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LIAQUAT UNIVERSITY

OF MEDICAL & HEALTH SCIENCES JAMSHORO SINDH,

Study Guide

INFECTIOUS DISEASE MODULE

THIRD PROFESSIONAL MBBS

B AT C H 2020-21

ACADEMIC SESSION 2022-23

Module details

Course **MBBS**

Year **One**

Duration of module **07 weeks**

Learning outcomes, **the competent medical practitioner,**
Competencies covered **I (Skillful), and II (Knowledgeable/ problem solver),**

Module assessment **End-module assessment**

Assessment meth **SBQs SEQs, OSPE VIVA**

The Infectious Module Committee:

Module integration committee will comprise members from all the faculties participating in the module.

Module Coordinator

1. Prof. Dr Abid Hussain Chairperson Department of Pathology.

Committee Members

1. Dr. Abdul Karim Soomro Associate Professor Department of Pathology BMC
2. Dr. Gunesh Kumar Assistant Professor Department of Pharmacology.
3. Dr. Muzna Assistant Professor Dept of Pharmacology BMC
4. Dr. Kanwal Naz Lecturer Department of Community Medicine.

Introduction

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

At home, the story is no different. Pakistan is one of several countries, which together bear 95% of the burden of infectious diseases. Pakistan is ranked fifth out of twenty-two on the list of high-burden tuberculosis countries. An alarming average of about one million lives are also claimed yearly by malaria.1 Worst of all, Pakistan is one of the two remaining countries where polio is still endemic2. Hence, it is important to spread knowledge and information on the importance of immunization to the general public. Other factors such as overcrowding, poor hand washing practices and lack of effective prescriptions contribute to further worsening the situation. An estimated 32% of general practitioners in Pakistan fail to administer the proper medication thus increasing the disease burden.

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

Rationale

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

The learnings objectives of introductory session are

After completion of this module student should be able to:

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

General learning outcomes

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

Knowledge

By the end of this module student should be able to;

1. Acquire a high level of clinical proficiency in history taking, physical examination, differential diagnosis, and the effective use of
medicine's evolving diagnostic and procedural capabilities including therapeutic and palliative modalities
2. Manage the common prevalent diseases in community
3. Identify the common medical emergencies
4. Develop plan for prevention of common community diseases
5. Formulate a referral plan
6. Compose a prescription plan

Skills

By the end of this module student should be able to;

1. Demonstrate the ability to perform the disease specific relevant examination
2. Respond to common medical emergencies
3. Master the skill of first aid
4. Perform BLS
5. Apply the best evidenced practices for local health problems

Attitude

By the end of five year MBBS program the KGMC student should be able to

1. Relate to patient and careers vulnerability
2. Demonstrate ethical self-management
3. Counsel and educate patients and their families to empower them to participate in their care and enable shared decision-making.
4. Display compassion with patient and colleagues
5. Demonstrate in clinical care an understanding of the impact of psychological, social, and economic factors on human health and disease

MODULE: 01 [COMMUNITY MEDICINE]
INFECTIOUS DISEASES [COMMUNICABLE DISEASES]

Learning Outcomes:

By the end of the module, student should be able to:

- Understand the basics of communicable disease and its epidemiology
- Discuss the emerging and re-emerging diseases and provide examples.
- Explain the differences among outbreak, epidemics, endemics and pandemics with examples.
- know the different infectious disease control programs in Pakistan
- Understand the chain of transmission of infection and its role in infectious disease control.
- Understand the different infectious agent and their mode of transmission and the disease that they cause.
- Apply the control and prevention measures of specific infections.

Rationale:

Globally, Infectious diseases continues to keep on increasing the list of global public health threats. Understanding the transmission of infections and their effective control is an important public health issue. The purpose of this module is to introduce students to infectious disease/communicable diseases and the agents that cause them. This module will clear the difference between communicable disease and non-communicable disease, distinguish among outbreak, epidemics, endemic, pandemics and emerging and re-emerging disease, explore the different kinds of organisms that cause disease and will be helpful for understanding the control and prevention of specific infection

Structure of the Course:

THEMES

To achieve these overall aims, this module comprises seven weeks including a revision week with a separate theme for almost each week for enhancing learning of students on different aspect of infections.

Theme 1: Revisit
Theme 2: Immuno-pathogenesis
Theme 3: Diagnostic approach to infection
Theme 4: Pyogenic bacteria
Theme 5: Pyogenic bacteria
Theme 6: Pyrexia of unknown origin
Theme 7: Parasitic infections

(1st Week)

Theme 1: Revisit

Real life Scenario: An outbreak of postsurgical wound infections caused by S. aureus has occurred in the hospital. The infection control team was asked to determine whether the organism could be carried by one of the operating room personnel. Using your knowledge of normal microbiota/ flora

Q. Which body sites is the most likely location for this organism?

Q. Define normal microbiota /flora?

Q. What is difference between permanent and transient flora?

Q. What are the benefits and harmful effects of normal flora?

Q. Describe the N. Flora of different parts of human body & which part of body has no normal flora?

Real life Scenario A 50 years old woman with lymphoma. Who is receiving chemotherapy via intravenous catheter. She suddenly developed fever, shacking, chills and hypotension. Blood culture grows a gram -ve rods

Q. In above scenario which component of gram -ve rods (bacteria) is responsible to cause the fever and hypotension

Q. Mention the essential and non-essential component of gram-negative bacteria?

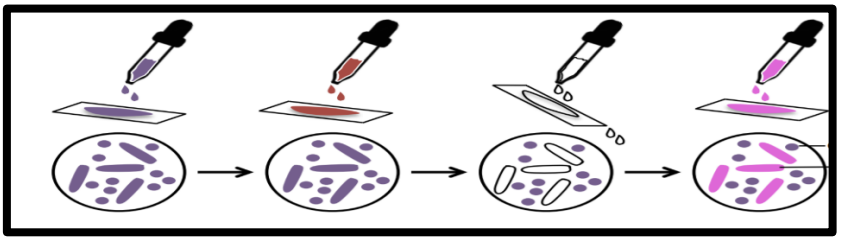
Q. what is the composition of peptidoglycan?

Q. What is periplasmic space & its importance?

Q. What is the significance of LPS (Lipopolysaccharide)?

Q. Define L- forms?

Real life Scenario



Q. Identify the staining procedure?

Q. what are different types of staining procedures?

Q. Name the reagents required for this staining procedure?

Q. what is the principle of this staining?

Q. Differentiate between gram positive & gram-negative bacteria?

S. NO	LEANING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
PATHOLOGY				
01	Enlist essential and non-essential components of a typical bacterial cell with their function	Bacterial Structure	Interactive Lecture	BCQ, SEQ, OSPE
02	Classify bacteria on the basis of Gram staining. Differentiate characteristics of gram- positive and gram-negative bacteria Define normal flora. Describe colonization of normal flora. Name the members of normal flora with their appropriate anatomical locations	Classification of bacteria & normal flora (human microbiota)	Interactive Lecture	BCQ, SEQ, OSPE
03	Define acute inflammation Describe the sequence of vascular changes Define exudates and transudate and their mechanism of formation	General features of inflammation & vascular changes	Interactive Lecture	BCQ, SEQ, OSPE
04	Describe the acute inflammatory cells and their functions. Name the various types of chemical mediators and their role Describe the local and general clinical features of acute inflammation	Cellular events of Chemotaxis, phagocytosis	Interactive Lecture	BCQ, SEQ, OSPE
05	Define chronic Inflammation Describe the characteristic features and types of chronic Inflammation Define granuloma, mention a etiological classification of granuloma with examples	Chronic inflammation	Interactive Lecture	BCQ, SEQ, OSPE
06	Outline various methods for transfer of genetic information in bacterium. Describe the phases of bacterial growth.	Bacterial genetics & bacterial growth	Interactive Lecture	BCQ, SEQ, OSPE
07	State the criteria are used in viral classification Describe the characteristics of DNA and RNA viruses Describe structure of virus	Classification & structure of viruses	Interactive Lecture	BCQ, SEQ, OSPE
08	To demonstrate the principle & procedure of Gram's staining	Gram's staining	Practical	BCQ, SEQ, OSPE
PHARMACOLOGY				
01	Describe the classification , mechanism of action & side effects of penicillin's	Beta lactam antibiotics	Interactive Lecture	BCQ, SEQ, OSPE
02	Describe the classification , mechanism of action & side effects of cephalosporin's & other cell wall synthesis inhibitors	Beta lactam antibiotics	Interactive Lecture	BCQ, SEQ, OSPE
COMMUNITY MEDICINE				
01	To define communicable disease and other basic definitions regarding the infectious disease To differentiate between infection, contamination, pollution, infestation To classify the communicable disease To discuss the infectious disease control programs in Pakistan	Introduction to communicable disease and basic concept and infectious disease control program in Pakistan	Interactive Lecture	BCQ, SEQ, OSPE
02	To understand the chain of infection To describe the various route of transmission of infectious diseases To describe the preventive and control measures of infectious diseases	Chain of transmission & Its role in infectious disease control	Interactive Lecture	BCQ, SEQ, OSPE
03	To discuss the steps of investigation of epidemics (Epidemic endemic, pandemic and steps of investigation of epidemics, explain with examples)	Steps of investigation of epidemics	Interactive Lecture	BCQ, SEQ, OSPE
FORENSIC MEDICINE				
01	Define Forensic Medicine and Toxicology and its various branches Discuss the importance and utility of Forensic	INTRODUCTION Forensic Medicine	Interactive Lecture	BCQ, SEQ, OSPE

	Medicine and Toxicology and its various branches, its role in crime detection and other medical, legal and ethical issues in civilized society. Describe the basics of Legal system in Pakistan Discuss the types of Courts in Pakistan and their powers			
02	Discuss medical ethics and its significance Describe Hippocratic Oath and principles of Bioethics Discuss the duties of doctor as advised by international code of medical ethics	LAWS IN RELATION TO MEDICAL MAN-1: Medical Ethics	Interactive Lecture	BCQ, SEQ, OSPE
03	Define poison, Toxicology and Forensic Toxicology.	Introduction Toxicology	Practical	BCQ, SEQ, OSPE

(2nd Week)

Theme 2: Immuno-pathogenesis

Real life Scenario A 32-year-old woman presents to an emergency department with abdominal pain, fever and watery bloody diarrhea. History shows eating an undercooked egg a day before. Physical exam shows a dehydrated febrile patient. The laboratory cultures salmonella enteritis's from stool sample using selective media

Q. What do you mean by selective media and which selective media is used for Salmonella?
Q. Name the bacteria which produces endotoxins?
Q. How will you differentiate between endotoxin and exotoxin?
Q. Describe mechanism of action and effect of endotoxins?
Q. What is horizontal transmission?
Q. Why MacConkey's agar is called selective and differential media?

Real life Scenario A 60-year-old man presented in opd of a hospital with fever & cough with prulent sputum. Sputum sample was collected and sent to microbiology lab. The lab reported plenty of pus cells with gram +ve cocci in chains. On blood agar these organisms show beta hemolysis.

Q. What is the most likely organism involved in this illness?
Q. How will you differentiate alpha and beta hemolytic organisms on blood agar?
Q. What is the route of transmission of this organism?
Q. What do you mean by vertical transmission and describe different modes by which organisms are transmitted vertically?
Q. What do you mean by virulence factor and name virulence factor in this organism?
Q. Which type of toxin is produced by this organism and name toxin mediated disease produced by gram +ve cocci?

Real life Scenario: A 50 years' woman receiving chemotherapy via a subclavian catheter for acute leukemia has the sudden one set of blindness in her right eye. Her total WBC= 120/microliter. Blood cultures grew budding yeasts that formed germ tubes. Endophthalmitis caused by candida albicans a normal flora of skin enters through unsterilized catheter.

Q. what is the difference between sterilization & disinfection?
Q. Describe the chemical agents used to control microorganisms?
Q. How does moist heat kill microorganisms?
Q. what are the different types of heat applied for microbial control?
Q. describe the autoclave?
Q. what types of radiation are used for sterilization?

SR. NO.	OBJECTIVES	TOPICS	TEACHING STRATEGY	ASSESS MENT
PATHOLOGY				
01	Differentiate b/w true pathogens, opportunists and commensals List the routes of transmission of infection Describe colonization, pathogenesis, spread and excretion of infectious agents.	Bacterial pathogenesis I	Interactive Lecture	BCQ, SEQ, OSPE
02	Differentiate b/w true pathogens, opportunists and commensals List the routes of transmission of infection Describe colonization, pathogenesis, spread and excretion of infectious agents.	Bacterial pathogenesis II	Interactive Lecture	BCQ, SEQ, OSPE
03	Define viral pathogenesis. Describe the effect of virus infection on host cell. Explain specific and non-specific defense mechanism against viral infection.	Viral pathogenesis	Interactive Lecture	BCQ, SEQ, OSPE
04	Describe host defense mechanism against bacteria. Distinguish between passive & active adaptive immunity. To discuss the failure of host defense against infections.	Host defense against bacterial infection	Interactive Lecture	BCQ, SEQ, OSPE
05	Distinguish between innate and acquired immunity Describe the role of interferons, natural killer cells, cytotoxic T cell in viral diseases Explain how interferons limit cell-to-cell spread of viruses.	Host defense against viral infection	Interactive Lecture	BCQ, SEQ, OSPE
06	To demonstrate the principle & procedure of Acid-fast staining.	Acid fast staining	Practical	BCQ, SEQ,
PHARMACOLOGY				
01	Describe classification, mechanism of action & side effects of anti-viral drugs	Anti-viral drugs -1	Interactive Lecture	BCQs, SEQs
02		Anti-viral drugs-2	Interactive Lecture	BCQs, SEQs
COMMUNITY MEDICINE				
01	To define arthropods and classify the wing and wingless insects. To discuss the Common disease transmitted by wing and wingless insects To discuss the Control and preventive measures of wing and wingless insects of medical importance To know Insecticides and their public health importance	Arthropods and their Public Health Importance	Interactive Lecture	BCQ, SEQ, OSPE
02	To discuss the problem statement of malaria To define the malaria and vectors of malaria The describe the epidemiology of Malaria To discuss the preventive and control measures of malaria	Epidemiology & control measure of Malaria	Interactive Lecture	BCQ, SEQ, OSPE
FORENSIC MEDICINE				
01	Describe the composition, functions of Pakistan Medical & Dental Council at present and its role in medical education Define Privileges & obligations of registered medical practitioners	PM & DC	Interactive Lecture	BCQ, SEQ, OSPE
02	Define consent, types of consent & roles of consent in Medical Examination Describe Professional misconduct (Infamous conduct) Discuss Criteria for giving valid consent Define Doctrine of informed consent (Rule of full	Consent	Interactive Lecture	BCQ, SEQ, OSPE

	disclosure) Determine Certain legal deviations/exemptions of consent			
03	Classify poisons. Explain routes of administration and elimination of poisons from the body. Describe the factors modifying action of poisons. Discuss diagnosis of poisoning in living dead. List the common household poisons	General Toxicology: Poison	Practical	BCQ, SEQ, OSPE

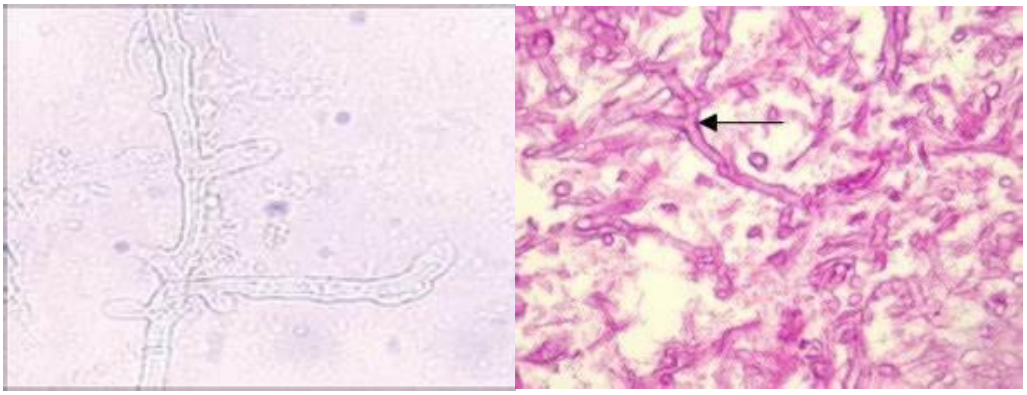
(3rd Week)

Theme 3: Diagnostic approach to infection

Real life Scenario A 75-year-old man had an episode of acute urinary retention and had to be catharized. Two days later he developed fever and suprapubic pain. Urine culture revealed a thin film of bacterial growth over blood agar, non-lactose fermenter colonies on MacConkey's agar and urease test was positive

Q. Name organisms which produce non lactose fermenting colonies on MacConkey's agar?
Q. What are biochemical test media?
Q. What different reactions gram –ve bacilli produced on Triple sugar iron agar?
Q. How will you differentiate between urease +ve and urease –ve medium?
Q. Name two urease +ve and urease –ve bacteria?
Q. Describe stages of an infectious disease?

Real life Scenario A 34-year-old man with diabetic ketoacidosis develops headache, nasal congestion, periorbital swelling and a bloodstained nasal discharge. Over a period of a week he becomes drowsy and unresponsive. ENT examination shows black, necrotic lesions on the nasal septum, which is perforated. A lumbar puncture is performed but the CSF findings are entirely normal. 10% KOH and gram stain is as follows:



Q. What kind of hyphae you see on the fungal smears?
Q. Define different types of hyphae with examples
Q. What is your diagnosis?
Q. You are working in a laboratory, and you see this fungal smear. How will you proceed?
Q. Define Dimorphism?

Q. discuss sexual and asexual reproduction of fungi?

SR. NO.	OBJECTIVES	TOPICS	TEACHING STRATEGY	ASSESS MENT
		PATHOLOGY		
01	Describe the steps of viral replication Explain mode of replication of various RNA and DNA viruses.	Viral Replication	Interactive Lecture	BCQ, SEQ, OSPE
02	Compare and contrast the various methods used to diagnose bacterial diseases Describe various microscopic and culture techniques used for diagnosis Discuss molecular techniques in diagnosis of infectious diseases.	Laboratory diagnosis of bacterial diseases	Interactive Lecture	BCQ, SEQ, OSPE
03	Compare and contrast the various methods used to diagnose viral diseases Describe various microscopic and culture techniques used for diagnosis Discuss molecular techniques in diagnosis of infectious diseases.	Laboratory diagnosis of viral diseases	Interactive Lecture	BCQ, SEQ, OSPE
04	Define healing, repair and regeneration Describe the mechanisms of primary and secondary wound heal	Healing & Repair -1	Interactive Lecture	BCQ, SEQ, OSPE
05	Distinguish the differences between healing by first and secondary intention List the local and general factors influencing healing List the complications of wound healing	Healing & Repair -2	Interactive Lecture	BCQ, SEQ, OSPE
06	Distinguish between fungal & bacterial cell contrast sexual & asexual reproduction of fungi. Define dimorphism Describe pathogenesis, fungal toxins and lab diagnosis of fungi	Basic Mycology	Interactive Lecture	BCQ, SEQ, OSPE
07	Classify culture media Enlist various ingredients used for making culture media Demonstrate selective and biochemical test media	Culture Media	Practical	BCQ, SEQ, OSPE
		COMMUNITY MEDICINE		
01	To define the Leishminasis and its types To understand the epidemiology of Leishminasis To discuss the preventive and control measures of Leishminasis	Epidemiology & control measure of Leishmaniasis	Interactive Lecture	BCQ, SEQ, OSPE
02	To discuss the problem statement of influenza To understand the epidemiology of influenza To define and describe the mode of transmission of influenza To discuss the preventive and control measures of influenza	Epidemiology & control measure of Influenza	Interactive Lecture	BCQ, SEQ, OSPE
		FORENSIC MEDICINE		
01	Define Injury, Hurt, Wound, Assault and Battery?	**TRAUMATOLOGY** Injury	Interactive Lecture	BCQ, SEQ,

	Classify Injuries Describe Blunt weapon injuries- Abrasions, Bruises			OSPE
02	Describe Lacerated wounds, types, mechanism of production and medico legal significance Describe Sharp weapon injuries- Incised wounds, stab wounds with medico legal significance	**TRAUMATOLOGY** Wound	Interactive Lecture	BCQ, SEQ, OSPE
03	Discuss the general treatment / management of poisoning. Discuss the duties of doctor in a case of poisoning. Discuss the forensic aspects of poisons.	Management of Poison	Practical	BCQ, SEQ, OSPE

(4th Week)

Theme 4: Pyogenic bacteria

Real life Scenario A 30-year-old female presents with a pyogenic infection along the suture line 24 hours following a cesarean section surgery. The primary causative agent is identified from a wound biopsy as beta-hemolytic, catalase-positive.

Q. Which organism is likely to be the cause of patient's infection?
Q. Which extracellular enzymes and toxins are produced by this organism?
Q. What are the predominate infections caused by this organism?
Q. How this organism is diagnosed in lab?
Q. What are pyogenic bacteria & which bacteria are included in this group?

Real life Scenario A 46-year-old febrile man was admitted to the hospital. He had been coughing with yellowish expectoration. He also complains of chest pain. Chest X-ray suggest dense left lower consolidation gram's stain of sputum revealed gram positive diplococcic.

Q. What is your diagnosis?
Q. What are the bacterial etiologic agents of pneumonia?
Q. What are the virulence factors of pneumococci?
Q. On what basis will you differentiate pneumococci from streptococcus viridians, as both they produce alpha haemolysis on blood agar?
Q. What is quelling reaction?

Real life Scenario: A young child was brought to the hospital emergency with fever, chills, malaise, sole throat, dysphagia and dyspnea. On examination grayish wide pseudo membrane in throat was noted. A gram stain of pharyngeal membrane shows numerous gram-positive club shaped rods arranged in palisades or V or L- shaped formation.

Q. What is the most likely organism involved in this illness?
Q. What is the route of transmission of this organism?
Q. Describe the mechanism of exotoxin in pathogenesis of disease?
Q. What are the clinical features & complication of disease caused by this organism?
Q. How this organism is diagnosed in lab?
Q. Define Schick's test?

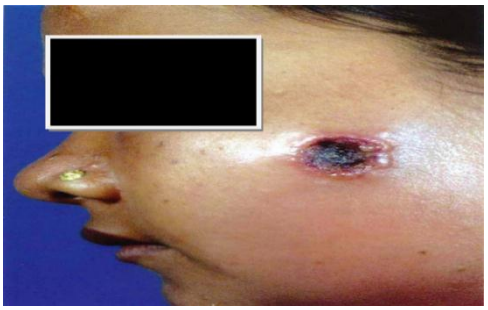
SR. NO.	Objectives	Topics	Teaching Strategy	Assessment
PATHOLOGY				
01	Enlist the species of Staphylococci Enlist the virulence factors & toxins. Describe pyogenic and toxin mediated diseases caused by staphylococcus aureus. Discuss lab diagnosis of staphylococci	Staphylococci	Interactive Lecture	BCQ, SEQ
02	Classify medically important streptococci Describe toxins, enzymes & hemolysins produced by streptococci. Discuss their pyogenic, toxigenic & post streptococcal diseases. Describe the lab diagnosis of streptococci.	Streptococci	Interactive Lecture	BCQ, SEQ
03	Describe morphology, pathogenesis, clinical features and lab diagnosis of Pneumococcus.	Pneumococci	Interactive Lecture	BCQ, SEQ
04	Enlist species of Neisseria . Describe their morphology, pathogenesis and laboratory diagnosis.	Neisseria	Interactive Lecture	BCQ, SEQ
05	Define Diphtheria & Listeriosis. Describe important properties, transmission, pathogenesis of diphtheria & Listeria. Discuss the laboratory diagnosis of Corynebacterium diphtheria & Listeria monocytogens.	Corynebacterium diphtheria & Listeria monocytogens	Interactive Lecture	BCQ, SEQ
06	Describe various microscopic and culture techniques used for diagnosis	Lab diagnosis of gram positive & negative cocci.	Practical	BCQ, SEQ, OSPE
PHARMACOLOGY				
01	Describe classification, mechanism of action & side effects of Aminoglycosides	Antibiotics-1	Interactive Lecture	BCQ, SEQ, OSPE
02	Describe classification, mechanism of action & side effects of tetracyclines & chloromphenicol	Antibiotics-2	Interactive Lecture	BCQ, SEQ, OSPE
03	Describe classification, mechanism of action & side effects of macrolides	Antibiotics-3	Interactive Lecture	BCQ, SEQ, OSPE
04	Describe classification, mechanism of action & side effects flouroquinolones	Antibiotics-4	Interactive Lecture	BCQ, SEQ, OSPE
05	Describe classification, mechanism of action & side effects of sulfonamides & trimethoprim	Antibiotics-5	Interactive Lecture	BCQ, SEQ, OSPE
COMMUNITY MEDICINE				
01	To define the yellow fever To understand the epidemiology of yellow fever To discuss the importance of yellow fever to Pakistan To discuss the preventive and control measures of yellows fever	Epidemiology & control measure of yellow fever	Interactive Lecture	BCQ, SEQ, OSPE
02	To discuss the problem statement of chicken pox To define chickenpox and describe the mode of transmission of	**DROPLET INFECTIONS:** Epidemiology & control measure of Chickenpox	Interactive Lecture	BCQ, SEQ, OSPE

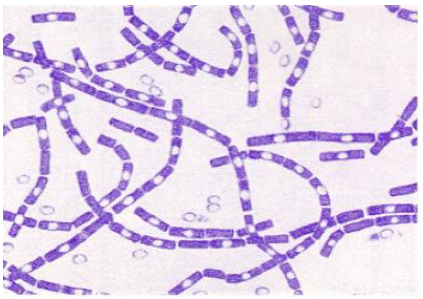
	chickenpox To understand the epidemiology of chickenpox To discuss the preventive and control measures of chickenpox			
03	To discuss the problem statement of Measles, Mumps, Rubella To understand the epidemiology of Measles, Mumps, Rubella To define and describe the modes of transmission of Measles, Mumps, Rubella To describe diagnosis of mumps. To discuss the preventive and control measures of Measles, Mumps, Rubella	Epidemiology & control measure of Measles, Mumps, Rubella	Interactive Lecture	BCQ, SEQ, OSPE
FORENSIC MEDICINE				
01	Define & classify Qisas and Diyat Act with interpretation of injuries accordingly	**TRAUMATOLOGY** Qisas & Diyat	Interactive Lecture	BCQ, SEQ, OSPE
02	Describe Complete and partial identification Describe Identification in living and dead bodies with examples Describe Determination of race Determine Sex and intersex states	**PERSONAL IDENTITY -I** Identification	Interactive Lecture	BCQ, SEQ, OSPE
03	Define food poisoning Describe what causes of food poisoning Explain the effects of food poisoning	Food Poisoning	Practical	BCQ, SEQ, OSPE

(5th Week)

Theme 5: Pyogenic bacteria

Real life Scenario: Malignant pustule black eschar, a necrotic lesion covered by a crust, caused by lethal factor and edema surrounding the eschar caused by another exotoxin called edema factor.





Q. Which bacteria is most likely to be cause of this condition?
Q. How is the capsule of identifying bacteria different from that of most other bacteria?
Q. What is the appearance of bacteria on gram-stained smear?
Q. Describe the mechanism of lethal & edema toxins
Q. name the important gram-positive spore forming bacteria?
Q. What are characteristic symptoms of human clinical anthrax?

Real life Scenario: A 40 years old woman has vomiting and diarrhea with blurred vision and slurred speech after eating canned vegetable and fruit. A few hours later she developed difficulty in speaking, bilateral weakness of her arm, dizziness, dry mouth and muscle paralysis. She is alert, oriented and has no fever.
Q. Which organism is most likely to be the cause of illness and name of this disease?

Q. Name toxins produced by this organism and mechanism of action of toxin?
Q. Name selective medium for culture the organism?
Q. Name other bacteria belong to same species and their pathogenicity?

Real life Scenario: A burn patient develops infection of the burn wound. Culture of the exudate on blood agar produces numerous green pigmented beta hemolytic colonies on blood agar. The organism grows well on MacConkey's agar produces non lactase fermenter colonies. On biochemical reaction no evidence of production of acid on TSI agar and organism is oxidase positive.
Q. Which organism is likely to be the cause of infection?
Q. Name pigments produce by this organism?
Q. What are the predominate infections caused by this organism?
Q. Enlist the virulence factors of this organism?
Q. How this organism is diagnosed in lab?

S. No	Objectives	Topics	Teaching Strategy	Assessment
PATHOLOGY				
01	Outline morphology, pathogenesis, clinical features and lab diagnosis of Bacillus	Bacillus	Interactive Lecture	BCQ, SEQ, OSPE
02	Classify clostridia Describe morphology, pathogenesis, clinical features and lab diagnosis of Clostridia	Clostridia	Interactive Lecture	BCQ, SEQ, OSPE
03	Enlist pathogenic strains of E. coli Describe morphology, virulence factors, cultural characteristics and Lab diagnosis of E.coli and Klebsiella	E.coli & Klebsiella	Interactive Lecture	BCQ, SEQ, OSPE
04	Classify different strains of Salmonella & Shigella Describe antigenic structure and virulence factor of salmonella & Shigella Discuss lab diagnosis of Salmonella & shigella	Salmonella & Shigella	Interactive Lecture	BCQ, SEQ, OSPE
05	Enlist various species of proteus and pseudomonas Describe pathogenesis and lab diagnosis	Proteus & Pseudomonas	Interactive Lecture	BCQ, SEQ, OSPE
06	Describe various microscopic and cultural characteristics used for diagnosis	Lab diagnosis of gram positive bacilli (rods).	Practical	BCQs, SEQs, OSPE
MEDICINE				
01		Typhoid fever	Interactive Lecture	BCQ, SEQ, OSPE
02		Gastroenteritis / Diarrhea / Dysentery	Interactive Lecture	BCQ, SEQ, OSPE
COMMUNITY MEDICINE				
01	To discuss the problem statement of typhoid fever To define the typhoid fever To understand the epidemiology of typhoid fever To discuss the preventive and control measures of Typhoid fever	Epidemiology & control measure of Typhoid	Interactive Lecture	BCQ, SEQ, OSPE
02	To discuss the problem statement of Whooping Cough To understand the epidemiology of Whooping Cough To define Whooping Cough and describe the mode of transmission of Whooping	Epidemiology & control measure of Whooping Cough	Interactive Lecture	BCQ, SEQ, OSPE

	Cough To discuss the preventive and control measures of Whooping Cough			
03	To discuss the problem statement of amoebiasis To Know public health importance of amoebiasis To discuss the Important factors of Agent/Host/Environment responsible for occurrence of amoebiasis To discuss the preventive and control measures of amoebiasis	Epidemiology and control measure of Amoebiasis	Interactive Lecture	BCQ, SEQ, OSPE
FORENSIC MEDICINE				
01	Describe Parameters of identification	Parameter of Identification	Interactive Lecture	BCQ, SEQ,
02	Determine Age estimation in medico legal cases by General examination Discuss Medico legal importance of age	Age	Interactive Lecture	BCQ, SEQ, OSPE
03	Classify corrosive poisons. Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: Caustics Inorganic – sulphuric, nitric, and hydrochloric acids; Organic- Carbolic Acid (phenol), Oxalic and acetylsalicylic acids	corrosives	Practical	BCQ, SEQ,

(6th WEEK)

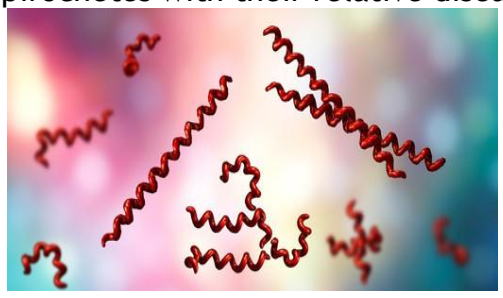
Theme 6: Pyrexia of unknown origin

Real life Scenario: An old man has a 3cm inflamed area on the skin overlying the broken tooth that is draining pus. Sulfur granules are seen in pus located on the orifice of the sinus tract in the skin, Gram stain of pus reveals gram positive filamentous rods.

Q. Which organism is likely to be the cause of infection?
Q. Define Sulfur granules?
Q. What infections are caused by this organism?
Q. How this organism is diagnosed in lab?
Q. Differentiate between Nocardia & Actinomyces?

Real life Scenario:

Q. Name different species of spirochetes with their relative diseases?


Q. what is the mode of transmission of Lyme disease & leptospirosis?
Q. Name different approaches for the diagnosis of spirochetes?
Q. Define erythema chronicum migrans?
Q. describe different stages of syphilis?
Q. How syphilis is diagnosed in laboratory?

S. NO	OBJECTIVES	TOPICS	TEACHING STRATEGY	ASSESS MENT
		PATHOLOGY		
01	Describe the important properties, transmission, pathogenesis, clinical findings and lab diagnosis of wall less & filamentous bacteria	Mycoplasma & actinomycetes	Interactive Lecture	BCQs, SAQs, OSPE
02	Classify the obligate intracellular parasite -Describe the important properties, transmission, pathogenesis, clinical findings and lab diagnosis of Chlamydia & Rickettsia	Chlamydia & Rickettsia	Interactive Lecture	BCQs, SAQs, OSPE
03	Classify the medically important Spirochetes. -Describe the important properties, transmission & clinical findings. -Discuss the lab diagnosis of Syphilis	Spirochetes (Treponema, Borrelia, Leptospira)	Interactive Lecture	BCQs, SAQs, OSPE
04	Classify Herpes virus Describe pathogenesis, clinical presentation and lab diagnosis of herpes virus	Herpes Viruses	Interactive Lecture	BCQs, SAQs, OSPE
05	Define Dengue fever Describe vector, life cycle and clinical manifestation of dengue virus Discuss mode of transmission, pathogenesis and clinical feature of polio virus	Dengue & polio virus	Interactive Lecture	BCQs, SAQs, OSPE
06	Describe various microscopic and culture techniques used for diagnosis	Lab diagnosis of gram negative bacilli (rods)	Practical	BCQs, SEQs, OSPE
		PHARMACOLOGY		
01	Describe the different drug options for treatment of dengue fever	Anti-viral drugs for dengue fever	Interactive Lecture	BCQs, SAQs,
		COMMUNITY MEDICINE		
01	To know the burden of hookworm infestation To describe the epidemiological determinants related to agent/host/ environment To discuss the various preventive and control measures of hookworm infestation	Epidemiology and control measure of hookworm infestation	Interactive Lecture	BCQs, SAQs, OSPE
02	To discuss the problem statement of Meningitis To understand the epidemiology of Meningitis To define Meningitis and describe the mode of transmission of Meningitis To discuss the preventive and control measures of Meningitis	Epidemiology & control measure of Meningitis	Interactive Lecture	BCQs, SAQs, OSPE
03	To discuss the problem statement of dengue fever To discuss the type of dengue fever To understand the epidemiology of dengue fever To discuss the preventive and control measures of dengue fever	Epidemiology & control measure of Dengue Fever	Interactive Lecture	BCQ, SEQ, OSPE
		FORENSIC MEDICINE		
01	Define Forensic Odontology & its medico legal importance	Odontology	Interactive Lecture	BCQs, SAQs, OSPE

02	Define Forensic Radiology & its medico legal importance	Radiology	Interactive Lecture	BCQs, SAQs, OSPE
03	Describe Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination	Chlorinated Comp	Interactive Lecture	BCQs, SAQs, OSPE
MEDICINE				
01		Syphilis	Interactive Lecture	BCQs, SAQs,
02		Dengue Fever	Interactive Lecture	BCQs, SAQs,

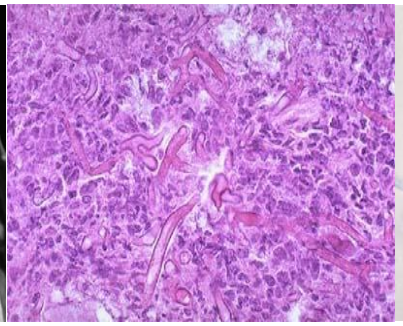
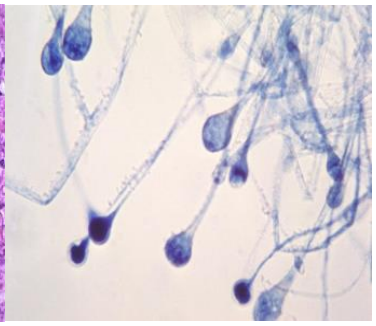
7th Week

Theme 7: Parasitic infections

Real life Scenario: A gynecologist while doing a cesarean section for an HIV positive female got accidently pricked by a needle. After 2- weeks of acquiring the infection, the serum sample was sent for analysis.

Q. Describe the clinical stages of HIV infection?
Q. What are the important mode of transmission of HIV?
Q. Describe the genome of HIV, its genes and their function?
Q. How the HIV infections are diagnosed in the laboratory?
Q. Describe the replicative cycle of HIV?
Q. Discuss the epidemiology & problem statement of HIV/AIDS
Q. what are the preventive and control measure of HIV/AIDS?
Q. Describe the antiviral drugs used for treatment of HIV with their mechanisms and side effects?

Real life Scenario: A 30-year-old woman is neutropenic following bone marrow transplantation. She develops acute onset unilateral facial pain, fever, and nasal discharge. A CT scan of her sinuses is shown, together with Histopathology and microscopy of the fungus cultured from her nasal sinus biopsy sample.

Q. What is the most likely diagnosis?
Q. What is the likely pathogen?
Q. How will you manage this infection?
Q. State their complications?
Q. Classify the systemic and opportunistic fungi?

S. NO	OBJECTIVES	TOPICS	TEACHING STRATEGY	ASSESSMENT
		PATHOLOGY		
01	Describe structure of HIV. Discuss clinical stages of HIV infection Outline opportunistic infection in late stage of AIDS	HIV	Interactive Lecture	BCQs, SAQs, OSPE
02	Describe the life cycle and important properties of Toxoplasma. Relate the pathogenesis to the clinical features and lab Diagnosis of Toxoplasmosis.	Toxoplasma	Interactive Lecture	BCQs, SAQs, OSPE
03	Classify the medically important trematodes. Describe the life cycle , clinical features & lab diagnosis	Trematodes (flukes)	Interactive Lecture	BCQs, SAQs, OSPE
04	Classify the medically important tissue Nematodes. Describe their important properties Clinical findings and laboratory diagnosis.	Tissue Nematodes (wuchereria, Onchocerca, Loa, Dracunculus)	Interactive Lecture	BCQs, SAQs, OSPE
05	Classify & explain the important properties, transmission, pathogenesis, clinical findings and lab diagnosis of cutaneous, systemic and opportunistic fungi.	Cutaneous, systemic and opportunistic mycoses.	Interactive Lecture	BCQs, SAQs, OSPE
06	Define Sterilization and Disinfection. List various methods used for sterilization and disinfection	Sterilization & disinfection	**Practical**	BCQ, SEQ
		PHARMACOLOGY		
01	Describe the antiviral drugs used for treatment of HIV with their mechanisms and side effects.	Antiretroviral drugs	Interactive Lecture	BCQs, SAQs,
02	Classify anti helminths drugs with their mechanism and side effects	Anti-parasitic drugs	Interactive Lecture	BCQs, SAQs,
		COMMUNITY MEDICINE		
01	To discuss the problem statement of Sexually Transmitted disease & HIV/AIDS To define Sexually Transmitted disease & HIV/AIDS To understand the epidemiology of Sexually Transmitted disease & HIV/AIDS To discuss the preventive and control measures of Sexually Transmitted disease & HIV/AIDS	Epidemiology & control measure of Sexually Transmitted disease (STDs) & HIV/AIDS	Interactive Lecture	BCQ, SEQ, OSPE
02		TB sanatorium Kotri	Field Visit	
		FORENSIC MEDICINE		
01	Describe Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to hydrogen cyanide & derivatives	**Veg Poison:** Hydrocyanic acid & Cyanides	Practical	BCQs, SAQs, OSPE
02	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Arsenic, lead, mercury, copper, iron, cadmium and thallium.	**Metallic Poisons:** Arsenic, Mercury poisoning & Lead Poisoning	Practical	BCQs, SAQs, OSPE
		MEDICINE		
01		AIDS	Interactive Lecture	BCQs, SAQs,

BOOKS RECOMMENDED

- **PHARMACOLOGY**
  - Text book of Pharmacology by Katzung Latest Edition
  - Review of Katzung
  - Illustrated Review of Pharmacology by Lippincott Latest Edition
- **GENERAL PATHOLOGY**
  - Basic of Pathology Latest Edition (Robbins)
  - Basis of Disease of Pathology Latest Edition (Robbins)
- **MICROBIOLOGY**
  - Textbook by Levenson
  - Textbook by Jawetz
- **PARASITOLOGY**
  - Text book by Chatterjee
  - Text book by Black Lock
- **COMMUNITY MEDICINE**
  - Text book of Community Medicine & public health by Ilyas shah Ansari
  - Text Book of Prevention & Social Medicine by J E PARK
- **FORENSIC MEDICINE & TOXICOLOGY**
  - Nasib R. Awan. Principles and practice of Forensic Medicine 1st ed. 2002.
  - Parikh, C.K. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 6th ed.1999.
  - Knight B. Simpson's Forensic Medicine. 11th ed.1993.
  - Polson. Polson's Essential of Forensic Medicine. 4th edition. 1985.
  - Taylor. Taylor's Principles and Practice of Medical Jurisprudence. 1984.
  - Gradwhol, R.B.H. Gradwhol's Legal Medicine. 3rd ed.1976.
  - Rao. Atlas of Forensic Medicine.
  - Govindiah. Color Atlas of Forensic Medicine. 1999.
- **CDs:**
  - Lectures on Forensic Medicine.
  - Atlas of Forensic Medicine.

- WEBSITES: www.forensicmedicine.co.uk