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A Chartered University

DEPARTMENT OF MEDICAL EDUCATION

3RD YEAR MBBS STUDY GUIDES

CURRICULUM



OUTCOME-BASED



INTEGRATED



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COMMUNITY-ORIENTED



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MOHI-UD-DIN ISLAMIC MEDICAL COLLEGE

MIRPUR (AJK), PAKISTAN



APPROVED BY
ACADEMIC COUNCIL



ALIGNED WITH
PMDC MBBS CURRICULUM
2024 & HEC STANDARDS



PREPARED BY
DEPARTMENT OF
MEDICAL EDUCATION

VERSION
1.0

MOHI-UD-DIN ISLAMIC UNIVERSITY

A Chartered University

MOHI-UD-DIN ISLAMIC MEDICAL COLLEGE MIRPUR

DEPARTMENT OF MEDICAL EDUCATION



FOUNDATION-II

3RD YEAR MBBS (BATCH-16)

BLOCK: G

DURATION: 5 WEEKS

MODULE CODE: MB3-G-FND-II-12



2. Learning Objectives

General Learning Outcomes

By the end of this module the students would be able to;

- 1) Define pathology, its different branches and enumerate clinically important bacteria.
- 2) Describe the structure of bacterial cell and mechanisms by which they cause the disease.
- 3) Describe methods used to identify different microbes in laboratory and explain the interventions employed to prevent infections including vaccines.
- 4) Describe cell injury, its different mechanisms and sub cellular responses to cell injury.
- 5) Describe necrosis, apoptosis and adaptive changes seen in clinical settings and its identification in surgical specimens.
- 6) Define common terms related to Pharmacology.
- 7) Describe the basic principles of pharmacokinetics and pharmacodynamics and apply these principles to clinical practice as they relate to drug absorption, distribution, metabolism, excretion, mechanism of action, clinical action and toxicity.
- 8) Describe the cellular and biochemical sites where drugs bind to act.
- 9) Describe the general principles of drug interactions in relation to clinical practice.
- 10) Describe the process of new drug development.
- 11) Identify different dosage forms of drugs.
- 12) Demonstrate searching accurate information quickly in a formulary.
- 13) Demonstrate administration of a drug through intramuscular and intravenous routes.
- 14) Write down the basic format of drug prescription and describe the general principles of prescribing drugs.
- 15) Write correctly medical abbreviations used in clinical practice.
- 16) Identify commonly used equipments in pharmacy.
- 17) Describe Forensic medicine, its different branches and importance.
- 18) Describe law and its various components.
- 19) Explain medicolegal system and legal procedure for a doctor.
- 20) Describe the contents of medical jurisprudence.
- 21) Describe the diagnosis of death and WHO death certificate.
- 22) Describe different refractive errors and its management.
- 23) Explain causes of watery eyes in both infants and elders and its management.
- 24) Describe the basic concept of health, disease and primary health care.
- 25) Demonstrate different pathological laboratory procedures and identify gross and microscopic features in the given specimens.
- 26) Demonstrate professionalism, respect, honesty and compassion by behaving in a courteous manner with colleagues and teachers during course activities like long lectures, SGDs and Practicals.
- 27) Describe the PMC code of Ethics
- 28) Describe the steps of process of developing a research protocol

3. Specific learning objectives

THEME-I: (Molecules and Bacteria)

SNO	Subject: Pharmacology	Learning Outcomes	hours	MIT
	Topics			
1	Introduction to the subject	Define basic terms like Pharmacology, Clinical Pharmacology, Therapeutics, drug, medicine, pro-drugs, prototype drugs, Materia medica, pharmacopoeia, formulary, national formulary, poisons, toxins, pharmacokinetics, pharmacodynamics, excipient, compounding and dispensing. Describe the branches of Pharmacology like Pharmacy, Pharmacognosy, pharmacogenetics, pharmacogenomics, toxicology and posology. Define prescription drugs, OTC drugs, WHO essential drugs and Orphan drugs with examples	<i>I</i>	<i>II</i>
2	Nomenclature of drugs	Describe how drugs are named, i.e. chemical, generic, approved, official and trade names of drugs with examples.	<i>I</i>	<i>II</i>
3	Sources of drugs	Enlist various sources of drugs. Give examples of drugs obtained from plants, animals, mineral and synthetic sources. Describe the genetic engineering source of drugs with examples	<i>I</i>	<i>II</i>
4	Active principles of crude drugs	Enlist important principles of crude drugs with examples.		
5	Routes of drug administration	Enlist various routes of drug administration.	<i>2</i>	<i>II</i>
		Describe the merits and demerits of oral, sublingual, rectal, intramuscular, subcutaneous, intravenous, intra-arterial, inhalational, spinal, topical and transdermal routes of drug administration.		

		Give examples of drugs given through oral, sublingual, rectal, intramuscular, subcutaneous, intradermal, intravenous, intra-arterial, inhalational, spinal, topical and transdermal routes of drug administration. Describe the difference between topical and transdermal routes of drug administration. Describe the difference between subcutaneous and intradermal routes of drug administration.		
6	Absorption of drugs	Define drug absorption.	<i>I</i>	<i>II</i>
		Describe various mechanisms of drug absorption like simple diffusion, facilitated diffusion, active transport, ion-pair transport, endocytosis and filtration with examples.		
		Describe the concept of ionization of drug molecules and clinical significance of ion trapping.		
		Describe factors affecting drug absorption.		
7	Bioavailability and Bioequivalence	Define bioavailability, bioequivalence and pharmaceutical equivalence. Explain Time-Concentration curve. Describe AUC (Area Under the Curve). Describe the factors affecting bioavailability.	<i>I</i>	<i>II</i>
8	Hepatic first pass effect (Pre-systemic elimination)	Describe hepatic first-pass effect (Pre-systemic elimination) and its clinical significance.	<i>I</i>	<i>II</i>
9	Enterohepatic circulation	Define enterohepatic circulation. Describe enterohepatic circulation with examples and its clinical significance.		
10	Distribution of drugs	Define distribution of drugs. Define redistribution of drugs with example. Describe plasma protein binding and its clinical significance in diseased conditions. Describe factors affecting drug distribution.	<i>I</i>	<i>II</i>
	Volume of distribution	Define volume of distribution. Enlist drugs with small volume of distribution. Enlist drugs with large volume of distribution.		
	Loading dose	Define loading dose of a drug. Enlist some drugs whereby loading dose is administered. Apply formula for calculating loading dose.		
11	Physiological barriers to transport of	Enlist important physiological barriers to transport of drugs. Describe important physiological barriers to	<i>I</i>	<i>II</i>

	drugs	transport of drugs like blood brain barrier and placental barrier with reference to their clinical significance.		
12	Biotransformation (metabolism) of drugs	Define biotransformation. Define xenobiotics. Describe the objectives of biotransformation and fate of drugs after biotransformation. Name major sites of biotransformation. Describe major drug metabolizing enzymes i.e. microsomal (P450) and non-microsomal enzymes. Describe the phases and reactions of biotransformation. Describe the factors affecting drug biotransformation.	<i>I</i>	<i>II</i>
13	Genetic influence on biotransformation of drugs	Define pharmacogenetics and pharmacogenomics. Define idiosyncrasy with examples. Describe the genetic factors influencing biotransformation of drugs with examples.	<i>I</i>	<i>II</i>
	Enzyme induction	Define enzyme induction. Enlist enzyme inducers. Describe enzyme induction and its clinical significance.		
	Enzyme inhibition	Define enzyme inhibition. Enlist enzyme inhibitors. Describe enzyme inhibition and its clinical significance. Describe suicide inhibition (mechanism-based inhibition) with examples of drugs.		
14	Excretion of drugs and drug clearance	Define drug excretion and drug clearance. Enlist major and minor routes of drug excretion. Differentiate between excretion, elimination and clearance. Apply the formula for calculating drug clearance.	<i>I</i>	<i>II</i>
	Maintenance dose	Define maintenance dose of a drug. Apply the formula for calculating the maintenance dose. Apply Young's formula, Dilling's formula and Clark's formula for calculating doses of drugs.		
	Plasma half life	Define plasma half-life. Enlist drugs with short half-life. Enlist drugs with long half-life. Apply the formula for calculating plasma half		

		life. Explain the clinical significance of half life.		
15	Steady-state concentration of drugs	Define steady-state concentration of drugs. Describe the time to reach steady-state concentration of drugs. Describes the importance of steady-state concentration in clinical practice	<i>I</i>	<i>II</i>
	First- and zero-order kinetics	Define first- and zero-order kinetics. Differentiate between first- and zero-order kinetics with examples. Explain the clinical significance of first- and zero-order kinetics		
	Bioassay and standardization	Define bioassay and standardization. Describe the relative importance of bioassay compared with physical or chemical assays. Describe the most common type of bioassay, i.e. three-point assay.		
16	Pharmacodynamics	Define pharmacodynamics. Define agonist, antagonist, partial agonist and inverse agonist with examples. Describe receptors. Define orphan receptors, serpentine receptors and spare receptors. Describe the biochemical and cellular sites of drug targets. Describe intracellular Second-messenger system and enlist some important Second-messengers. Describe up regulation and down regulation of receptors with examples. Define drug selectivity and specificity.	<i>2</i>	<i>II</i>
	Dose-response curves (Graded and Quantal)	Define dose response curve, graded dose-response curve and quantal dose response curve. Describe graded dose-response curve and quantal dose-response curve. Describe the limitations of graded dose-response curve and its remedy in a quantal dose-response curve. Describe the significance of constructing dose-response curves. Explain the advantages of taking log dose values on the dose axis.		
17	Therapeutic index	Define therapeutic index. Describe therapeutic index with reference to its clinical importance. Apply formula for calculating therapeutic index	<i>I</i>	<i>II</i>

		Define median lethal dose, median toxic dose and median effective dose. Enlist some drugs with narrow therapeutic index. Enlist some drugs with broad therapeutic index.		
	Protective index	Define protective index. Differentiate between therapeutic index and protective index.		
18	Therapeutic window	Define therapeutic window. Describe therapeutic window with reference to its clinical importance.	<i>I</i>	<i>II</i>
	Potency and efficacy	Define potency and efficacy. Describe potency and efficacy with examples.		
		Describe the clinical importance of efficacy compared to potency.		
	Drug antagonism	Define drug antagonism. Enlist types of antagonism. Describe chemical, physiological (functional) and pharmacological (competitive/surmountable and non-competitive) antagonisms with examples		
19	Drug interactions	Define drug interaction. Define drug incompatibilities with examples. Describe pharmacokinetic drug interactions with examples and its clinical significance. Describe pharmacodynamics drug interactions with examples and its clinical significance. Describe drug-food interactions and drug-disease interactions with examples. Define summation, synergism and potentiation with examples.	<i>I</i>	<i>II</i>
20	Tolerance and Tachyphylaxis	Define Tolerance, cross tolerance, reverse tolerance (sensitization), innate tolerance, tachyphylaxis and drug resistance. Describe the mechanisms of development of tolerance and tachyphylaxis. Define drug holidays with example.	<i>I</i>	<i>II</i>
21	Adverse drug reactions	Define adverse drug effect, secondary effect and intolerance to a drug. Classify adverse drug reactions. Describe dose-related adverse effects (side effects and toxic effects) with examples. Describe non-dose-related adverse effects (idiosyncrasy and drug allergy)	<i>I</i>	<i>II</i>

		with examples. Describe causes of adverse drug reactions. Enlist some drugs causing hepatotoxicity. Enlist some drugs causing renal toxicity. Enlist some cardio toxic drugs. Enlist some drugs causing adverse effects on reproduction.		
22	New drug development	Describe the processes involved in drug discovery and development. Define lead compound and drug screening. Describe pre-clinical and clinical studies. Define placebo, placebo response and nocebo response. Define no-effect dose and minimum lethal dose. Describe 04 phases of clinical trials. Define post-marketing surveillance. Define single-blind, double-blind, crossover and ADME studies. Describe the role of Food and Drug Administration (FDA) in the drug development process. Differentiate between IND (Investigational New Drug) and NDA (New Drug Application)	<i>I</i>	<i>II</i>
	Subject: Pathology			
	Topics			
1.	Introduction to the subject	Define pathology, microbiology and list its major branches Describe essential characteristics of five major groups of microorganisms Differentiate between prokaryotes and eukaryotic cells based on their structure and complexity of their organization	<i>I</i>	<i>II</i>
2.	Introduction to cell	Define cell Describe structure of cell membrane Describe cell organelles	<i>I</i>	<i>II</i>
3	Classification of Bacteria	Describe classification of bacteria based on oxygen requirement as aerobes and anaerobes with examples. Describe classification of bacteria based on staining characteristics, nature of cell wall, ability to grow in the presence of oxygen and ability to form spores.	<i>I</i>	<i>II</i>
4	Structure of bacterial cell	Describe structure and function of each of various parts of the bacterial cell including cell wall, cytoplasmic membrane, Mesosome, ribosomes, granules and nucleoid Describe specialized structures outside the cell	<i>I</i>	<i>II</i>

		wall including capsule, flagella, pilli and glycocalyx List the differences between cell wall characteristics of Gram Positive and Gram Negative Bacteria Describe classification and important functions of plasmids. Describe functions and arrangement of transposons. Describe structure, functions and medical importance of bacterial spores with examples		
5	Bacterial growth curve	Describe various phases of bacterial growth curve	<i>I</i>	<i>II</i>
	Normal Flora	Describe medically important members of normal flora and their anatomic location		
6	Bacterial genetics	Define mutation Describe the classification of various types of mutations and their common causes. Describe methods of transfer of DNA within bacterial cells including process of conjugation, transduction, recombination and transformation.	<i>I</i>	<i>II</i>
7	Lab diagnosis of bacterial infections	Describe the bacteriologic approach to diagnosis of bacterial infections including blood, throat, stool, sputum, spinal fluid, urine, genital tract and wound cultures. Describe general principals of various immunologic and nucleic acid based methods for identification of an organism	<i>I</i>	<i>II</i>
8	Bacterial pathogenesis	Define the term pathogen, infection, virulence, communicable, endemic, epidemic and pandemic diseases, carrier, pathogens, opportunists, commensals and colonizers. Describe stages/determinants of bacterial pathogenesis.	<i>I</i>	<i>II</i>
		Describe colonization, invasion, toxins, immune-pathogenesis. Differentiate between exotoxins and endotoxins. Describe the various modes of action of endotoxins and endotoxins produced by gram positive and gram-negative bacteria. Describe the four stages of a typical infectious disease and Koch's postulates for establishing the causal role of an organism in the disease.		

9	Antibacterial Vaccines	Define immunization and vaccination. Describe role of immunization in inducing active and passive acquired immunity. Enlist the current bacterial vaccines and their indications. Describe various types of bacterial vaccines in terms of composition, preparation, indications, route of administration and common side effects.	<i>I</i>	<i>II</i>
	Subject:			
	FORENSIC MEDICINE & TOXICOLOGY			
1	Introduction to the subject of Forensic Medicine	Describe forensic medicine and its various branches Describe pillars of forensic medicine Describe the various terminologies used in forensic medicine	<i>I</i>	<i>II</i>
	Introduction to medicolegal system	Discuss different prevailing medicolegal systems in the world		
2	Introduction to Law	Describe its various types.	<i>I</i>	<i>II</i>
	Legal proceedings	Describe court procedures for a doctor		
	Chain of evidence	Describe evidence, its types and recording of evidence		
	PPC and CrPC	Describe the relevant sections of Pakistan penal code and CrPC		
	Medical jurisprudence	Describe the components of medical jurisprudence (consent, negligence, secrecy, professional misconduct and privileged communication) Describe code of medical ethics Describe the duties of a registered medical practitioner		
	Subject:			
	ENT			
1	Introduction to the subject	Describe common ENT symptoms. Name common diseases of ENT. Name recommended books that students must read.	<i>I</i>	<i>II</i>
	Subject:			
	OPHTHALMOLOGY			
1	Introduction to the subject; Career in Ophthalmology	Define Ophthalmology and its branches Highlight the scope of field of Ophthalmology as a future career	<i>I</i>	<i>II</i>

	y			
2	Refractory errors	Describe refractive error and its effect on vision. Describe the concept of myopia and its correction. Describe the concept of hypermetropia and its correction. Describe the concept of astigmatism & cylindrical lens. Describe the concept of presbyopia, its possible causes and correction. Describe aphakia and possible methods of its correction.	I	II
3	Watery Eyes	Explain the structural details, development and functions of lacrimal system. Correlate the clinical presentation of watery eye with anatomical structures. Correlate the clinical features with a disease entity. Describe the causes, clinical features and treatment of congenital nasolacrimal duct obstruction. Assess the time of probing. Describe the causes, clinical presentation and treatment modalities. Differentiate between acute and chronic dacryocystitis.	I	II
	SUBJECT:			
	COMMUNITY MEDICINE			
1	Introduction to the subject	Define Community medicine and Public health Describe the role of teaching of public health in prevention of diseases	I	II
2	Health system of Pakistan: INTRODUCTION	Define health care system of Pakistan using WHO Health system framework	I	II
3	Health and disease	Define community medicine, public health and preventive medicine. Discuss the history and philosophy of public health as well as its concepts and functions regionally & globally. Describe the stages in the natural history of a disease. Describe epidemiological triad, web of causation and multifactorial causation Describe the dimensions and determinants of health	2	II

		Describe the indicators of health and its characteristics		
		Discuss the concept of disease control Discuss the different levels of prevention and their modes of interventions. Explain the natural history of disease. Describe the iceberg phenomenon Describe mode of intervention of diseases with emphasis on health education		
4	Primary Health Care	Define Primary health care (PHC). Describe the elements of PHC, its principles and strategies for implementation of PHC. Describe Health for all by the year 2000. Enumerate the MDGS & SDGS related to health.	<i>I</i>	<i>II</i>
		Describe the history of development of PHC Describe comprehensive & selective PHC Describe reasons for failure of PHC Describe Health Systems before & after PHC Describe district health care system Enumerate indicators for assessing PHC.		
	SUBJECT: PRIME			
1	Personal Identity Professional identity	Describe personal identity in the context of medical education Define professional identity and Describe the basic pre-requisites of professional identity formation	<i>I</i>	<i>II</i>
2	Patient safety, clinical governance and quality improvement	Explain the concept of patient safety, clinical governance and quality improvement in primary healthcare	<i>I</i>	<i>II</i>
3	Professionalism-Trust	Explain the dynamics of professionalism and trust in health professional patient relationship Adheres to principles of trust in day to day professional interactions	<i>I</i>	<i>II</i>
	Professional identity formation Types and Multiple identities	Define professional identity formation and explain the Students' roles in terms of professional identity		
4	Motivation	Explain motivational skills for team members for clinical tasks	<i>I</i>	<i>II</i>

Theme-2 (Aging and Death)

SN O	Subject: PATHOLOGY	Learning Outcomes	hours	MIT
1	Cellular injury, cell death	Define the following terms: Pathology, disease, etiology, pathogenesis, morphology, cell injury and homeostasis. Describe the causes of cell injury from gross physical trauma to single gene defect. Describe the nature and severity of cell injury with cellular responses. Enumerate different classes of pathology. Describe the following basic mechanisms of cell injury: General Biochemical mechanisms, Ischemic and hypoxic injury, Ischemic/reperfusion injury, Free radical induced cell injury and chemical injury. Differentiate between reversible and irreversible cell injury. Describe the mechanism, morphological and biochemical changes and functional alterations in reversible and irreversible cell injury.	2	IL
		Define phagocytosis, endocytosis, pinocytosis, autophagy and heterophagy. Describe the subcellular responses to injury including lysosomal catabolism, heterophagy and autophagy.		
2	Cellular adaptation	Describe types of cellular adaptations. Differentiate between physiologic and pathologic adaptation. Define hypertrophy, hyperplasia, atrophy and metaplasia. Describe the causes and mechanism of hypertrophy, hyperplasia, atrophy and metaplasia. Describe hypertrophy of the smooth endoplasmic reticulum with examples and mitochondrial alterations. Describe cytoskeletal abnormalities in pathological states with examples.	1	IL
3	Necrosis	Define necrosis. Describe types of necrosis with examples. Describe the mechanism and morphology of necrosis.	1	IL
	Apoptosis	Define apoptosis. Describe physiological and pathological causes of apoptosis with examples.		

		Describe morphology with alterations in cell structure. Describe the biochemical features of apoptosis altering the cell structure. Describe the intrinsic and extrinsic pathways of apoptosis. Differentiate between necrosis and apoptosis.		
		Describe role of apoptosis in health and disease. Describe the mechanism and causes of cellular ageing including genetic & environmental factors, structural & biochemical changes. Describe adaptive changes in clinical settings.		
4	Steatosis	Describe causes and mechanism of steatosis. Explain the morphology and consequences of steatosis.	<i>I</i>	<i>II</i>
	Intracellular accumulations	Describe three general pathways for abnormal intracellular accumulations. Define steatosis. Describe causes, mechanism, morphology and consequences of lipid accumulation. Describe causes, mechanism, morphology, consequences of protein and glycogen accumulation Describe types of pigments Differentiate between endogenous and exogenous pigments.		
	Pathologic calcification	Define Pathologic calcification Describe types, morphology and functional alterations of pathologic calcification with examples. Differentiate between dystrophic and metastatic calcification.		
	SUBJECT: FORENSIC MEDICINE & TOXICOLOGY			
1	Introduction to Thanatology; Death	Define death and describe its phases. Describe criteria of diagnosis of death. Enlist the importance of diagnosis of death	<i>I</i>	<i>II</i>
		Describe the medicolegal aspects of brain stem death and suspended animation Define cause, mode, manner and mechanism of death Enlist various methods of disposal of dead body		
2	Death certificate	Define cause of death Describe the WHO format of death certificate	<i>I</i>	<i>II</i>

	<i>Subject:</i> <i>OPHTHALMOLOGY</i>			
1	Cataracts	Define cataract Describe the types of cataracts Describe the pathogenesis and complications of cataracts Describe the management of cataracts	<i>I</i>	<i>II</i>
	SUBJECT: PRIME Research			
1	Research Protocol	Describe the steps of developing a research protocol	<i>I</i>	<i>II</i>
2	Health system research	Define research and health system research. List types of research. Describe characteristics of health system research. Describe building blocks of health system. Discuss key areas of concern in health system. Discuss briefly research methodology.	<i>I</i>	<i>II</i>
3	Purpose and process of health research	Define and categorize types of health research Explain the purpose of health research	<i>I</i>	<i>II</i>
	SUBJECT: FAMILY MEDICINE			
1	History and current structure of general practice	Describe the historical perspectives of general practice Explain the structure of general practice nationally and internationally	<i>I</i>	<i>II</i>
	Models of healthcare	describe the models of healthcare		
	Essential healthservice package (levels of health services in KP)	Describe the levels of health services in the province of KP.		
PRACTICALS				
	SUBJECT: Pharmacology			
1	Lab protocols; Introduction to Pharmacy; Apparatus used in Pharmacy	Identify and name common apparatus used in pharmacy laboratory. Identify and label common apparatus used in the field of Pharmacy.	1.5	
2	Metrology &	Define metrology.	<i>1.5</i>	

	Medical abbreviations	Describe metric and imperial systems of measurements. Calculate the equivalency of metric system with imperial system. Describe the common medical abbreviations. Apply these abbreviations correctly in medical documentations.		
3	Dosage forms of drugs	Define dosage form. Enlist the types of dosage forms. Describe the characteristic properties of each dosage form. Identify dosage forms administered through different routes.	1.5	
4	Searching information in a formulary	Define formulary. Describe National Formulary. Demonstrate searching accurate information quickly in a formulary.	1.5	
5	To demonstrate IM and IV injection of drugs on a dummy (manikin)	Describe the general protocols for IM and IV injection of a drug. Demonstrate standard protocols during administration of a drug through Intramuscular route. Demonstrate standard protocols during administration of an IV drug through Intravenous route.	1.5	
6	Prescription writing	Define a medical prescription. Describe the components of a prescription. Describe how to reduce medication errors. Define compliance to the prescribed treatment. Write down the basic format of drug prescription.	1.5	
	SUBJECT: PATHOLOGY			
1	Biosafety procedures/ Precautions in Microbiology Lab	Define sterilization and disinfection. Demonstrate steps of hand washing. Enlist various physical and chemical methods of sterilization and disinfection. Define biosafety and biosecurity.	1.5	
2	Tissue processing	Describe steps involved in tissue processing. Identify various tools/instruments involved in tissue processing and their indications. Demonstrate slide focusing.	1.5	
3	Gram staining	Describe principal and significance of Gram staining. Enlist steps of Gram staining. Demonstrate Gram staining procedure. Identify Gram positive and Gram-negative	1.5	

		bacteria morphologically under the microscope.		
4	ZN staining	Describe principal and significance of ZN staining. Enlist steps of ZN staining. Demonstrate ZN staining procedure. Identify AFB and inflammatory cells microscopically.	1.5	
5	Culture media	Define terms like culture, bacterial colony, media, aerobe, anaerobe, agar, selective and differential. Describe classification of culture media. Describe basic and enriched media, transport media, selective media and differential media. Describe preparation/ inoculation of culture media. Enlist ingredients, indications, important properties and organisms grown on various culture media.	1.5	
6	Bacterial motility	Enumerate motile bacteria Identify motile bacteria under the microscope	1.5	
7	Hyperplasia (BPH)	Define hypertrophy and hyperplasia. Differentiate between hypertrophy and hyperplasia. Describe gross and microscopic morphology of BPH. Identify the slide of BPH.	1.5	
	Atrophy (Testicular atrophy)	Define atrophy Describe gross and microscopic features of atrophy over a slide of testicular atrophy as an example		
	Pathologic calcification	Describe causes and various types of calcification. Identify the slide.		
	SUBJECT: FORENSIC MEDICINE & TOXICOLOGY			
1	Death certificate	Formulate death certificate based on WHO criteria	1.5	
2	Legal procedure	Doctor in a witness box- role play	1.5	
3	Recording of evidence	Recording of dying declaration	1.5	
4	Consent form	Take written informed consent for various procedures	1.5	

MIT:mode of information transfer. E.g. lecture, SGD, DSL, Practical, skill lab etc etc

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DEPARTMENT OF MEDICAL EDUCATION



INFECTION & INFLAMMATION

3RD YEAR MBBS (BATCH-16)

BLOCK: G

DURATION: 6 WEEKS

MODULE CODE: MB3-G-INF-II-13



2. Learning Objectives

General Learning Outcomes

By the end of this module the students would be able to;

1. Describe the process of acute & chronic inflammation with their outcomes
2. Relate different aspects of healing and repair
3. Differentiate common pathogenic bacteria based on morphology, pathogenesis & lab diagnosis.
4. Relate bacterial pathogenic factors to clinical manifestations of common infectious diseases.
3. 5. Describe the pharmacological details of anti-inflammatory drugs
6. Apply/relate the pharmacokinetics & pharmacodynamics of chemotherapeutic agents to their use in infectious diseases
7. Construct / Write prescriptions for various inflammatory and infectious diseases
8. Describe medico legal aspects of HIV patient.
9. Describe mechanism of wound causation.
10. Describe medico legal aspects of parameters used for personal identification in real life situation
11. Apply parameters of a person's identification in a simulated environment
12. Describe the epidemiology of common infectious diseases.
13. Explain the preventive and control measures for infectious diseases.
14. Explain the control & preventive measures for nosocomial infections.
15. Describe the risks associated with hospital waste and its management.

9. Specific learning objectives

THEME–I: Pain and Fatigue

SNO	Subject:Pharmacology	Learning Outcomes	hours	MIT
	Topics			
1	Overview to anti inflammatory drugs	-Classify anti-inflammatory drugs -Describe the role of DMARDs and glucocorticoids as anti inflammatory agents	1	IL
2	NSAIDs (Non-selective cox inhibitors: Aspirin & other commonly used NSAIDs)	Classify NSAIDS -Differentiate between non-selective COXinhibitors and selective COX-2 inhibitors based on mechanism of action. -Name the prototype non-selective COX inhibitor. -Describe the pharmacokinetics of Aspirin -Describe the mechanism of action of aspirin as anti-platelet, analgesic, antipyretic and antiinflammatory agent. -Give the dose of Aspirin as anti-platelet, analgesic/antipyretic and as anti-inflammatory drug. -Describe clinical uses of NSAIDs. -Describe the adverse effects of NSAIDs. -Describe drug treatment of Aspirin poisoning -Describe the pharmacokinetics with emphasis on dosage, duration of action and elimination of Diclofenac, Ibuprofen, Indomethacin, Mefanamic acid and Piroxicam in contrast to Aspirin -Relate pharmacokinetics and pharmacodynamics of NSAIDs to their clinical applications	1	
3	Selective COX-2 inhibitors	Describe the mechanism of action of selective COX-2 inhibitors. -Describe the clinical uses of selective COX-2 inhibitors -Describe the adverse effects of selective COX-2 inhibitors -Describe the merits and demerits of	1	IL

		selective COX-2 inhibitors and non-selective COX inhibitors.		
4	Paracetamol (Acetaminophen)	Describe the pharmacokinetics of Paracetamol -Describe the mechanism of action of Paracetamol. -Describe the clinical uses of Paracetamol. -Describe the adverse effects of Paracetamol. -Give therapeutic and fatal doses of Paracetamol. -Describe the drug treatment of Paracetamol poisoning	1	IL
	Anti-histamines	-Classify anti-histamines -Differentiate between first and second generation anti-histamines -Describe the pharmacologic effects of H1-receptor antagonists. -Describe the clinical uses of H1-receptor antagonists. -Enlist the adverse effects of H1-receptor antagonists. -Describe the drug interactions of H1-receptor antagonists	1	IL
	Serotonin agonist and antagonist	- Enlist serotonin agonists - Classify serotonin antagonists - Describe the mechanism of action of serotonin - Describe the organ system effects of serotonin. - Describe the clinical uses of serotonin agonists and antagonists - Describe the pharmacological basis of ondansetron in chemotherapy induced vomiting.	1	IL
	Pathology			
1	Cells of Inflammation	Describe different cells of inflammation -Describe the functions of various cells of inflammation - Enumerate different causes of leukopenia and leucocytosis (each neutrophil, lymphocyte, monocyte, eosinophil, basophil separately)	1	IL
2	Overview to Acute Inflammation and	-Define acute inflammation -Describe causes of acute inflammation	1	IL

	vascular phase	-Describe the vascular events of acute inflammation		
3	Recognition of Microbes	Describe various molecular patterns and appropriate receptors used by the inflammatory cells to identify microbes -Relate the recognition of microbes to the initiation of inflammation	1	IL
4	Cellular phase of acute inflammation	Describe the sequence of events and cellular changes involved in cellular phase of acute inflammation	1	IL
5	Plasma Derived Mediators	Enumerate plasma derived mediators -Enlist the functions of each mediator -Describe the different cascades involved in the generation of mediators	1	IL
6	Cell Derived Mediators	-Enumerate cell derived mediators -Enlist the functions of each mediator	1	IL
7	Morphological patterns, outcomes, defects of inflammation	-Enumerate the different morphological patterns of inflammation -Describe the histological changes in each pattern - Enlist the outcomes of inflammation -Enumerate the various defects of inflammation -Describe the consequences of the defects of inflammation	1	IL
8	Overview to chronic inflammation	-Define chronic inflammation -Differentiate chronic from acute inflammation -Describe the causes and morphological features of chronic inflammation	1	IL
9	Granulomatous inflammation	Define granulomatous inflammation -Describe the morphological features and mediators involved in granulomatous inflammation	1	IL
10	Cells and mediators of chronic inflammation	-Enlist the cells of chronic inflammation -Enumerate the mediators of chronic inflammation -Describe the function of the mediators -Relate the functions of mediators to the morphological changes seen in	1	IL

		chronic inflammation		
11	Systemic effects of inflammation	Enumerate the systemic effects of inflammation -Describe the pathophysiology of the systemic effects of inflammation	1	IL
Forensic Medicine & Toxicology				
1	Antidotes	Define and classify antidotes Describe the mechanism of action of different antidotes	1	IL
2	Steps of management in a case of poisoning	Describe general steps of management in a case of poisoning	1	IL
Community Medicine				
1	Infectious disease epidemiology	Define incubation period ☐ Explain the principles of disease eradication and control ☐ Define serial intervals ☐ Define infectivity period	1	IL
2	Infection control	Define the basic definition related to infectious disease epidemiology ☐ Review the role of susceptible host for successful parasitism, modes of transmission and the host defense system ☐ List and explain the various classifications of communicable Diseases with special reference to the scope and purpose of the International classification of Disease (ICD -10). ☐ Enlist the common infectious diseases affecting the population of Pakistan as per National institute of Health Pakistan. ☐ Explain the effect of climate change and seasonal variation on specific diseases globally and in Pakistan. ☐ Explain the role of personal hygiene & PPE in infection control.	2	IL
	Disease carriers ☐ Reservoirs of infection ☐ Disinfection ☐ Communicable disease control measure (aimed at agent, host, others, administrative measures and vector control measures	Define disease carriers ☐ Explain the reservoirs of infection ☐ Differentiate between sterilization and disinfection ☐ Explain the types and procedures of disinfection ☐ Discuss Communicable disease control measure (aimed at agent, host, others, administrative measures and	1	IL

		vector control measures		
Theme 2- Trauma and Repair				
Pathology				
1	Prostaglandins	Enlist various prostaglandins- - Describe the mechanism of action of Prostaglandins. - Describe the organ system effects of Prostaglandins. - Describe the clinical uses of Prostaglandins.	1	IL
2	Overview to tissue healing and repair	-Differentiate between regeneration and repair -Describe various steps involved in the process of tissue healing and repair		
3	Tissue regeneration	-Define regeneration -Enlist organs capable of regeneration -Describe the process and mediators involved in regeneration	1	IL
	Cell Cycle and its role in repair	-Define cell cycle -Describe the initiation, various phases and proteins involved in the cell cycle -Discuss cells capable of entering the cell cycle -Describe proliferative capabilities of various cells		
4	Repair by scarring	Describe the various steps involved in process of repair by scarring -Describe the various mediators involved in the steps of scarring		
5	Growth factors and receptors	enumerate various growth factors and their receptors -Describe the most common pathways by which growth factors affect tissue repair and regeneration	1	IL
	ECM	Classify various components of ECM -Describe the role and importance of ECM in tissue repair		
6	Factors affecting wound healing/abnormal scarring	Enlist the various factors that influence wound healing -Describe the mechanism by which these factors affect wound healing -Describe the abnormalities of repair and their consequences	1	IL
Forensic Medicine and Toxicology				
1	Overview to medico-legal aspects of trauma (Wound causation)	Describe mechanism of wound causation	1	IL

2	Toxicity by analgesics	Describe the medico legal aspects of toxicity by aspirin and paracetamol	1	IL
Community Medicine				
1	Nosocomial infection & its control	Describe the prevalence of the nosocomial infections globally and Specifically in Pakistan. ☐ Identify the cause of nosocomial infections in Pakistan. ☐ Enlist common nosocomial infections. ☐ Describe the importance of different modes of transmission for causation of the nosocomial infections. ☐ Explain the control & preventive measures for nosocomial infections	1	IL
Theme 3- Fever and Infection				
Pharmacology				
1	Introduction to Chemotherapy	1. Define basic terms like chemotherapy, antibiotic, antimicrobial, MIC, MBC, chemoprophylaxis, empirical therapy and post-antibiotic effect, bacteriostatic and bactericidal antimicrobials. 2. Explain advantages of drug combinations. 3. Describe various mechanisms of bacterial resistance against antibiotics. 4. Differentiate between concentration and time dependent killing with examples. 5. Classify antimicrobials on the basis of mechanism of action (MOA)	2	IL
2	Penicillins	1. Classify beta-lactam antibiotics 2. Enlist narrow and broad spectrum Penicillins. 3. Enlist anti-pseudomonal, anti-staphylococcal/ beta lactamase Resistant Penicillin. 4. Enlist long- and short-acting Penicillins 5. Describe anti-bacterial spectrum of Penicillins. 6. Describe pharmacokinetics in respect of emphasis on route of administration and excretion of Penicillins	2	IL
		7. Describe mechanism of action of Penicillins		

		8. Describe clinical uses of Penicillins 9. Describe adverse effects of Penicillins,		
		10. Describe contraindications of Penicillins. 11. Describe principal mechanism of bacterial resistance to Penicillins 12. Describe drug interactions of Penicillins 13. Apply formula for interconversion of milligrams and units of Penicillin G. 14. Relate pharmacokinetics and pharmacodynamics of Penicillin with their clinical applications / uses.		
3	Cephalosporins	1. Classify Cephalosporins 2. Describe anti-bacterial spectrum of Cephalosporins. 3. Describe pharmacokinetics of Cephalosporins with special emphasis On route of administration and excretion. 4. Describe clinical uses of Cephalosporins 5. Describe the adverse effects of Cephalosporins. 6. Describe drug interactions of Cephalosporins with Ethanol. 7. Describe the principal bacterial mechanism of resistance to Cephalosporins. 8. Relate pharmacokinetics and pharmacodynamics of Cephalosporin With their clinical applications / uses.	1	IL
4	Beta lactamase inhibitors	1. Enlist beta-lactamase inhibitors 2. Explain the rationale for using beta lactamase inhibitors in combination with β -lactam antibiotics.	1	IL
5	Monobactams & Carbapenem	1. Describe the antibacterial spectrum of Monobactams and Carbapenem 2. Describe the clinical uses of Monobactams and Carbapenem		
6	Vancomycin	1. Describe the MOA of Vancomycin. 2. Describe clinical uses of Vancomycin 3. Describe the use of vancomycin in MRSA (Methicillin-resistant Staph aureus). 4. Describe adverse effects of Vancomycin 5. Describe "Red man/Red neck" syndrome.	1	IL

7	Fosfomycin Bacitracin & Cycloserine	1. Enlist clinical uses of Fosfomycin, Bacitracin & Cycloserine	1	IL
8	Protein synthesis inhibitors:	Classify bacterial protein synthesis inhibitors	1	IL
9	Tetracyclines	Classify Tetracyclines. ☐ Describe anti-bacterial spectrum of Tetracyclines. ☐ Describe the pharmacokinetics of Tetracycline with special emphasis on absorption of Tetracyclines. ☐ Describe mechanism of action of Tetracyclines. ☐ Describe the principal mechanism of resistance to Tetracyclines. ☐ Describe clinical uses of Tetracyclines. ☐ Describe adverse effects of Tetracyclines ☐ Describe Black Bone disease. Describe the teratogenic effects of Tetracyclines. ☐ Describe drug interactions of Tetracyclines. ☐ Describe the adverse effect related to the use of outdated (expired) Tetracycline products. ☐ Relate pharmacokinetics and pharmacodynamics of Tetracycline with their clinical applications / uses.	1	IL
Pathology				
1	Bacteria: Pyrogenic Bacteria	Define boil and furuncle -Enlist organisms responsible for pyrogenic infections -Describe important properties, Pathophysiology, lab diagnosis of GPC & GNC	1	IL
2	Bacteria: Rickettsia	-Define Rickettsia -Describe the important properties, pathophysiology, lab diagnosis of diseases caused by Rickettsia	1	IL
3	Spore forming GProds	Enumerate spore forming GP rods - Describe the important properties, pathophysiology, clinical features and lab diagnosis of spore forming GP rods	1	IL
	Non Spore forming GP rods	Enumerate non spore forming GP rods Describe the important properties, pathophysiology, clinical features and lab diagnosis of non-spore forming GP rods		
4	Chlamydia	Describe the important properties,	1	IL

		pathophysiology, clinical features and lab diagnosis of chlamydia.		
5	Miscellaneous: Sepsis and Septic Shock	Define sepsis and septic shock -Enlist organisms capable of causing sepsis and inducing septic shock -Describe the pathophysiology and clinical features of septic shock	1	IL
6	Zoonotic Infections	-Enlist organisms causing zoonotic infections -Describe the important properties, pathophysiology, clinical features and lab diagnosis of different zoonotic diseases	1	IL
Forensic medicine and Toxicology				
1	General outlines of identification	Describe methods and parameters of identification	2	IL
	Fetal age determination	Write important physical developmental stages of fetus for age estimation		
	Age determination by skeletal study	Write important skeletal points of age estimation		
	Age estimation by dental study	Write important dental points for age estimation		
	Ages of medico legal significance	Enlist important ages of legal significance		
Pharmacology				
1	Aminoglycosides	Enlist Aminoglycosides. ☐ Describe anti-bacterial spectrum of Aminoglycosides. ☐ Describe the pharmacokinetics of Aminoglycosides with special emphasis on route of administration, concentration-dependent killing and post-antibiotic effect. ☐ Describe mechanism of action of Aminoglycosides. ☐ Describe the principal mechanism of resistance to Aminoglycosides. ☐ Describe clinical uses of Aminoglycosides. ☐ Describe adverse effects of Aminoglycosides. ☐ Describe the drug interactions of Aminoglycosides. ☐ Relate pharmacokinetics and pharmacodynamics of Aminoglycosides with their clinical applications / uses.	1	IL
2	Macrolides & other	Enlist Macrolides.	2	IL

	related drugs	☐ Describe anti-microbial spectrum of Macrolides ☐ Describe pharmacokinetics of Macrolides ☐ Describe the mechanism of action of Macrolides ☐ Describe the principal mechanism of resistance to Macrolides ☐ Describe clinical uses of Macrolides ☐ Describe adverse effects of Macrolides. ☐ Describe drug interactions of Macrolides ☐ Differentiate the salient features of Erythromycin, Clarithromycin and Azithromycin in respect of dosing and clinical use. ☐ Relate pharmacokinetics and pharmacodynamics of Macrolides with their clinical applications / uses.		
3	Linezolid	Describe mechanism of action of Linezolid ☐ Describe clinical uses of Linezolid with special emphasis on methicillin resistant staphylococci and vancomycin-resistant enterococci	1	IL
	Clindamycin	Describe mechanism of action of Clindamycin. ☐ Enumerate clinical uses of Clindamycin. ☐ Describe antibiotic associated (pseudomembranous) colitis.		
	Streptogramins	Enumerate Streptogramins. ☐ Describe clinical use of Quinupristin-Dalfopristin in VRE (Vancomycin-resistant enterococci).		
4	Chloramphenicol	Describe anti-microbial spectrum of Chloramphenicol ☐ Describe mechanism of action of Chloramphenicol ☐ Enlist clinical uses of Chloramphenicol ☐ Describe the reason for obsoleting the systemic use of Chloramphenicol ☐ Enlist adverse effects of Chloramphenicol	1	IL
5	Quinolones	Describe Gray baby syndrome. ☐ Classify Quinolones.	1	IL

		☐ Describe the pharmacokinetics of Fluroquinolones with special emphasis on half-life of Moxifloxacin ☐ Enlist respiratory Quinolones. ☐ Describe anti-microbial spectrum of Fluroquinolones. ☐ Describe mechanism of action of Fluroquinolones. ☐ Describe the principal mechanism of resistance to Fluroquinolones, ☐ Describe clinical uses of Fluroquinolones ☐ Describe adverse effects of Fluroquinolones ☐ Describe drug interactions of Fluroquinolones ☐ Relate pharmacokinetics and pharmacodynamics of Fluroquinolones with their clinical applications / use.		
2	Sulfonamides and Trimethoprim	Classify Sulfonamides ☐ Describe anti-microbial spectrum of Sulfonamides ☐ Describe mechanism of action of Sulfonamides and Trimethoprim ☐ Describe mechanism of resistance to Sulfonamides ☐ Describe clinical uses of Sulfonamides and Trimethoprim ☐ Describe adverse effects of Sulfonamides and Trimethoprim ☐ Describe the advantages of combining sulfamethoxazole with trimethoprim (CoTrimoxazole) ☐ Describe the drug interaction of Sulphonamides with Phenytoin.	2	IL
Pathology				
1	Parasites: Hydatid Cyst	Describe the life cycle and important properties of Echinococcus ☐ Relate the pathogenesis to the clinical features and lab work up of Echinococcus ☐ Identify cysts of Echinococcus in the lab	1	IL
	Leishmania	Describe the life cycle, and important properties of Leishmania ☐ Relate the pathogenesis to the clinical features and lab work up of Leishmania		

2	Toxoplasma	Describe the life cycle and important properties of Toxoplasma ☐ Relate the pathogenesis to the clinical features and lab work up of Toxoplasma	2	IL
	Malaria	Describe the life cycle and important properties of Malarial parasite ☐ Relate the pathogenesis to the clinical features and lab work up of Malaria		
	Tenia	Describe the life cycle, important properties, of <i>Teniasaginata</i> and <i>solium</i> ☐ Relate pathogenesis to the clinical features and lab work up of <i>Tenia saginata</i> and <i>solium</i>		
Forensic Medicine & Toxicology				
1	Sex determination	Describe parameters of sex determination	2	IL
	Race determination	Describe parameters of race determination		
	Examination of hair	Describe medico legal aspects of hair		
	Forensic odontology	Write the application of odontology in forensic medicine		
	Forensic Anthropometry	Describe medico legal aspects of forensic anthropometry		
Community Medicine				
1	Epidemiology and control of vector borne diseases ☐ Malaria ☐ Dengue and other Viral haemorrhagic fevers and Arboviral infections ☐ Plague ☐ Filariasis	Describe the epidemiological determinants, frequency and distribution of Malaria ☐ Compare the prevalence/incidence of malaria in different provinces of Pakistan. ☐ Explain the preventive and control measures of Malaria ☐ Describe the scope/function of Malaria control program. ☐ Explain the types, risk factors, complications and control measures of viral hemorrhagic fevers including Dengue fever	2	IL
2	Epidemiology & control of Leishmaniasis	Describe the epidemiological determinants, frequency and distribution of Leishmaniasis ☐ Explain the preventive and control measures of Leishmaniasis	1	IL
3	zoonotic and direct contagious diseases ☐ Rabies ☐ Anthrax	☐ Explain the pre and post exposure prophylaxis of Rabies ☐ Explain the epidemiology, types of Anthrax and its preventive measures	2	IL

	☐ Plague ☐ Brucellosis ☐ Tetanus ☐ Scabies Leprosy ☐ Trachoma	☐ Discuss the history, types and prevention of Plague ☐ Explain the etiology, risk factors, clinical features and prevention of Brucellosis ☐ Explain the preventive measures of Scabies ☐ Discuss the etiology, risk factors, clinical features and prophylaxis of pre and post exposure of Tetanus Explain the etiology, risk factors, stages and preventive measures of Leprosy ☐ Explain the etiology, risk factors, complications and preventive measures of Trachoma		
Family medicine				
1	Malaria & Hepatitis control program teams	Explain the etiology, clinical features, types, investigations and management of Malaria in family practice ☐ Describe the red-flags in a patient with Malaria for referral to specialty care ☐ Identify at risk patients of hepatitis and Malaria and offer them screening	1	IL
Pharmacology				
1	Antimalarials	Describe terms like chemoprophylaxis, causal prophylaxis, terminal Prophylaxis and radical cure with examples of drugs. ☐ Classify antimalarial drugs. ☐ Enlist drugs used for chemoprophylaxis of malaria.	3	IL
		Enlist drugs used for radical cure of malaria. ☐ Describe the pharmacokinetics of Chloroquine with special emphasis on volume of distribution and dosing ☐ Describe mechanism of action of Chloroquine, Quinine, Mefloquine, Halofantrine, Primaquine, Pyrimethamine and Artemisinins. ☐ Describe adverse effects of antimalarial drugs ☐ Describe Cinchonism and Blackwater fever. ☐ Enlist the antimalarial drugs		

		relatively safe in pregnancy. ☐ Describe the antimalarial drugs contraindicated in G6PD deficiency. ☐ Relate pharmacokinetics and pharmacodynamics of antimalarial drugs with their clinical applications / use.		
2	Antifungal drugs	Classify Antifungal drugs. ☐ Describe the pharmacokinetics of Amphotericin B and Ketoconazole ☐ Describe the advantages of liposomal preparation of Amphotericin B ☐ Describe mechanism of action of Azoles, Amphotericin B, Griseofulvin, Terbinafine, and Nystatin. ☐ Describe clinical uses of Azoles, Amphotericin B, Griseofulvin, Terbinafine, and Nystatin. ☐ Describe adverse effects of Azoles, Amphotericin B, Griseofulvin, Terbinafine, and Nystatin. ☐ Describe drug interactions of Ketoconazole and Amphotericin B	2	IL
3	Antivirals	Classify antiviral drugs	1	IL
4	Anti-herpes	☐ Enlist anti- Herpes drugs ☐ Describe the pharmacokinetics of Acyclovir ☐ Describe mechanism of action of Acyclovir ☐ Describe clinical uses of Acyclovir. ☐ Describe adverse effects of Acyclovir Describe the role of Ganciclovir in CMV retinitis.	1	IL
5	Anti-HIV drugs	Classify anti-HIV drugs.	3	IL
		Describe the role of entry inhibitors, integrase inhibitors, protease inhibitors, NRTIs and NNRTIs in HIV treatment ☐ Describe adverse effects of Zidovudine and Indinavir ☐ Describe the rationale of HAART therapy.		
6	Viruses: Corona Viruses: HIV	Describe the structure, important properties, pathogenesis and clinical features along with labwork up of Corona Virus. Describe the structure, important properties, pathogenesis and clinical features along with labwork up of HIV	1	IL
7	Viruses:	Describe the structure, important	1	IL

	Herpesviruses	properties, pathogenesis and clinical features along with labwork up of Herpesviruses		
	Viruses: Tumor Viruses	Describe the structure, important properties, pathogenesis and clinical features along with labwork up of Tumor viruses		
	Viruses: MMR	Describe the structure, important properties, pathogenesis and clinical features along with lab work up of MMR viruses		
8	Fungi: Aspergillus	Describe the structure, important properties, pathogenesis and clinical features along with labwork up of Aspergillus	1	IL
	Fungi: Candida	Describe the structure, important properties, pathogenesis and clinical features along with lab work up of Candida		
	Tenia	Describe the structure, important properties, pathogenesis and clinical features along with labwork up of Tenia		
Forensic Medicine and Toxicology				
1	Medico legal issues related to HIV patient	Describe legal issues related to HIV patient	1	IL
	Dactylography	Describe medico legal aspects of dactylography		
2	DNA finger printing	Define DNA finger printing ☐ Write its application in forensic practice ☐ Write methods of collection of samples and dispatch to laboratory	1	IL
	Tattoos, Scarmarks, Superimposition and facial reconstruction	Describe medico legal aspects of tattoo marks, Describe medico legal aspects of scar tissue, ☐ Describe medico legal aspects of superimposition		
	Polygraph	Describe medico legal aspects of polygraph		
	Narcoanalysis	Describe medico legal aspects of narcoanalysis		
Family Medicine				
1	TORCH infections	Define TORCH infection Describe the steps of investigations for TORCH infections Describe the preventive strategies for TORCH infections & their complications	1	

Community Medicine				
1	Epidemiology & control of airborne diseases	Describe the epidemiological determinants, frequency and distribution of measles, mumps, chickenpox, rubella, Diphtheria, Pertissus and meningitis	1	IL
		Explain the preventive and control measures of measles, mumps & rubella with reference to Pakistani context.		
2	Epidemiology & control of Corona virus infection	Describe the epidemiological determinants, frequency and Distribution of corona ☐ Compare the prevalence/incidence of corona in different parts of the world. ☐ Describe the preventive and control measures of corona Describe the role of Pakistani government in corona control program.	1	IL
3	Epidemiology and prevention of water borne diseases: ☐ Cholera ☐ Typhoid ☐ Acute Diarrhea and Dysentery ☐ Polio ☐ Hepatitis A and E ☐ Food poisoning Amebiasis and Giardiasis ☐ Brucellosis ☐ Leptospirosis ☐ Worm infestations	Enumerate common water borne diseases ☐ Explain the epidemiology & prevention measures of these diseases ☐ describe the current situation of these diseases on Pakistan and worldwide	2	IL

Practical Work

Week 1 Practicals				
Pathology				
	Cell of inflammation	Identify Cells of inflammation in the microscope	1.5	
	Acute Appendicitis	Identify the histopathological changes in acute appendicitis	1.5	
Forensic Medicine				
	Gastric Lavage	Demonstrate the steps of gastric lavage	1.5	
Week 2 Practicals				
Pathology				

	Chronic cholecystitis	-Identify the morphological changes occurring in chronic cholecystitis	1.5	
	Granuloma	- Identify the various cells and their arrangement in a granuloma	1.5	
Week 3 Practicals				
Pathology				
	Granulation Tissue	-Identify the histological features of granulation tissue	1.5	
Week 4 Practicals				
Pathology				
	Catalase test	Perform and interpret the result of catalase test by tube and slide method	1.5	
	Coagulase test	Perform and interpret the result of coagulase test by tube method		
	Oxidase test	Perform and interpret the result of coagulase test		
	Culture media	-Identify blood agar, Mannitol salt agar, Chocolate media, Cary Blair transport media in the lab -Identify different types of haemolysis on blood agar		
Pharmacology				
		Prescription Writing		
	Acute Tonsillitis	Construct a prescription for a patient with acute tonsillitis.		
Forensic Medicine				
	Sex determination through bones	Identify human sex through bones	1.5	
	Hair, Fibre	Identify human hair through microscopy Differentiate between hair and fibre		
Week 5 Practicals				
Pharmacology				
		Prescription Writing		
	Malaria	Construct a prescription for a patient with Malaria		
Week 6 Practicals				
Pathology				
	Hydatid Cyst	Identify cysts and ova of Echinococcus in the lab	1.5	
	Leishmania	Identify leishmania in slides of bone marrow/ skin biopsies		
	Malaria	Identify Malarial parasite trophozoites and gametocytes under microscope		

	Taenia saginata/solium	Identify ova of Taenia in the lab		
Community medicine				
	Communicable diseases models	Identify the models related to the communicable diseases Explain the complication, preventive measures and the identification signs of concerned disease	1.5	

MIT: Mode of information transfer. E.g. lecture, SGD, DSL, Practical, skill lab etc etc.

MOHI-UD-DIN ISLAMIC MEDICAL COLLEGE MIRPUR

DEPARTMENT OF MEDICAL EDUCATION



MULTISYSTEM-I

3RD YEAR MBBS (BATCH-16)

BLOCK: H

DURATION: 4 WEEKS

MODULE CODE: MB3-H-MTS-I-14



2. Learning Objectives

General Learning Outcomes

By the end of this module the students would be able to;

- 1) Explain the functional organization of Autonomic Nervous system(ANS)
- 2) Describe the basic and clinical pharmacology of drugs acting on theANS
- 3) Describe anticancer drugs
- 4) Describe the basic and clinical pharmacology of Eicosanoids.
- 5) Describe the basic and clinical pharmacology of drugs used for common skin problems.
- 6) Describe the clinical uses of some popular herbal medications.
- 7) Describe single Gene Disorders, cytogenetic disorders and different mutations
- 8) Describe the molecular Genetics Diagnosis
- 9) Define neoplasia and nomenclature of tumors
- 10)Describe characteristics of benign and malignant tumors
- 11)Describe epidemiology of cancer
- 12)Describe carcinogens, their types and clinical aspects of neoplasia
- 13)Describe diagnosis of cancer, grading and staging of tumors
- 14)Describe pathways for tumor spread and tumor immunity
- 15)Describe the protocols and procedures of autopsy.
- 16)Describe Thanatology and its medicolegal implications.
- 17)Describe general principles of Toxicology and their role in medicolegal sciences.
- 18)Describe the fundamentals of Research Ethics

3. Specific learning objectives

Subject	Topic	Hours	S. No	Learning Objectives
Theme-1(VomitingandBlurredvision)				
Physiology	Functional organization of ANS- and overview	1	1	Describe the functional organization of ANS and its related neurotransmitters and receptors
Pharmacology	Introduction to the pharmacology of Autonomic Nervous System (ANS)		2	Enlist major autonomic neurotransmitters.
			3	Enlist various types of cholinergic, adrenergic and dopaminergic receptors discovered so far.
			4	Describe the organ system distribution of autonomic receptors.
			5	Describe presynaptic receptors (autoreceptors and heteroreceptors).
			6	Describe inotropy, chronotropy and dromotropy.
	Cholinomimetic drugs (Parasympathomimetic drugs)		7	Classify cholinomimetic drugs.
			8	Enlist the naturally-occurring cholinomimetic alkaloids.
			9	Enlist major organophosphate compounds.
			10	Enlist the organophosphates used as "Nerve gases".
			11	Describe the pharmacokinetics of cholinomimetics with emphasis on metabolism and duration of action.
			12	Describe the mechanism of action of directly-acting and indirectly-acting cholinomimetics.

			13	Describe the organ system effects of directly-acting and indirectly-acting cholinomimetics with special reference to their effects on receptors.
			14	Describe the clinical uses of cholinomimetics.
			15	Describe the cholinomimetics used in glaucoma and Alzheimer's disease.
			16	Describe the use of Edrophonium to differentiate between cholinergic crisis and Myasthenic crises.
			17	Describe the adverse effects of cholinomimetics.
			18	Describe the clinical manifestations
			19	Describe the clinical manifestations of mushroom poisoning.
			20	Explain the pharmacological rationale of prophylactic use of Pyridostigmine in situations where chemical warfare with nerve gases is anticipated.
			21	Enlist the contraindications of cholinomimetics.
	Anticholinergic drugs (Parasympatholytics)		22	Classify anticholinergic drugs (Parasympatholytics/Cholinoreceptor - blocking drugs).
			23	Describe belladonna alkaloids with reference to their natural sources.
			24	Describe the pharmacokinetics of antimuscarinic drugs with emphasis on metabolism and duration of action.
			25	Describe the mechanism of action of antimuscarinic drugs.
				Describe the organ system effects of antimuscarinic drugs with special
			27	Describe the clinical uses of antimuscarinic drugs.
			28	Describe the drug treatment of organophosphate poisoning.
			29	Enlist cholinesterase regenerating compounds.
				Describe "aging" of the phosphorylated enzyme complex and its clinical
			31	Describe the drug treatment of mushroom poisoning.

		32	Describe the adverse effects of antimuscarinic drugs.
		33	Describe atropine fever.
		34	Name the antidote for atropine poisoning.
		35	Describe the contraindications of
	Ganglion-blocking drugs	36	Enlist major ganglion-blocking drugs.
		37	Describe the mechanism of action of ganglion-blocking drugs.
		38	Describe the organ system effects of ganglion-blocking drugs.
		39	Enlist the clinical uses of ganglion-blocking drugs.
		40	Enlist the adverse effects of ganglion-blocking drugs.
Forensic Medicine	Poison & related laws	41	Define a poison
		42	Describe laws related to poisoning or drug use.
	Legal duties of a Registered Medical Practitioner in a case	43	Explain legal, ethical, and moral duties of Registered Medical Practitioner in a case of poisoning.
	Fate of Poison	44	Enumerate different routes of administration of poisons.
		45	Describe Biotransformation.
		46	Enlist the route of excretion of Poisons
	Diagnosis of poisoning	47	Describe the protocols of diagnosing poisoning in living and Dead
	Antidotes	48	Define and classify antidotes
		49	Describe the mechanism of action of different antidotes
	Steps of management in a case of poisoning	50	Describe general steps of management in a case of poisoning
	Organophosphate group	51	Describe the mechanism of action of commonly used organophosphate poisons.
		52	Describe the characteristics finding for organophosphate group in postmortem examination.
		53	describe different signs and symptoms for organophosphate group.
		54	Describe the medico-legal importance for organophosphate group.

			55	Explain fatal dose, fatal period, and treatment for organophosphate poisons.
Community medicine	Smoking	1	55	Describe the global distribution and increase of smoking
			56	Discuss the causes of smoking
			57	Discuss the effects of smoking on Health
			58	Describe preventive and control Measures
	International Health	1	59	Describe International health regulations and their importance
			60	Describe preventive measures for travelers visiting disease endemic areas
	Role of international health agencies in	1	61	Enumerate international health agencies working in health sector
			62	Discuss structure and function of WHO & UNICEF
			63	Explain the roles of WHO & UNICEF in Pakistan
PRIME/ Research	Research Ethics	1	64	Define ethics in research
			65	Discuss importance of research Ethics
			66	Discuss principles of ethics
			67	Describe the theories of ethics
			68	Discuss research misconduct
	Referencing	1	69	Differentiate between references, citation & bibliography
			70	List different styles of referencing
			71	Select appropriate referencing style
Theme-2: (Palpitation, fainting and death)				
Pharmacology	Sympathomimetic drugs		72	Classify sympathomimetic drugs according to the spectrum of adrenoceptors they affect and on the basis of their mode of action (directly-acting and indirectly-acting).
			73	Define Catecholamines with examples.
			74	Describe the pharmacokinetics of sympathomimetic drugs with emphasis on their metabolism.
			75	Describe the mechanism of action of sympathomimetics.

		76	Describe the organ system effects of sympathomimetics with special reference to their effects on receptors.
		77	Compare the effects of Adrenaline, Noradrenaline, Phenylephrine and Isoprenaline on heart rate and blood pressure.
		78	Describe the clinical uses of sympathomimetics.
		79	Describe the drug treatment of Anaphylactic shock.
		80	Describe the dose-dependent effects of Dopamine and its clinical importance.
		81	Describe the sympathomimetic drugs used in the management of glaucoma.
		82	Describe the role of mannitol and acetazolamide in the treatment of Glaucoma
		83	Describe the adverse effects of sympathomimetics.
		84	Describe hypertensive cheese Reaction
		85	Enlist the foods with high Tyramine content.
		86	Describe the drug interactions of sympathomimetics with Monoamine oxidase inhibiting drugs.
		87	Describe the treatment of accidental overdose of adrenaline.
	Sympatholytic drugs (Adrenoceptor antagonists)	88	Classify sympatholytic drugs (adrenoceptor antagonists) on the basis of spectrum of adrenoceptors they affect.
		89	Name the prototype α -blocker.
		90	Name the α -blocker having more specificity for prostate muscle.
		91	Describe the mechanism of action of α -blockers.
		92	Describe the organ system effects of α -blockers with special reference to their effects on receptors.
		93	Describe the phenomenon of epinephrine reversal.

			94	Describe the clinical uses of α -blockers.
			95	Describe the adverse effects of α -blockers.
			96	Name the prototype β -blocker.
			97	Enlist the β -blockers with intrinsic sympathomimetic activity (partial agonist activity).
			98	Enlist the β -blockers with membrane stabilizing activity (Na channel-blocking activity).
			99	Enlist the β -blockers which have proved to be inverse agonists.
			100	Enlist the β -blockers which are relatively safe in chronic stable heart failure.
			101	Enlist the β -blockers which are relatively safe in asthmatic patients.
			102	Describe the pharmacokinetics of propranolol.
			103	Describe the mechanism of action of β -blockers.
			104	Describe the organ system effects of β -blockers with special reference to their effects on receptors.
			105	Describe the clinical uses of β -blockers.
			106	Describe β -blockers used in the management of glaucoma.
			107	Describe stage fright and name the β -blocker used for its management.
			108	Describe the adverse effects of β -blockers.
			109	Name the antidote for β -blockers' toxicity.
			110	Enlist the contraindications of β -blockers.
			111	Describe the limitations of beta-blockers in patients with Diabetes Mellitus, Hyperlipidemias, Bronchial Asthma and peripheral arterial disease.

		112	Enlist mixed adrenoceptor antagonists (Labetalol and Carvedilol).
		113	Describe the clinical uses of mixed adrenoceptor antagonists.
Forensic medicine	Thanatology/Death	114	Describe death.
		115	Describe phases of death.
		116	Define brain death.
		117	Describe the criteria of brain
		118	Describe the role of EEG/ECG in
		119	Explain apparent death.
		120	Describe human tissue act.
		121	Describe medicolegal importance of death.
	Postmortem changes	122	Define Post Mortem changes.
		123	Classify Post-mortem changes.
		124	Describe immediate, early and late
		125	Describe Post-mortem lividity.
		126	Describe the steps to report changes due to post-mortem Lividity
	Rigor mortis	127	Define Rigor Mortis.
		128	Describe the mechanism of formation of Rigor mortis
		129	Describe the special features of
		130	Describe time consumed to develop
		131	Describe chemical basis of Rigor
		132	Describe factors affecting Rigor
		133	Describe the conditions that simulate Rigor Mortis.
		134	Describe procedure of its confirmation.
		135	Describe medico legal importance of Rigor Mortis.
	Cooling of dead body (Algor Mortis)	136	Define Algor Mortis?
			Describe different methods of
		138	Describe the PM body cooling curve?

		139	Describe the formula/calculation used for time since death.
	Late P.M. changes & putrefaction	140	Define putrefaction?
		141	Describe the process of Putrefaction
		142	Describe stages of putrefaction.
		143	Describe order of progression in putrefaction.
		144	Describe factors affecting Putrefaction.
		145	Describe Casper dictum.
		146	Describe medicolegal importance of putrefaction.
	Maceration	147	Define maceration.
		148	Describe features of maceration.
		149	Discuss differentiation point for maceration
		150	Discuss medicolegal importance of maceration.
	Adipocere formation (Saponification)	151	Define Adipocere formation.
		152	Describe features of Adipocere formation.
		153	Discuss medicolegal importance of Adipocere formation.
	Mummification	154	Define Mummification.
		155	Describe features of Mummification.
		156	Discuss medicolegal importance of Mummification.
	Introduction to autopsy	157	Define Autopsy.
		158	Describe the modified continental system and compare it with other medicolegal systems in the world.
		159	Classify types of Autopsy.
		160	Describe the role of Autopsy in Criminal offences.
		161	Describe section 174 and 176 of the Criminal Procedure Code (CrPC), 1973

	Modern autopsy suite		162	Describe the components of modern autopsy suite
			163	Describe the precautions taken while working in modern autopsy suites
			164	Explain the hazards encountered in modern autopsy suites
	Autopsy Protocol		165	Describe pre-examination in Autopsy.
			166	Describe the protocol of examination of clothes, and external examination in autopsy.
			167	Classify and describe different autopsy incisions.
			168	Describe internal examination in an autopsy.
			169	Describe the procedure to collect different autopsy samples.
			170	Describe the chain of custody.
			171	Describe the steps of writing an autopsy report
			172	Describe autopsy procedure for death due to heat and cold.
	Exhumation		173	Define exhumation.
			174	Describe authorisation of autopsy surgeon for exhumation.
			175	Describe protocol of exhumation.
			176	Describe time limit for exhumation.
			177	Describe the precautions for exhumations.
			178	Describe the procedure to collect samples.
			179	Describe the limitations of exhumations.
			180	Describe the scope of exhumation.

	Skeletonized body	181	Describe the steps of examination of a skeletonized body to assess its race, age, sex and stature
		182	Describe the protocol for autopsy of a skeletonized body
		183	Describe cause of death in such cases.
		184	Describe nature of injury and type of weapon used in such cases.
		185	Describe time since death in such cases.
	Negative autopsy	186	Define negative autopsy.
		187	Describe causes of the negative autopsy.
		188	Describe concealed trauma.
	Autopsy artifacts and hazards	189	Describe autopsy artefacts.
		190	Describe the importance of forensic artefacts.
		191	Describe effect of artefacts on the opinion of post-mortem report.
	Infanticide	192	Describe infanticide and its related law.
		193	Describe the Age of viability and its medico legal significance.
		194	Describe the concept of live birth and separate existence.
		195	Describe the Hydrostatic test and its importance.
		196	Explain Cause of death, i.e. acts of commission and acts of omission
			Describe sudden infant death syndrome (SIDS)
	Autopsy of an infected body	197	Describe the protocols for autopsy of the infected dead body.
		198	Describe the precautions required for autopsy of an infected person.
		199	Enlist the diseases transferred from during autopsy infected dead body

	Autopsy of fragmentary remains		200	Describe autopsy of a fragmentary remains and mutilated body.
			201	Discuss the protocols adopted for autopsy of fragmentary remains
			202	Describe the samples needed for autopsy of fragmentary remains.
	Embalming		203	Define Embalming.
			204	Enlist the chemical used for Embalming.
			205	Describe the procedure for Embalming.
			206	Describe the use of Embalming.
Community Medicine	Child labor and Child Abuse	1	207	Define child labor
			208	Describe different types of child labor and its effects
			209	Describe statistics of child labor
			210	Describe governments' actions against child labor
			211	Define IPEC 2011 (international program on elimination of child Labor)
			212	Define child abuse
			213	Describe different forms of child abuse
			214	Describe statistics of child abuse
			215	Describe the preventive strategies regarding child abuse
Medicine	General management of poisons	1	216	Describe approach to manage a poisoned patient in accident and emergency department

Theme-3:(Heredity and Cancers)

Pathology	Genetics		217	Define the term mutation, hereditary, congenital, genotype, phenotype, codon, Mendelian Disorder
	Mutations		218	Describe various types of mutations
			219	Describe trinucleotide-repeat Mutations

		220	Enlist few examples of trinucleotide-Repeat Disorders
		221	Describe mutations in mitochondrial genes
	Transmission pattern of single Gene disorders	222	Enumerate transmission patterns of single gene disorders
		223	Describe biochemical and molecular basis of Autosomal Dominant Disorders
		224	Enlist few examples of Autosomal Dominant Disorders
		225	Describe biochemical and molecular basis of Autosomal Recessive disorder
		226	Enlist few Examples of Autosomal Recessive Disorders
		227	Describe mechanism of transmission of X-Linked disorders
		228	Enumerate examples of X-Linked Disorders
	Biochemical and molecular basis of single gene disorders	229	Discuss enzyme defects and their consequences
		230	Describe defects in receptors and transport system
		231	Describe alterations in structure, functions or quantity of non-enzyme proteins
		232	Describe genetically determined adverse reactions to drugs
	Complex multigeneic disorders	233	Describe multigeneic disorders with Examples
	Cytogenetic Disorders involving Autosomes	234	Discuss Trisomy 21 and its molecular basis
		235	Describe diagnostic clinical features of Trisomy 21

	Molecular genetic diagnosis		236	Describe the basic principles of various molecular techniques including PCR, FISH and Southern/Western blotting
			237	Enumerate indications of these techniques.
	Introduction to Neoplasia		238	Define the terms: neoplasia, neoplasm, oncology, tumor, benign tumor, malignant tumor, anaplasia,metaplasia, differentiation and dysplasia.
	Nomenclature of Tumors		239	Describe the basic principle of nomenclature of tumors with respect to tissue of origin, benign and malignant nature
	Characteristics of Benign and Malignant Tumors		240	Describe characteristics of benign and malignant tumors
			241	Differentiate between benign and malignant tumors
			242	Describe characteristics of benign and malignant neoplasms in terms of differentiation, anaplasia, rate of growth, local invasion and Metastasis
	Epidemiology of Cancer		243	Describe the epidemiology of cancer with respect to overall incidence of cancer and various
				host factors (age and hereditary) that predisposes to cancer
			244	Discuss the epidemiology of cancer with respect to geographical and environmental factors that predispose to cancer
	Molecular Basis of Cancer		245	Describe the molecular/genetic basis of carcinogenesis
			246	Describe genetic lesions in cancer
			247	Define oncogene, proto-oncogene and Oncoproteins.
	Carcinogenesis		248	Enumerate carcinogens

		249	Describe the process of carcinogenesis
		250	Describe the hallmarks of cancer cells and process involved
		251	Describe the role of p53
	Types of Carcinogens	252	Discuss properties of chemical Carcinogens
		253	Describe direct and indirect chemical carcinogens and their mechanism of action
		254	Describe the mechanism of radiation carcinogenesis
		255	Enumerate viral and bacterial Carcinogens
		256	Describe mechanism of carcinogenesis by viral and microbial oncogenes
	Clinical Aspects of neoplasia	257	Define cachexia
		258	Describe the clinical features of neoplasia including effects of tumor on host cancer cachexia
		259	Describe the clinical significance of paraneoplastic syndromes
		260	Describe clinical syndromes with respect to its causal mechanism and major forms of underlying Cancer
	Diagnosis of Cancer	261	Describe morphologic, biochemical and molecular methods employed for diagnosis of cancer
	Pathways for tumor spread	262	Describe the pathways for spread of tumors like local invasion and metastasis
	Grading and Staging of tumors	263	Describe grading and staging of Tumors
	Tumor immunity	264	Discuss host defenses against Tumors

			265	Describe tumor antigens and anti-tumor effect mechanisms
			266	Describe tumor surveillance and Immune evasion by the tumors
Pharmacology	Anticancer drugs		267	Describe terms like cell cycle-specific drugs and cell cycle-nonspecific drugs.
			268	Describe the role of P-glycoprotein in relation to the development of resistance to cytotoxic drugs.
			269	Classify anticancer drugs.
			270	Describe general adverse effects of anticancer drugs.
			271	Describe the mechanism of action of alkylating agents.
			272	Describe the clinical uses and adverse effects of Busulfan and Cyclophosphamide.
			273	Describe the mechanism of action, clinical uses and adverse effects of Cisplatin.
			274	Describe in general the mechanism of action of antimetabolites.
			275	Describe the mechanism of action, clinical uses, adverse effects and contraindications of Methotrexate, Azathioprine, 6-Mercaptopurine and 5-Fluorouracil.
			276	Describe the drug interaction of Azathioprine and 6-Mercaptopurine with Allopurinol.
			277	Describe the natural source of plant alkaloids Vinblastine and Vincristine.
			278	Describe the mechanism of action, clinical uses and adverse effects of Vinblastine and Vincristine.

			279	Describe the mechanism of action, clinical uses and adverse effects of Doxorubicin, Daunorubicin, Dactinomycin and Bleomycin.
			280	Enlist the anticancer mechanism of action and uses of hormonal agents like Tamoxifen, Flutamide, Goserelin and Aminoglutethimide.
			281	Enlist the drugs of choice for ALL, AML, CLL, CML, Hodgkin's disease, Non-Hodgkin's lymphoma, Ca breast, Ca lung, Ca prostate and Ca stomach.
			282	Describe cancer treatment modalities (primary induction, adjuvant, neo-adjuvant and maintenance chemotherapy)
			283	Describe the antidotes of Methotrexate, Cyclophosphamide and Doxorubicin toxicity.
	Eicosanoids-Prostaglandins		284	Classify eicosanoids.
			285	Describe the mechanism of action of Prostaglandins.
			286	Describe the organ system effects of Prostaglandins.
			287	Describe the clinical uses of Prostaglandins.
			288	Describe the prostaglandins used in the management of glaucoma.
			289	Describe the pharmacologic effects of Thromboxane's.
	Dermatologic preparations		290	Describe dermatologic formulations like creams, ointments, gels, lotions, pastes, powders, tinctures and wet dressings.
			291	Describe the choice of dermatologic formulation with reference to the nature of the lesion.
	Drug treatment of scabies		292	Enlist the drugs used for the treatment of Scabies

			292	Describe the method of application of Permethrin, Crotamiton and Benzyl benzoate for treating scabies.
	Drug treatment of Acne vulgaris		293	Enlist the drugs used for treating Acne (including antibiotics and hormonal agents).
			294	Describe the mechanism of action and adverse effects of Benzoyl peroxide, Tretinoin and Isotretinoin.
			295	Describe the teratogenicity of Isotretinoin.
	Drug treatment of Psoriasis		296	Enlist the drugs used for treating Psoriasis.
			297	Describe the teratogenicity of Acitretin.
	Herbal medications		298	Describe the terms like herbal medications, botanicals and nutritional supplements with special referenceto drug regulatory factors.
			299	Describe the pharmacologic effects and intended uses of Garlic (Allium sativum).
			300	Describe the drug interactions of Garlic with Warfarin and Aspirin.
			301	Describe the possible medicinal use of Kalonji (Nigella sativa).
			302	Describe the pharmacologic effects and intended uses of Ginseng.
			303	Describe the drug interactions of Ginseng with antipsychotic and hypoglycemic medications.
			304	Describe the intended clinical uses of Coenzyme Q10.
			305	Describe the drug interactions of Coenzyme Q10 with Warfarin.
Community Medicine	Cancers	1	306	Enlist the common cancers prevalent in Pakistan

		307	Describe the burden and epidemiology of common cancers prevalent globally and in Pakistan
		308	Describe the prevention and control of cancers
		309	Describe various governmental programs and strategies for the prevention of cancers
Family medicine	Cancer screening	310	Identify red-flags in patient which need referral for cancer screening
		311	Explain the psychosocial impact of disease on patient and their families
		312	Describe the indications, rationale and common diseases which require routine cancer screening
Practical work			
Pathology	Lipoma	313	Identify the morphological changes occurring in lipoma
	Squamous cell carcinoma	314	Identify morphological changes of squamous cell carcinoma
	Fibro adenoma	315	Enlist points of identification of gross and microscopic features of fibro adenoma of breast
	Karyotyping	316	Demonstrate preparation of Karyogram
		317	Identify gender on the basis of Karyogram
		318	Identify common numerical chromosomal abnormalities on Karyogram
Pharmacology	Introduction to experimental Pharmacology (experiments on isolated piece of rabbit's Ileum)	319	Differentiate between Qualitative and Quantitative experiments.
		320	Recognize various parts of Tissue Organ Bath and describe their functions.

		321	Describe the ingredients and their quantities required for preparing the Tyrode's Solution.
		322	Describe the technique of slaughtering of rabbit and removal of a piece of ileum.
		323	Describe the fixation of piece of ileum in the inner organ bath.
		324	Enumerate the causes of tissue death.
	Ceiling effect for Parasympathomimetic drug (Acetylcholine)	325	Demonstrate ceiling effect for Acetylcholine on the isolated piece of rabbit's ileum by adding proper
			doses of the drug into the inner organ bath.
		326	Interpret the recording of acetylcholine-induced ileal activity on the revolving drum.
		327	Demonstrate washing of the inner organ bath for the subsequent doses of Acetylcholine.
		328	Construct tables and graphs for inference of the results.
	Antagonism between acetylcholine and atropine	329	Demonstrate surmountable antagonism between acetylcholine and atropine on piece of rabbit's ileum by adding proper doses of the drugs into the inner organ bath.
		330	Interpret the recording of acetylcholine- and Atropine-induced ileal activity on the revolving drum.
		331	Construct tables and graphs for inference of the results.
	Ceiling effect for Histamine	332	Demonstrate ceiling effect for Histamine on the isolated piece of rabbit's ileum by adding proper doses of the drug into the inner organ bath.
		331	Interpret the recording of Histamine - induced ileal activity on the revolving drum.

			332	Demonstrate washing of the inner organ bath for the subsequent doses of Histamine.
			333	Construct tables and graphs for inference of the results.
	Antagonism between Histamine and antihistamine		334	Demonstrate surmountable antagonism between Histamine and antihistamine on piece of rabbit's ileum by adding proper doses of the drugs into the inner organ bath.
			335	Interpret the recording of Histamine- and antihistamine-induced ileal activity on the revolving drum.
			336	Construct tables and graphs for inference of the results.
	To identify an unknown drug on rabbit's ileum with the help of two known antagonists		337	Demonstrate ceiling effect for the known agonist drug (Acetylcholine or Histamine) on the isolated piece of rabbit's ileum by adding proper doses of the drug into the inner organ bath.
			338	Demonstrate surmountable antagonism between the agonist drug and the unknown antagonists (Atropine and antihistamine) on piece of rabbit's ileum by adding proper doses of the drugs into the inner organ bath.
			339	Interpret the recording of drug-induced ileal activity on the revolving drum.
			340	Construct tables and graphs for inference of the results.
	Introduction to experimental Pharmacology (effects of drugs on rabbit's Eye)		341	Demonstrate measuring the pupil size.
			342	Demonstrate corneal reflex.
			343	Demonstrate light reflex.
	Effects of Parasympathomimetic drug (e.g.,		344	Demonstrate the effect of Pilocarpine on the size of the pupil in the test eye in comparison with the control eye.

	Pilocarpine) on rabbit's eye			
			345	Demonstrate the effect of Pilocarpine on the colour of the conjunctiva in the test eye in comparison with the control eye.
			346	Demonstrate the effect of Pilocarpine on the corneal reflex in the test eye in comparison with the control eye.
			347	Demonstrate the effect of Pilocarpine on the light reflex in the test eye in comparison with the control eye.
	Effects of Sympathomimetic drug (e.g., Ephedrine) on rabbit's eye		348	Demonstrate the effect of Ephedrine on the size of the pupil in the test eye in comparison with the control eye.
			349	Demonstrate the effect of Ephedrine on the colour of the conjunctiva in the test eye in comparison with the control eye.
			350	Demonstrate the effect of Ephedrine on the corneal reflex in the test eye in comparison with the control eye.
			351	Demonstrate the effect of Ephedrine on the light reflex in the test eye in comparison with the control eye.
	Effects of Parasympatholytic drug (e.g., Tropicamide) on rabbit's eye		352	Demonstrate the effect of Tropicamide on the size of the pupil in the test eye in comparison with the control eye.
			353	Demonstrate the effect of Tropicamide on the colour of the conjunctiva in the test eye in comparison with the control eye.
			354	Demonstrate the effect of Tropicamide on the corneal reflex in the test eye in comparison with the control eye.
			355	Demonstrate the effect of Tropicamide on the light reflex in the test eye in comparison with the control eye.

	Effects of Local anaesthetic (e.g., Proparacaine) on rabbit's eye		356	Describe the mechanism of action of Proparacaine regarding its effects on the eye.
			357	Demonstrate the effect of Proparacaine on the size of the pupil in the test eye in comparison with the control eye.
			358	Demonstrate the effect of Proparacaine on the colour of the conjunctiva in the test eye in comparison with the control eye.
			359	Demonstrate the effect of Proparacaine on the corneal reflex in the test eye in comparison with the control eye.
			360	Demonstrate the effect of Proparacaine on the light reflex in the test eye in comparison with the control eye.
	To identify an unknown drug on rabbit's eye		361	Demonstrate the effect of the unknown drug on the size of the pupil in the test eye in comparison with the control eye.
			361	Demonstrate the effect of the unknown drug on the colour of the conjunctiva in the test eye in comparison with the control eye.
			362	Demonstrate the effect of the unknown drug on the corneal reflex in the test eye in comparison with the control eye.
			363	Demonstrate the effect of the unknown drug on the light reflex in the test eye in comparison with the control eye.
			364	Interpret the results.
			365	Identify the unknown drug.
Forensic medicine	Autopsy report		366	Construct a full autopsy report including all components after thorough examination.
	Toxicology Sample collection		367	Explain the procedures, organ needed, and preservation used in sample collection.
	Toxicology Report Analysis		368	interpret the toxicology report received and then incorporate it in final opinion.

	Thanatology		369	Identify and describe various models of post-mortem changes
	Stomach wash		370	Perform stomach wash on a manikin

MOHI-UD-DIN ISLAMIC MEDICAL COLLEGE MIRPUR

DEPARTMENT OF MEDICAL EDUCATION



BLOOD AND IMMUNOLOGY-II

3RD YEAR MBBS (BATCH-16)

BLOCK: H

DURATION: 3 WEEKS

MODULE CODE: MB3-H-BLD-II-15



2. Learning Objectives

General Learning Outcomes

By the end of this module the students would be able to;

1. Describe the pathophysiology and diagnosis of different types of anemia.
2. Explain the pathogenesis of different hematological malignancies.
3. Discuss the diagnostic approach to malignant hematological disorders.
4. Discuss the pathophysiology and diagnosis of bleeding disorders.
5. Explain the immune system of the body and its components.
6. Describe the mechanism of defense from infection.
7. Explain hypersensitivity and allergy.
8. Discuss the rationale for immunomodulation and its impact on improving the therapeutic dynamics of autoimmune disorders and malignancies.
9. Describe the drugs for treating various types of anemia.
10. Write prescription for the prevention and treatment of iron-deficiency anemia.
11. Describe the application of blood groups in Forensic work
12. Describe the examination of blood stains
13. Describe the medico legal importance of blood as trace evidence
14. Describe the EPI schedule of Pakistan and the basic principles of Immunization.
15. Describe the most prevalent anemia's that affect the population of Pakistan and the risk factors for vulnerable populations.
16. Describe the most prevalent blood-borne infections that affect the population of Pakistan, and the appropriate preventive strategies including safe blood practice.

3. Specific learning objectives

Learning objectives Theme 1: Pallor and Fatigue			
Subject	Topic	Sr. No	Learning objectives
PHYSIOLOGY	Red blood cells	1	Discuss the steps of Erythropoiesis with correlation to Red cell indices and its clinical implications.
PATHOLOGY	Anemias	2	Discuss Physiologic basis of Anemia.
		3	Classify anemia's according to underlying mechanism
	Blood loss	4	Describe the pathogenesis of blood loss anemia
	Hereditary Spherocytosis	5	Discuss the pathogenesis of Hereditary Spherocytosis
		6	Describe morphological changes in peripheral smear of HS patient
		7	Explain how will you diagnose a case of HS?
	Sickle cell Anemia	8	Discuss the morphology of RBCs in Sickle cell Anemia
		9	Describe the etiology and pathogenesis in SA
		10	Explain how will you diagnose a case of SA?
	Thalassemias	11	Describe Thalassemias
		12	Discuss the conditions contributing to the pathogenesis of Beta- Thalassemias
		13	Explain the genetics of Thalassemias
		14	Describe the morphological changes physically and on peripheral smear
		15	Explain how will you diagnose a case of alpha or beta Thalassemias
	Glucose 6 phosphate dehydrogenase deficiency	16	Classify G6PD
		17	Discuss the pathogenesis of G6PD with reference to oxidative injury of RBCs
		18	Describe the morphology of RBCs in G6PD
		19	Explain how will you diagnose a case of G6PD deficiency
	Paroxysmal Nocturnal Hemoglobinuria	20	Describe the pathophysiology of Paroxysmal Nocturnal Hemoglobinuria
		21	Explain the diagnosis of a case of PNH?

	Immune hemolytic anemia's	22	Classify immune hemolytic anemia's
		23	Discuss the etiological mechanism of warm and cold antibody immune hemolytic anemia
		24	Explain the diagnostic workup of immune hemolytic anemia
	Iron deficiency anemia		Discuss the pathophysiological mechanism of iron deficiency anemia
			Describe the clinical course and morphological changes in IDA
			Explain laboratory investigations for the diagnosis of IDA
	Megaloblastic Anemia		Describe Megaloblastic Anemia
			Describe the pathogenesis of MA with respect to Vitamin B12 and Folic acid
			Discuss the morphological changes in RBCs, WBCs and platelets in MA.
			Explain how will you diagnose the cause of MA?
	Aplastic Anemia		Enumerate causes of Aplastic anemia
			Describe the pathophysiology of aplastic anemia
			Diagnose a case of aplastic anemia
	polycythemia vera		Discuss the pathophysiology of polycythemia vera
			Describe the clinical course and morphological features of Polycythemia vera
			Explain how will you diagnose a case of Polycythemia vera?
PHARMACOLOGY	Drugs used in anemia		Classify the drugs used in anemia
			Describe the pharmacokinetics of iron
			Describe the various oral and parenteral formulations of iron
			Describe the adverse effects of iron therapy
			Describe the drug treatment of Iron toxicity
			Describe the various oral and parenteral preparations of cyanocobalamin (Vit B12)
			Describe the clinical use of cyanocobalamin (Vit: B12)
			Describe the clinical use of Folic acid
			Describe the pharmacological rationale of combining cyanocobalamin with folic acid and iron
			Describe the role of granulocyte colony

			stimulating factors (Filgrastim) and granulocyte monocyte colony stimulating factors in the treatment of leucopenia.
			Describe the role of thrombocyte colony stimulating factor (Oprelvekin) in the treatment of thrombocytopenia.
FORENSIC MEDICINE	Forensic evidence	49	Describe trace evidence
		50	Classify trace evidence.
		51	Describe Locard's exchange principle.
		52	Describe composition of blood and characteristics of different blood cells.
		53	Describe basic genetic principles related to blood groups and blood groups as hereditary factors.
	Blood group systems	54	Describe different blood groups systems. ▪ Grouping based on red cell antigens ▪ Grouping based on blood proteins ▪ Grouping based on enzymes ▪ Grouping based on white cell antigens. ▪ Describe different methods for blood group determination. ▪ Direct agglutination ▪ Ring test ▪ Gel diffusion ▪ Immune-electrophoresis ▪ Indirect agglutination
		55	Describe the application of blood in forensic work. (medico legal importance) ▪ Inheritance claims ▪ Rh hazards ▪ Transfusion errors and adverse reactions ▪ DNA profiling ▪ Disputed paternity and maternity
COMMUNITY MEDICINE	Epidemiology Of Diseases Of Blood & Blood Forming Organs	56	Differentiate between diseases of blood, blood forming organs and blood borne infections
	Epidemiology of nutritional anemias		Classify nutritional anemias
		57	Describe the population at risk of nutritional

			anemia in Pakistan.
		58	Explain effective public health strategies for prevention of different types of anemia's in a community in Pakistan
		59	Describe risk factors for different nutritional anemia's
		60	Describe effective public health strategies for prevention of different types of anemia's in Pakistan
PEADS	Thalassemias	61	Describe Classification, Laboratory Investigation and management of Thalassemia
MEDICINE	Sickle Cell Anemia	62	Discuss the pathophysiology, investigations and management of Sickle Cell Anemia.

Learning objectives Theme 2: Fever

Subject	Topic	Sr. No	Learning objectives
PHYSIOLOGY	White Blood Cells	63	Classify the different types of white blood cells, Polymorph's, Lymphocytes and Plasma cells and their disorders.
PATHOLOGY	Acute Myelogenous Leukemia	64	Classify acute myelogenous leukemias according to FAB.
		65	Discuss the pathophysiology of AML.
		66	Describe the morphological features of AML.
		67	Explain how will you proceed for diagnosis of AML?
	Chronic Myelogenous Leukemia	68	Discuss the pathophysiology of CML.
		69	Describe the peripheral blood findings in CML
		70	Explain how will you proceed for diagnosis of CML?
	Myelodysplastic Syndrome (Mds)	71	Enlist types of MDS.
		72	Discuss causes, pathogenesis and Morphology.
		73	Interpret blood and bone marrow changes in patient with MDS.
		74	Discuss symptoms and diagnostic strategies for patient with MDS.
	Lymphoid Neoplasms	75	Enumerate Lymphoid neoplasm
		76	Classify lymphoid neoplasms according to WHO classification.
	Acute Lymphocytic Leukemia	77	Discuss the pathophysiology of Acute lymphocytic leukemia
		78	Discuss the morphological features of ALL
		79	Explain how will you diagnose a case of

			ALL?
	Chronic Lymphocytic Leukemia	80	Discuss the pathophysiology of Chronic lymphocytic leukemia
		81	Describe the distinguishing morphological features of CLL
		82	Explain the diagnostic workup for a case of CLL
	Plasma cell disorder	83	Describe the pathogenesis of multiple myeloma
		84	Describe the molecular genetics involved in multiple myeloma
	Hodgkin's lymphoma	85	Discuss the type of multiple myeloma
		86	Enlist the clinical features
		87	Classify Hodgkin's lymphoma
		88	Discuss the etiology and pathogenesis of Hodgkin's lymphoma
		89	Describe the morphological changes and clinical course of the disease in Hodgkin's Lymphoma
	Non-hodgkin's lymphoma	90	Enlist Non-Hodgkin's lymphoma
		91	Describe the basic pathologic classification of NHL (the WHO classification).
		92	Describe the predisposing factors to developing NHL, including infectious agents associated with development of specific lymphomas.
		93	Describe the morphologic features of lymph nodes involved in Non-Hodgkin lymphoma
		94	Enlist the lab investigations required for diagnosis of NHL
	Immunity	95	Describe the functions and types of immunity.
		96	Enlist the three lines of defenses and outline their properties
		97	Describe the characteristics, origin and functions of cells of immune system
		98	Compare innate and acquired immunity
		99	Compare the mechanism of active and passive immunity
	Humeral immunity	100	Describe the role of T and B lymphocytes in immunity
		101	Describe the role of B lymphocytes in humeral immunity
		102	Describe humeral immunity
		103	Explain how helper T cells regulate the immune system
		104	Differentiate between humeral and cell mediated immunity

	Cell mediated immunity	105	Explain the Specificity of immune response
		106	Describe cell mediated components of Cell mediated immunity (CMI),
		107	Explain types of cells in CMI system
		108	Describe T-cell activation and diversity
			Illustrate Schematic representation of T cell activation and diversity
			Differentiate between Primary and secondary immune response
	Antibodies		Describe antigen and antibodies.
			Differentiate B/W Monoclonal and polyclonal antibodies.
			Classify immunoglobulin
			Illustrate structure (diagram) of immunoglobulin A.
			Describe important functions of immunoglobulin
			Explain How antibodies neutralize toxins, microbes and viruses
			Illustrate class switching of immunoglobulin
			Explain transfer of immunity from mother to fetus and from mother to infant during breast-feeding
	Allergy & hypersensitivity		Describe the pathophysiology of allergy and hypersensitivity with examples
			Compare immediate and delayed hypersensitivity reactions
			Enlist the diseases associated with hypersensitivity reactions
	Immunotolerance		Describe Immunotolerance.
			Describe Immunological unresponsiveness of the body especially to self-antigens.
			Explain the role of immune system in protecting the human body.
			Distinguishing between types of immunotolerance
			Explain the mechanism of graft rejection and graft vs host disease.
	Autoimmune diseases		Describe Autoimmunity.
			Discuss Pathogenesis of Autoimmune diseases.
			Explain the factors leading to Autoimmune Diseases.
	Immunodeficiency diseases		Describe immunodeficiency
			Differentiate between Autoimmune and immunod

			efficiency diseases.
			Classify Congenital and acquired Immunodeficiency diseases.
			Describe the pathogenesis of HIV.
	COMPLEMENT		Describe complement.
			Describe components of the Complement System
			Describe the synthesis of complements
			Describe pathways of activation and inactivation of complement
			Describe important functions of each component of complement system
			Describe the diseases associated with deficiency of the complement proteins
PHARMACOLOGY	Immune modulator drugs		Classify immunomodulating drugs
			Describe the role of corticosteroids as immunosuppressant agents.
			Describe mechanism of action of immunophilin ligands.
			Describe clinical uses and adverse effects of immunophilin ligands.
			Describe mechanism of action of enzyme inhibitors.
			Describe clinical uses and adverse effects of enzyme inhibitors.
			Describe mechanism of action of cytotoxic agents as immunosuppressant
			Describe clinical uses and adverse effects of cytotoxic agents
			Describe mechanism of action of immunosuppressive antibodies used as immunosuppressant
			Describe clinical uses and adverse effects of immunosuppressive antibodies
			Describe mechanism of action of monoclonal antibodies
			Describe clinical uses and adverse effects of monoclonal antibodies
			Describe mechanism of action of immunostimulant drugs
			Describe clinical uses and adverse effects of immunostimulant drugs
			Describe the advantages and disadvantages of various combinations of Immuno-modulating drugs
			Describe Forensic Lab Systems
Prime/research	Academic writing and plagiarism		Emphasize the role of academic writing in research

		Explain the role of “Grammarly” for use in academic writing
		Define plagiarism
		Enlist plagiarism detection software
Community medicine	Immunization	Define immunity
		Explain the types of immunity
		Discuss immunizing agents
		Explain the hazards of immunization
	Vaccination	Explain the cold chain in the context of immunization
		Explain the importance of vaccination in the control of infectious diseases
		Describe the basic principles of vaccination
		List the main types of vaccine and illustrate them with examples
		Describe vaccines that are associated with adverse reactions
		Explain the difference between live attenuated and inactivated vaccines
		Describe the role of vaccines in preventing disease.
		Differentiate between vaccination and immunization
		Describe the strategies used from community medicine's perspective to promote vaccination in communities. (EPI)
		Explain various programs of vaccination in Pakistan with particular reference to EPI.
		Describe the factors responsible for success and failure of vaccination programs in Pakistan.
	Epidemiology of blood borne diseases/infections	List the important blood borne diseases in Pakistan as prioritized by the National Institute of health (NIH)
		Discuss the global burden of blood borne diseases & compare with Pakistan
		Describe important blood borne pathogens
		Explain the evidence based public health practice to reduce transmission of blood borne infectious disease
MEDICINE	Myeloproliferative Disorders (MPN)	Explain the evidence based best practices and procedures for safe blood transfusion and prevention of needle stick injury
		Classify myeloproliferative neoplasms.

Discuss the investigations & management steps of CML.

Learning objectives Theme 3: Bleeding

Subject	Topic	Sr.	Learning objectives
PHYSIOLOGY	Platelets	155	Enumerate the causes of thrombocytopenia.
		156	Explain the intrinsic and extrinsic pathways of Coagulation
PATHOLOGY	Thrombocytopenia & Von Willebrand disease	157	Enlist causes of Thrombocytopenia
		158	Describe the pathogenesis of immune thrombocytopenic purpura
		159	List thrombotic micro angiopathies.
		160	Explain the diagnostic plan for ITP
		161	Classify VWD
		162	Enlist investigations required for diagnosis of VWD
	Hemophilia	163	Discuss the pathogenesis of hemophilia A and B
		164	Describe the clinical course of the disease.
		165	Enlist the laboratory investigation for diagnosing a case of hemophilia
	Disseminated Intravascular coagulopathies	166	Enlist major disorders associated with DIS
		167	Discuss the pathophysiology of DIC
		168	Explain the morphological changes in DIC
		169	Explain how will you diagnose DIC?
	Transfusion medicine	170	Describe various blood component preparation
		171	Identify indications for different blood components
		172	Describe transfusion reactions associated with blood transfusion
PHARMACOLOGY	Antiplasmin (Antifibrinolytic) drugs	173	Describe mechanism of action of Antiplasmin (antifibrinolytic) drugs
		174	Describe clinical uses and adverse effects of Anti-plasmin (antifibrinolytic) drugs
	Drug treatment of Haemophilia	175	Describe the drug treatment for various types of Haemophilia
		176	Describe the role of Desmopressin in the treatment of haemophilia
FORENSIC MEDICINE	Blood stains	177	Describe examination of blood stains. · Physical examination

			- Chemical examination - Physicochemical examination - Micro chemical examination - Spectroscopic examination Immunological and enzymological methods for species determination
		178	Describe the medico-legal importance of blood stains.
	Collection and Preservation of Biological Material	179	Describe the collection and preservation of biological material - Blood - Swabs and smears - Saliva - Semen
MEDICINE	Platelets (ITP)	180	Describe Clinical features, investigations and management of a patient with Immune Thrombocytopenia (ITP)
PRIME/Medical education	Principles of medical ethics		Explain the pillars of medical ethics
			Explain the privacy and confidentiality of the patients and its medico-legal and cultural aspects
	Confidentiality		Exhibit Confidentiality of colleagues and patients
			Appropriately use of social media

Practical Work

Subject	Topic	Sr. No	Learning objectives
PATHOLOGY	Normal Complete blood count	181	Differentiate between a normal blood cells of different lineages
	Abnormal Peripheral Smear in Different Anemias	182	Differentiate between a normal and an abnormal RBC
		183	Identify different shapes of RBCs.
		184	Identify the common types of Anemia on the basis of RBC morphology
PHARMACOLOGY	Iron deficiency anemia	185	Write prescription for a patient at risk of developing iron-deficiency anemia
		186	Write Chart order for treating an in-door patient with iron-deficiency anemia
FIELD VISIT	Visit to blood	187	Explain safe blood transfusion practices
	Bank of a tertiary	188	List the common pathogens that cause blood borne infections which may be

			acquired from unsafe blood transfusion practices.
	Care hospital	189	List the most common transfusion reactions seen in a blood bank in a local teaching hospital in Pakistan
		190	Communicate with health care staff effectively
		191	Describe the standard operating procedures (SOP's) of blood transfusion

Theme 2

PATHOLOGY	Normal White cell smear	192	Describe causes of leukocytosis
		193	Differentiate different types of white blood cells under microscope
FORENSIC MEDICINE	Microscopic examination of animal and human blood	194	Perform Microscopic examination of animal and human blood.
	Examination of blood stains under ultraviolet light	195	Perform examination of blood stains under ultraviolet light.
	Different pattern of stains	196	Identify different pattern of stains.
FIELD VISIT	Visit to basic health care unit/ EPI center	197	Observe administration of different vaccines as part of Expanded Program of immunization
			(EPI) schedule of Pakistan at the vaccination center.
		198	List and explain the route of administration and mechanism of storage and maintenance of cold chain of each vaccine in the EPI schedule (support with images where possible)
		199	List the different components of each vaccine in the EPI schedule including the adjuvants, preservatives and explain their relevance to the vaccine.
		200	Differentiate between live attenuated vaccines, conjugate vaccines, subunit vaccines, and toxoid vaccines in the EPI schedule and their mode of action
		201	Identify the contraindications for vaccination that may present an additional risk
		202	Describe the organ gram of EPI center
		203	Explain the role of EPI center.
		204	Observe the process of vaccination on a case.

Theme 3

PATHOLOGY	Coagulation tests	205	Interpret Prothrombin time and activated partial thromboplastin time
		206	Interpret bleeding time and clotting time

MIT: Mode of information transfer. E.g. lecture, SGD, DSL, Practical, skill lab etc etc.

MOHI-UD-DIN ISLAMIC MEDICAL COLLEGE MIRPUR

DEPARTMENT OF MEDICAL EDUCATION



MUSCULOSKELETAL II

3RD YEAR MBBS (BATCH-16)

BLOCK: H

DURATION: 4 WEEKS

MODULE CODE: MB3-H-MSK-II-16



2. Learning Objectives

General Learning Outcomes

By the end of this module the students would be able to;

Knowledge

Reinforcement

Explain important anatomical and physiological characteristics of the musculoskeletal system.

Pathology

Explain essential pathological concepts of diseases involving.

- Joints
- Bones
- Muscles
- Cartilages
- Soft tissues
- Skin

Pharmacology

1. Describe the clinical applications of NSAIDs in the treatment of musculoskeletal disorders
2. Describe the basic and clinical pharmacology of drugs affecting bone and Mineral Homeostasis
3. Describe the basic and clinical pharmacology of drugs used to treat Gout and Rheumatoid Arthritis
4. Describe the basic and clinical pharmacology of skeletal muscles relaxants
5. Describe the drugs used for dermatological disorders.

Community medicine

1. Classify accidents and injuries, burden of RTAs, prevention and control strategies of RTAs
2. Define poliomyelitis and discuss the epidemiology, prevention, and control of poliomyelitis
3. Define Ergonomics, Principles of Ergonomics, Epidemiology of MSK disorders and their prevention
4. Discuss burden and prevention of Osteoporosis, Osteomalacia and Rickets

Forensic medicine

1. Define and classify wounds.
2. Describe types of hurt according to Qisas and Diyat Act
3. Describe firearm and explosives injuries
4. Describe RTAs, Railway and Aircraft injuries
5. Describe the Medico legal aspects of wounds

Medicine

1. Describe Osteoporosis and Osteomalacia and develop its management plan
2. Discuss Rheumatoid Arthritis and Ankylosing Spondylitis
3. Discuss Myopathies

Orthopedic

1. Describe types of fracture and explain the open fractures

2. Explain the emergency treatment of an injured limb.
3. Identify and describe common benign and malignant bone tumours.
4. Describe common ligamentous, tendon injuries and common spinal fractures

Dermatology

- Describe the pathological lesions of skin and their clinical presentation with differential diagnosis.

Radiology

- Interpret normal X-Rays and X-Rays showing structural deformities

Paeds

- Explain bone pains and aches in children
- Discuss Congenital/Hereditary Myopathies

Eye

- Describe the basic Anatomy of Eye

ENT

- Discuss anatomy of Ear, Nose, Para nasal Sinuses and Oral Cavity

PRIME:

- Communication Skills
- Dealing with patients
- Behavioral Sciences / Professionalism
- Attributes of Professionalism
- Research
- Study Designs
- Research question

Skills:**Special Pathology**

- Identify morphological features of Basal cell carcinoma and Squamous cell carcinoma
- Identify morphological features of Tuberculous osteomyelitis

Pharmacology

- Writing a prescription for a patient with Rheumatoid arthritis
- Writing a prescription for a patient with Gout

Forensic Medicine

- Identify types of mechanical wound
- Identify the causative weapon
- Identify the manner of wound causation
- Issue a medico legal certificate for the given wound

Orthopedic/Medicine

1. Acquire a thorough history in relevance to MSK and take focused general examination of musculoskeletal system.
2. Identify, evaluate and interpret the X-ray to diagnose fractures/musculoskeletal conditions
3. Discuss the radiological characteristics of fractures and radiological characteristics of dislocations.
4. Attitude:

5. While not necessarily taught explicitly, students are expected to develop following attitudes throughout the course:
6. Demonstrate teamwork, leadership, punctuality and good manners
7. Demonstrate humbleness and use socially acceptable language during academic and social interactions with colleagues and teachers.
8. Make ethically competent decisions when confronted with an ethical, social or moral problem related to MSK in professional or personal life
9. Discuss ethical issues, social and preventive aspect of health care in the context of MSK system.

3. Specific learning objectives

Theme I: Aching Bones			
Subject	Topic	Learning Outcome	Hrs
Anatomy	Important Anatomical Characteristics of MSK	Discuss important anatomical characteristics of musculoskeletal system	1
Physiology	Important Physiological Characteristics of MSK	Discuss important Physiological characteristics of musculoskeletal system	1
Pathology	Metabolic diseases of bone	Describe the following metabolic diseases of bone from pathological point of view: • Osteopenia and Osteoporosis • Paget Disease (Osteitis Deformans) • Osteomalacia and Rickets	1
	Fracture and Osteonecrosis	Classify fractures and describe healing process in fractures	1
		Enlist aetiologies of osteonecrosis (Avascular Necrosis)	
		Describe clinical features and morphological findings in osteonecrosis	
	Osteomyelitis	Classify osteomyelitis and delineate its etiology, pathogenesis, common clinical features, morphological findings, and complications related to osteomyelitis	1
	Bone Tumors	Classify bone tumors	1
		Describe the frequency of different bone tumors in general population	
		Enlist common clinical features found in common types of bone tumors.	
		Enlist key morphological features of Osteosarcoma, Osteoid osteoma and Osteoblastoma	
	Cartilage-Forming Tumors	Discuss the frequency of different cartilaginous tumors in general population	1
		Enlist common clinical features of common cartilaginous tumors	
	Tumors of Unknown Origin	Describe etiology, pathogenesis, and key clinico-morphological features of Ewing's Sarcoma and Giant Cell Tumor	1

	Lesions Simulating Primary Neoplasms	Describe key clinico-morphological features and essential points in the pathogenesis of Fibroma	1
Pharmacology	NSAIDs	Describe the clinical applications of NSAIDs in the treatment of musculoskeletal disorders	1
	Drug affecting Bone & Mineral Homeostasis	Classify drugs used in metabolic bone disorders	2
		Enlist calcium preparations	
		Describe clinical uses of calcium salts	
		Enlist vitamin D preparations	
		Describe action of vitamin D on intestine, Kidney and Bone	
		Describe clinical uses of vitamin D	
		Describe the mechanism of action, clinical uses and adverse effects of Bisphosphonates	
		Describe the mechanism of action, clinical uses and adverse effects of calcitonin	
		Classify drugs used to treat osteoporosis	
		Explain the mechanism of action of SERM (Raloxifene) and RANK ligand (Denosumab)	
Forensic Medicine	Mechanism of production of wound	Define and classify wound	1
		Describe mechanism of action of wound production associated factors, appearance and complications.	
	Abrasion	Define and classify abrasion	
		Explain types of abrasion and mechanism of wound production associated factors, appearance, and complication.	
		Differentiate between antemortem & postmortem abrasion.	
		Describe the medico-legal aspects of abrasion	
	Bruise	Define and classify bruise	1
		Describe types of bruise and mechanism of wound production associated factors, appearance, and complication.	
		Differentiate between antemortem & postmortem Bruise.	
		Describe the medico-legal aspects of Bruise	
	Lacerated wound	Define and Classify lacerated wound	1

		Describe types of lacerated wound and Mechanism of wound production associated factors, appearance and complication.	
		Difference between antemortem & postmortem Laceration.	
		Describe the medicolegal aspects of Lacerated wound	
	Incised Wound	Define and classify incised wound	1
		Describe types of incised wound and mechanism of wound production associated factors, appearance, and complication.	
		Difference between antemortem & postmortem Incised Wound	
		Differentiate between incised & lacerated wound.	
		Describe the medicolegal aspects of Incised wound	
	Stab wounds	Define and classify Stab wound	
		Describe types of Stab wound and mechanism of wound production associated factors, appearance, and complication.	
		Difference between antemortem & postmortem stab wound	
		Describe the medicolegal aspects of stab wound	
	Battered baby syndrome	Explain the salient features of diagnosing Battered baby syndrome	1
Community Medicine	Ergonomics	Describe Ergonomics	1
		Describe the principles & importance of Ergonomics at work place	
		Explain the epidemiology of musculoskeletal disorders	
		Discuss prevention and control strategies for Musculoskeletal disorders	
	Public health aspects of disability limitations: (Osteoporosis, Osteomalacia and Rickets)	- Explain the types of rehabilitation and public health issues faced by the disabled person, and measures to be taken for rehabilitation - Discuss epidemiology and prevention of Osteoporosis, Osteomalacia and Rickets	1
Medicine	Osteoporosis and	Describe Osteoporosis and Osteomalacia	1

	Osteomalacia	List common causes and risk factors of Osteoporosis and Osteomalacia Discuss clinical features , differential diagnosis of Osteoporosis and Osteomalacia Enlist the Investigations for patient presenting with Osteoporosis and Osteomalacia	
Orthopedics	Fractures	Describe and illustrate types of fracture, fracture patterns, displacement and angulation of fractures in children and adults.	1
		Explain open fractures Discuss the basic principle of wound debridement.	
	Bone Tumours	To recognize, investigate and describe the radiological features of common benign and malignant Bone Tumours.	1
Radiology	X-Ray Interpretation	Identify and interpret different types of fractures	1
Eye	Anatomy of Eye	Describe anatomy of Orbit	1
		Describe anatomy of Eye Ball	
ENT	Ear	Explain anatomy of ear	1
Paeds	Bone pains and aches in children	Common causes of bone aches and pains including Growing pains in children	1
		Discuss nutritional Rickets causation, clinical presentation, Lab and Radiological findings and prevention	
	Skeletal dysplasias	Discuss clinical feature and differential diagnosis of the following • Achondroplasia • Osteopetrosis • Osteogenesis Imperfecta	1
PRIME/Research	Proposal writing	Write a proposal for research project using KMU or CPSP guidelines or any other standard guidelines	3
PRIME/MEDICAL EDUCATION	Attributes of professionalism- Empathy	Discriminate empathy and sympathy	1
		Demonstrate empathy in patient- health professional interaction	
Theme II: Joint Stiffness			
Pathology	Osteoarthritis	Describe aetiology and pathogenesis of osteoarthritis	1

		Discuss clinical and morphological features of osteoarthritis	
		Enumerate complications of osteoarthritis	
	Rheumatoid Arthritis	Describe aetiology and pathogenesis of Rheumatoid Arthritis	1
		Discuss clinical and morphological features of Rheumatoid Arthritis	
		Enumerate complications of Rheumatoid Arthritis	
	Seronegative Spondyloarthropathies	Classify and explain spondyloarthropathies	1
		Discuss pathogenesis and clinical features of Ankylosing Spondylitis	
		Discuss pathogenesis and clinical features of Reactive Arthritis	
	Infectious Arthritis	Discuss pathogenesis and clinical features of Psoriatic Arthritis	1
		Describe aetiology and pathogenesis of Suppurative Arthritis	
		Discuss clinical features and morphological features of Suppurative arthritis.	
Pharmacology		Enumerate complications of Suppurative arthritis	
		Describe aetiology and pathogenesis of Mycobacterial Arthritis	
		Discuss clinical features and morphological features of Mycobacterial Arthritis	
		Enumerate complications of Mycobacterial Arthritis	
	Rheumatic Fever	Describe key structural features, virulence factors, modes of pathogenesis and diagnosis of Streptococcus pyogenes	1
		Explain aetiology, pathogenesis, clinical features, diagnosis, and complications of Rheumatic Fever.	
	Crystal-Induced Arthritis	Enlist different types of crystal-Induced arthritis	1
		Describe key points of aetiology, pathogenesis, clinical features, morphological features, and complications of: - Gout - Calcium Pyrophosphate Crystal deposition Disease (Pseudo- Gout)	
Pharmacology	Pharmacotherapy of Gout	Classify drugs used to treat gout	2
		Describe the role of NSAIDs in the treatment of gout	

		Describe the role of Glucocorticoids in the treatment of gout	
		Describe the mechanism of action of various drugs (Colchicine, Probenecid, Allopurinol, Febuxostat) used in the treatment of Gout	
		Discuss the adverse effects of anti-gout drugs	
		Describe the drug interactions of Allopurinol and Probenecid	
		Enlist the drugs causing hyperuricemia	
		Discuss the mechanism by which drugs cause hyperuricemia	
	Pharmacotherapy of Rheumatoid Arthritis	Classify drugs used in Rheumatoid arthritis	3
		Discuss the role of NSAIDs in Rheumatoid Arthritis	
		Discuss the role of Glucocorticoids in Rheumatoid Arthritis	
		Define and classify DMARDs	
		Enlist biological and non-biological agents used to treat rheumatoid arthritis	
		Describe pharmacokinetics mechanism of action, clinical uses and adverse effects of methotrexate.	
		Enlist adverse effects and therapeutic uses of DMARDs	
Forensic Medicine	Age of Wound & Complication	Describe events associated with wound healing	1
		Differentiate between old and fresh wound	
		Describe injury zone on the basis of histo-chemical changes and Biochemical events taking place.	
	Qisas & Diyat	Define hurt, Wound & injury	1
		Classify hurt according to International law	
		Types of hurt according to Qisas & Diyat Act	
		Explain Punishments (tazir), compensation and Fine (Diyat)	
	Injured person medical aid act	Describe the salient features of injured person medical aid act	1
	Work-men compensation laws	Describe the salient features of Work-men compensation laws	

Medicine	Rheumatoid Arthritis	Describe Rheumatoid Arthritis with its clinical presentation and differential diagnosis.	1
	Ankylosing Spondylitis	Describe Ankylosing Spondylitis with its clinical presentation and differential diagnosis.	
Orthopedics	Bone and Joint Infections	Describe the aetiology, pathology, clinical presentation and investigations of Bone and Joint infections	1
ENT	Nose, Para Nasal Sinuses & Oral Cavity	Discuss anatomy of Nose, Paranasal sinuses & oral cavity	1
Paeds	Juvenile Idiopathic arthritis (JIA)	Discuss criteria for classification of JIA	1
		Discuss its clinical features and differential diagnosis.	

PRIME/MEDICAL EDUCATION	Communication Skills: Dealing with Patients	Explain importance of answering questions and giving explanation and/or instructions	1
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Theme III: Muscle weakness and Trauma

Pathology	Tumors of adipose tissue	Classify soft tissue tumors and provide a brief description of their salient clinical features	1
		Enlist key morphological features of lipoma and liposarcoma	
	Fibrous Tumors	Describe important clinico-pathological and morphological features of: - Nodular Fasciitis - Fibromatosis	1
	Muscle tumors	Classify muscle tumors	1
		Describe etiology, clinico-morphological features, and complications of Rhabdomyosarcoma	
		Describe etiology, clinico-morphological features, and complications of Leiomyoma	
		Describe etiology, clinico-morphological features, and complications of Leiomyosarcoma	
	Skeletal muscle atrophy and myopathies	Describe etiology, clinico-morphological features, and complications of Fibrosarcoma	1
		Describe pathological features of Skeletal Muscle Atrophy	

		Describe pathological features of Neurogenic and Myopathic changes in Skeletal Muscle	
		Describe pathological features of Inflammatory Myopathies	
		Describe pathological features of Dermatomyositis	
		Describe pathological features of Polymyositis	
		Describe pathological features of Inclusion Body Myositis	
		Describe pathological features of Toxic Myopathies	
	Inherited Diseases of Skeletal Muscle	Describe genetic abnormality, morphology and clinical features of Muscular Dystrophies	1
Pharmacology	Skeletal muscle relaxants	Classify skeletal muscle relaxants.	3
		Describe the mechanism of action of Non-depolarizing and depolarizing neuromuscular blockers.	
		Discuss the differences between depolarizing and non-depolarizing skeletal muscle relaxants	
		Describe the therapeutic uses and adverse effects of skeletal muscle relaxants	
		Describe centrally acting skeletal muscle relaxants (Spasmolytics)	
		Name drugs causing malignant hyperthermia	
		Discuss the rationale for use of Dantrolene in the treatment of malignant hyperthermia	
		Discuss succinylcholine apnea and its management	
Forensic Medicine	Transportation Accidents	Discuss injuries to the driver & front seat occupant and rear seat occupant.	2
		Discuss spinal injuries including Whiplash injury and railway spine	
		Explain Railway injuries with medico legal significance	
		Discuss Air crash accidents.	
	Firearm Injuries	Describe wound ballistics and its types.	3
		Describe terms/Definition used in firearm injuries, types of bullets.	

		Explain basic mechanism of firearm.	
		Explain ranges of fire in firearm injuries, beveling phenomenon, wound production mechanism.	
		Identify types of gunpowders and ammunition used.	
		Interpret findings of injuries produced by different weapons.	
		Explain pattern of identification of entry and exit wound.	
		Explain information inferred from examination of firearm entry wound.	
	Injuries By Explosives	Describe mechanism of production of injuries by bomb blast.	1
		Explain different causes of death in blast injuries.	
		Interpret Autopsy findings in explosion fatalities.	
	Thermal Injuries	Describe Thermal Injuries	1
		Describe their classifications	
		Describe Burns and Scalds	
	Electrical Injuries	Explain electrocution	1
		Types of electrical injuries	
		Describe PM findings	
		Explain Lightning	
Community Medicine	Rehabilitation of disabilities: Poliomyelitis	Define disabilities and its types, and concepts, and distinguish between impairment, disability and handicapped, and significance of DALYs and QALYs.	1
		Describe the Epidemiology, determinants & distribution of poliomyelitis	
		Describe the prevention and control measures and rehabilitation of Poliomyelitis	
	Accidents and its prevention	Describe types of accidents and their mechanisms and their prevention (Haddon's model)	
		Describe Road Traffic Accidents	1
		Classify different types of road traffic accidents and injuries?	
		Describe and compare the burden of road traffic accidents in a developed country with a developing country like Pakistan	

		List and Explain the risk factors of road traffic accidents	
		Explain effective public health strategies used at individual and national level to prevent road traffic accidents	
Medicine	Myopathies	Define Myopathy	1
		Enlist Myopathies (Hereditary & Acquired Myopathies)	
		Describe the etiology and clinical features of Myopathies	
		Plan investigations for Myopathies	
Orthopedic	Application of Cast	Explain the emergency treatment of an injured limb.	1
		Explain emergency immobilization techniques of the Neck, Spinal column and limbs.	
		Describe and discuss the basic principles pertaining to application of a cast, the complications of cast application.	
		Discuss the principles of a three-point pressure system in a cast.	
	Soft Tissue Injuries, Spinal Injuries	Describe the common ligamentous and tendon injuries and advise appropriate management	1
		Recognize common Spinal fractures, and provide appropriate initial management	
Paeds	Congenital/Hereditary Myopathies	Discuss common congenital and hereditary myopathies, their genetics, causation, clinical presentation, diagnosis.	1
	Duchenne Muscular dystrophy (DMD)	Describe DMD, its clinical presentation and differential diagnosis.	1

Theme IV: Skin Rash and Itching

Pathology	Important pathological terms	Define the following skin lesions and describe these with respect to their etiologies and gross morphological features. • Macule • Papule • Nodule • Plaque • Vesicle • Bulla • Blister • Pustule • Scale • Lichenification • Excoriation	1
		• Hyperkeratosis • Parakeratosis • Acanthosis • Dyskeratosis • Acantholysis • Papillomatosis • Lentiginous spongiosis • Urticaria • Pemphigus • Bullous pemphigoid • Warts	
	Eczematous dermatitis	Classify eczematous dermatitis Describe the morphological and clinical features of acute eczematous dermatitis Describe the etiology and pathogenesis of • Contact dermatitis • Atopic dermatitis • Drug related eczematous dermatitis • Photoeczematous eruption • Primary irritant dermatitis	1
	Erythema multiforme	List the conditions which are associated with erythema multiforme and describe its clinical features	1
	Psoriasis	Describe the etiopathogenesis, morphological and clinical features of psoriasis	1

	Pre-malignant epithelial lesions	List the pre-malignant epithelial lesions (Epidermal) - List the predisposing factors for squamous cell carcinoma of skin - Differentiate squamous cell carcinoma from basal cell carcinoma on the basis of morphology and clinical features	1
	Nevocellular Nevus and Malignant Melanoma	List types of Nevocellular Nevus (Congenital Nevus, blue nevus, Spitz's Nevus, halo nevus, dysplastic nevus) along with their clinical significance. (Dermal) - Describe the clinical and morphological features of dysplastic nevi - Describe malignant melanoma with respect to frequent site of origin, clinical and morphological features.	1
	Viralskin infections	Describe the following viral skin infections in context of etiopathogenesis: - Herpes simplex virus - Herpes zoster virus	1
	Fungal skin infections	Classify and describe the following fungal skin infections in context of etiopathogenesis: - Tinea - Candida	1
	Skin and soft tissue infections	Describe the following skin lesions in context of etiopathogenesis and diagnosis - Impetigo - Cellulitis / Erysipelas - Folliculitis - Skin Abscess (Furuncle & Carbuncle) - Necrotizing Soft Tissue Infections	1
Pharmacology	Drugs used for dermatological disorders	Classify dermatological preparations	2
		Enlist topical antibacterial, antifungal & antiviral preparations.	
		Describe clinical uses and adverse effects of topical antibacterial, antifungal and antiviral drugs.	
		Discuss oral treatment of candidiasis, dermatophytosis and onychomycosis.	

		Describe various acne preparations and antibiotics used to treat acne.	
		Enlist clinical uses of immunomodulators (Imiquimod, Tacrolimus) related to skin diseases.	
		Enlist ectoparasiticides	
		Enlist clinical uses and adverse effects of Permethen.	
		Discuss drug treatment of Scabies & Pediculosis.	
		Describe the mechanism of action and adverse effects of various agents used for pigmentation disorders	
		Describe the clinical uses and adverse effects of drugs used for the treatment of psoriasis.	
		Describe clinical uses and adverse effects of topical corticosteroids	
		Enlist dermatological disorders responsive to topical corticosteroids ranked in order of sensitivity.	
		Discuss keratolytic agents, antipruritic agents, trichogenic and antitrichogenic agents and use of antineoplastic agents in topical conditions	

Medicine/Dermatology	Important pathological terms with Clinical presentations	Enlist and explain the clinical presentation of the following skin Lesions: • Macule • Papule • Nodule • Plaque • Vesicle • Bulla • Blister • Pustule • Scale • Lichenification • Excoriation • Hyperkeratosis • Parakeratosis • Acanthosis • Dyskeratosis • Acantholysis • Papillomatosis • Lentiginous spongiosis • Urticaria • Pemphigus • Bullous pemphigoid • Warts	1
	Pre-malignant skin conditions	Enlist the pre-malignant skin conditions Explain their differential diagnosis on the basis of clinical presentations Enlist the relevant investigations	1
	Malignant conditions of skin	Enlist the malignant conditions of skin (squamous and basal cell carcinoma) Explain their differential diagnosis on the basis of clinical presentations Enlist the relevant investigations	
	Nevocellular Nevus	List the types of Nevocellular Nevus and discuss their differential diagnosis on the basis of their clinical presentations. Enlist the relevant investigations	
Family medicine	Leishmaniasis	Explain the clinical features and management of cutaneous Leishmaniasis in primary healthcare	
Paeds	Juvenile Dermatomyositis (JDM)	Discuss diagnostic criteria of JDM	1
		Discuss its clinical features differential diagnosis	

PRIME/Research	Qualitative and quantitative study	Write a proposal for research project using KMU or CPSP guidelines or any other standard guidelines	7
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Pathology Practicals

Week	Topic	Practical
Week1	Tuberculous osteomyelitis	Identify gross and microscopic morphological features of tuberculous osteomyelitis
Week2	Osteogenic sarcoma, Osteoclastoma and chondrosarcoma	Identify gross and microscopic morphologic features of osteogenic sarcoma, osteoclastoma and chondrosarcoma
Week3	ASO (Anti Streptolysin O) test	Perform ASO (Anti Streptolysin O) test by latex agglutination technique
Week4	Tumors of Skin	Identify gross and microscopic features of • Squamous cell carcinoma • Basal cell carcinoma

Pharmacology Practicals

Week	Topic	Practical
Week1	Gout	Write prescription for Gout
Week2	Rheumatoid Arthritis	Write prescription for Rheumatoid Arthritis
Week4	Drugs used to treat Dermatological Disorders	Write down prescription for scabies.

Write down prescription for Psoriasis

Forensic Practicals

Week	Topic	Practical
Week1	Examination of wound and weapon	• Abrasion • Bruise • Laceration • Incised wound • Qisas and Diyat models/ • Dura print of injuries

Week2	Examination of wound and weapon	• Stab wound • Fracture • Displacement • Qisas and Diyat models of injuries/multimedia slides remaining
Week3	Examination of wound and weapon	Firearm injuries/Weapons Identification of bullets
Week4	Writing a medico legal certificate	Medico legal report writing in case of firearm Injuries

MIT: Mode of information transfer. E.g. lecture, SGD, DSL, Practical, skill lab etc etc.

MOHI-UD-DIN ISLAMIC MEDICAL COLLEGE MIRPUR

DEPARTMENT OF MEDICAL EDUCATION



CARDIOVASCULAR

II

3RD YEAR MBBS (BATCH-16)

BLOCK: I

DURATION: 3 WEEKS

MODULE CODE: MB3-I-CVS-II-17



2. Learning Objectives

General Learning Outcomes

By the end of this module the students would be able to;

a. Knowledge

To be added

To be added

To be added

To be added

To be added

To be added

b. Skills

To be added

To be added

To be added

To be added

To be added

To be added

c. Attitude

To be added

To be added

To be added

To be added

To be added

To be added

3. Specific learning objectives

Theme 1: Chest pain			
Subjects	Topics	Hours	LOs
Anatomy	Gross anatomy of heart, valves and coronary arteries	1	Describe surface anatomy of the heart and heart valves
			Describe the anatomy of coronary circulation
			Enumerate heart valves and describe their gross morphology
Biochemistry	Lipoproteins and cholesterol	1	Classify and Describe types of lipoproteins
			Summarize cholesterol synthesis
Pathology	Atherosclerosis	1	Discuss the risk factors, Morphology, pathological changes and consequences of Atherosclerotic plaque
	Ischemia and infarction		Define Ischemia and infarction, and differentiate it from
			Discuss Classification and pathophysiology of ischemic heart disease
			Discuss pathophysiology of myocardial infarction
Pharmacology	Antianginal drugs	1	Classify antianginal drugs
			Explain mechanism of action, pharmacokinetics and adverse effects of organic nitrates and calcium channel blockers
			Explain the rationale for use of β -adrenergic blockers and sodium channel blocker in the management of angina pectoris
	Lipid lowering drugs	2	Briefly describe the types of dyslipidemias
			List the lipid lowering drug
			Explain the mechanism of action, effect on serum lipid profile and adverse effects of each of the five drug classes

			Discuss drug-drug interaction of lipid lowering drugs
	Anticoagulant drugs	2	Classify anticoagulant drugs
			Discuss mechanism of action, uses of Unfractionated heparin
			Compare low molecular weight and unfractionated heparin
			Describe adverse effects of heparin and treatment of heparin overdose
			Describe mechanism of action and uses of direct Xa and IIa inhibitors
			Describe mechanism of action and uses of warfarin
			Describe adverse effects of warfarin and treatment of warfarin overdose
			Compare heparin and warfarin in terms of mechanism and onset of
			Explain monitoring of anticoagulant therapy
			Describe important diet and drug interactions of warfarin
	Antiplatelet and thrombolytic drugs	1	Classify antiplatelet drugs
			List indications of antiplatelet therapy
			Explain the mechanism of action and adverse effects of each antiplatelet drug group
			Name thrombolytic drugs and explain their mechanism of action, uses and adverse effects
Forensic Medicine	Chest trauma	1	Describe heart injuries caused by regional injuries
			Discuss chest wall injuries in general
			Enumerate the complications of rib fracture
	Sudden death	1	Define sudden death
			Explain the causes of
			Describe autopsy findings in sudden death

			Describe the medicolegal importance of sudden death
Commu	Non-communicable diseases:	2	Define Cardiovascular disease
	Cardiovascular diseases of public health importance		Elaborate the concept of CVD risk stratification
			Describe the epidemiology of cardiovascular diseases and explain cardiovascular diseases of Public Health importance globally and in Pakistan
			Explain the known risk factors of CVD and cultural, racial and gender difference in CVD prevalence and incidence
	Hypertension		Describe the epidemiology of hypertension and its public health importance globally and in Pakistan
General Medicine /Cardiology	Coronary Heart disease	1	Discuss CAD risk factors and strategies to reduce them
			Discuss strategies for primary and secondary prevention of CHD in Pakistan
			Define chronic stable angina, its clinical signs and symptoms, laboratory findings, imaging techniques for assessment of it and management
			Discuss coronary vasospasm and angina with normal coronary angiograms
	Acute coronary syndrome	1	Define Acute coronary syndrome
			Explain the spectrum of illness in ACS and relevant management steps
			Describe the clinical features and steps of the management of Myocardial infarction
			Describe risk stratification in myocardial infarction
			Describe complications of acute Myocardial infarction
	Hypertrophic cardiomyopathy		Discuss clinical features, imaging protocols, risk stratification and management

PRIME/MEDICAL EDUCATION	Informed consent	1	Obtaining informed consent from a patient before an invasive procedure
Theme 1: blood pressure			
Pathology	Blood pressure	2	Describe the mechanisms of blood pressure regulation
			Classify shock
	Shock		Describe the pathophysiology and
			Describe the stages of shock
			Define sepsis and septic shock
			Discuss causes, pathogenesis, and laboratory findings in shock
			Discuss Disseminated intravascular coagulation in the context of sepsis
			Describe classification and
	Hypertension	1	Describe the causes, Pathogenesis, morphology and complications of Hypertension
	Aneurisms	1	Discuss pathophysiology of
			Describe the etiology, morphology and manifestations of vascular aneurisms
			Describe the causes, Pathogenesis and types of
	Aortic dissection		Describe the pathogenesis, morphology and clinical features of Aortic Dissection
	Vasculitis	1	Define vasculitis
			Classify vasculitides
			Describe the immunological mechanisms of non-infectious vasculitis
			Describe the morphology and clinical features of Giant cell arteritis
			Describe the morphology and clinical features of Takayasu arteritis
			Describe the morphology and clinical features of Polyarteritis nodosa

			Describe the morphology and clinical features of Kawasaki disease
	Diseases of veins	1	Describe the morphology, serologic markers and clinical features of Wegener granulomatosis
			Describe the morphology and clinical features of Thromboangitis obliterans
			Differentiate between thrombophlebitis and Phlebothrombosis
			Describe the etiology and clinical features of varicose veins
			Enlist the benign and malignant tumors of the arteries and veins
Pharmacology	Antihypertensive drugs	2	Classify antihypertensive drugs
			Discuss role of diuretics in the
			Discuss the role of ACE inhibitors, Angiotensin receptor-blocking agents, Renin inhibitor in hypertension
			Explain the rationale for the use of β -blockers, α -adrenoceptor blocking agent, centrally acting sympatholytic drugs in hypertension
			Describe the direct vasodilators (mechanism of action and drug toxicity) in relation to antihypertensive drug therapy
General Medicine / Cardiology	Hypertension	1	Describe the role of Calcium channel blockers in hypertension
			Define and classify hypertension
			Discuss drug treatment protocols for hypertension
			Describe the risk factors and complications of hypertension
			Describe the management of hypertensive emergencies and urgencies

Forensic medicine	Cardiac poisons	1	Classify Cardiac Poisons
			Describe the characteristic, clinical signs/symptoms, treatment and medicolegal aspects of cardiac glycosides
			Discuss cardiac effects of methylphenidate, cocaine and Ice
			Describe the characteristic, clinical signs/symptoms, treatment and medico legal aspects of Oleander
PRIME/MEDICAL EDUCATION	Counselling skills	1	Develops counselling skills in professional life
Theme III: Shortness of breath			
Physiology	Cardiac cycle	1	Outline major events in cardiac cycle
			Discuss physiology of heart sounds
Pathology	Congestive heart failure	2	Describe the types, etiology, pathogenesis, and clinical features of congestive heart failure
	Cardiomyopathies		Describe the pathological patterns, causes, morphological changes and clinical features of Cardiomyopathies
	Congenital heart diseases	2	Describe the etiology, pathogenesis and clinical features of Tetralogy of Fallot, ASD, VSD and pulmonary stenosis
	Valvular heart diseases		Describe the etiology, pathogenesis and clinical features of Aortic stenosis, Aortic regurgitation, Mitral stenosis and Mitral regurgitation
	Rheumatic fever	1	Discuss pathophysiology and laboratory findings in rheumatic fever
	Rheumatic heart disease		Discuss pathological changes and morphology of rheumatic heart disease
	Thrombosis and Embolism	1	Describe the mechanism and pathogenetic mechanisms of vascular thrombosis
			Enlist hypercoagulable states
			Define embolism

		1	Discuss types of embolism
			Describe the etiology, pathogenesis, morphology and clinical features of pulmonary embolism
	Endocarditis	1	Discuss Etiology, Pathogenesis, Morphology, diagnostic criteria, clinical features and complications of infective endocarditis
			Discuss the types of non-infected vegetation
Pharmacology	Drugs used in heart failure	2	Define the different classes of the drug used in the treatment of heart failure
			Explain the pharmacological effects, clinical uses, adverse effects and drug
			Explain the signs symptoms and treatment of digoxin overdose
			Enlist positive inotropic drugs (other than digoxin) that are used in heart failure
			Classify the five major groups of diuretic drugs and relate them to their site of action
			Discuss the mechanism of action, clinical applications and adverse effects of carbonic anhydrase enzyme inhibitors, osmotic diuretics, thiazide diuretics, loop diuretics and potassium sparing diuretics
			Enlist potassium sparing and potassium losing diuretics
	Antiarrhythmic drugs	2	Classify antiarrhythmic drugs
			Describe the effect of different classes of antiarrhythmic drugs on membrane potential of cardiomyocytes

			Explain the mechanism of action of all the classes of antiarrhythmic drugs
			Discuss the adverse effects and clinical uses of antiarrhythmic drugs
			Discuss workup and management of pulmonary edema
GeneralMedicine /Cardiology	Heartfailure	1	Enlist and explain causes of heart failure
			Describe workup and management of heart failure
	Disordersofheartratean drhythm	1	Classify arrhythmias and heart blocks
			Describetheetiology,ECGfindings andmanagementofAtrial fibrillation
			Discuss types, workup and management of ventricular arrhythmias
	Pulmonaryembolism	1	Describetheetiology,clinicalfeatu resanddiagnosticworkupof pulmonary embolism
			Discuss risk stratification and management of pulmonary embolism
	Pulmonaryhypertensio n		Discuss cardiac causes of pulmonary hypertension and outline their management
	Myocarditis	1	Discuss causes and management of myocarditis
	Pericardialdiseases		Define and classify pericarditis
			Discuss clinical findings and treatment of pericarditis
			Describe the etiology and management of pericardial effusion
Pediatrics	Cyanoticandacyanoticcon genitalheartdisease	1	Delineatethedifferencebetweent heacyanoticandcyanotic heart disease conditions
			Enumerate the various defects, involving both conditions
	Rheumaticfever	1	Describe the etiology of rheumaticfever

			Describe Duckett Johns criteria for diagnosis of RF
			Discuss about primary and secondary prophylaxis of rheumatic heart disease
PRIME/MEDICAL EDUCATION	SWOT Analysis	1	Perform SWOT analysis for a particular task

Practical			
Subjects	Topics	Hours	LOs
Pharmacology	Myocardial Infarction	1.5	Construct a prescription for a patient with Myocardial
	Hypertension	1.5	Construct a prescription for a patient with Hypertension
	Congestive Cardiac Failure	1.5	Construct a prescription for a patient with Congestive Cardiac Failure
Pathology	Lipid Profile	1.5	Demonstrate Estimation of total cholesterol
	Hemangioma	1.5	Identify the morphological changes occurring in hemangioma
Forensic medicine	Cardiac toxins	1.5	Identify the following cardiogenic toxins: • Digitalis • Cannabis • Heroin

MIT: Mode of information transfer. E.g. lecture, SGD, DSL, Practical, skill lab etc etc.

MOHI-UD-DIN ISLAMIC MEDICAL COLLEGE MIRPUR

DEPARTMENT OF MEDICAL EDUCATION



RESPIRATORY II

3RD YEAR MBBS (BATCH-16)

BLOCK: I

DURATION: 4 WEEKS

MODULE CODE: MB3-I-RES-II-18



2. Learning Objectives

General Learning Outcomes

By the end of this module the students would be able to;

1. At the end of this module, students will be able to:
2. Explain various lower respiratory tract infections
3. Explain obstructive respiratory diseases.
4. Describe various Granulomatous lung diseases
5. Prescribe medication according to guidelines for common respiratory disorders.
6. Describe medico legal aspect of asphyxial death.
7. Describe respiratory tract diseases of public health importance with emphasis on agent factors, epidemiology, preventive and control measures.
8. Describe management of common respiratory problems.

3. Specific learning objectives

Theme1:Coughwithsputum,andfever			
Subject	Topic	Hours	LOs
Anatomy		1	Describeclinicalanatomyofthoraxincludingthoracicwall,lungsand trachea-bronchial tree anatomy
			Correlatethedifferentdevelopmentalstagesoflungwithitscongenital anomalies
			Describethesurfacemarkingofclinicallyrelevantareasoftherespiratory system
Physiology		1	Describethemechanicsofventilationanddifferentvolumesandcapacities of lungs
			Describerespiratory gas exchange.
Biochemistry		1	Describetheeffectsofhyperventilation(e.g.Anxiety)andhypoventilation (e.g. COPD) on pH and blood gases, HCO ₃ and electrolytes.
Microbiology	Legionella	1	DescribePathogenesis,Structure,ClinicalFindings&Laboratory Diagnosisof Legionella infection
	Mycoplasma	1	DescribePathogenesis,Structure,Clinicalfindings&LaboratoryDiagnosisof mycoplasma infection.
	H-Influenza	1	DescribePathogenesis,Structure,ClinicalFindings&Laboratory Diagnosisof H-Influenza infection.
	Bordetella	1	DescribePathogenesis,Structure,ClinicalFindings&Laboratory Diagnosisof Bordetella infection
	Mycobacterium Tuberculosis	1	DescribePathogenesis,ImportantProperties,ClinicalFindings&Laboratory Diagnosis of Mycobacterium Tuberculosis.
	Pulmonary Infections	2	Describecommunityacquiredpneumoniaanditsdifferent types.
			Describecommunityacquiredatypical Pneumonia.
			Describeetiology,pathogenesis&clinicalfeaturesofnocomial pneumonia.
			Describeetiology, pathogenesis &clinical features of pneumonia.
			Describeetiology, pathogenesis & clinical features of chronic pneumonia.
			Describeetiology,pathogenesis,clinical&radiologicfeaturesofPulmonary Tuberculosis.
			Describepneumoniainimmunocompromisedhost.
	Granulomatous diseases	1	Describesarcoidosisitsetiology,pathogenesis,morphologyandclinical course.

			Describe etiology, pathogenesis, clinical & radiologic features of hypersensitivity pneumonitis.
			Describe etiology, pathogenesis, clinical & radiologic features of pulmonary eosinophilia.
	Lung abscess	1	Define Lung Abscess
			Describe Pathogenesis, morphology & Clinical Course of Lung abscess
	Empyema		Describe empyema & its pathogenesis
Pharmacology	Laryngeal tumors	1	Describe the risk factors, morphology, clinical features and staging of laryngeal tumors.
	Anti-tussives	1	Classify Anti-tussives
	Cough Suppressants		Describe the pharmacology of Cough suppressants
	Expectorants		Describe the pharmacology of Expectorants, Mucolytic agents in cough
	Tuberculosis	2	Classify Antituberculous drugs
			Describe the pharmacology of First line antituberculous drugs
			Describe the pharmacology of 2nd line antituberculous drugs
			Discuss the drug treatment & duration of susceptible newly diagnosed pulmonary tuberculosis patient
			Discuss the development of resistance to mycobacterium tuberculosis against conventional antibiotics
			Discuss the classification & duration of therapy in patients having MDR tuberculosis
Community Medicine	Tuberculosis	1	Discuss the drug treatment & duration of antitubercular therapy in pregnant woman & patients having Hepatic & Renal insufficiency
			Describe the rationale for the use of Multi Drug therapy against pulmonary tuberculosis.
			Describe agent, host and environmental factors for the disease.
			Describe DOTS strategy for Tuberculosis
			Explain different preventive and control measures for Tuberculosis including "stop TB" and "End TB" strategies
		1	Describe types of influenza
	Influenza and COVID infection		Describe agent, host and environmental factors for the disease.
			Explain the antigenic drift and antigenic shift
			Describe various preventive and control measures for influenza

			Describe the epidemiology, clinical features, control measures and vaccination for COVID-19 infection
Family medicine	Social determinants of health	1	Describe the social determinants of health
	Environmental and climate factors in disease causation		Explain the role of environmental and climate factors in disease causation
	Principles of prevention and health promotion	1	Describe the Principles of prevention and health promotion Describe the role of counselling and patient education in health promotion and disease prevention
		1	Explain the types of Pulmonary Tuberculosis
	Tuberculosis (individuals' identifications, routine contact tracing, and linking to care)		Explain the pathophysiology, clinical features, complications, and management of a patient with pulmonary Tuberculosis
			Describe the technique of contact tracing in a patient with non-MDR and MDR tuberculosis
			Describe the indications of specialist referrals in patients with Pulmonary Tuberculosis
Forensic Medicine	Asphyxia (General Aspects)	1	Define asphyxia
			Define anoxia
			Enlist causes of anoxia
			Explain causes of asphyxia
			Classify mechanical asphyxia
			Describe pathophysiology of asphyxia
			Describe general signs of asphyxia
	Hanging	1	Define hanging
			Describe causes of death in hanging
			Explain mechanism of death in hanging

			Describe the procedure of neck dissection in hanging
			Describe autopsy findings in hanging
			Explain medicolegal aspects of hanging
	Mechanical asphyxia (Strangulation)	1	Define strangulation
			Describe causes of death in strangulation
			Explain mechanism of death in strangulation
			Describe the procedure of neck dissection in strangulation
			Describe autopsy findings in strangulation
			Explain medicolegal aspects of strangulation
	Drowning	1	Define drowning
			Describe causes of death in drowning
			Explain mechanism of death in drowning
			Describe types of drowning
			Describe autopsy findings in drowning
			Differentiate between ante and post mortem drowning
			Explain medicolegal aspects of drowning
	Suffocation	1	Define suffocation and explain its medicolegal aspects.
	Smothering		Define smothering
			Explain medicolegal aspects of smothering
	Chocking		Define chocking
			Explain medicolegal aspects of chocking
	Gagging		Define Gagging
			Explain medicolegal aspects of Gagging
	Overlaying		Define overlaying

			Explain medicolegal aspects of underlying
	Traumatic asphyxia	1	Define traumatic asphyxia
			Describe autopsy findings of traumatic asphyxia
			Explain medico legal aspects of traumatic asphyxia
	Sexual asphyxia		Define sexual asphyxia
ENT	Larynx anatomy	1	Describe clinical anatomy of larynx.
	Laryngitis		Describe etiology, clinical feature, management of acute and chronic laryngitis.
Medicine	Respiratory symptoms	1	Describe approach to a patient of respiratory symptomatology
	Differential diagnosis		Discuss the differential diagnosis of granulomatous inflammation including TB
	Pulmonary TB	1	Describe the signs & symptoms, investigations, clinical diagnosis, management protocol & prognosis for TB and MDRTB according to WHO categories.
Pediatrics	Childhood Pneumonia	1	Classify pneumonia according to IMNCI (integrated management of neonatal and childhood illnesses)
			Describe the risk factors for recurrent pneumonia in childhood.
			Describe the etiological agents for Pneumonia according to the age of the child.
			Describe the indication for hospitalization of child with pneumonia.
Radiology		1	Describe the common radiological abnormalities on chest x-rays
Theme II: Wheezy chest & shortness of breath			
Pathology	Atelectasis	1	Define Atelectasis
			Describe different types of atelectasis
	Acute Lung	1	Define Acute Respiratory Distress Syndrome (ARDS)

	injury		Describe Pathogenesis and morphological features of ARDS
	Obstructive Pulmonary disease	1	Define obstructive pulmonary disease and enlist its different types
			Define Emphysema
			Describe different types of emphysema
			Describe the pathogenesis, morphology and underline course of emphysema
			Define chronic bronchitis
			Describe its pathogenesis and morphology
			Describe asthma and its pathogenesis
			Differentiate between types of asthma
			Describe morphology and clinical course of asthma
		2	Define bronchiectasis, describe the causes, morphology and pathogenesis of bronchiectasis
	Restrictive or infiltrative lung diseases		Define diffuse interstitial lung disease.
			Describe pathogenesis of diffuse interstitial lung disease.
			Enlist major categories of chronic interstitial lung disease
			Describe the fibrosing lung diseases.
			Describe pneumoconiosis, its morphology and different types.
			Describe drug and radiation induced pulmonary diseases.
	Diseases of vascular origin	1	Describe pulmonary embolism, hemorrhage and infarction.
			Describe pulmonary Hypertension.
			Describe diffuse alveolar hemorrhage syndromes.
	lung tumors	1	Describe carcinoma of lung, its etiology, pathogenesis, morphology and clinical course.
			Differentiate between small cell lung carcinoma and non-small cell lung carcinoma.
			Describe bronchial carcinoids
			Describe malignant mesothelioma and its morphology.

	Pleural lesions	1	Describe pleural effusion and pleuritis.
			Describe pneumothorax, Hemothorax and chylothorax
Pharmacology	Asthma	2	Classify the Drugs used in the treatment of asthma
			Describe the role of beta 2 agonists used in Asthma
			Describe the role of Methylxanthine drugs used in Asthma
			Describe the role of Antimuscarinic agents used in Asthma
			Describe the role of Corticosteroids used in Asthma
			Describe the pharmacokinetic & pharmacodynamic aspects of Mast cell stabilizers used in Asthma
			Describe the pharmacokinetic & pharmacodynamic aspects of Leukotriene antagonist used in Asthma
			Describe the pharmacokinetic & pharmacodynamic aspects of Anti-IgE antibodies used in Asthma
			Describe drug treatment of acute and chronic asthma and status asthmaticus
Community Medicine	Asthma	1	Describe the epidemiology & preventive measures of asthma.
			Define occupational asthma and describe its preventive measures.
	Pneumoconiosis	1	Describe various pneumoconiosis diseases
			Describe the control and preventive measures of pneumoconiosis
		1	Describe the epidemiological determinants of Diphtheria and Pertussis
	Diphtheria and Pertussis		Describe preventive and control measures.
			Explain their current public health importance in Pakistan.
Forensic Medicine	Asphyxiant (CO)	1	Explain medico-legal aspects of sexual asphyxia
			Enlist sources of CO poisoning
			Describe signs and symptoms of CO poisoning
			Explain treatment plan of CO poisoning
			Describe autopsy findings of CO poisoning
			Explain ML aspects of CO poisoning
	CO₂	1	Enlist sources of CO ₂ poisoning
			Describe signs and symptoms of CO ₂ poisoning
			Explain treatment plan of CO ₂ poisoning
			Describe autopsy findings of CO ₂ poisoning
			Explain ML aspects of CO ₂ poisoning
			Enlist sources of H ₂ S poisoning

			Describe signs and symptoms of H ₂ S poisoning.
	H₂S		Explain treatment plan of H ₂ S poisoning
			Describe autopsy findings of CO poisoning
			Explain ML aspects of H ₂ S poisoning
	War gases		Define war gases
			Classify war gases
			Describe medico legal aspects of war gases
ENT	Non – Neoplastic laryngeal lesions	2	Describe clinical features and management of different non neoplastic laryngeal lesions (Vocal cords nodules, polyps, and laryngocele)
	Neoplastic laryngeal lesions		Describe the clinical feature and management of neoplastic laryngeal lesions.
	Vocal cord Palsy	2	Describe the clinical feature and management of vocal cord palsy
	Emergency Tracheotomy		Describe the indication, contraindication, complications, and operative steps to perform emergency tracheotomy.
Medicine	COPD	1	Describe the epidemiology, patho-physiology and etiology of COPD
			Explain the clinical presentation of COPD
			Describe the investigations required for the diagnosis of COPD
			Describe the management plan of COPD
	Asthma	1	Describe the epidemiology, pathophysiology, etiology, and contributing factors related to the development of asthma
			Describe the clinical presentation, diagnosis and treatment of asthma
			Classify asthma on the basis of clinical presentation into mild, moderate, life threatening and near fatal asthma
			Explain the stepwise pharmacologic approach for the treatment of asthma status asthmaticus
			Describe long-term asthma management plan including pharmacological, physical and occupational health education.
	Respiratory failure	1	Describe the long term Oxygen therapy in COPD

	Pneumothorax	1	Describe the etiology, classification, diagnosis and management of pneumothorax
	Pleural effusion		Describe the causes of exudates and transudate effusion.
			Differentiate between exudate and transudate effusion.
Family medicine	COPD	1	Explain the management strategies of a patient with COPD in general practice
			Describe the strategies for prevention of complications of COPD
			Describe the methods of home oxygen therapy
			Perform routine annual health checkup of an Asthmatic and COPD patient under supervision
			Identify the red-flags in a patient with COPD and appropriately refer to speciality care when required
	Bronchial Asthma	1	Discuss the risk factors for Asthma in our population
			Explain the risk assessment for Asthma
			Interpret spirometry results
			Discuss the primary and secondary prevention of Asthma in a primary health setting
			Identify the guidelines that should be followed in a patient with Asthma
			Identify the red-flags in a patient that need referral for specialist care
	ARIs (Croup and Epiglottitis)	1	Differentiate Croup and epiglottitis based on etiology and clinical features.
			Explain the management of croup and epiglottitis.
			Explain the most effective ways to prevent and control ARIs
	Respiratory distress syndrome (RDS)		Describe the risk factors, clinical features, investigation and management for RDS.
	Reactive airway disease.	1	Describe the different types of wheezers in pediatric population
			Discuss the risk factor for persistent wheezing / asthma.
			Describe management of bronchiolitis
	Cystic	1	Define bronchiectasis and its risk factors.

	fibrosis and bronchiectasis		Describe diagnostic criteria for cystic fibrosis.
			Describe the GI, respiratory and other systemic manifestations of cystic fibrosis.
PRIME/MEDICAL EDUCATION	Power dynamics	1	Explain the concept of power dynamics and delegate power to juniors and team mates

Table 4 Practical

Subject	Topic	Los
Pharmacology		Write the proper prescription for Pulmonary Tuberculosis
Forensic Medicine		Demonstrate the differences between hanging and strangulation on a model
		Demonstrate the differences between different types of hanging on a model
Community Medicine	Visit	Visit to TB control program center
	Mask wearing.	Demonstrate Identification of different types of masks and its uses.
		Demonstrate the proper protocol for wearing a mask
Pharmacology		Demonstrate the proper stepwise use of metered dose inhaler along with spacer.
		Write the proper prescription for Acute & Chronic Asthmatic patients
		Write the proper prescription for patients with Status Asthmaticus

MIT: Mode of information transfer. E.g. lecture, SGD, DSL, Practical, skill lab etc etc.