Block I

3rd Year MBBS

Study Guide

Faisalabad Medical University

Faisalabad

Contents

Respiratory - II
Module


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EVIDENCE

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Introduction to the Respiratory-II Module

The Respiratory-II Module, designed for 3rd-year MBBS students at Faisalabad Medical University (FMU), is a comprehensive educational program developed by the Health Professions Education & Research Department (HPERD). FMU aspires to become a global leader in health sciences education and research, delivering efficient and compassionate healthcare. This curriculum aims to foster professional competence through innovation and learning, aligned with HPERD's mission to develop leaders in health professions education. The module is organized into key themes, including "Cough with Sputum and Fever" and "Wheezy Chest and Shortness of Breath," covering essential aspects of microbiology, pathology, pharmacology, family medicine and forensic medicine over specific durations. The learning outcomes target a deep understanding of Pathology, respiratory Microbiology, Pharmacokinetics, Pharmacodynamics, and practical skills in drug administration and prescription writing. Students are also introduced to family medicine and the respiratory aspects of forensic science. Additionally, time is allocated for respiratory medicine. The students will also attain practical skills related to respiratory pharmacology and community medicine. The curriculum is carefully structured to allocate time for each subject to ensure a balanced education, with assessments designed to evaluate both theoretical knowledge and practical competencies. This comprehensive approach prepares students for advanced medical studies and professional practice, ensuring they are well-equipped to meet healthcare challenges.

Rationale of the Respiratory-II Module

The Respiratory II Module for 3rd Year MBBS students at Faisalabad Medical University aims to provide a comprehensive understanding of respiratory diseases, their diagnosis, and treatment. Building on foundational knowledge from earlier in the MBBS program, it integrates clinical and basic sciences to prepare students for advanced medical practice. Given the global impact of respiratory diseases, understanding their pathophysiology and management is crucial for future medical professionals.

The module adopts a multidisciplinary approach, combining anatomy, physiology, biochemistry, pathology, pharmacology, forensic science and clinical medicine. This integration enhances students' understanding of respiratory system disorders and promotes critical thinking and problem-solving skills essential for medical practice.

Incorporating case-based learning, problem-solving exercises, and practical sessions that simulate real-life clinical scenarios, the module significantly enhances diagnostic and therapeutic skills. This prepares students to effectively manage respiratory conditions in their medical careers.

Overall, the Respiratory II Module ensures students gain the necessary knowledge, skills, and attitudes to excel in respiratory medicine, ultimately improving patient care and public health outcomes.

Teaching Hours Allocation

S. No	Subject	Hours needed
1	Pathology	26
2	Pharmacology	15
3	Forensic medicine	10
4	Community medicine	5
5	Family medicine	7
6	Medicine	6
7	Pediatrics	1
8	ENT	5
9	Anatomy	1
10	Physiology	1
11	Biochemistry	1
12	Radiology	1
13	PRIME/Medical Education	1
	Total	**80**

General Learning Objectives

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

- Explain anatomy and physiology of respiratory system
- Explain various lower respiratory tract infections
- Explain obstructive respiratory diseases.
- Discuss the restrictive/ infiltrative lung diseases.
- Describe various Granulomatous lung diseases
- Prescribe medication according to guidelines for common respiratory disorders.
- Discuss anti tuberculous drugs.
- Describe pharmacologic treatment of asthma.
- Discus acid base disorders and their lab. investigations.
- Describe medico legal aspect of asphyxial death.
- Discuss various asphyxiants and their medico legal aspects..
- Describe respiratory tract diseases of public health importance with emphasis on agent factors, epidemiology, preventive and control measures.
- Discuss various epidemiologic preventive and control measures for tuberculosis and a comprehensive strategy of anti-tuberculous (TB) treatment.
- Describe various laryngeal non neoplastic and neoplastic lesions.
- Describe management of common respiratory problems.

List of Themes

S. No.	Theme	Duration
1	Cough with sputum, and fever.	Two weeks
2	Wheezy Chest and Shortness of breath	Two weeks

Theme I: Cough with sputum, and fever.

Sr. No.	Subject	Topic	LOS	Teaching Hours	Teaching Strategies	Assessment
1	**Anatomy**	**Thorax**	Describe clinical anatomy of thorax including thoracic wall, lungs and trachea-bronchial tree anatomy Correlate the different developmental stages of lung with its congenital anomalies Describe the surface marking of clinically relevant areas of the respiratory system	1	Interactive Lecture	MCQ
2	**Physiology**	**Respiratory System**	Describe the mechanics of ventilation and different volumes and capacities of lungs Describe respiratory gas exchange.	1	Interactive Lecture	MCQ
3	**Biochemistry**	**Biochemical effects of hyperventilation and hypoventilation**	Describe the effects of hyperventilation (e.g. Anxiety) and hypoventilation (e.g. COPD) on pH and blood gases, HCO3 and electrolytes.	1	Interactive Lecture	MCQ
4	**Microbiology**	**Legionella**	Describe Pathogenesis, Structure, Clinical Findings & Laboratory Diagnosis of Legionella infection	1	Interactive Lecture	MCQ
		Mycoplasma	Describe Pathogenesis, Structure, Clinical findings & Laboratory Diagnosis of mycoplasma infection.	1	Interactive Lecture	MCQ
		H-Influenza	Describe Pathogenesis, Structure, Clinical Findings & Laboratory Diagnosis of H-Influenza infection.	1	Interactive Lecture	MCQ
		Bordetella	Describe Pathogenesis, Structure, Clinical Findings & Laboratory Diagnosis of Bordetella infection	1	Interactive Lecture	MCQ

		Mycobacterium Tuberculosis	Describe Pathogenesis, Important Properties, Clinical Findings, Radiological findings & Laboratory Diagnosis of Mycobacterium Tuberculosis.	1	Interactive Lec	MCQ
				2	SGD	
		Pulmonary Infections	Describe community acquired pneumonia and its different types. Describe community acquired atypical Pneumonia. Describe etiology, pathogenesis & clinical features of nosocomial pneumonia. Describe etiology, pathogenesis & clinical features of pneumonia. Describe etiology, pathogenesis & clinical features of chronic pneumonia.	2	Interactive Lec	MCQs
			Define Lung Abscess & Describe Pathogenesis, morphology & Clinical Course of Lung abscess	2	SGD	
			Describe etiology, pathogenesis, clinical & radiologic features of Pulmonary Tuberculosis.			
			Describe pneumonia in immunocompromised host.			
		Granulomatous diseases	Describe sarcoidosis its etiology, pathogenesis, morphology and clinical course.	1	Interactive Lecture	MCQ
			Describe etiology, pathogenesis, clinical & radiologic features of hypersensitivity pneumonitis.			
			Describe etiology, pathogenesis, clinical & radiologic features of pulmonary eosinophilia.			
		Empyema	Describe empyema & its pathogenesis			
5	**Pharmacology**	**Anti-tussives**	Classify Anti-tussives	1	Interactive	MCQ

		Cough Suppressants	Describe the pharmacology of Cough suppressants		Lecture	
		Expectorants	Describe the pharmacology of Expectorants, Mucolytic agents in cough			
		Tuberculosis	Classify Anti tuberculous drugs	2	Interactive Lecture	MCQ
			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	2	SGD	
			Discuss the development of resistance to mycobacterium tuberculosis against conventional antibiotics	1	Interactive Lecture	MCQ
			Discuss the classification & duration of therapy in patients having MDR tuberculosis			
			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.			
6	**Community Medicine**	**Tuberculosis**	Describe agent, host and environmental factors for the disease.	1	Interactive Lecture	MCQ
			Describe DOTS strategy for Tuberculosis			
			Explain different preventive and control measures for Tuberculosis including "stop TB" and "End TB" strategies			

		Influenza and COVID Infection	Describe types of influenza	1	Interactive Lecture	MCQ
			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			
7	**Family medicine**	**Social determinants of health**	Describe the social determinants of health	1	Interactive Lecture	MCQ
		Environmental and climate factors in disease causation	Explain the role of environmental and climate factors in disease causation			
		Principles of prevention and health promotion	Describe the Principles of prevention and health promotion			
			Describe, the role of counselling and patient education in health promotion and disease prevention			
		Tuberculosis (individuals identification , routine contact tracing, and linking to care)	Explain the types of Pulmonary Tuberculosis	1	Interactive Lecture	MCQ
			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			
8		**Asphyxia (General Aspects)**	Define asphyxia	1	Interactive Lecture	MCQ
			Define anoxia			
			Enlist causes of anoxia			
			Explain causes of asphyxia			

	Forensic Medicine		Classify mechanical asphyxia			
			Describe patho physiology of asphyxia			
			Describe general signs of asphyxia			
		Hanging	Define hanging	1	Interactive Lecture	MCQ
			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 medico legal aspects of hanging			
		Mechanical asphyxia (Strangulation)	Define strangulation	1	Interactive Lecture	MCQ
			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 medico legal aspects of strangulation			
		Drowning	Define drowning	1	Interactive Lecture	MCQ
			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 medico legal aspects of drowning			
		Suffocation	Define suffocation and explain its medico legal aspects.	1	Interactive Lecture	MCQ
		Smothering	Define smothering			
			Explain medico legal aspects of smothering			

		Choking	Define choking			
			Explain medico legal aspects of chocking			
		Gagging	Define Gagging			
			Explain medico legal aspects of Gagging			
		Overlaying	Define overlying			
			Explain medico legal aspects of overlying			
		Traumatic asphyxia	Define traumatic asphyxia	1	Interactive Lecture	MCQ
			Describe autopsy findings of traumatic asphyxia			
			Explain medico legal aspects of traumatic asphyxia			
		Sexual asphyxia	Define sexual asphyxia,describe the medicolegal aspect of asphyxia.			
9	**ENT**	**Larynx anatomy**	Describe clinical anatomy of larynx.	1	Interactive Lecture	MCQ
		Laryngitis	Describe etiology, clinical feature, management of acute and chronic laryngitis.			
10	**Medicine**	**Respiratory symptoms**	Describe approach to a patent of respiratory symptomatology	1	Interactive Lecture	MCQ
		Differential diagnosis	Discuss the differential diagnosis of granulomatous inflammation including TB			
		Pulmonary TB	Describe the signs & symptoms, investigations, clinical diagnosis, management protocol & prognosis for TB and MDRTB according to WHO categories.	1	Interactive Lecture	MCQ
11	**Pediatrics**	**Childhood Pneumonia**	Classify pneumonia according to IMNCI (integrated management of neonatal and childhood illnesses)	1	Interactive	MCQ

			Describe the risk factors for recurrent pneumonia in childhood.		Lecture	
			Describe the etiological agents for Pneumonias according to the age of the child.			
			Describe the indication for hospitalization of child with pneumonia.			
12	**Radiology**	**chest x-rays**	Describe the common radiological abnormalities on chest x-rays	1	Interactive Lecture	MCQ

Theme II: Wheezy chest & shortness of breath

Sr. No.	Subjects	Topics	Los	Teaching Hours	Teaching Strategies	Assessment
1	**Pathology**	**Atelectasis**	Define Atelectasis	1	Interactive Lecture	MCQ
			Describe different types of atelectasis Discuss congenital anomalies of the lung			
		Acute Lung injury	Define Acute Respiratory distress Syndrome (ARDS)	1	Interactive Lecture	MCQ
			Describe Pathogenesis and morphological features of ARDS			
		Obstructive Pulmonary disease	Define obstructive pulmonary disease and enlist its different types	2	Interactive	MCQ
			Define Emphysema			
			Describe different types of emphysema			

			Describe the pathogenesis morphology and underline course of emphysema		Lecture	
			Define chronic bronchitis			
			Describe its pathogenesis and morphology			
			Describe asthma and its pathogenesis			
			Differentiate between types of asthma	2	SGD	
			Describe morphology and clinical course of asthma			
			Define bronchiectasis, describe the causes, morphology and pathogenesis of bronchiectasis			
		Restrictive or infiltrative lung diseases	Define diffuse interstitial lung disease.	2	interactive Lecture	MCQ
			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.	2	SGD	
			Describe drug and radiation induced pulmonary diseases.			
		Diseases of vascular origin	Describe pulmonary embolism, hemorrhage and infarction.	1	Interactive	MCQ

			Describe pulmonary Hypertension.		Lecture	
			Describe diffuse alveolar hemorrhage syndromes.			
		Lung tumors	Describe carcinoma of lung, its etiology pathogenesis, morphology and clinical course.	1	Interactive Lecture	MCQ
			Differentiate between small cell lung carcinoma and non-small cell lung carcinoma.			
			Describe bronchial carcinoids			
			Describe malignant mesothelioma and its morphology.			
		Pleural lesions	Describe pleural effusion and pleuritic and empyema	2	SGD	MCQ
			Describe pneumothorax, Hemothorax and chylothorax			
		Diagnosis of Acid Base Disorders	Laboratory diagnosis of acid base disorder (Laboratory investigations for acid base disorder, concept of anion gap, types of acid base disorders and steps to diagnose , ABGs sample collection protocol)	2	Interactive Lecture	MCQ
2	**Pharmacology**	**Bronchial Asthma**	Classify the Drugs used in the treatment of asthma	1	Interactive Lecture	MCQ
			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	2	Interactive Lecture	MCQ
			Describe the pharmacokinetic & pharmacodynamic aspects of Mast cell stabilizers used in Asthma	2	SGD	
			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 asthmatics			
3	**Community Medicine**	**Asthma**	Describe the epidemiology & preventive measures of asthma.	1	Interactive Lecture	MCQ
			Define occupational asthma and describe its preventive measures.			
		Pneumoconiosis	Describe various pneumoconiosis diseases			
			Describe the control and preventive measures of pneumoconiosis			
		Diphtheria and Pertussis	Describe the epidemiological determinants of Diphtheria and Pertussis			
			Describe preventive and control measures.			
			Explain their current public health importance in Pakistan.			
4	**Forensic Medicine**	**Asphyxiant (CO)**		1	Interactive Lecture	MCQ
			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	Enlist sources of CO2 poisoning	1	Interactive Lecture	MCQ
			Describe signs and symptoms of CO2 poisoning			
			Explain treatment plan of CO2 poisoning			
			Describe autopsy findings of CO2 poisoning			
			Explain ML aspects of CO2 poisoning			
			Enlist sources of H2S poisoning			
			Describe signs and symptoms of H2S poisoning.			
		H2S	Explain treatment plan of H2S poisoning			
			Describe autopsy findings of H2S poisoning			
			Explain ML aspects of H2S poisoning			
		War gases	Define war gases			
			Classify war gases			
			Describe medico legal aspects of war gases			
5	**ENT**	**Non –Neoplastic laryngeal lesions**	Describe clinical features and management of different non neoplastic layrangeal lesions (Vocal cords nodules, polyps, and laryngocele)	2	Interactive Lecture	MCQ
		Neoplastic laryngeal lesions	Describe the clinical feature and management of neoplastic laryngeal lesions.			
		Vocal cord Palsy	Describe the clinical feature and management of vocal cord palsy	2	Interactive Lecture	MCQ
		Emergency Tracheotomy	Describe the indication, contraindication, complications, and operative steps to perform			

			emergency tracheotomy.			
6	Medicine	**COPD**	Describe the epidemiology, patho-physiology and etiology of COPD	1	Interactive Lecture	MCQ
			Explain the clinical presentation of COPD			
			Describe the investigations required for the diagnosis of COPD			
			Describe the management plan of COPD			
		Asthma	Describe the epidemiology, pathophysiology, etiology, and contributing factors related to the development of asthma	1	Interactive Lecture	MCQ
			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	Describe the long term Oxygen therapy in COPD	1	Interactive Lecture	MCQ
		Pneumothorax	Describe the etiology, classification, diagnosis and management of pneumothorax	1	Interactive Lecture	MCQ
		Pleural effusion	Describe the causes of exudates and transudate effusion.			
			Differentiate between exudate and transudate effusion.			
7	Family medicine	**COPD**	Explain the management strategies of a patient with COPD in general practice	1	Interactive Lecture	MCQ
			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	Discuss the risk factors for Asthma in our population	1	Interactive Lecture	MCQ
			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)	Differentiate Croup and epiglottitis based on etiology and clinical features.	1	Interactive Lecture	MCQ
			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 air way disease.	Describe the different types of wheezers in pediatric population	1	Interactive Lecture	MCQ
			Discuss the risk factor for persistent wheezing /asthma.			
			Describe management of bronchiolitis			
		Cystic fibrosis and bronchiectasis	Define bronchiectasis and its risk factors.	1	Interactive Lecture	MCQ
			Describe diagnostic criteria for cystic fibrosis.			
			Describe the GI, respiratory and other systemic manifestations of cystic fibrosis.			

8	**Prime/Medical Education**	**Power dynamics**	Explain the concept of power dynamics and delegate powers to juniors and team mates	1	Interactive Lecture	MCQ

Theme 1: Cough with sputum and Fever

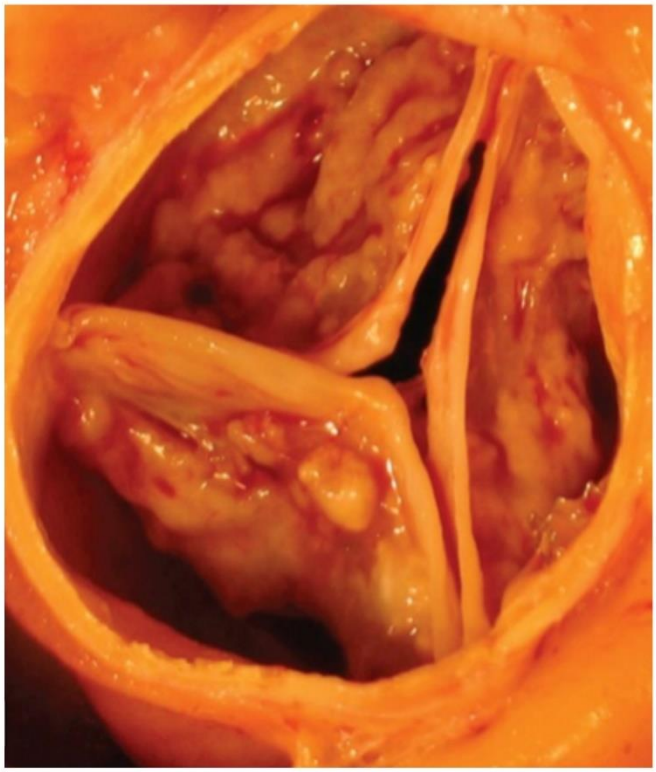
Practicals

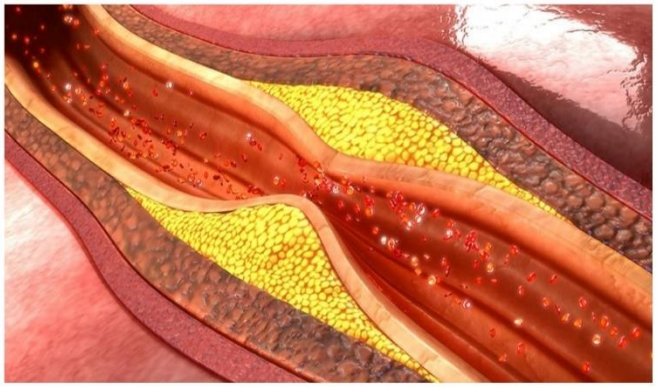
Sr. No.	Subject	Topic	Los	Hours	Teaching Strategy	Assessment
1	**Pharmacology**	Writing Prescription for TB	Write the proper prescription for Pulmonary Tuberculosis	1.5	Skill Lab	OSPE
2	**Forensic Medicine**	Hanging and strangulation	Demonstrate the differences between hanging and strangulation on a model	1.5	Skill Lab	OSPE
			Demonstrate the differences between different types of hanging on a model			
3	**Community Medicine**	Visit	Visit to TB control program center	1.5	Skill Lab	OSPE
		Mask wearing	Demonstrate Identification of different types of masks and its uses.			
			Demonstrate the proper protocol for wearing a mask			
4	**Pharmacology**	Prescription writing Asthmatic patients	Demonstrate the proper stepwise use of metered dose inhaler along with spacer.	1.5	Skill Lab	OSPE
			Write the proper prescription for Acute & Chronic Asthmatic patients			
			Write the proper prescription for patients with Status Asthmaticus			

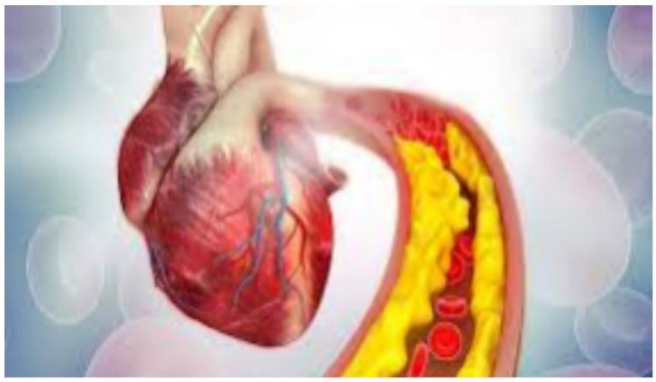
Learning Resources

S#	Subjects	Textbooks
1.	**Community Medicine**	1. Community Medicine by Parikh 2. Community Medicine by M Illyas 3. Basic Statistics for the Health Sciences by Jan W Kuzma
2.	**Forensic Medicine**	1. Nasib R. Awan. Principles and practice of Forensic Medicine 1st ed. 2002. 2. Parikh, C.K. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 7th ed.2005. 3. Knight B. Simpson's Forensic Medicine. 11th ed.1993. 4. Knight and Pekka. Principles of forensic medicine. 3rd ed. 2004 5. Krishan VIJ. Text book of forensic medicine and toxicology (principles and practice). 4th ed. 2007 6. Dikshit P.C. Text book of forensic medicine and toxicology. 1st ed. 2010 7. Polson. Polson's Essential of Forensic Medicine. 4th edition. 2010. 8. Rao. Atlas of Forensic Medicine (latest edition). 9. Rao.Practical Forensic Medicine 3rd ed ,2007. 10. Knight: Jimpson's Forensic Medicine 10th 1991,11th ed.1993 11. Taylor's Principles and Practice of Medical Jurisprudence. 15th ed.1999
3.	**Pathology**	1. Robbins & Cotran, Pathologic Basis of Disease, 9th edition. 2. Rapid Review Pathology, 4th edition by Edward F. Goljan MD

CVS-II MODULE







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Anatomy	Dr. Uzma Ali	Assistant Professor Anatomy Department
Physiology	Dr. Abdul Basit	Assistant Professor Physiology Department
Ophthalmology	Dr. M. Muneeb	Senior Registrar Ophthalmology Department
ENT	Dr. M. Zahid Rafique Gill	Associate Professor E.N.T Department
Medicine	Dr. Zaheer Ahmad	Senior Registrar Medicine Department
Surgery	Dr. Ghulam Mustafa	Assistant Professor Surgery Department
Pediatric Medicine	Pediatric Medicine Department	Dr. Sumaira Hassan Senior Registrar
Gynaecology & Obstetrics	Dr. Ammara Niaz	Assistant Professor Gynaecology & Obstetrics Department
PRIME	Dr. Sinha	PRIME Coordinator
3rd year MBBS	Students	Class 3rd Year MBBS

Cardiovascular-II Module

The cardiovascular system, often referred to as the circulatory system, is a vital network responsible for transporting blood, nutrients, oxygen, carbon dioxide, and hormones throughout the body. This intricate system comprises the heart, blood vessels, and blood, and plays a critical role in maintaining homeostasis and overall health.

At the core of the cardiovascular system is the heart, a muscular organ that functions as a pump to circulate blood. The heart consists of four chambers: two atria and two ventricles. It operates through a series of coordinated contractions, moving blood through two main circuits: the pulmonary circuit and the systemic circuit. The pulmonary circuit carries deoxygenated blood from the heart to the lungs for oxygenation and returns it to the heart. The systemic circuit transports oxygen-rich blood from the heart to the rest of the body and returns deoxygenated blood back to the heart.

Blood vessels, including arteries, veins, and capillaries, form a complex network that facilitates the distribution of blood. Arteries carry blood away from the heart, veins return blood to the heart, and capillaries enable the exchange of gases, nutrients, and waste products between blood and tissues.

Overall, the cardiovascular system is essential for sustaining life by ensuring that every cell in the body receives adequate oxygen and nutrients while removing metabolic wastes. Its efficient function is crucial for overall health and well-being, underscoring the importance of cardiovascular fitness and the prevention of cardiovascular diseases.

Rationale of Cardiovascular System

The cardiovascular system, comprising the heart, blood vessels, and blood, is essential for sustaining life by facilitating the transport of nutrients, gases, and wastes throughout the body. Its primary rationale lies in maintaining homeostasis and ensuring cellular function. The heart pumps oxygen-rich blood through the arteries to tissues, where oxygen and nutrients are exchanged for carbon dioxide and metabolic waste products. This continuous circulation supports cellular respiration and energy production, crucial for maintaining bodily functions and overall health.

Additionally, the cardiovascular system plays a key role in regulating body temperature, fluid balance, and pH levels. It helps to manage the distribution of heat by adjusting blood flow to the skin and vital organs, thereby contributing to thermoregulation. The system also aids in the immune response by transporting white blood cells and antibodies to sites of infection or injury.

Furthermore, the cardiovascular system supports hormonal signaling by delivering hormones from endocrine glands to target tissues, influencing various physiological processes. Overall, the cardiovascular system's intricate network ensures that each cell receives necessary resources and that waste products are efficiently removed, thus sustaining life and enabling the body to adapt to changing conditions.

Teaching Hours Allocation

S. No	Subject	Hours needed
1	Pathology	24
2	Pharmacology	27
3	Forensic medicine	6
4	Community medicine	2
5	General medicine / cardiology	7
6	Pediatrics	2
7	Anatomy	1
8	Physiology	1
9	Biochemistry	1
10	PRIME/MEDICAL EDUCATION	3
Total		**74**

General Learning Objectives

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

- Explain various cardiovascular problems
- Explain anatomy of heart valves, muscles and coronary arteries
- Describe various types of chest pain
- Differentiate between ischemia, infarction and angina
- Understand different drugs used for treatment of hyperlipidemia and chest pain
- Explain the physiology, pathology of hypertention, shock, aortic dissection and aortic aneurysms
- Prescribe different groups of anti-hypertensive drugs according to various co- morbidities
- Explain anatomy, physiology and pathology of heart failure, cardiomyopathies, rheumatic fever and rheumatic heart disease
- Describe drugs for heart failure and rheumatic fever and rheumatic heart diseases

LIST OF THEMES

S. No.	Theme Title	Week No.
Theme 1	Chest Pain	2 (1)
Theme 2	blood pressure	1
Theme 3	Shortness of breath	2 (1)

Learning Objectives

Theme 1: Chest Pain

Sr. #	Subjects	Topics	Learning Objectives	Hours	Teaching strategies	Assessment method
1.	Anatomy	Gross anatomy ofheart, valves andcoronary arteries	Describe surface anatomy of the heart and heart valves	1	Interactive lecture	MCQ
			Describe the anatomy of coronary circulation			
			Enumerate heart valves and describe their gross morphology			
2.	Biochemistry	Lipoproteins and cholesterol	Classify and Describe types of lipoproteins	1	Interactive lecture	MCQ
			Summarize cholesterol synthesis			
3.	Pathology	Atherosclerosis	Discuss the risk factors, Morphology, pathological changes and consequences of Atherosclerotic plaque	1	Interactive lecture	MCQ
		Ischemia and infarction	Define Ischemia and infarction, and differentiate it from infarction	2	Interactive lecture	MCQ
			Discuss Classification and pathophysiology of ischemic heart disease			
			Discuss pathophysiology & morphological features of myocardial infarction			

		Biochemical markers of ischemic heart disease	Define and discuss properties of ideal biochemical marker.	**1**	Interactive lecture	MCQ
			Discuss role of troponins, CKMB, Myoglobin, BNP and NT pro BNP in cardiac diseases			
			Discuss Laboratory diagnosis of hyperlipidemias(Fasting and non fasting lipid profile, Fredrickson classification , Primary and secondary hyperlipidemia)			
4.	**Pharmacology**	**Antianginal drugs**	Classify anti-anginal drugs	**1**	Interactive lecture	MCQ
			Explain mechanism of action, pharmacokinetics and adverseeffects 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	Briefly describe the types of dyslipidemias	2	Interactive lecture	MCQ
			List the lipid lowering drug classes			
			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			
		Anticoagulantdrugs	Classify anti-coagulant drugs	2	Interactive lecture	MCQ
			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 action			
			Explain monitoring of anticoagulant therapy			
			Describe important diet and drug interactions of warfarin			

		Antiplatelet and thrombolytic drugs	Classify antiplatelet drugs	1	Interactive lecture	MCQ
			List indications of antiplatelet therapy			
			Explain the mechanism of action and adverse effects of each antiplatelet drug groups			
			Name thrombolytic drugs and explain their mechanism ofaction, uses and adverse effects			
5.	**Forensic Medicine**					
		Sudden death	Define sudden death	2	Interactive lecture	MCQ
			Explain the causes of sudden death			
			Describe autopsy procedure for detection of pneumothorax and pulmonary thromboembolism in sudden death			
			Describe the medico legal importance of sudden death			
6.	**Community Medicine**	**Non-communicable diseases:** **Cardiovascular diseases of public health importance**	Define Cardiovascular disease (CVD)	2	Interactive lecture	MCQ
			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			
7.	**General Medicine/Cardiology**	**Coronary Heartdisease**	Discuss CAD risk factors and strategies to reduce them	1	Interactive lecture	MCQ
			Discuss strategies for primary and secondary prevention of CHDin outpatient setting			
			Define chronic stable angina, its clinical signs and symptoms, laboratory findings, imaging techniques for assessment of it and management protocols			
			Discuss coronary vasospasm and angina with normal coronary angiograms			
		Acute coronary	Define Acute coronary syndrome	1		

		syndrome	Explain the spectrum of illness in ACS and relevant managementsteps			
			Describe the clinical features and steps of the management of Myocardial infarction			
			Describe risk stratification in myocardial infarction			
			Describe complications of acute MI			
		Hypertrophic cardiomyopathy	Discuss clinical features, imaging protocols, risk stratification and short/long-term management of hypertrophic cardiomyopathy			
8.	**Prime/Medical Education**	**Informed consent**	Obtaining informed consent from a patient before an invasive procedure	1	Interactive lecture	MCQ

Theme II: blood pressure						
Sr. #	**Subjects**	**Topics**	**Los**	**Hours**	**Teaching strategies**	**Assessment method**
1.	**Pathology**	**Hypertension**	Describe the mechanisms of blood pressure regulation Describe the causes,	1	Interactive lecture	MCQ

			Pathogenesis, morphology and complication s of Hypertension Discuss pathophysiology of hypertension in pregnancy			
		Shock	Classify shock	1	Interactiv e lecture	MCQ
			Describe the pathophysiology and types of shock			
			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	2	SGD	
			Describe classification and pathophysiology of Haemorrhage			
		Aneurysms	Describe the etiology, morphology and manifestation of vascular aneurysms	1	Interactiv e lecture	MCQ
			Describe the causes, Pathogenesis and types of Aortic Aneurysms			
		Aortic dissection	Describe the pathogenesis, morphology and clinical features of Aortic Dissection			
		Vasculitis	Define vasculitis			MCQ
			Classify vasculitides			

			Describe the immunological mechanisms of non-infectiousvasculitis	1	Interactive lecture	
			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 Polyarteritisnodosa			
			Describe the morphology and clinical features of Kawasaki disease			
			Describe the morphology, serological markers and clinicalfeatures of Wegener granulomatosis	2	SGD	
			Describe the morphology and clinical features of Thromboangitis obliterans			
		Diseases of veins& lymphatics Vascular tumors	Differentiate between thrombophlebitis and Phlebothrombosis	1	Interactive lecture	MCQ
			Describe the etiology and clinical features of varicose veins Describe lymphangitis, lymphadenitis & Raynaud's phenomenon			
			Enlist the benign and malignant tumors of the arteries and veins	2	SGD	

2.	**Pharmacology**	**Anti-hypertensive drugs**	Classify antihypertensive drugs	3	Interactive lecture	MCQ
			Discuss role of diuretics in the management of hypertension			
			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	1	SGD	
			Describe the direct vasodilators (mechanism of action and drug toxicity) in relation to antihypertensive drug therapy			
			Describe the role of Calcium channel blockers in hypertension			
3.	**General Medicine/Cardiology**	**Hypertension**	Define and Classify hypertension	1	Interactive lecture	MCQ
			Discuss drug treatment protocols for hypertension			
			Describe the risk factors and complications of hypertension			
			Describe the management of hypertensive emergencies and urgencies			
4.	**Forensic medicine**	**Cardiac poisons**	Classify Cardiac Poisons	1	Interactive lecture	MCQ

			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 medicolegal aspects of Oleander			
5	**Prime/Medical Education**	**Counselling skills**	Develops counselling skills in professional life	1	Interactive lecture	MCQ

Theme III: Shortness of breath						
Sr. No.	**Subjects**	**Topics**	**LOS**	**Hours**	**Teaching strategies**	**Assessment method**
1.	**Physiology**	**Cardiac cycle**	Outline major events in cardiac cycle	1	Interactive lecture	MCQ
			Discuss physiology of heart sounds and murmurs			
2.	**Pathology**	**Congestive heartfailure**	Describe the types, etiology, pathogenesis, morphological and clinical features of congestive heart failure	2	Interactive lecture	MCQ
		Cardiomyopathies	Describe the Pathological patterns, causes, morphologicalchanges and clinical features of Cardiomyopathies			
		Congenital heartdiseases	Describe the Etiology, Pathogenesis and clinical	2	Interactive lecture	MCQ

			features of Tetrology of Fallots, ASD, VSD and pulmonary stenosis	2	SGD	
		Valvular heart diseases	Describe the Etiology, pathogenesis and clinical features of Aortic stenosis, Aortic regurgitation, Mitral stenosis and Mitral regurgitation			
		Rheumatic fever	Discuss pathophysiology and laboratory findings in rheumatic fever	1	Interactive lecture	MCQ
		Rheumatic heartdisease	Discuss pathological changes and morphology of rheumatic heart disease			
		Thrombosis and Embolism	Describe the mechanism and pathogenetic mechanisms ofvascular thrombosis	1	Interactive lecture	MCQ
			Enlist hypercoagulable states			
			Define embolism Discuss types of embolism			
			Describe the etiology, pathogenesis, morphology and clinical features of pulmonary embolism			
		Endocarditis	Discuss Etiology, Pathogenesis, Morphology, diagnostic criteria,clinical features and complications of infective endocarditis	1	Interactive lecture	MCQ
			Discuss the types of non-infected vegetation			
3.	**Pharmacology**	**Drugs used in heart failure**	Define the different classes of the drug used in the treatmentof heart failure	4	Interactive lecture	MCQ
			Explain the pharmacological effects, clinical uses, adverse effects and drug interactions of digitalis glycosides			
			Explain the signs symptoms and treatment of digoxin overdose	1	SGD	
			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	Classify antiarrhythmic drugs	2	Interactive lecture	MCQ
			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	1	SGD	
			Discuss workup and management of pulmonary edema			
4.	**General Medicine/Cardiology**	**Heart failure**	Enlist and explain causes of heart failure	1	Interactive lecture	MCQ
			Describe workup and management of heart failure			
		Disorders of heart rate and rhythm	Classify arrhythmias and heart blocks	1	Interactive lecture	MCQ
			Describe the etiology, ECG findings and management of Atrialfibrillation			
			Discuss types, workup and management of ventricular arrhythmias			
		Pulmonary embolism	Describe the etiology, clinical features and diagnostic workup of pulmonary embolism	1	Interactive lecture	MCQ
			Discuss risk stratification and management of pulmonaryembolism			

		Pulmonary hypertension	Discuss cardiac causes of pulmonary hypertension and outlinetheir management			
		Myocarditis	Discuss causes and management of myocarditis	1	Interactive lecture	MCQ
		Pericardial diseases	Define and classify pericarditis			
			Discuss clinical findings and treatment of pericarditis			
			Describe the etiology and management of pericardial effusion			
5.	**Pediatrics**	**Cyanotic and acyanotic congenital heartdisease**	Delineate the difference between the acyanotic and cyanotic heart disease conditions	1	Interactive lecture	MCQ
			Enumerate the various defects, involving both conditions			
		Rheumatic fever	Describe the etiology of rheumatic fever	1	Interactive lecture	MCQ
			Describe Duckett Johns criteria for diagnosis of RF			
			Discuss about primary and secondary prophylaxis of rheumatic heart disease			
6.	**PRIME/ MEDICAL EDUCATION**	**SWOT Analysis**	Perform SWOT analysis for a particular task	1	Interactive lecture	MCQ

Practical						
Sr. No.	**Subject**	**Topics**	**Los**	**Hours**	**Teaching strategy**	**Assessment**
1.	**Pharmacology**	Myocardial Infarction	Construct a prescription for a patient with Myocardial Infarction	1.5	Skill lab	OSPE
		Hypertension	Construct a prescription for a patient with Hypertension	1.5	Skill lab	OSPE
		Congestive Cardiac Failure	Construct a prescription for a patient with Congestive CardiacFailure	1.5	Skill lab	OSPE
2.	**Pathology**	Lipid Profile	Demonstrate Estimation of total cholesterol	1.5	Skill lab	OSPE
		Hemangioma	Identify the morphological changes occurring in hemangioma			
3.	**Forensic medicine**	Cardiac toxins	Identify the following cardiogenic toxins: • Digitalis • Cannabis • Heroin	1.5	Skill lab	OSPE

Learning Resources

S#	Subjects	Textbooks
1.	**Community Medicine**	1. Community Medicine by Parikh 2. Community Medicine by M Illyas 3. Basic Statistics for the Health Sciences by Jan W Kuzma
2.	**Forensic Medicine**	**1.** Nasib R. Awan. Principles and practice of Forensic Medicine 1st ed. 2002. **2.** Parikh, C.K. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 7th ed.2005. **3.** Knight B. Simpson's Forensic Medicine. 11th ed.1993. **4.** Knight and Pekka. Principles of forensic medicine. 3rd ed. 2004 **5.** Krishan VIJ. Text book of forensic medicine and toxicology (principles and practice). 4th ed.2007 **6.** Dikshit P.C. Text book of forensic medicine and toxicology. 1st ed. 2010 **7.** Polson. Polson's Essential of Forensic Medicine. 4th edition. 2010. **8.** Rao. Atlas of Forensic Medicine (latest edition). **9.** Rao.Practical Forensic Medicine 3rd ed ,2007. **10.** Knight: Jimpson's Forensic Medicine 10th 1991,11th ed.1993 **11.** Taylor's Principles and Practice of Medical Jurisprudence. 15th ed.1999
3.	**Pathology**	1. Robbins & Cotran, Pathologic Basis of Disease, 9th edition. 2. Rapid Review Pathology, 4th edition by Edward F. Goljan MD
4.	**Pharmacology**	1. Lippincott Illustrated Pharmacology 2. Basic and Clinical Pharmacology by Katzung
5.	**Anatomy**	K.L. Moore, Clinically Oriented Anatomy

Assessment

Assessment Plan – 3rd Year MBBS

The year-3 will be assessed in 3 blocks

1. **Block-G** (Foundation 2 and Infection and Inflammation modules) will be assessed in paper-G
2. **Block-H** (Multisystem, blood and MSK modules) will be assessed in paper-H
3. **Block-I** (CVS -II and Respiratory – II module) will be assessed in paper-I
4. Each written paper consists of 120 MCQs and
5. Internal assessment will be added to final marks in FMU as shown in below table.
6. In OSPE, each station will be allotted 6 marks, and a total of 120 (+10% marks of internal assessment) marks are allocated for each OSPE/OSCE examination

3rd Professional MBBS Examination in

Theory paper	Modules	Theory marks	Internal assessment theory (10%)	OSPE	Internal assessment OSPE (10%)	Total Marks
Paper G	***Foundation-II***	120	14	120	14	268
	Inf. & Inflammation 1					
Paper H	***Multisystem 1***	120	13	120	14	267
	Blood II					
	MSK-II					
Paper I	***CVS-II***	120	12	120	13	265
	Respiratory-II					
TOTAL MARKS		**360**	**40**	**360**	**40**	**800**

Subject	CVS	Respiratory module	Total MCQs
Pharmacology	12	5	17
Pathology	20	22	42
Forensic medicine	4	9	13
Community medicine	2	6	8
ENT	0	6	6
PRIME	2	1	3
Research	1	1	2
Medicine	13	2	15
Paediatrics	3	5	8

Anatomy	1	1	2
Physiology	1	1	2
Biochemistry	1	1	2
Total	**60**	**60**	**120**

OSPE			
Subject	**OSPE/OSCE**	**Viva stations**	**Total***
Pharmacology	5	2	7
Pathology	2	2	4
Forensic medicine	3	2	5
Community medicine	0	2	2
Medicine ALLIED(Pulmonology)	1	0	1
General Surgery	**1**	**0**	**1**

THEORY

Sr. no.	CRITERIA	NUMBERS
1.	Attendance(>90%=3,80-89%=2,70-79%=1, <70%=0)	3
2.	Creative work/assignments/Task	1
3.	Continuous Assessment throughout block (Formative assessments, Viva Voce, departmental activities)	1
4.	Block examination theory	4
5.	Pre prof Examination of Block	3
	TOTAL	12

OSPE

Sr. No,	Criteria	Numbers
	Attendance=(>90%=3,80-89%=2,70-79%=1, <70%=0)	3
	Log Book/practical copy	3
	Discipline, Responsibility and Team work	3
	Block examination OSPE	4
	TOTAL	13