wool padding from distal to proximal, without applying tension to the roll, overlapping each layer by 50%. | Safe to practice under direct supervision | Surgery | | |
| 3 | Perform surgical scrubbing up | Follow approved processes for cleaning hands and wearing appropriate personal protective equipment before procedures or surgical operations | Safe to practice under direct supervision | Surgery | | |

| | | | | | | |
|----|--|--|---|----------------|---|--|
| 4 | Digital rectal examination and Proctoscopy | Should know common causes of bleeding per rectum and common perianal diseases and be able to diagnose them by means of digital rectal examination and proctoscopy. | safe to practice under direct supervision | Surgery | | |
| 5 | Identifying and learning the use of basic surgical instruments . | | Safe to practice under indirect supervision | Surgery | https://www.youtube.com/watch?v=U8tKeMLI5p4 | |
| 6 | Taking informed consent | | Safe to practice under indirect supervision | Surgery | | |
| 7 | Preoperative counselling | | Safe to practice under indirect supervision | Surgery | | |
| 8 | Carry out male Urinary Bladder Catheterization | Insertion of a catheter tube through the urethra and into the bladder to drain urine. | Safe to practice under indirect supervision | Surgery | | |
| 9 | Carry out wound care and basic wound closure and dressing | Provide basic care of surgical or traumatic wounds and apply dressing appropriately. | Safe to practice under direct supervision | Surgery | | |
| 10 | Carry out nasogastric tube placement | Pass a tube into the stomach through the nose and throat for feeding and administering drugs or draining the stomach's | Safe to practice simulation | Surgery | | |

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|----|--|--|---|----------------|---|--|
| | | contents. Should know how to ensure correct placement. | | | | |
| 11 | Use local anesthetics | Inject or topically apply a local anaesthetic. Understand maximum doses of local anaesthetic agents. | Safe to practice under direct supervision | Surgery | | |
| 12 | Apply a splint for fractures POP, | Can apply routine splints for fractures like Thomas, - Neck of femur | Safe to practice under direct supervision | Surgery | | |
| 13 | Nebulization | Follow the directions for the specific brand of nebulizer machine and cup | Safe to practice under indirect supervision | Medicine | | |
| 14 | Set up an infusion | Set up run through and intravenous infusion. Have awareness of the different equipment and devices used. | Safe to practice under direct supervision | Medicine | | |
| 15 | Use correct techniques for moving and handling, including patients who are frail | Use, and/ or direct other team members to use, approved methods for moving, lifting and handling people or objects, in the context of clinical care, using methods that avoid injury to patients, colleagues, or oneself | Safe to practice under indirect supervision | Medicine | | |
| 16 | Breaking bad news (video) | | Safe to practice under indirect supervision | Medicine | https://youtu.be/MKnWkrPLGOs?si=JQ | |

| | | | | | | |
|----|--|---|---|----------|---|--|
| | | | | | KQ6bP znsfW hIRE | |
| 17 | Introduction to care of the elderly & dying (palliative care)(video) | | Safe to practice under indirect supervision | Medicine | https://youtu.be/Lbbd1ulwbs?si=3ahg-eaZX-3_mNm | |
| 18 | Instruct patients in the use of devices for inhaled medication | Explain to a patient how to use an inhaler correctly, including spacers, and check that their technique is correct. Should know about various types of Inhalers | Safe to practice under direct supervision | Medicine | | |
| 19 | Prescribe and administer oxygen | Prescribe and administer oxygen safely using a delivery method appropriate for the patient's needs and monitor and adjust oxygen as needed. Knows the exact volume given per Minute | Safe to practice under direct supervision | Medicine | | |
| 20 | Prepare and administer injectable (intramuscular , subcutaneous , intravenous) drugs | Prepare and administer injectable drugs and prefilled syringes Knows about various channels of CVP | Safe to practice under direct supervision | Medicine | | |

| | | | | | | |
|----|---|---|---|------------|--|--|
| 21 | Measure CVP (central venous pressure) | should be able to measure, interpret, and monitor central venous pressure readings | safe to practice under direct supervision | Medicine | | |
| 22 | Should be able to perform essential lifesaving procedures (BLS) | Tracheostomy, endotracheal intubation, and chest intubation. Should be competent at Basic Life Support. | safe to practice under direct supervision | Medicine | | |
| 23 | Nutritional assessment | Calculate BMI, carry out nutritional assessment of patients, and guide them according to their caloric requirements | safe to practice under direct supervision | Medicine | | |
| 24 | Take HVS | To test vaginal discharge for the presence of vaginal thrush, bacterial vaginosis, and Trichomonas vaginalis. Carried out in clean conditions, using a speculum to look at the cervix and vagina. | Safe to practice under direct supervision | Gynae/ Obs | | |
| 25 | Positioning for breastfeeding | Should be able to direct the patient on the positioning of breastfeeding | Safe to practice under indirect supervision | Gynae/ Obs | | |
| 26 | Performing CTG and its interpretation | | | Gynae/ Obs | | |
| 27 | Carry out female urinary catheterization | Insert a urethral catheter in both male and female patients. Should know its complications and Management | | Gynae/ Obs | | |

| | | | | | | |
|----|--|--|--|------------|--|--|
| 28 | Antenatal Care & calculating EDD | Should be able to direct the patient on the positioning of breastfeeding | | Gynae/ Obs | | |
| 29 | Normal Vaginal Delivery | Should be able to direct the patient on the positioning of breastfeeding | | Gynae/ Obs | | |
| 30 | Obstructed labor and assisted deliveries | Should be able to direct the patient on the positioning of breastfeeding | | Gynae/ Obs | | |
| 31 | Performing CTG and its interpretation | | | Gynae/ Obs | | |
| 32 | History taking | | | | | |
| 33 | Pediatric Examination | | | | | |
| 34 | Dehydration and IV infusion | | | | | |
| 35 | Nutritional Diseases | | | | | |
| 36 | Infectious Diseases & EPI | | | | | |

Mentorship:

Mentor will check and grade as:

Attendance (will be marked by biomedical devices in the ward during morning and afternoon (2.30 pm) and in Survive, on paper in the workshop at SDC, Laboratory, Radiology, and OPD.

Excellent- 90-100%

Good 80-89%

Acceptable 75-79

Need improvement 65-74

Parents will be informed and asked to be proactive every week.

Academic performance so far e.g marks secured in Survive and in assignments.

Any presentation,

Progress in research,

Any disciplinary problem(s).

Comments by the mentor.

Comments by the mentee.

Assessment (Midterm and End of term):

On Thursday and Friday of week 5, a midsession with the mentor and a comprehensive test of Surgery including MCQs (25-50 marks), OSCEs (10 interactive stations-50 marks) and Long case-50 marks, mentoring process-50 marks), attendance (50 marks), Workshop attended (10 marks), history/examinations Journal (10 marks for 5 history & examinations-2 marks each), participated in weekly presentation (10 marks), Portfolio (10 marks), research project completed (10 marks), total 300 marks.

On Thursday and Friday of week 10, an end-of-term mentoring session and a final test will be conducted, including MCQs (25-75 marks), OSCEs (10 interactive stations-75 marks), and a long case (50 marks).

Marks distribution will be as follows:

Total 200 marks from end of term examination.

Total 50 marks from the midterm

Total 50 marks for attendance

Total 50 marks for performance as Workshop attended (10 marks), history/examinations Journal (10 marks for 10 history & examinations-1 mark each), participated in weekly presentation (10 marks), Portfolio (10 marks), research project completed (10 marks)

Total 200 marks for survive (numbers obtained and assignments, one plus PTD per week).

50 marks for the mentoring process.

Total-600 marks. Final marks in the internal assessment will be 10% of the marks obtained here.

CONTEXUALLY DEVELOPED PLAN OF SURGICAL DEPARTMENT

The following is the contextually developed surgical plan. It includes everything that LUMHS has planned. However, keeping in view of our situation and strengths, I have made following changes:

Added 6 modules, increasing the number of modules from 12 to 18.

Instead of dividing the modules into surgical units, I have divided them into a team of 2-3 senior teachers.

We will not conduct one unit after another. Instead, 5 teams (team A, B, C, D & E) will start their one module on each day of the week simultaneously. The 6th team (team F) will conduct the afternoon session (2.30-5: 00 Pm).

Additional modules of Diagnostic imaging, Interpretation of Lab results and Basic surgical skills workshop will be conducted by team A. They will include the Professors of Radiology and Pathology too.

Weekly survive test with 10 MCQs of Surgery (other 3 departments will answer 10 MCQs of their subjects) will be held at 4 pm on Monday. Students will need to write an assignment too. Post Test Discussion assignments will continue.

On Tuesday, an additional module of Surgical Research & SPSS have been added (students will be divided into a group of 4, will work on and prepare a project for the annual symposium).

On Tuesday, **a surgical case presentation will be held between 12-2pm.** Prof. Tahir, Prof. Mahesh and Prof. Pir Abdul Lateef should be supervising and conducting this session every week.

On Thursday, all students of final year will be meeting with their assigned mentors between 1pm-2pm (students will go to meet their mentors, wherever mentors are stationed, both will fill the Weekly report of mentoring). We will include a weekly report of mentoring for 10 weeks. Students' Progress book will include section for 40 weeks of structured reporting of mentoring). Each week will include students' attendance, academic performance, including survive results comments by Mentor and comments by Mentee.

Every afternoon, the students will be taught about History & Examination, on Wednesday, they will be attending my afternoon clinic. This will ensure they get extra training on clinical skills. We will also teach them the affective domain in this time which otherwise remains a hidden curriculum. We also intend to revise the topics taught in the morning sessions.

Every 5th Thursday, there will be a mid-term exam consisting of MCQs, OSCE and Long cases. Every 10th Friday there will be an end of term examination from the whole syllabus. If a holiday falls on these days, the days may be adjusted.

DEPARTMENT OF MEDICINE

ACADEMIC SESSION 2024-25

| DEPARTMENT OF MEDICINE FACULTY OF MEDICINE & ALLIED MOHAMMAD MEDICAL COLLEGE-MIRPURKHAS | | | | |
|--|-------------------------------------|-----------|---------------------------------------|--|
| TEACHING FACULTY | | | | |
| DEAN, CHAIRMAN: PROF. DR. A. QADIR KHAN | | | | |
| S # | MEDICAL UNIT I (FIRST FLOOR) | | MEDICAL UNIT II (GROUND FLOOR) | |
| 01 | Prof: Dr. A. Qadir Khan | 01 | Prof: Dr. Iqbal Memon | |
| 02 | Prof: Dr Aslam Ghouri | 02 | Prof: Dr. Muhammad Ali | |
| 03 | Prof: Dr. Nadeem Memon | 03 | Prof: Dr. Fayaz Memon | |
| 04 | Prof: Dr. Khalid Sheikh | 04 | Prof: Dr. Shaheen Mughal | |
| 05 | Prof: Dr. Rashid Khan | 05 | Prof: Dr. Syed Fasih Hashmi | |
| 06 | Dr. Shabnam Rani A.P | 06 | Dr. Mahesh Kumar A.P | |
| 07 | Dr. Saleem Rashid A.P | 07 | Dr. Faizan Qaiser A.P | |
| 08 | Dr. Bharat Kumar A.P | 08 | Dr. Chaman Das A.P | |
| 09 | Dr. Muneeba Asif A.P | 09 | Dr. Sabira Khan A.P | |
| 10 | Dr. Babita A.P | 10 | Dr. Naeem Laghari | |
| 11 | Dr. Sarwat Anjum | | | |

| COURSE CONTENT: DISTRIBUTED INTO 9 MODULES | |
|---|--|
| MODULE I BLOOD | MODULE II ONCOLOGY (HEMATOLOGICAL MALIGNANCY) |
| Iron Deficiency Anemia | Acute Myeloid Leukemia |
| Hemolytic Anemia and Related Disorders. | Acute Lymphoblastic Leukemia |
| Aplastic Anemia | CLL |
| Haemoglobinopathies | CML |
| Megaloblastic Anemia | Myeloproliferative Disorders |
| Blood Transfusion and Complications | Lymphoproliferative Disorders |
| | Multiple Myeloma |
| | Myelodysplastic Syndrome |

| | |
|--|---|
| <p>MODULE III BLEEDING DISORDERS</p> <p>ITP Hemophilia DIC Coagulation Disorders Thrombolytic therapy Anti-coagulants</p> | <p>MODULE IV INFECTIOUS DISEASES</p> <p>Malaria Rabies Coronavirus infection and related disorders Sexually transmitted infections and related conditions Pyrexia of unknown origin/Sepsis/septic Shock Amebic Liver Abscess Hydatid Cyst</p> |
| <p>MODULE V MUSCULOSKELETAL SYSTEM</p> <p>Approach to joint disorders SLE MCTD overlap syndrome Rheumatoid arthritis Osteoarthritis Osteoporosis and osteomalacia Sjogren's Syndrome Systemic sclerosis Polyarteritis nodosa Gout Wegener's granulomatosis Ankylosing Spondylitis Psoriatic Arthritis Paget's Disease Reactive arthritis Pott's Disease</p> | <p>MODULE VI POISONING</p> <p>Paracetamol Poisoning Organophosphorus Poisoning Snakebite Blackstone Poisoning Salicylates Poisoning Opioid Poisoning Benzodiazepine Poisoning</p> |
| <p>MODULE VII ENDOCRINE AND METABOLIC DISEASES</p> <p>Down's syndrome Klinefelter syndrome Marfan's syndrome Turner's syndrome Health problems of the elderly General Principles of treating the elderly Patient Safety: How to Ensure</p> | <p>MODULE VIII GENETIC & GERIATRIC</p> <p>Acute Pulmonary Edema ARDS Shock Hemochromatosis Wilson's Disease Primary Biliary Cirrhosis Autoimmune Hepatitis Alcoholic Liver Disease MASH & MAFLD Hepatocellular Carcinoma</p> |
| <p>MODULE IX MULTISYSTEM</p> <p>Acute Pulmonary Edema ARDS Shock Hemochromatosis Wilson's Disease primary biliary cirrhosis Autoimmune Hepatitis Alcoholic Liver Disease MASH & MAFLD Hepatocellular Carcinoma</p> | |

LIST OF PROCEDURES:

By the end of the course student should acquire skills in common paediatric procedures according to the following level of competency

LEVEL: 1 Able to perform under the direct supervision: 1a; on a mannequin, 1b; on a simulator

LEVEL: 2 Able to perform under indirect supervision

| PROCEDURE | LEVEL |
|--|-------|
| Instruct patients in the use of devices for inhaled medication, Nebulization | 2 |
| Prepare and administer injectable (intramuscular, subcutaneous, intravenous) drugs | 1 |
| Prescribe and administer oxygen | 2 |
| Carry out intravenous cannulation | 2 |
| Carry out a safe and appropriate blood transfusion | 2 |
| Carry out male and female urinary catheterization | 2 |
| Carryout nasogastric tube placement | 2 |
| Lumbar puncture | 1 |
| Measure capillary blood glucose | 2 |
| Blood sampling: Carry out arterial blood gas and acid-base sampling from the radial artery in adults | 2 |
| Set up an infusion | 2 |

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS 41

DEPARTMENT OF MEDICINE -D ALLIED -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025

CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 01 / MODULE I THEME HEMATOLOGICAL DISEASES

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|-----------------------------|---|---|--|--|---|
| 8.30 to 9.30 | Students with postgraduates for learning history taking and physical examination | Students with postgraduate for learning history taking and physical examination | Students with postgraduate degrees for learning history taking and physical examination | Students with postgraduate degrees for learning history, taking and physical examination | Students with postgraduate degrees for learning history, taking and physical examination |
| 9.30 to 10.30 | Attending ward Round in Unit I with Prof Dr. Aslam Ghouri, Prof: Dr.Khalid Sheikh, Dr. Shabnam Rani | Attending ward Round with Prof: Dr.A.Qadir Khan, Dr.Muneeba Asif Dr.Chaman Das Dr. Mahesh Kumar | Attending ward Round with Prof: Dr. Aslam Ghouri, Pof: Dr. Khalid Sheikh,, Dr.Sarwat Anjum | 9:00 am 10:00 Attending ward Round in Unit I with Prof Dr. Aslam Ghouri , Prof: Dr.Khalid Sheikh, Dr Nadeem Memon | Attending ward Round with Prof: Dr.Iqbal Memon, Prof: Dr.Muhd Ali, Prof: Dr.Fayaz Memon |
| 10.30 to 11.30 | Interactive Lecture at Medicine Seminar Room Approach the patient with Anemia and Iron Deficiency Anemia Prof: Dr. Aslam Ghouri | Interactive Lecture at Medicine Seminar Room Approach the patient with Hemolytic Anemia and Aplastic Anemia Dr.Mahesh Kumar | Interactive Lecture at Medicine Seminar Room Approach the patient with Megaloblastic Anemia Prof: Dr.Iqbal Memon | 11:00-12:00 pm Interactive Lecture at Medicine Seminar Room: Approaching the Patient with Hemoglobinopathies, Prof. Dr. Nadeem Memon | Alternate week Skill lab/ Tutorial on Approach with Patient Blood Transfusion complication Prof:Dr.Muhammad Ali |
| 11.30 Am to 12.30 pm | Tutorial on Approach to patient with Anemia Prof: Dr.Aslam Ghouri | 01:00 pm to 02:00 pm Mantor Session Prof: Dr.A.Qadir Khan | Tutorial on Approach to patient with Lymphadenopathy and Hepatosplenitic- megalys Prof: Dr.Iqbal Memon | Tutorial on Approach to patient with Pancytopenia Prof:Dr.Nadeem Memon | Alternate week Skill lab Small Group Learning Bedside/Topic Dr.Muhd Ali |
| 12.30 To 2.00 pm | Small Group Learning Bedside/Topic Prof: Dr. Aslam Ghouri | Small Group Learning Bedside/Topic Prof: Dr.A.Qadir Khan | Small Group Learning Bedside/Topic Prof: Dr. Iqbal Memon & MENTORING | Small Group Learning Bedside/Topic-Prof: Dr.Nadeem Memon | Small Group Learning Bedside/Topic Dr.Muhd Ali |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 4.00 pm | Individual History and exam by subgroups as per allotted beds, supervised by postgraduate | Individual History and exam by subgroups as per allotted beds, supervised by postgraduate | Individual History and exam by sub groups as per allotted beds supervised by postgraduate | Individual History and exam by subgroups as per allotted beds supervised by postgraduate | Self-Directed Learning (SDL) |
| 4.00 Pm 5:00 | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG |

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS
DEPARTMENT OF MEDICINE ALLIED -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025
CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 02 / MODULE II-THEME: BLOOD-SUB THEME HEMATOLOGICAL DISEASES-PULMONOLOGY

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|-----------------------------|--|---|----------------|--|---|
| 8.30 to 9.30 | Students with postgraduate degrees for learning history taking and physical examination | Students with postgraduate degrees for learning history, taking a physical examination | Holiday | Students with postgraduate degrees for learning history, taking and physical examination | Students with postgraduate degrees for learning history, taking a physical examination |
| 9.30 to 10.30 | Attending ward rounds | Attending ward rounds | Holiday | Attending ward rounds | Attending ward rounds |
| 10.30 to 11.30 | Interactive Lecture Approach the patient with AML , ALL Dr.Faizan Qaiser | Interactive Lecture approach the patient with CLL, CML Dr.Muneeba Asif Dr.Yawer Durani | Holiday | Interactive Lecture on Approaching the Patient with Myeloproliferative Disorders Lymph Proliferative Disorders by Prof Dr. Nadeem Memon | Alternate week Skill lab/ Tutorial on Approach to Patient with Multiple Myeloma Myelodysplastic Syndrome Prof Dr.M.Ali |
| 11.30 Am to 12.30 pm | Interactive Lecture on introduction to pulmonological disorders by Prof Dr Rashid Khan / Dr Yawer Durani | Interactive Lecture on Pneumonias by Prof Dr Rashid Khan / | Holiday | Interactive Lecture on COPD, Bronchial Asthma by Prof Dr Rashid Khan / Dr Yawer Durani | Interactive Lecture on CA LUNG by Prof Dr Rashid Khan / Dr Yawer Durani |
| 12.30 To 2.00 pm | Small Group Learning Bedside/Topic Dr.Faizan Qaiser | 01:00 pm to 02:00 pm Mantor Session Prof: Dr.A.Qadir Khan | Holiday | Small Group Learning Bedside/Topic Prof Dr.Shaheen Mughal | Small Group Learning Bedside/Topic Dr.Saleem Rashid |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break | Holiday | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 4.00 pm | Individual History and exam by sub groups as per allotted beds supervised by postgraduate | Individual History and exam by sub groups as per allotted beds supervised by postgraduate | Holiday | Individual History and exam by sub groups as per allotted beds supervised by postgraduate | Self-Directed Learning (SDL) |
| 4.00 Pm 5:00 | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Holiday | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG |

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS

DEPARTMENT OF MEDICINE -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025

**CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 03 / MODULE III-SUB THEME HEMATOLOGICAL DISEASES-
REVISION OF PULMONOLOGY**

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|----------------------|--|---|--|--|--|
| 8.30 to 9.30 | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical Examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination |
| 9.30 to 10.30 | Attendingward rounds | Attendingward Rounds | Attendingward rounds | Attendingward rounds | Attendingward Rounds |
| 10.30 to 11.30 | Interactive Lecture Approach the patient with ITP Dr.Iqbal Memon | Interactive Lecture approach the patient with Hemolytic Anemia and Aplastic Anemia Dr. Mahesh Kumar | Interactive Lecture approach the patient with Megaloblastic anemia Prof Dr. Aslam Ghouri | Interactive Lecture approach the patient with Hemoglobinopathies Prof Dr. Nadeem Memon | Alternate week Skill lab/ Tutorial on Approach with Patient Blood Transfusion complications by Prof Dr.Mohammad Ali |
| 11.30 Am to 12.30 pm | Tutorial on Approach to patient with Bleeding Disorders by Dr. Shabnam Rani | Mentor Session by Prof: Dr.A.Qadir Khan | Tutorial on Approach to patient with Lymphoma Prof Dr. Aslam Ghouri | Tutorial on Approach to patient with Upper GI Bleed Hematemesis by Prof Dr. Abdul Qadir Khan | Alternate week Skill lab Small Group Learning Bedside/Topic By Prof Dr. Mohammad Ali |
| 12.30 To 2.00 pm | Small Group Learning Bedside/Topic Prof Dr.Iqbal Memon | OPD with Prof: Dr.A.Qadir Khan | Small Group Learning Bedside/Topic Dr. Faizan Qaisar & MENTORING | Small Group Learning Bedside/Topic By Prof Dr. Abdul Qadir Khan | Small Group Learning Bedside/Topic By Prof Dr. Mohammad Ali |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 4.00 pm | Individual History and exam by sub groups as per allotted beds supervised by Postgraduate Dr.On Call | Individual History and exam by sub groups as per allotted beds supervised by postgraduate Dr. On Call | Individual History and exam by sub groups as per allotted beds supervised by postgraduate Dr.On Call | Individual History and exam by sub groups as per allotted beds supervised by postgraduate Dr.On Call | Self-Directed Learning (SDL) |
| 4.00 Pm 5:00 | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar, Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr.Hanif Khan/ On Call PG |

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS
DEPARTMENT OF MEDICINE -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025
CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 04 / MODULE IV THEME: INFECTION DISEASES SUB THEME
INFECTION DISEASES

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|-----------------------------|--|---|---|---|---|
| 8.30 to 9.30 | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical Examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination |
| 9.30 to 10.30 | Attending ward rounds | Attending ward Rounds | Attending ward rounds | Attending ward rounds | Attending ward Rounds |
| 10.30 to 11.30 | Interactive lecture Rabies+ Malaria by Dr Iqbal Memon | Interactive lecture on COVID 19 By Dr Mahesh | Interactive lecture by Dr Aslam Ghouri on PUD | Interactive lecture on sepsis / Septic shock by Dr Nadeem Memon | Interactive lecture on amebic liver abcess/ hydatid cyst by Dr Muhammad Ali |
| 11.30 Am to 12.30 pm | Tutorial approach to the patient with Dengue and chicken guinea by Dr Shabnam | Approach to the pt with Lower GI bleeding by Dr Abdul Qadir Khan | Tutorial approach to the patient by Dr Faizan Qaiser | Approach to the patient with CLD by Dr Abdul Qadir Khan | Skill lab, bedside with Dr Muhammad Ali |
| 12.30 To 2.00 pm | Small group, bedside by Dr Babita | OPD with Dr Abdul Qadir Khan | Small group, bedside by Dr Rahid Khan & MENTORING | Small group learning, bedside by Dr Abdul Qadir Khan | Small group learning bedside with Dr Faizan |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 4.00 pm | Individual History and exam by sub groups as per allotted beds supervised by Postgraduate Dr.On Call | Individual History and exam by subgroups as per allotted beds supervised by postgraduate Dr.On Call | Individual History and exam by subgroups as per allotted beds supervised by postgraduate Dr.On Call | Individual History and exam by subgroups as per allotted beds supervised by postgraduate Dr.On Call | Self-Directed Learning (SDL) |
| 4.00 Pm 5:00 | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar, Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan/ On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan/ On Call PG |

Prof Dr Abdul Qadir Khan, Chairman, Department of Medicine-MMCH

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS
DEPARTMENT OF MEDICINE -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025
CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 05 / MODULE V-THEME: MUSCULOSKELETAL SYSTEM-SUB THEME
MUSCULOSKELETAL SYSTEM

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|-----------------------------|--|--|---|---|--|
| 8.30 to 9.30 | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical Examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination |
| 9.30 to 10.30 | Attendingward rounds | Attendingward Rounds | Attendingward rounds | Attendingward rounds | Attendingward Rounds |
| 10.30 to 11.30 | Interactive lecture on SLE+ MCTD+ overlap syndrome by Dr Shabnam Rani | Interactive lecture on RA+ OA By Dr Mahesh | Interactive lectureon Osteoporosis + Osteomalacia by Dr Aslam Ghouri | Interactive lecture Gout, Psoriatic Arthritis by Dr Nadeem Memon | Interactive lecture on Reactive Arthritis, Sclerosis, Sjogerns syndrome Dr Muhammad Ali |
| 11.30 Am to 12.30 pm | Tutorial approach to the patient with renal failure and Difference between CKD and AKI by Dr Babita | Approach to the pt with CLD by Dr Abdul Qadir khan | Small group, bedside learning by Prof Dr Fasih Hashmi | Approach to the patient with Ascites by Dr Abdul Qadir khan | Tutorial approach to the pt With RA by Dr Muhammad Ali |
| 12.30 To 2.00 pm | Small group, bedside by Dr Khalid Shaikh | OPDwith Dr Abdul Qadir khan | approach to the pt with osteoporosis and osteomalacia, by Dr Aslam Ghouri | Small group learning, bedside by Dr Faizan Qaiser/Dr Abdul Qadir Khan | Small group learning bedside with Dr Faizan |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 4.00 pm | Individual History and exam by sub groups as per allotted beds supervised by Postgraduate Dr.On Call | Individual History and exam by subgroups as per allotted beds supervised by postgraduate Dr. On Call | Individual History and exam by subgroups as per allotted beds supervised by postgraduate Dr.On Call | Individual History and exam by subgroups as per allotted beds supervised by postgraduate Dr.On Call | Self-Directed Learning (SDL) |
| 4.00 Pm 5:00 | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan/ On Call PG |

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS
DEPARTMENT OF MEDICINE -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025
CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 06 / MODULE VI-THEME:POISONING

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|-----------------------------|---|---|---|---|---|
| 8.30 to 9.30 | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination |
| 9.30 to 10.30 | Attending ward rounds | Attending ward Rounds | Attending ward rounds | Attending ward rounds | Attending ward Rounds |
| 10.30 to 11.30 | Interactive lecture on Paracetamol poisoning by Dr Shabnam Rani | Interactive lecture on OPP / Black stone poisoning By Dr Mahesh | Interactive lecture on Snake Bite by Dr Aslam Ghouri | Interactive lecture Salicylate Poisoning by Dr Nadeem Memon | Interactive lecture on Opiod Poisoning Dr Muhammad Ali |
| 11.30 Am to 12.30 pm | Tutorial approach to the patient with Nephrotic syndrome by Dr Babita | Approach to the pt with Diarrhea by Dr Abdul Qadir khan | Small group, bedside learning by Prof Dr Fasih Hashmi | Approach to the patient with PSE by Dr Abdul Qadir khan | Tutorial approach to the pt With Corrosive poisoning by Dr Muhammad Ali |
| 12.30 To 2.00 pm | Small group, bedside by Dr Khalid Shaikh | OPD with Dr Abdul Qadir khan | Small group Bedside by Dr Rashid Khan | Small group learning on pt with liver abscess/ Hydiated cyst Dr Abdul Qadir Khan | Small group learning bedside with Dr Faizan /Dr Sarwat Anjum |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 4.00 pm | Individual History and exam by subgroups as per allotted beds supervised by Postgraduate Dr.On Call | Individual History and exam by subgroups as per allotted beds supervised by postgraduate Dr.On Call | Individual History and exam by subgroups as per allotted beds supervised by postgraduate Dr.On Call | Individual History and exam by subgroups as per allotted beds supervised by postgraduate Dr.On Call | Self-Directed Learning (SDL) |
| 4.00 Pm 5:00 | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar, Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan/ On Call PG |

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS
DEPARTMENT OF MEDICINE -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025

CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 07 / MODULE VII-THEME:ENDOCRINE AND METABOLIC DISEASES

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|----------------------|--|--|--|--|---|
| 8.30 to 9.30 | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduates for learning history taking and physical examination |
| 9.30 to 10.30 | Attending ward rounds | Attending ward Rounds | Attending ward rounds | Attending ward rounds | Attending ward Rounds |
| 10.30 to 11.30 | Interactive lecture on Diabetes and its complications by Dr khalid shaikh | Interactive lecture on Polyglandular failure By Dr Mahesh | Interactive lecture on Hypogonadism by Dr Aslam Ghouri | Interactive lecture on Hypoglycemia by Dr Nadeem Memon | Interactive lecture on Dyslipidemia Dr Sarwat Anjum |
| 11.30 Am to 12.30 pm | Case PPT | Approach to the pt by Dr Babita | Small group, bedside learning by Prof Dr Fasih Hashmi | Approach to the patient by Dr Abdul Qadir khan | Tutorial approach to the pt With DM and Complications by Dr Sarwat Anjum |
| 12.30 To 2.00 pm | Small group, bedside by Dr Nadeem Memon | Small group learning with Dr Abdul Qadir khan | Mentor Mentees Meeting | Small group learning /OPD By Dr Muneeba /Dr Faizan | Small group learning with psychiatric illness with Dr Saleem Rashid |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 4.00 pm | Individual History and exam by sub groups as per allotted beds supervised by Postgraduate Dr.On Call | Individual History and exam by sub groups as per allotted beds supervised by postgraduate Dr.On Call | Individual History and exam by sub groups as per allotted beds supervised by postgraduate Dr.On Call | Individual History and exam by sub groups as per allotted beds supervised by postgraduate Dr.On Call | Self-Directed Learning (SDL) |
| 4.00 Pm 5:00 | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar, Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar,Dr.Hanif Khan/ On Call PG |

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS
DEPARTMENT OF MEDICINE -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025
CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 08 / MODULE VIII-THEME:GENETIC AND GERIATRIC DISEASES

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|-----------------------------|--|--|---|--|---|
| 8.30 to 9.30 | Students with postgraduate degrees for learning history, taking and physical examination | Students with postgraduates for learning history taking and physical examination | Students with postgraduate degrees for learning history taking and physical examination | Students with postgraduate degrees for learning history, taking and physical examination | Students with postgraduate degrees for learning history taking and physical examination |
| 9.30 to 10.30 | Attending ward rounds | Attending ward Rounds | Attending ward rounds | Attending ward rounds | Attending ward Rounds |
| 10.30 to 11.30 | Interactive lecture on Down's Syndrome, Kline Felter's syndrome by Dr Shabnam Rani | Interactive lecture on Marfan's Syndrome By Dr Mahesh | Interactive lecture on Health problem with elderly pt by Dr Aslam Ghouri | Interactive lecture on General principles of treating elderly by Dr Nadeem Memon | Interactive lecture on patient safety, how to ensure by Dr Muhammad Ali |
| 11.30 Am to 12.30 pm | Case Presentation by Students | Posttest discussion with Dr Abdul Qadir khan | Small group, bedside learning by Prof Dr Fasih Hashmi | Approach to the patient by Dr Abdul Qadir khan | Skill lab/ Workshop by Dr Muhammad Ali |
| 12.30 To 2.00 pm | Small group, bedside by Dr Khalid Shaikh | Small group learning with Dr Abdul Qadir khan | Small group Bedside by Dr Rashid Khan | 1:00 to 2:00 pm Mentoring Session | Short cases by Dr Nadeem Dr Faizan Dr Muneeba |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 5.00 pm | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan/ On Call PG |

Prof Dr Abdul Qadir Khan, Chairman, Department of Medicine-MMCH

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS
DEPARTMENT OF MEDICINE -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025

CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 09 / MODULE IX-THEME: MULTISYSTEM CRITICAL CARE MEDICINE

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|-----------------------------|---|---|---|---|---|
| 8.30 to 9.30 | Students with SR Dr. Yawerl Durrani | Students with SR Dr. Saba Khan | Students with SR Dr. Yawerl Durrani | Students with SR Dr. Saba Khan | Students with SR Dr. Yawerl Durrani |
| 9.30 to 10.30 | Attending ward rounds | Attending ward Rounds | Attending ward rounds | Attending ward rounds | Attending ward Rounds |
| 10.30 to 11.30 | Introductory lecture on Acute Pulmonary Edema Prof. Dr. Iqbal | IL on ARDS Dr. Mahesh Kumar | IL on Shock Dr. Nadeem Memon | IL on Heart Stroke Dr. Saba / Dr. Muneeba | IL Review of Critical Care Medicine Prof. Dr. M.Ali / Dr. Mahesh Kumar |
| 11.30 Am to 12.30 pm | Case Presentation by Students Prof. Dr. Iqbal / Dr. Faizan / Dr. Nadeem | Bedside Teaching Prof. Dr. Abdul Qadir Khan | Bedside C.T. / T.B. / R.S. cases Prof. Dr. Iqbal / Dr.S.Fashi Hashmi | DSA / Hospital Posting | Bedside / C.T. Dr. Saleem Rashid SR |
| 12.30 To 2.00 pm | Bedside / C.T. Prof. Dr. Khalid Shaikh | Post Test Discussion Dr. Mahesh Kumar | 1-2 PM Mentoring Session | Bedside Teaching Dr. Khalid / Dr. Waleed Arshad | Workshop Procedures Dr. Saba Khan |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 5.00 pm | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG |

MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS
DEPARTMENT OF MEDICINE -ROTATION-TIMETABLE FOR FINAL YEAR MBBS -ACADEMIC YEAR 2025
CURRICULUM: INTEGRATED MODULAR CURRICULUM- WEEK 10 / MODULE X-THEME:ONCOLOGY AND MISCELLANEOUS

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|-----------------------------|---|---|---|---|--|
| 8.30 to 9.30 | Students with SR Dr. Yawer Durani | Students with SR Dr. Saba Khan | Students with SR Dr. Yawer Durani | Students with SR Dr. Saba Khan | Students with SR Dr. Yawer Durani |
| 9.30 to 10.30 | Attending ward rounds | Attending ward Rounds | Attending ward rounds | Attending ward rounds | Attending ward Rounds |
| 10.30 to 11.30 | IL on AML / ALL Prof. Dr. Iqbal Noman | IL on CML / CLL Dr. Mahesh Kumar | IL on Multiple Myeloma Dr. Nadeem Memon | IL on Vasculitis Dr. Saba Khan | IL on Pulmonary HTN, Pulmonary Embolism Prof. Dr. M.Ali |
| 11.30 Am to 12.30 pm | Case Presentation Prof. Dr. Abdul Qadir Khan, Dr. Iqbal, Dr. Faizan | Bedside Teaching / Cases Prof. Dr. Abdul Qadir Khan | Bedside / CT Prof. Dr. Fashi Hashim Prof. Dr. Rashid Khan | DSA / Hospital Posting (11 AM – 12 PM) | WARD EXIT TEST |
| 12.30 To 2.00 pm | Bedside / CT Dr. Mahesh / Teaching Topics | Post-Test Discussion Dr. Mahesh Kumar | 1 – 2 PM Mentoring Session | Bedside Dr. Waleed Asad | WARD EXIT TEST |
| 2.00 pm- 3.00 pm | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break | Prayers and Lunch Break |
| 3.00 Pm To 5.00 pm | Weekly BCQ Test IT LAB | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan / On Call PG | Evening class by Dr. Mahesh Kumar, Dr. Hanif Khan/ On Call PG |

Prof Dr Abdul Qadir Khan, Chairman, Department of Medicine-MMCH

ASSESSMENT

Students go through formative and summative assessments in their ward postings. Summative assessment is done at the end of the clinical posting. The students are assessed on

Written examination.

Clinical examination

Total=100 marks

Written examination consists of 15 B.C.Qs (Total 30 marks)

Clinical examination (one long case 40 marks and one short case 20 marks) 05 marks on History submission 05 marks on attendance

Students having attendance less than 75 percent will not be allowed to sit in the ward test

BOOKS RECOMMENDED

MEDICINE

Davidson's Principles and Practice of Medicine

Kumar & Clark Clinical Medicine

MacLeod's Clinical Examination

Hutchison's Clinical Methods: An Integrated Approach to Clinical Practice, 25th

DEPARTMENT OF

PAEDIATRICS

ACADEMIC SESSION 2024-25

| DEPARTMENT OF PEDIATRIC MMC TEACHING FACULTY | |
|---|--------------------------------|
| S. No | Name |
| 1. | Prof Dr M Hassan A Memon |
| 2. | Prof Dr Ghulam Shabbir Laghari |
| 3. | Dr Naheed Kazi |
| 4. | Dr Akram Sheikh |
| 5. | Dr Om Parkash |
| 6. | Dr Bilawal |
| 7. | Dr Faisal Nadeem |

MISSION OF UNDERGRADUATE PEDIATRIC TRAINING:

To deliver excellence in teaching and learning and actively engage students to develop the minimum essential clinical knowledge, psychomotor skills, critical thinking decision making, and counseling and communication skills regarding the management of pediatric illnesses to ensure the delivery of safe patient care, keeping in mind the contextual needs of the community, and to deal with global healthcare challenges effectively.

RULES AND REGULATIONS:

Daily timings for pediatric posting is 8.30 to 3.00 pm, biometric (digital) and manual attendance both will be taken into account for this purpose.

75% of class attendance is mandatory to appear in end of rotation test.

After 9.00 a.m. Students are considered to be late and three late coming will be count as one absent.

Attendance of all three sessions will be mandatory for attendance of the day

Evening calls will be assigned in groups for 3 hours/day either 3-6 pm or 5 to 8 pm as per their residence and availability conveyance facility.

Bed allotment of students will be done, and all students are supposed to follow their patients accordingly.

Formative assessment in form of end modular test/ TBL and WBA (Mini- Cex) will be taken multiple times throughout the rotation while summative assessment will be arranged for last 2-3 days of rotation (clinical examination & OSCE).

OPD timing will be strictly followed from 11.30 to 12.30 pm on respected days as per the task of the day whether outdoor or indoor.

Discipline-Specific Outcomes of Pediatric teaching (undergraduate).

At the end of the Paediatric clerk ship, the students should be able to:

Take the appropriate history of patients taking into consideration the age, birth history development, socioeconomic status, family, nutritional, and immunization aspects.

Demonstrate Physical examination skill that reflect consideration of clinical presentation and comfort according to age and development of child.

Formulate problem list of active and chronic issues, including a differential diagnosis of their paediatric presentations. A safe and patient-centred approach should be used for the diagnosis of major presenting problems encountered in paediatrics by using clinical reasoning skills based on the following:

Relevant basic and clinical science knowledge and Evidence-based medicine.

Select the most appropriate investigation relevant to each of the presenting clinical scenarios with justification for its selection

Septic screening

Metabolic workup

Screening test

Radiological investigation

Develop a management plan for each problem on the problem list, justify it, interpret data, and learn to identify and manage critical and acute paediatric illnesses.

While presenting a management plan

Evidence-based recommendations should be considered.

Basic and clinical science concepts should be applied.

Demonstrate proficiency in specific procedural skills.

Demonstrate practical communication skills with the patient's family.

Establish rapport with children

Counselling of patients regarding common paediatric presentations
Communicate the result of paediatric history and physical examination in a well-organized, written and oral report.

Demonstrate collaboration with other team members as a part of a multidisciplinary team in caring for children. Work as a team in solving clinical problems as in Case Based Learning (CBLs) during the paediatric rotation.

Able to demonstrate professionalism. Professional behaviour in the form of:

- Punctuality
- Expresses awareness of emotional, personal, family, and cultural influences on patient well being
- Respectable and professional dressing, including wearing a white coat.
- Demonstration of respect and courtesy towards patients and classmates.

Ensure patient safety: The student should be aware of and practice the principles of patient safety, which include.

- Understanding and learning from errors
- Engaging with patients and caregivers
- Being an effective team player
- Practicing infection control
- Improving medication safety

Identify and access information/resources on evidence-based pediatric practice.

- Demonstrate continuous learning
- Participate in departmental Continuing Medical Education activities to update their knowledge.

PROGRAM

The 5th-year MBBS Pediatric clinical posting comprises 8-weeks of clinical rotation in pediatric department. Students go through the pediatric outpatient clinic, the EPI clinics, pediatric ward, pediatric ICU, and Neonatal ICU. **TEACHING/LEARNING STRATEGY:** During rotation, students will learn through

- Case-based learning
- Bedside clinical teaching sessions
- Flipped classrooms
- Seminars
- Role-play/role modelling
- Outpatient-based teaching
- Interactive lectures

Working as a team with postgraduates and senior colleagues (house officers) during their evening postings, students also visit Emergency paediatric patients under the supervision of paediatric residents and then follow the patients from admission till discharge.

PAEDIATRICS 5th YEAR CLINICAL TEACHING SCHEDULE

| TIME | ACTIVITY |
|--------------------------|---|
| 08:30 to 09:30 am | Introduction of the task by lead facilitator and a brief description/demonstration on the topic |
| 09:30 to 10:30 am | History Taking/bedside teaching |
| 11:00 to 12.00 pm | Case-based learning/Interactive lecture |

| | |
|--------------------------|---|
| 12:00 to 01:30 pm | Practical task and clinical examination demonstration by lead facilitators /OPD/clinical skills |
| 1:45 to 3.00 pm | Summarization of the task, feedback and assignment for next day |

Case-based learning: Students present the history and examination of a patient, and then **the** differential diagnosis, investigations, and management is discussed in detail

Bedside teaching: History taking, clinical examination, and counseling skills are taught and practiced at the bedside or at OPD as **a** task of the day

Flipped Classroom: Students prepare for the class by going through study material provided in the form of PowerPoint presentations, articles, videos, case history or topic then they come to the classroom to solve cases, quizzes, practice problems and engage in teamwork.

Seminar: Students present PowerPoint presentations in small groups of 3-4 students on assigned topics.

EPI/OPD: Students go to **the** OPD and EPI Center in small groups to learn Vaccination and practice clinical skills, mainly focusing on IMNCI.

Clinical skills: Students master their examination, procedural, and counseling skills.

Interactive lectures: Small group discussions on specific topics, scenarios, or clinical cases to enhance the active participation of students.

Assignments / Self Studies: Students participate in unsupervised group discussions where they discuss and research their assigned topics and also take follow-up notes of pediatric ward patients.

[CPC organized by the Paediatrics Department:](#)

Components of the EPI program, its success, and failure.

EENC and KMC when and where.

CMAM program's role in the prevention of malnutrition in children under 5.

Updates in asthma management in children.

[Research projects:](#)

To identify the risk factors for failure of immunization in children under one year.

To evaluate the risk factor of formal nutrition in children.

Reasons for lack of exclusive breastfeeding in infants under 6 months.

Association of pneumonia with malnutrition.

ASSESSMENT: Students go through formative and summative assessments **during the ten** weeks of clinical rotation.

[Formative assessment:](#)

Formative assessment focuses on learning and improvement of students by giving them specific tasks and providing them constructive feedback.

End Modular test: That will be taken after end of each module. Though that will be formative, but we will assign 5% weightage.

Structured Bedside Assessment: is a method of formative assessment in which groups of 4-5 students are observed while they perform clinical skills, followed by structured feedback. by facilitator and co facilitators.

TBL Team-based learning taken after some modules which are cognitively rich. Though that will be

formative because feedback will be given but we will assign 5% weightage as well.

Summative Assessment: Summative assessment focuses on **the** cumulative evaluation of the student learning. Its further divided into Continuous assessment and End of rotation test. 20% of the total marks are carried to the final year university-based assessment at the end of the course.

Marks assigned on Assessment:

Continuous assessment has 40% weightage, and it has the following components

| | |
|-----------------------|--------|
| End module assessment | 5X8=40 |
| TBL | 5x2=10 |

Mandatory requirement to appear in the end rotation assessment:

- Attendance/punctuality during clinical posting, including Evening posting
- Logbook (history and daily work record)
- Submission of the assignment.

End of rotation test: 50%

Students should submit a clinical Logbook at the end of their rotation in Pediatrics.

75% attendance is required to be eligible for the end-of-rotation test.

In summative assessment, students will be examined for

Short case and long case 20marks

Ten stations of OSCE (static and interactive) $10 \times 3 = 30$

| COURSE CONTENT: DISTRIBUTED INTO 8 MODULES | |
|---|--|
| MODULE I: INTRODUCTION MODULE Overview of Pediatric Medicine Overview of growth and development Pediatric history taking (inpatient) Pediatric history taking and examination (outpatient) Physical examination | MODULE I NEONATOLOGY ENCC, HBB Sick young infant (neonatal Sepsis) Neonatal Jaundice Prematurity with complications Birth Asphyxia with complications Breastfeeding counseling. |
| MODULE II PEDIATRIC INFECTIONS EPI Program EPI Disease Non-EPI Diseases | MODULE III NUTRITION Normal Nutrition/IYCF CMAM/SAM Micronutrient deficiency Wasting/Obesity |
| MODULE IV BLOOD Anemia: Nutritional & Hemoglobinopathies, Bone marrow aplasia Bleeding: Hemophilia, ITP, Von Willebrand, Leukemia, Lymphoma Blood transfusion Protocols and reactions | MODULE V NEUROPSYCHIATRY Brief introduction on development CNS infections with complications Epilepsy/Cerebral Palsy Small/ large Head ADHD/Autism |

MODULE VI CARDIO/RESPIRATORY DISEASES

Upper Airway disease: Croup, Epiglottitis, Foreign Body inhalation
Lower Airway: Asthma, Pneumonia & TB cover in infections module
X-ray Interpretation
Poison and Shock will be covered in this session.
Congenital Heart Disease: Cyanotic and Acyanotic CHD with complications.
Rheumatic Heart Disease / Congestive cardiac Failure / Myocarditis
Essential Hypertension

MODULE VII GIT & HEPATOLOGY

Acute diarrhea cover in infections
Chronic Diarrhea, Celiac and Cystic Fibrosis
Viral Hepatitis/ CLD and portal hypertension

MODULE VIII RENAL & ENDO

Nephrotic syndrome
AGN & Renal failure
UTI
CKD/Short stature
Thyroid Problem Diabetes Mellitus

APPENDIX (B) List of Mandatory Examination Skills

Measure and interpret height, weight, and head circumference, calculate BMI and plot these readings on a growth chart.
Measure and interpret vital signs
Palpate for fontanelles and suture lines
Elicit primitive reflexes
Palpate all pulses, including femoral
Assess the lumbosacral spine
Perform Developmental examination
Perform a thorough general physical examination
Perform a thorough Systemic examination, including Abdominal, respiratory, central nervous system, and cardiovascular system examination.

LIST OF PROCEDURES:

LEVEL:1 Able to perform under the direct supervision: 1a; on a mannequin 1b; on simulator

LEVEL:2 Able to perform under indirect supervision

| PROCEDURE | LEVEL |
|--|--------------|
| Instruct patients in the use of devices for inhaled medication | 2 |
| Prepare and administer injectable (intramuscular, subcutaneous, intravenous) drugs | 1 |
| Prescribe and administer oxygen | 2 |
| Carry out intravenous cannulation | 1 |
| Carry out safe and appropriate blood transfusion | 1 |
| Carry out male and female urinary catheterization | 1 |
| Carry out nasogastric tube placement | 1 |

Textbook

Resource material for final year teaching:

Nelson textbook of paediatrics, 22 editions

Nelson Essentials of Pediatrics

Current Diagnosis & Treatment Paediatrics, 23rd edition

Pakistan Paediatric Association textbook

Illustrated Paediatrics by Tom Lissauer

WHO Publications and Society Guidelines:

WHO publications on IMNCI

GINA Guidelines, Global Strategy for Asthma Management and Prevention.

WHO: Global Database on Child Growth and Malnutrition

WHO publication on Tuberculosis

Expanded Program on Immunization in Pakistan

Clinical Methods:

Macleod's Clinical Examination

Hutchison's Clinical Methods

| DEPARTMENT OF PEDIATRICS MMC TEACHING SCHEDULE FINAL YEAR MBBS WEAK 1 | | | | | |
|---|--|---|---|---|--|
| Day | 08.30-09.30 am | 09:30-11:00 am | 11.30-01:00 pm | 01:00-02:00 pm | 02:00-03:00 pm |
| Monday | Pediatric history with importance of BIND and systemic inquiry | Practice on history taking in small groups under supervision of co facilitators | Growth and development Assessment Practical demonstration on patient. | Practice on history taking with assessment of growth and development | Summarization of today's task: Home assignment IMNCI an integrated and holistic approach |
| Tuesday | Introduction to IMNCI with demonstration on wall charts 02 months to 59months | History taking by students in groups: Integration of IMNCI | Practical demonstration by lead facilitator on the general physical examination on patient and CBD and feedback on indoor history | Practice on general physical examination in small groups under the supervision of co-facilitators | Summarization of today's task: Introduction to CRF 2month to 5 years (5mainsymtoms) |
| Wednesday | Practice on filling of CRF (2month - 5 years) Check for general danger signs And 5 main symptoms | Practical demonstration on IMNCI strategy (Preventive components) | Practical demonstration on IMNCI strategy (Therapeutic components) | Practice on filling of CRF On five main symptoms at indoor (severe classification) | Summarization of today's task Home assignment for screen check for Malnutrition and palmar Pallor |
| Thursday | Practice on filling of CRF Demonstration and practice on the whole process at OPD/ indoor | First formative assessment on history, general physical examination and 2 months to 5 years IMNCI | | | Summarization of Today's task: Task for next session, Introduction ENCC Neonatal examination J2-J7 ENC |
| Friday | ENC Neonatal history and examination (neonatal recording form) | Practice on filling out Neonatal recording forms and taking neonatal history | Breastfeeding assessment: Feeding problems | Practical session on feeding problems and breastfeeding counseling | Summarization of today's task: Introduction IMNCI sick young infant module |

| DEPARTMENT OF PEDIATRICS MMC TEACHING SCHEDULE FINAL YEAR MBBS WEEK 2 | | | | | |
|---|---|--|--|--|---|
| Day | 08.30-09.30 am | 09:30-11:00 am | 11.30-01:00 pm | 01:00-2:00 pm | 02:00-03:00 pm |
| Monday | Brief introduction to sick young infants: Neonatal sepsis | Demonstration on neonatal examination, Practice on filling of CRF 0-2 months | SGD and CBD on a sick young infant and NNS | Check for HIV, IMNCI approach | Summarization of today's task Next day task: Neonatal jaundice, Difference in physiological and pathological jaundice CBD |
| Tuesday | Difference in physiological and pathological jaundice CBD | Practice on filling of CRF 0-2 months Followed by feedback | Birth Asphyxia, Neonatal Seizures | Demonstration on Neonatal resuscitation And Practice in Small groups | Summarization of today's task, Next day task Approach to a small baby & KMC |
| Wednesday | Practical approach to prematurity, its complications, and prevention | Practice on filling of CRF (0-2month) Whole case approach at OPD | Practical session on feeding assessment and feeding counseling with role plays by the lead facilitator | Feeding history and breastfeeding assessment. Feeding counseling | Summarization of today's task: Revision of the module |
| Thursday | 2 nd Formative assessment on case recording form 0 - 2 months IMNCI, and TBL (Neonatology) | | | | Nutrition in first1000 days Growth velocity charts, Nutritional statistics/ indicators |
| Friday | Nutrition in the first 1000 days, Growth velocity charts, Nutritional statistics/ indicators | Practice on history taking in small groups, Nutritional history | Practical demonstration on patients by lead facilitator on anthropometry: Height, weight, MUAC | Practice on IMNCI CRF Check for malnutrition | Summarization of today's task: Introduction to CMAM with four components |

| DEPARTMENT OF PEDIATRICS MMC TEACHING SCHEDULE FINAL YEAR MBBS WEEK 3 | | | | | |
|---|---|---|---|---|--|
| Day | 08.30-09.30 am | 09:30-11:00 am | 11.30-01:00 pm | 01:00-02:00 pm | 02:00-03:00 pm |
| Monday | Introduction CMAM | Practice on Screening by MUAC and Anthropometry | Practical demonstration by lead facilitator GPE on patient SAM child (Macro & micronutrients) | Practice on GPE in small groups under the supervision of co-facilitators Practice on filling of CCP form and daily care form | Summarization of today's task 10 step management of SAM |
| Tuesday | 10-step management of SAM Demonstration on filling of CCP form | Case based discussion on SAM with complication | Outdoor visit of OTP OPT protocol | Indoor visit of NSC Short case evaluation in NSC essential task to be assessed on each student's nutritional assessment and GPE on SAM child (Mini CEX) | Summarization of today's task BFHI / IYCF key messages Responsive feeding and its importance |
| Wednesday | BFHI/IYCF key messages Responsive feeding and its importance | Practical session on Nutritional counseling with role plays | 2nd Formative assessment SBQ, TBL and short assay on nutrition module | | Approach to a child with CNS infections, febrile convulsions |
| Thursday | Introduction to CNS infections Approach to a child with CNS infections, febrile convulsions | Practice on history taking in small groups for CNS infections, Febrile convulsions | Practical demonstration on patient by lead facilitator for CNS examination | Practice on IMNCI CRF Check for Neck stiffness General danger signs And motor system examination | Summarization of today's work Next day task tutorial on childhood epilepsy |
| Friday | Introduction to epilepsy, Approach to a child with unprovoked convulsions with case scenarios | Practice on history taking and CNS examination Able to differentiate b/w UMNL/ LMNL | Presentation on AFP by lead facilitator CBD | Practice on CNS examination in small groups under supervision of co facilitators | Summarization of today's task. Next day session tutorial on cerebral Palsy |

| DEPARTMENT OF PEDIATRICS MMC TEACHING SCHEDULE FINAL YEAR MBBS WEEK 4 | | | | | |
|---|--|---|--|---|---|
| Day | 08.30-09.30 am | 09:30-11:00 am | 11.30-01:00 pm | 01:00-02:00 pm | 02:00-03:00 pm |
| Monday | Introduction to Cerebral Palsy, etiology, presentation, and Management | History taking and examination of a child with cerebral palsy and developmental assessment | Visit to the Rehabilitation center with Demonstration of clinical signs on the patient by the lead Facilitator, and Developmental Assessment | Approach to a child with Behavioral disorders (ADHD and ASD) | Summarization of Today's task: Next day session tutorial on ADHS & ASD |
| Tuesday | Case based Discussion and video demonstration on ASD | Short case Examination motor system Developmental assessment SOMI/gait assessment | SBQ, TBL, and short essay on the Neuropsychiatric Module | | |
| Wednesday | Acute watery diarrhea and dysentery classification of dehydration and its management | Practice on history taking in small groups Hydration Status and its management according to IMNCI | Practical demonstration on patient by lead facilitator On hydration Status and Shock and Plan C Management | Practice on filling of CRF of IMNCI 02 month to 05 years age and counseling to patients with diarrhea | Summarization of today's task Next day session chronic diarrhea tutorial (CBD) |
| Thursday | Chronic diarrhea Causes and management case scenarios followed by CBD | Clinical approach to a child with chronic diarrhea. Celiac disease and other | GPE, demonstration of Signs of macro and micronutrients deficiency on malnourished child (SAM) | Mini Cex on GIT and Short case examination (abdominal examination with visceromegaly) Case of CLD or Celiac disease | Summarization of today's task Next day session tutorial on viral Hepatitis and CLD(CBD) |
| Friday | Acute viral hepatitis (A, B, C E) case scenarios followed by CBD | Clinical Approach to a child with CLD Case based discussion on CLD and its complications | Long case assessment on SAM child or CLD child followed by feedback | SBQ, TBL and short essay on GIT, Hepatobiliary | |

| DEPARTMENT OF PEDIATRICS MMC TEACHING SCHEDULE FINAL YEAR MBBS WEEK 5 | | | | | |
|---|---|--|--|--|--|
| Day | 08.30-09.30 am | 09:30-11:00 am | 11.30-01:00 pm | 01:00-02:00 pm | 02:00-03:00 pm |
| Mon day | Paediatric history with the importance of BIND and systemic inquiry | Practice on history taking in small groups under the supervision of co-facilitators | Growth and development Assessment Practical demonstration on a patient by lead facilitator | Practice on history taking with assessment of growth and development | Summarization of Today's task: Home assignment IMNCI an integrated and aholistic approach |
| Tues day | Introduction to IMNCI with demonstration on wall charts, 02 months to 59 months | History taking by students in groups: Integration of IMNCI | Practical demonstration by the lead facilitator on general physical examination on patient and the CBD, and feedback on indoor history | Practice general physical examination in small groups under the supervision of co-facilitators | Summarization of today's task: Introduction to CRF 2 month to 5 years (5 main symptoms) |
| Wed nesday | Practice on filling of CRF (2month - 5 years) Check for general danger signs and main symptoms | Practical demonstration on IMNCI strategy (Preventive components) | Practical demonstration on IMNCI strategy (Therapeutic components) | Practice on filling of CRF On five main symptoms at indoor(severe classification) | Summarization of today's task Home assignment for screen check for Malnutrition and palmar Pallor |
| Thur sday | Practice on filling of CRF Demonstration and practice on whole process at OPD/ indoor | First formative assessment on history, general physical examination and 2months to 5 years IMNCI | | | Summarization of today's task. Task for next session: Introduction to infectious disease in children |
| Frida y | Immunization | Interactive lecture on Immunization (EPI Centre) | CBL (vaccines and side effects) Schedule | Fever IMNCI Malaria Check for Immunization | Approach to a child with fever and body rashes: Measles/Chicken pox/Dengue/Rubella |

DEPARTMENT OF PEDIATRICS MMC TEACHING SCHEDULE FINAL YEAR MBBS WEEK 6

| Day | Theme | 08.30-9.30 am | 9.30-11.00 am | 11.30 am-12.30 pm | 12.30-02.00 pm | 02.00-2.30 pm |
|-----------|--|---|--|---|--|--|
| Monday | Fever with cough | Interactive lecture on the Approach to Cough Tuberculosis and HIV | Short case on GPE and Chest examination | CBL (Pneumonia and Pertussis) | CBD on the diagnosis of TB in children | Summarization and assignment |
| Tuesday | Fever with focus | Approach with throat and Ear | Practice patients with CRF on filling | CBL (Diphtheria and Mumps) | Long case assessment | Summarization and assignment: Malaria & Typhoid guideline |
| Wednesday | Fever without focus | Approach and Malaria and Typhoid CBL | Practice on Patients, history taking, and Examination | Rabies with pre and post exposure vaccination | Tetanus treatment and prevention | Summarization and assignment For the next module |
| Thursday | Assessment of whole module (Mini-CEX(short cases, SBQs. | | | | | |
| Friday | Pallor | Interactive lecture on Approach to child with Anemia (Nutritional Anemia & Thalassemia) | Practice on patient by history taking and focused examination (GPE & Hepatosplenomegaly) | Case presentation by students and discussion | Data interpretation CBC interpretation, Hb Electrophoresis PBL in small groups | Summarization and assignment On Blood Transfusion in children: Indications & complications |

| Department of Pediatrics MMC Teaching Schedule Final Year MBBS Week 7 | | | | | | |
|---|---|---|--|--|--|---|
| Day | Theme | 08:30 am to 9:30 am | 09:30 am to 11:00 am | 11:30 am-12:30 pm | 12:30 pm to 02:00 pm | 02:00 pm-02:30 pm |
| Mond ay | Bleeding disorder in children, Group discussion on Pediatric malignancies | Hands-on demonstration on transfusion procedure and discussion | Interactive lecture on the approach to children with Bleeding disorders in children. Hemophilia, ITP, Von Willebrand disease | Practice on patients: history taking and rashes on the body. | CBL, data interpretation, and discussion Q&A | Summarization and assignment On common hematological malignancies |
| Tuesd ay | Case based discussion on Fever, Pallor And, Lymphadenopathy | Approach to a child with Fever, pallor, and Lymphadenopathy | Assessment of the whole module (Mini-CEX, short cases, Long case SBQs. | | | Summarization of whole module and feedback |
| Wedn esday | Cough & Difficult Breathing | Interactive lecture on Common Respiratory Conditions Upper and Lower Airway Obstruction | History taking and examination on patients with Bronchiolitis, Asthma or cystic fibrosis | CBD on patients with respiratory emergencies: Anaphylaxis, Foreign Body Inhalation, Epiglottitis and Croup | Practical demonstration on patients with use of nebulizer & Inhaler | Summarization and assignment Oxygen therapy in Children |
| Thurs day | Difficult breathing | Live session on oxygen therapy in children case-based Discussion | Interactive session on X-ray chest interpretation & correlation with clinical findings | Interactive discussion on Approach to children with CCF | Practice on Patient by history taking and precordial examination in a small groups | Summarization and assignment on Rheumatic fever and RHD |
| Friday | Recurrent Difficult Breathing | Approach to child with congenital heart disease | Case-based discussion on diagnosis and management of cyanotic and acyanotic Heart disease | Short case & OSCE assessment and module test | Summarization of the module and feedback Assignment on common poisons (SDL) | |

| DEPARTMENT OF PEDIATRICS MMC TEACHING SCHEDULE FINAL YEAR MBBS WEEK 8 | | | | | |
|---|--|--|---|--|---|
| Day | 08:30-9:30 am | 09:30-11:00 am | 11:30 am-12.30 pm | 12:30-02:00 pm | 02:00-02:30 pm |
| Monday | Approach to a child with Proteinuria & hematuria interactive lecture | Practice on Patients for history taking & examination | Interpretation of Labs/CBD On AGN, Nephrotic syndrome | Practical demonstration on catheterization, fluid balance and management | Summarization & Assignment on Urinary Tract |
| Tuesday | Case base Discussion on pyelonephritis Cystitis Practical demonstration on collection of urine culture | Approach to a child with Renal failure Acute and chronic | Practice on a patient for history taking and examination | Practice on labs and management case-based discussion in a small group | Summarization & Assignment on Obesity |
| Wednesday | Approach to short stature: Interactive session | Practice on patient for history taking and examination | Practical demonstration on anthropometry and plot on centiles and labs in OPD | Approach to child with hypothyroidism interactive session with discussion | Summarization of Hyperthyroidism in children |
| Thursday | Case-Based Discussion on Hyperthyroidism in Children | Interactive lecture on Diabetes Mellitus in children | Practice on patient history taking and examination in OPD | Demonstration: Insulin types and techniques. Discussion on complications and counseling of Nutrition | Summarization & Assignment on Obesity in Children |
| Friday | Case-based discussion on Obesity | Assessment SBQs OSCE, and Modular test | | | Summarization & Feedback |

In every rotation student will conduct the CPC and present a research project. Participation in research projects and CPCs is mandatory.

DEPARTMENT OF

GYNAECOLOGY AND OBSTETRICS

ACADEMIC SESSION 2024-25

Introduction:

A study guide encourages effective study skills and self-directed lifelong learning. Study guide is like a 24/7 tutor sitting on the students' shoulder to advise them on what they should be doing at any stage in their study. The study guide is an important tool in the educational process because of information overload, curriculum change, spiral curriculum, distance learning, work-based learning and self-directed learning. The study guides are usually made to direct the students toward a pathway that dictates completion of syllabus through integrated curriculum. It is a time bound document which facilitate timely completion of proposed curriculum, and anyone can identify at any time what is to be taught in which part of academic year. A preloaded document that ensures how and when to complete the part of curriculum. This helps the need for documentation and prevents information overload. These are helpful to students to manage their own learning. These are helpful in planning for excellence awards to be achieved in a competitive environment. These can be used for distance learning, curriculum maintenance and curriculum dissemination. The benefits of study guide are:

- It helps in incorporating integrated programs.
- It facilitates students' interaction with the curriculum.
- Provides a framework for learning. It ensures uniformity
- Record of students' work can be obtained, Helps inculcating self-study skills
- It prepares the student for examinations It presents content related to the subject. It provides knowledge about the content Reading is the only activity required

Rationale:

Since doctors are concerned with community health that makes it necessary to acquire knowledge and skills to impart health care to make a 7 Seven Star doctor who has to be a care provider, good communicator, decision maker, community leader, manager, researcher, and professional he has to be guided through a system that can impart all these competencies. This requires orientation and introduction to medical sciences in relation to health and disease. These guidelines will help the doctor to become a successful healthcare leader and ethical doctor of tomorrow. Female genital tract and diseases related to the reproductive system are very important and gaining attention constantly and have been incorporated in millennium development goals as well. The diseases related to the genital tract are core teaching in this module. There are 7 modules of Gynecology that make up the major portion of genital tract disorders. Themes are further have multiple clinical conditions. Table of specification of each clinical condition are made accordingly. There is a separate portion for obstetrics as well consisting of 13 modules.

Integrated modular curriculum for the subject Gynecology Obstetrics of final year. MBBS is divided into 20 modules related to 13 modules related to Obstetrics and 7 modules related to Gynecology distributed among different senior teachers.

Each module will be further broken into academic teaching utilizing the resources and considering the limitations. It includes lectures, ward teachings, OT and OPD attendance, skill lab teaching, presentation by the students, workshops, research and mentoring meetings.

An integrated curriculum is designed to enhance learning by connecting theoretical knowledge with practical application. In contrast to traditional method, an integrated approach promotes a meaningful understanding of concepts by integrating basic science with clinical practice.

Integrated approach is consistent with global trends in medical education, with an emphasis on systems-based and competency-based learning to prepare students for real-world healthcare.

Integrated curriculum allows students to relate principles of anatomy, physiology, pathology, and pharmacology to clinical scenarios. This comprehensive framework not only enhances understanding but also improves clinical reasoning, decision-making, and problem-solving skills. By incorporating active learning methods, such as case- based discussions, simulation exercises, and interdisciplinary teamwork, students are equipped to address comprehensive patient care.

Curriculum also emphasizes professionalism, ethical consideration, and effective communication, preparing students to provide empathetic, patient-centered care. It also promotes self-directed learning, required for thriving in a rapidly changing medical education. Thus, the integrated approach ensures that future doctors are competent, confident, and prepared to meet the challenges of healthcare delivery. Rationale:

Integrated curriculum in Gynecology and Obstetrics for undergraduates (Final year MBBS) is essential as this is the critical phase in preparing students for their roles as competent medical professionals. By integrating anatomy, physiology, pathology, and radiology with clinical practice, students gain ability to correlate theoretical knowledge with real-life patient management. This approach enhances their diagnostic decision-making skills while preparing them to address complex clinical scenarios in a multidisciplinary healthcare setting. Additionally, integrating procedural skills and evidence-based medicine ensures that students are equipped for the needs of obstetrical and gynecological practice, from preoperative assessment to postoperative care. Antenatal care, intrapartum and postpartum care.

Curriculum also emphasizes professionalism, ethical decision-making, and effective communication, which are critical components of patient-centred care. Teamwork and interdisciplinary collaboration exposure prepares students for real-world challenges, promoting holistic care. Curriculum not only enhances clinical competence but also instils lifelong learning

habits. Ultimately, an integrated OBG curriculum. This curriculum will ensure that graduating students are ready to transition into their roles as capable healthcare professionals.

Learning Objectives:

At the end of the Integrated Curriculum of Gynaecology and Obstetrics, students will be able to:

Cognitive Objectives:

Demonstrate in-depth knowledge of anatomy, physiology, pathology and clinical features of Gynaecology and Obstetrics problems and integrate this knowledge into patient care.

Conduct detailed histories and physical examination, interpret relevant diagnostic tests, and make accurate diagnoses of common OBG conditions.

Demonstrate in depth understanding of the indications, contraindications of common surgical procedures related to Obstetrics and Gynaecology.

Integrate basic scientific and clinical knowledge for the management of obstetrical patients and newborn care.

Provide Obstetrical care and Gynaecology care. Deals efficiently obstetrical and gynaecological emergencies, including normal labour, APH, PPH, medical disorders (eclampsia, anemic failure, preterm labour, in pregnancy, Pepsis, shock (ectopic, miscarriage molar pregnancy and acute OBG conditions, with an emphasis on timely interventions and stabilization of patient and fetus and new-born.

Anticipate, recognize, and manage postoperative complications, including infections, bleeding, and thromboembolic events.

Learn to engage in modern diagnostic tools, minimally invasive techniques and surgical innovations related to Obstetrics and Gynaecology to improve patient care.

Should be able to counsel the woman and her attendant about the nature of clinical problem with reasonable communication skills.

Can identify high-risk cases for referral to senior gynaecologists & be able to provide initial life-saving measures in an emergency before referring to a tertiary care hospital.

Shall be able to practice ethically and can follow principles of safe and value-based community health services focusing on the wellness of women.

Shall present a summary of at least one assigned case to a faculty member during a ward round. (CBL)

Observe communication between doctor and patient, including explanation of the condition, treatment options, and complications of treatment.

Suggest a management plan for the patient.

Observe the following:

Pelvic ultrasound scan, Hysteroscopy, Diagnostic laparoscopy, Endometrial sampling

Perform a cervical smear (model/patient).

Explain the significance of cervical smear results and appropriate management.

Attend a family planning clinic.

Attend a genitourinary clinic.

Psychomotor Objectives:

Perform basic surgical skills under supervision, including basic procedures such as normal vaginal delivery, instrumental delivery, wound dressing, catheterization, intravenous cannulation, passing nasogastric tubes, suturing, assisting in minor obstetrical and gynaecological procedures and basic life support related to mother and newborn.

Affective Domain Objectives:

Apply principles of patient safety, sterility, infection control, and surgical ethics to clinical practice.

Provide compassionate, respectful and culturally appropriate care, and communicate effectively with patients and their families.

Work effectively within multidisciplinary teams, coordinating with pediatrician anesthesiologists, radiologists, and other healthcare professionals to improve patient outcomes.

Recognize the role of OBG practice in public health and low-resource settings, emphasizing preventive and cost-effective care.

Engage in self-directed learning and participate in clinical research to stay abreast of OBG advances.

Advocate professional values, ethical principles, and commitment to continuous improvement in patient care.

CONTEXTUAL PLAN OF GYNEA & OBS DEPARTMENT AT MMCH

Following is the OBG developed plan. It includes everything that LUMHS has planned. However, keeping in view of our situation and strengths, the following changes are incorporated contextually:

Instead of dividing the modules into OBG units, I have divided them among senior teachers.

Weekly survive test with 10 MCQs of OBG (the other 3 departments will answer 10 MCQs of their subjects) will be held at 4 pm on Monday. Students will need to write an assignment, too. Post Test Discussion, assignments will continue.

The OBGYN case presentation or topic will be held once a week by a group of 4 to 5 students

On Wednesday, all students of the final year will be meeting with their assigned mentors between 1 pm and 2 pm (students will go to meet their mentors, wherever mentors are stationed, and both will fill out the Weekly report of mentoring). We will include a weekly report of mentoring for 10 weeks. The students' Progress book will include a section for 40 weeks of structured reporting of mentoring. Each week will include students' attendance, academic performance, including survive results, comments by Mentor, and comments by Mentee.

Once a week, on Tuesday, students posted in the gynae ward attend clinical teaching in the city branch of MMCH.

Every 5th Thursday, there will be a mid-term exam consisting of MCQs, OSCE, and long cases.

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| <p>Every 10th Friday, there will be an end-of-term examination covering the whole syllabus. If a holiday falls on these days, the days may be adjusted.</p> | |
| <p>COURSE CONTENT OF OBSTETRICS MODULES: DISTRIBUTED INTO 13 MODULES</p> | |
| <p><u>MODULE – 01 BASIC CLINICAL SKILLS:</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate adequate knowledge, skills, and attitudes in relation to history taking, general physical and systemic examination, suggesting relevant investigations, appropriate procedural and communication skills in Obstetrics</p> | <p><u>MODULE – 02 PHYSIOLOGY OF PREGNANCY:</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate adequate knowledge, skills (Application), and attitudes in relation to the physiology of pregnancy</p> <p>Re-Call:</p> |
| <p><u>MODULE III: ANATOMY OF FETAL SKULL AND MATERNAL BONY PELVIS</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate adequate knowledge, skills, and attitudes in relation:</p> <p>Re-Call:</p> | <p><u>MODULE IV NORMAL PREGNANCY</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate adequate knowledge, skills, and attitudes in relation to antenatal care in low-risk pregnancy and the appropriate modification to antenatal care</p> |

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| <p><u>MODULE – V HIGH RISK PREGNANCY</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate adequate knowledge, skills, and attitudes in relation to recognition of the high-risk pregnancy and the appropriate modification to antenatal care:</p> | <p><u>MODULE – VI MISCELLANEOUS MEDICAL DISORDERS IN PREGNANCY</u></p> <p>Learning Outcome: By the end of this module, students will be able to understand and demonstrate adequate knowledge, skills and attitudes in relation to the effect of pre-existing medical conditions on pregnancy and the effect of pregnancy on these conditions</p> |
| <p><u>MODULE – VII PERINATAL INFECTIONS</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to demonstrate an understanding of the etiologic, risk factors for, risks, and management of the perinatal infections.</p> | <p><u>MODULE – VIII ABNORMAL PREGNANCY</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to demonstrate an understanding of the etiology, risk factors for, risks and management of the major antenatal complications of pregnancy</p> |
| <p><u>MODULE IX NORMAL LABOR</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate appropriate knowledge, skills, and attitudes in relation to labour Normal Labor.</p> | <p><u>MODULE – 10 ABNORMAL LABOR</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate appropriate knowledge, skills, and attitudes in relation to abnormal labor</p> |
| <p><u>MODULE – 11 PUERPERIUM</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to demonstrate an understanding of the normal and post-partum period</p> | <p><u>MODULE – 12 NEWBORN CARE</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to demonstrate an understanding of essential newborn care and common neonatal problems and their management</p> |
| <p><u>MODULE – 13 ETHICS IN OBSTETRICS PRACTICE</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate adequate knowledge, skills, and attitudes in relation to ethics and legal issues in Obstetrics: Ethics and Legal Issues in Obstetrics</p> | |
| <p>GYNAECOLOGY MODULES</p> | |

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| <p>MODULE – 14 GYNEACOLOGY MODULE</p> <p>LEARNING OUTCOME: By the end of this module, students will be able to understand and demonstrate Adequate knowledge, skills, and attitudes in relation to history taking, Examination, investigation, and common gynaecological problems in the Community:</p> <ul style="list-style-type: none"> Introduction, gynaecological history taking Clinical examination by video Anatomy of the female genital tract Development of the female genital tract Puberty and adolescence Ovulation and its legal importance Physiology of the menstrual cycle Menstrual disorders Abnormal menstruation Amenorrhea Primary amenorrhea Secondary amenorrhea Polycystic ovarian disease Hirsutism/virilism | <p>MODULE 15 SUB FERTILITY AND EARLY PREGNANCY LOSS</p> <p>LEARNING OUTCOME: By the end of this module, students will be able to</p> <p>Understanding of the common causes, investigations, and management of subfertility and early pregnancy loss:</p> <ul style="list-style-type: none"> Sub-fertility Early pregnancy loss Abortion Ectopic pregnancy Gestational trophoblastic disease Endometriosis and Adenomyosis |
| <p>MODULE – 16. SEXUAL AND REPRODUCTIVE HEALTH</p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate</p> <ul style="list-style-type: none"> Adequate knowledge, skills, and attitudes in relation to fertility control (Contraception and termination of pregnancy), The diagnosis and management of Sexually transmitted infections (including HIV), Sexual dysfunction Menopause and HRT. Introducing the sexual history taking Contraception and sterilization Infections of female genital tract Management of lower abdominal pain Acute pelvic inflammatory disease (PID) Chronic PID Sexually transmitted infections (STIs) including HIV/AIDS Screening and Management | <p>MODULE – 17 UROGYNAECOLOGY AND PELVIC FLOOR PROBLEMS</p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate Adequate knowledge, skills, and attitudes in relation to incontinence and prolapse:</p> <ul style="list-style-type: none"> Utero vaginal prolapse Urinary incontinence Stress incontinence Urge incontinence Urinary frequency Urinary tract infections Urinary fistulae |

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| <p>Prevention of STIs Iatrogenic infections of the female reproductive tract Reproductive tract infection in males Awareness of psycho sexual problems Vaginal discharge</p> | |
| <p><u>MODULE – 18 GYNECOLOGICAL ONCOLOGY</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate Adequate knowledge, skills and attitudes in relation to Gynaecology Oncology:</p> <ul style="list-style-type: none"> Conditions affecting the vulva and vagina Benign conditions of the vulva VIN and invasive vulval carcinoma Benign conditions of the vagina VIAN and vaginal carcinoma Condition affecting the cervix, uterus, ovarian and fallopian tubes Benign conditions of the cervix CIN and invasive carcinoma of the cervix Benign conditions of the uterus Malignant disease of the uterus Benign tumour of the ovaries Cancer of the ovaries Cancer of the fallopian tubes Chemotherapy for gynaecological cancers and GTDs, and radiotherapy | <p><u>MODULE – 19 COMMON GYNECOLOGICAL OPERATIONS</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate Adequate knowledge, skills, and attitudes in relation to common gynaecological</p> <p>Procedures, preoperative and postoperative management:</p> <ul style="list-style-type: none"> Common gynaecological procedures Hysteroscopy Laparoscopy Cystoscopy Dilatation and curettage Abdominal and vaginal hysterectomy Myomectomy Preoperative preparations Postoperative complications and their management |
| <p><u>MODULE – 20 Ethics in Gynecology</u></p> <p>Learning Outcome:</p> <p>By the end of this module, students will be able to understand and demonstrate Adequate knowledge, skills, and attitudes in relation to ethics and legal issues in Gynaecology:</p> <ul style="list-style-type: none"> Litigation and consents Ethics and reproductive health | |

TOPICS FOR TUTORIAL WEEK 1

| Date | Teachers | Topics | Workshop | Assignment |
|------|----------|--------|----------|------------|
| | | | | |

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| | name | | | |
| 27-1-25 | Dr Yasmeen | Introduction to Gynae history, examination and relevant investigation | | Gynae Hx |
| 28-1-25 | Dr Qamar | Introduction to OBS history, examination and relevant investigation | Obstetrical examination | |
| 29-1-25 | Dr Shazia | Essential drugs and immunization in pregnancy | | |
| 30-1-25 | Dr Hemlata | Diagnosis of pregnancy, conception, implantation, development of placentae, and physiological changes of pregnancy | | |
| 31-1-25 | Dr Bushra | Prenatal diagnosis | | Prenatal diagnosis |

| TOPICS FOR TUTORIAL WEEK 2 | | | | |
|-----------------------------------|----------------------|---|--|--|
| DATE | TEACHERS NAME | TOPICS | WORKSHOP / ASSIGNMENT | |
| 3-2-25 | Dr. Madhu Bala | Fetal skull and maternal pelvis (workshop) | Fetal skull and maternal pelvis Workshop | |
| 4-2-25 | Dr Asma | Normal Pregnancy +ANC(low and risk) | Assignment | |
| 5-2-25 | Dr Farkhunda | Imaging ultrasound all three trimester | | |
| 6-2-25 | Dr. Shazia | Haematological disorders of pregnancy, including Anaemia in pregnancy Thrombocytopenia and thrombophilia Coagulation and fibrinolytic disorders | Assignment | |

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| 7-2-25 | Dr. Bushra | IUGR and fetal monitoring | |
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TOPICS FOR TUTORIAL WEEK 3

| Day | Teacher | Topic | Assignment/workshop |
|-----------|----------------|--|---------------------|
| Monday | Dr Yasmeen | Prolonged pregnancy and Multiple pregnancy | |
| Tuesday | Dr Qamar Habib | Diabetes in pregnancy | Assignment |
| Wednesday | Dr Shazia | Liver diseases in pregnancy. | |
| Thursday | Dr Hemlata | Hypertensive disorders of pregnancy: PIH, Pre-eclampsia, Eclampsia, Essential HTN, Chronic renal diseases. Cardiac diseases in pregnancy | Assignment |
| Friday | Dr Bushra | ISO immunization | |

TOPICS FOR TUTORIAL WEEK 4

| DAY | TEACHER | TOPIC | ASSIGNMENT/WORKSHOP |
|-----------|--------------|---|---------------------|
| Monday | Dr Madhubala | Epilepsy Migraine Thyroid diseases | |
| Tuesday | Dr Asma | Respiratory disorders, Autoimmune disease | |
| Wednesday | Dr Shazia | Perinatal infections: Chlamydia, Gonorrhoea, Trichomoniasis, Genital warts, HIV, AIDS | |
| Thursday | Dr Farkhunda | Perinatal infections: Syphilis · Toxoplasmosis Cytomegalovirus Rubella Varicella zoster, Malaria, Urinary tract infection Bacterial infections, Herpes simplex viral infections | Assignment |

| | | | |
|--------|-----------|--|------------|
| Friday | Dr Bushra | Antepartum haemorrhage, Placenta previa, Abruptio placentae Vasa previa | Assignment |
|--------|-----------|--|------------|

TOPICS FOR TUTORIAL WEEK 5

| DAY | TEACHER | TOPIC | ASSIGNMENT/WORKSHOP |
|-----------|------------|--|---------------------|
| Monday | Dr Yasmeen | Intra uterine fetal death Polyhydramnios / oligohydramnios · | |
| Tuesday | Dr Qamar | Mal-presentation and position Breech presentation Transverse lie and shoulder presentation Face presentation Brow presentation Cord prolapsed | Assignment |
| Wednesday | Dr Shazia | Physiology, Mechanism, Diagnosis, Management of labor, Structure and use of partograph. Intra partum fetal monitoring Fetal heart rate monitoring. Fetal scalp sampling | Assignment |
| Thursday | Dr Hemlata | Methods of induction and augmentation of labor Indications, Contraindications, Complications. Analgesia and anesthesia. Management of 3rd stage of labor | |
| Friday | Dr Bushra | Antepartum haemorrhage, Placenta previa, Abruptio placentae Vasa previa | Assignment |

TOPICS FOR TUTORIAL WEEK 6

| DAY | TEACHER | TOPIC | ASSIGNMENT/WORKSHOP |
|-----------|--------------|---|---------------------|
| Monday | Dr Madhubala | Episiotomy Perineal trauma, and Caesarean section | |
| Tuesday | Dr Asma | Prolonged labour · Causes, Management Obstructed labour, ruptured uterus Causes | Assignment |
| Wednesday | Dr Shazia | Management Complications of the 3rd stage of labour · PPH (Primary & Secondary) workshop, Causes Management Uterine inversion · | Assignment |
| Thursday | Dr Furkhunda | Normal Puerperium · Physiological changes Abnormal Puerperium · Puerperal disorders Puerperal pyrexia the breasts and breast disorders · Contraception · Maternal and Perinatal mortality · | |
| Friday | Dr Bushra | Essential newborn care Observe the immediate assessment, apgar score and resuscitation of newborn · care Breast feeding and its importance · Neonatal problems · | Assignment |

Meeting with Mentors every Wednesday: 1pm-2 pm (students will meet their mentors, wherever mentors are stationed, both will fill the Weekly report of mentoring). We will include a weekly report of mentoring for 10 weeks. Students' Progress book will include a section for 40 weeks of structured reporting of mentoring. Each week will include students' attendance, academic performance, including survey results, comments by Mentor, and comments by Mentee.

Names of workshops conducted will be:

Maternal resuscitation
PPH management
Assisted Vaginal Delivery: Vacuum/Forceps
[CTG](#)
Breech Presentation
Contraception
Shoulder Dystocia
Pap smear
Hysterosalpingography
Maternal Pelvis and Fetal Skull
Mechanism of

Labour Mentorship:

Mentor will check and grade as:

Attendance (will be marked by biomedical devices in ward during morning 8:30 am and afternoon (2.30pm) and in Survive, on paper in workshop at SDC, Laboratory, Radiology and OPD.

Excellent- 90-100% Good 80-89%

Acceptable 75-79

Need improvement 65-74

Poor . Parents need to take action Less than 65%.

Academic performance so far e.g marks secured in Survive and in assignments.

Any presentation,

Progress in research,

Any disciplinary problem(s).

Comments by the mentor.

Workshops attended

Comments by the mentee.

Prof. Qamar Un Nisa requested to include weekly mentoring comments in the gradebook. Each page should cover two weeks. Hence, an addition of 10 leaves (20 pages) will be required with the above headings in the gradebooks.

I expect the examination department to participate in the assessment process throughout the year.

Assessment (Midterm and End of term):

On Thursday of week 5, a mid-session assessment will be held. Marks will be distributed as follows: On Friday of 10 week final term will be held

A WhatsApp group of parents & teachers will be formed where the progress of students will be shared. Only teachers will be able to post. Parents will be encouraged to make appointments through the Chairpersons of subjects to discuss their wards' progress.

On Friday of week 10, an end-of-term mentoring session and a final test will be conducted, including

MCQs- total of 25, 2 marks for each, 50 marks

OSCEs (10 interactive stations-5 marks each)-50 marks

Long case-50 marks,

Mentoring process-50 marks

Attendance-50 marks

Survive Score (week 5-10)- 50

Survive assignment (including PD) (week 5-10) 50

Workshops attended-10 marks

History/examinations Journal (2 marks for each history & examinations) total 10 marks

Participated in weekly presentation- 10 marks

Portfolio- 10 marks

Research project completed- 10 marks

Total 400 marks.

This will be shared in the WhatsApp group of parents.

For the internal assessment of the final year, the marks distribution will be as follows:

200 marks from the mid-term (50% of marks scored)

400 marks from end of term examination.

Total-600 marks.

Final marks in the internal assessment will be 10% of the marks obtained here.