

## **OBJECTIVES FOR MBBS (MICROBIOLOGY)**

### **Topic: General Microbiology and Immunity**

<b>MI1.1</b>	<b>Describe the different causative agents of Infectious diseases+A208, the methods used in their detection, and discuss the role of microbes in health and disease</b>
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#### **Objectives**

1. At the end of the session the phase II MBBS students must be able to define infection correctly.
2. At the end of the session the phase II MBBS students must be able to describe types of infection
3. At the end of the session the phase II MBBS students must be able to describe types of infectious disease accurately.
4. At the end of the session the phase II MBBS students must be able to enumerate the causative agents of various infectious diseases.
5. At the end of the session the phase II MBBS students must be able to describe different causative agents of infectious disease.
6. At the end of the session the phase II MBBS students must be able to discuss methods used for microbial detection.
7. At the end of the session the phase II MBBS students must be able to describe the role of microbes in health disease.

<b>MI1.2</b>	<b>Perform and identify the different causative agents of Infectious diseases by Gram Stain, ZN stain and stool routine microscopy</b>
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#### **Objectives**

1. At the end of the session the phase II MBBS students must be able to enumerate different causative agents of infectious disease.
2. At the end of the session the phase II MBBS students must be able to describe the principle of gram staining.
3. At the end of the session the phase II MBBS students must be able to explain the procedure of gram staining.

4. At the end of the session the phase II MBBS students must be able to describe the importance of gram staining.
5. At the end of the session the phase II MBBS students must be able to perform the gram staining under supervision.
6. At the end of the session the phase II MBBS students must be able to perform the gram staining independently.
7. At the end of the session the phase II MBBS students must be able to differentiate different causative agents of infectious disease on the basis of gram staining
8. At the end of the session the phase II MBBS students must be able to describe the principle of Ziehl Neelsen stain
9. At the end of the session the phase II MBBS students must be able to explain the procedure of Ziehl Neelsen stain.
10. At the end of the session the phase II MBBS students must be able to describe the importance of Ziehl Neelsen stain.
11. At the end of the session the phase II MBBS students must be able to perform Ziehl Neelsen staining under supervision.
12. At the end of the session the phase II MBBS students must be able to perform Ziehl Neelsen staining under independently.
13. At the end of the session the phase II MBBS students must be able to identify the causative agent of infectious disease on the basis of Ziehl Neelsen stain slides.
14. At the end of the session the phase II MBBS students must be able to describe the procedure of stool routine microscopy.
15. At the end of the session the phase II MBBS students must be able to discuss the importance of stool routine microscopy.
16. At the end of the session the phase II MBBS students must be able to perform stool routine microscopy under supervision.
17. At the end of the session the phase II MBBS students must be able to perform stool routine microscopy independently.
18. At the end of the session the phase II MBBS students must be able to identify the infectious agents on the basis of stool routine microscopy.

<b>MI1.3</b>	<b>Describe the epidemiological basis of common infectious diseases</b>
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### **Objectives**

1. At the end of the session the phase II MBBS students must be able to describe the transmission of infectious agents with emphasis on reservoir, mode of transmission, susceptible host.
2. At the end of the session the phase II MBBS students must be able to discuss factors predisposing to microbial pathogenicity accurately.

3. At the end of the session the phase II MBBS students must be able to differentiate between exotoxin, endotoxin.
4. At the end of the session the phase II MBBS students must be able to describe the epidemiological basis of common infectious disease.

<b>MI 1.4</b>	<b>Classify and describe the different methods of sterilization and disinfection. Discuss the application of the different methods in the laboratory, in clinical and surgical practice</b>
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### Objectives

1. At the end of the session the phase II MBBS students must be able to define sterilization.
2. At the end of the session the phase II MBBS students must be able to define disinfection.
3. At the end of the session the phase II MBBS students must be able to enumerate different methods of sterilization.
4. At the end of the session the phase II MBBS students must be able to describe different methods of sterilization.
5. At the end of the session the phase II MBBS students must be able to describe dry heat sterilization with emphasis on hot air oven.
6. At the end of the session the phase II MBBS students must be able to describe moist heat sterilization with emphasis on autoclave.
7. At the end of the session the phase II MBBS students must be able to describe criteria for ideal disinfectant.
8. At the end of the session the phase II MBBS students must be able to classify levels of disinfectant.
9. At the end of the session the phase II MBBS students must be able to describe different disinfectants.
10. At the end of the session the phase II MBBS students must be able to discuss application of different methods of sterilization in laboratory practices.
11. At the end of the session the phase II MBBS students must be able to discuss application of different methods of disinfectants in laboratory practices.
12. At the end of the session the phase II MBBS students must be able to discuss application of different methods of sterilization in health care setting.
13. At the end of the session the phase II MBBS students must be able to discuss application of different methods of disinfectants in health care setting.
14. At the end of the session the phase II MBBS students must be able to discuss application of different methods of sterilization in operation theatres and intensive care units.
15. At the end of the session the phase II MBBS students must be able to discuss application of different methods of disinfectants in operation theatres and intensive care units.

<b>MI 1.5</b>	<b>Choose the most appropriate method of sterilization and disinfection to be used in specific situations in the laboratory, in clinical and surgical practice</b>
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### **Objectives**

1. At the end of the session the phase II MBBS students must be able to discuss the most appropriate methods of sterilization in specific situation in the laboratory.
2. At the end of the session the phase II MBBS students must be able to discuss the most appropriate methods of disinfection in specific situation in the laboratory.
3. At the end of the session the phase II MBBS students must be able to discuss the most appropriate methods of sterilization in specific situation in clinical practice.
4. At the end of the session the phase II MBBS students must be able to discuss the most appropriate methods of disinfection in specific situation in clinical practice.
5. At the end of the session the phase II MBBS students must be able to discuss the most appropriate methods of sterilization in specific situation in surgical practice.
6. At the end of the session the phase II MBBS students must be able to discuss the most appropriate methods of disinfection in specific situation in surgical practice.

<b>MI1.6</b>	<b>Describe the mechanisms of drug resistance, and the methods of antimicrobial susceptibility testing and monitoring of antimicrobial therapy</b>
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### **Objectives**

1. At the end of the session the phase II MBBS students must be able to describe the mechanism of drug resistance.
2. At the end of the session the phase II MBBS students must be able to describe different methods of antimicrobial susceptibility testing.
3. At the end of the session the phase II MBBS students must be able to describe monitoring of antimicrobial therapy.

<b>MI1.7</b>	<b>Describe the immunological mechanisms in health</b>
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### **Objectives**

1. At the end of the session the phase II MBBS students must be able to define antigen.
2. At the end of the session the phase II MBBS students must be able to classify antigen.
3. At the end of the session the phase II MBBS students must be able to describe factors of antigenicity.
4. At the end of the session the phase II MBBS students must be able to discuss superantigen.
5. At the end of the session the phase II MBBS students must be able to define antibodies.
6. At the end of the session the phase II MBBS students must be able to discuss properties of antibodies.
7. At the end of the session the phase II MBBS students must be able to describe structure of antibodies.
8. At the end of the session the phase II MBBS students must be able to classify Immunoglobulin.
9. At the end of the session the phase II MBBS students must be able to enumerate all classes of Immunoglobulin.
10. At the end of the session the phase II MBBS students must be able to define complement system.
11. At the end of the session the phase II MBBS students must be able to describe classical pathway.
12. At the end of the session the phase II MBBS students must be able to describe alternate pathway.
13. At the end of the session the phase II MBBS students must be able to discuss biological effects of complement.

<b>MI1.8</b>	<b>Describe the mechanisms of immunity and response of the host immune system to infections</b>
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### **Objectives**

1. At the end of the session the phase II MBBS students must be able to define Immunity.
2. At the end of the session the phase II MBBS students must be able to describe Innate Immunity.
3. At the end of the session the phase II MBBS students must be able to describe mechanism of Innate Immunity.
4. At the end of the session the phase II MBBS students must be able to describe Acquired Immunity.
5. At the end of the session the phase II MBBS students must be able to describe mechanism of Acquired Immunity.

6. At the end of the session the phase II MBBS students must be able to describe type of immune response.
7. At the end of the session the phase II MBBS students must be able to elicit Humoral Immune response
8. At the end of the session the phase II MBBS students must be able to describe Monoclonal antibodies.
9. At the end of the session the phase II MBBS students must be able to elicit cell mediated immune response.

<b>MI1.9</b>	<b>Discuss the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing infectious diseases</b>
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### Objectives

1. At the end of the session the phase II MBBS students must be able to discuss immunological basis of vaccine.
2. At the end of the session the phase II MBBS students must be able to discuss /describe active immunization
3. At the end of the session the phase II MBBS students must be able to discuss /describe passive immunization
4. At the end of the session the phase II MBBS students must be able to discuss /describe combined active and passive immunization
5. At the end of the session the phase II MBBS students must be able to describe Universal immunization schedule.

<b>MI1.10</b>	<b>Describe the immunological mechanisms in immunological disorder (hypersensitivity, autoimmune disorders and immunodeficiency states) and discuss the laboratory methods used in detection.</b>
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### Objectives

1. At the end of the session the phase II MBBS students must be able to define hypersensitivity.
2. At the end of the session the phase II MBBS students must be able to list classification of hypersensitivity.

3. At the end of the session the phase II MBBS students must be able to distinguish between Immediate and delayed type of hypersensitivity.
4. At the end of the session the phase II MBBS students must be able to describe type I (anaphylactic) hypersensitivity along with example.
5. At the end of the session the phase II MBBS students must be able to describe type II (Cytotoxic) hypersensitivity along with example.
6. At the end of the session the phase II MBBS students must be able to describe type III (Immune complex) hypersensitivity along with example.
7. At the end of the session the phase II MBBS students must be able to describe type IV (Delayed / Cell Mediated) hypersensitivity along with example.
8. At the end of the session the phase II MBBS students must be able to enumerate type V (Stimulatory type) hypersensitivity along with example.
9. At the end of the session the phase II MBBS students must be able to describe / discuss the laboratory, methods used in detection of different hypersensitivity reaction.
10. At the end of the session the phase II MBBS students must be able to define Autoimmunity.
11. At the end of the session the phase II MBBS students must be able to describe different mechanism of autoimmunity.
12. At the end of the session the phase II MBBS students must be able to classify autoimmune disease.
13. At the end of the session the phase II MBBS students must be able to describe pathogenesis of autoimmune disease.
14. At the end of the session the phase II MBBS students must be able to discuss the laboratory methods used in detection of different autoimmune disease.
15. At the end of the session the phase II MBBS students must be able to define Immunodeficiency disease.
16. At the end of the session the phase II MBBS students must be able to classify Immunodeficiency disease.
17. At the end of the session the phase II MBBS students must be able to describe primary Immunodeficiency disease.
18. At the end of the session the phase II MBBS students must be able to describe secondary Immunodeficiency disease.
19. At the end of the session the phase II MBBS students must be able to discuss the laboratory methods used in detection of Immunodeficiency disease.

<b>MI1.11</b>	<b>Describe the immunological mechanisms of transplantation and tumor immunity</b>
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### **Objectives**

1. At the end of the session the phase II MBBS students must be able to define various types of transplants.
2. At the end of the session the phase II MBBS students must be able to describe allograft reaction.
3. At the end of the session the phase II MBBS students must be able to discuss Histocompatibility antigen.
4. At the end of the session the phase II MBBS students must be able to describe Graft versus Host reaction.
5. At the end of the session the phase II MBBS students must be able to describe role of immunity in tumor (Tumor immunity)
6. At the end of the session the phase II MBBS students must be able to describe tumor antigen.

### **Topic: Cardiovascular system and Blood**

<b>MI2.1</b>	<b>Describe the etiologic agents in rheumatic fever and their diagnosis</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to enumerate the etiologic agents of rheumatic fever.
2. At the end of phase II sessions, MBBS students must be able to describe the diagnosis of rheumatic fever.

<b>MI2.2</b>	<b>Describe the classification etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis</b>
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### **Objectives**



1. At the end of phase II session, MBBS students must be able to list the etiology-pathogenesis of Infective endocarditis.
2. At the end of phase II session, MBBS students must be able to describe the pathogenesis of Infective endocarditis.
3. At the end of phase II session, MBBS students must be able to describe the clinical features of Infective endocarditis.
4. At the end of phase II session, MBBS students must be able to elaborate the diagnostic modalities of Infective endocarditis.

<b>MI2.3</b>	<b>Identify the microbial agents causing Rheumatic heart disease &amp; infective Endocarditis</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to enumerate the microbial agents causing Rheumatic Heart Disease & Infective endocarditis.
2. At the end of phase II session, MBBS students must be able to identify the microbial agents causing Rheumatic Heart Disease.
3. At the end of phase II session, MBBS students must be able to identify the microbial agents causing Infective endocarditis.

<b>MI2.4</b>	<b>List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to list the common microbial agents causing anemia.
2. At the end of phase II session, MBBS students must be able to describe the morphology, mode of infection of microbial
3. agents causing anemia.
4. At the end of phase II session, MBBS students must be able to discuss the pathogenesis, clinical cause of microbial agents
5. causing anemia.
6. At the end of phase II session, MBBS students must be able to elaborate diagnosis, prevention, treatment of microbial agents causing anemia.

<b>MI2.5</b>	<b>Describe the etio-pathogenesis and discuss the clinical evolution and the laboratory diagnosis of kala azar, malaria, filariasis and other common parasites prevalent in India</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to describe the etio-pathogenesis of common parasites prevalent in India like Kala-azar, Malaria, Filaria.
2. At the end of phase II session, MBBS students must be able to discuss the clinical presentation of common parasites prevalent in India like Kala-azar, Malaria, Filaria.
3. At the end of phase II session, MBBS students must be able to describe the lab diagnosis of common parasites prevalent in India like Kala-azar, Malaria, Filaria.

<b>MI2.6</b>	<b>Identify the causative agent of malaria and filariasis</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to list the causative parasites of Malaria.
2. At the end of phase II session, MBBS students must be able to enumerate the causative agents of Filariasis.
3. At the end of phase II session, MBBS students must be able to identify the causative agents of Malaria in peripheral smear.
4. At the end of phase II session, MBBS students must be able to identify the causative agents of Filariasis in peripheral smear.

<b>MI2.7</b>	<b>Describe the epidemiology, the etio-pathogenesis, evolution, complications, opportunistic infections, diagnosis, prevention and the principles of management of HIV</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to describe morphology of

2. Human Immunodeficiency Virus.
3. At the end of phase II session, MBBS students must be able to explain mode of transmission of Human Immunodeficiency Virus infection.
4. At the end of phase II session, MBBS students must be able to discuss opportunistic infections associated with Human Immunodeficiency Virus infection.
5. At the end of phase II session, MBBS students must be able to describe pathogenesis of Human Immunodeficiency Virus infection.
6. At the end of phase II session, MBBS students must be able to discuss laboratory diagnosis of Human Immunodeficiency Virus infection.
7. At the end of phase II session, MBBS students must be able to classify strategies for Human Immunodeficiency Virus testing in India.
8. At the end of phase II session, MBBS students must be able to discuss post exposure prophylaxis of Human Immunodeficiency Virus.
9. At the end of phase II session, MBBS students must be able to describe Antiretroviral drugs for Human Immunodeficiency Virus.

**Topic:Gastrointestinal and hepatobiliary system**

<b>MI3.1</b>	<b>Enumerate the microbial agents causing diarrhea and dysentery. Describe the epidemiology, morphology, pathogenesis, clinical features, and diagnostic modalities of these agents</b>
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**Objectives**

1. At the end of phase II session, MBBS students must be able to define Diarrhoea.
2. At the end of phase II session, MBBS students must be able to define Dysentery.
3. At the end of phase II session, MBBS students must be able to enumerate the microbial agents causing Diarrhoea.
4. agents causing Diarrhoea.
5. At the end of phase II session, MBBS students must be able to enumerate the microbial agents causing Dysentery.
6. agents causing Dysentery.
7. At the end of phase II session, MBBS students must be able to describe the pathogens of Diarrhoea.
8. At the end of phase II session, MBBS students must be able to describe the pathogens of Dysentery.
9. At the end of phase II session, MBBS students must be able to elicit clinical features of Diarrhoea diseases.
10. At the end of phase II session, MBBS students must be able to describe diagnostic modelitis of bacillary Dysentery.

<b>MI3.2</b>	<b>Identify the common etiologic agents of diarrhea and dysentery</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to identify common etiological agents of diarrhoea by performing stool Routine examination.
2. At the end of phase II session, MBBS students must be able to identify common etiological agents of dysentery by performing stool routine microscopy.
3. At the end of phase II session, MBBS students must be able to perform modified Z.N stain to identify oocysts.

<b>MI3.3</b>	<b>Describe the enteric fever pathogens and discuss the evolution of the clinical course, the laboratory diagnosis of the diseases caused by them</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to define Enteric Fever.
2. At the end of phase II session, MBBS students must be able to enlist causative agents of Enteric Fever.
3. At the end of phase II session, MBBS students must be able to describe the pathogenesis of Enteric Fever caused by *salmonella* species.
4. At the end of phase II session, MBBS students must be able to discuss laboratory diagnosis of Enteric Fever.

<b>MI3.4</b>	<b>Identify the different modalities for diagnosis of enteric fever. Choose the appropriate test related to the duration of illness</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to identify different modalities for diagnosis of Enteric Fever.
2. At the end of phase II session, MBBS students must be able to perform widal test for diagnosis of Enteric Fever.
3. At the end of phase II session, MBBS students must be able to Interpret result of widal test.

<b>MI3.5</b>	<b>Enumerate the causative agents food poisoning and discuss the pathogenesis, clinical course and laboratory diagnosis</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to define Food Poisoning accurately.
2. At the end of phase II session, MBBS students must be able to enumerate the etiology of food poisoning.
3. At the end of phase II session, MBBS students must be able to discuss the pathogenesis of Food Poisoning.
4. At the end of phase II session, MBBS students must be able to describe the clinical course of Food Poisoning.
5. At the end of phase II session, MBBS students must be able to discuss the laboratory diagnosis of Food Poisoning.

<b>MI3.6</b>	<b>Describe the etio-pathogenesis of Acid Peptic disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD.</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to define Acid peptic disease.
2. At the end of phase II session, MBBS students must be able to enumerate the cause of Acid peptic ulcer.
3. At the end of phase II session, MBBS students must be able to describe the etiopathogenesis of Acid peptic ulcer.
4. At the end of phase II session, MBBS students must be able to describe the clinical course of Acid peptic ulcer.
5. At the end of phase II session, MBBS students must be able to discuss the diagnosis of *Helicobacter pylori*.

6. At the end of phase II session, MBBS students must be able to discuss the management of *Helicobacter pylori*.

<b>MI3.7</b>	<b>Describe the epidemiology, the etio-pathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis, and prevention of viral hepatitis</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to define Viral Hepatitis.
2. At the end of phase II session, MBBS students must be able to discuss the epidemiology of Viral Hepatitis.
3. At the end of phase II session, MBBS students must be able to describe the etio-pathogenesis of Viral Hepatitis.
4. At the end of phase II session, MBBS students must be able to discuss the viral markers in the evolution of Viral Hepatitis.
5. At the end of phase II session, MBBS students must be able to discuss various modalities in the diagnosis of Viral Hepatitis.
6. At the end of phase II session, MBBS students must be able to discuss the prevention of Viral Hepatitis.

<b>MI3.8</b>	<b>Choose the appropriate laboratory test in the diagnosis of viral hepatitis</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to discuss the appropriate laboratory test to be used in the diagnosis of viral hepatitis with emphasis on viral markers.

## **Topic: [Musculoskeletal system skin and soft tissue infection](#)**

<b>MI4.1</b>	<b>Describe the etiologic agents in rheumatic fever and their diagnosis</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to enumerate microbial agents causing anaerobic infections.
2. At the end of phase II session, MBBS students must be able to describe the etiopathogenesis of anaerobic infections.
3. At the end of phase II session, MBBS students must be able to describe the clinical course of anaerobic infections.
4. At the end of phase II session, MBBS students must be able to discuss the laboratory of anaerobic infections.

<b>MI4.2</b>	<b>Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of bone and joint infection.</b>
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### **Objectives**

1. At the end of Phase II session, MBBS students must be able to describe the etiopathogenesis of Bone & Joint infections.
2. At the end of Phase II session, MBBS students must be able to describe the clinical course of Bone & Joint infections.
3. At the end of Phase II session, MBBS students must be able to discuss the laboratory diagnosis of Bone & Joint infections.

<b>MI4.3</b>	<b>Describe the etiopathogenesis of infection of skin and soft tissue and discuss the clinical course and the laboratory diagnosis</b>
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### **Objectives**

1. At the end of Phase II session, MBBS students must be able to list the etiological of Skin and Soft tissue.
2. At the end of Phase II session, MBBS students must be able to describe pathogenesis of Skin and Soft tissue.
3. At the end of Phase II session, MBBS students must be able to describe the clinical course of Skin and Soft tissue.
4. At the end of Phase II session, MBBS students must be able to discuss/describe the laboratory diagnosis of Skin and Soft tissue.

## **Topic: Central Nervous System infections**

<b>MI5.1</b>	<b>Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis</b>
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### **Objectives**

- a) At the end of Phase II session, MBBS students must be able to list various etiological agents causing Meningitis.
- b) At the end of Phase II session, MBBS students must be able to describe pathogenesis of different Meningitis.
- c) At the end of Phase II session, MBBS students must be able to describe the clinical course of Meningitis.
- d) At the end of Phase II session, MBBS students must be able to discuss the laboratory diagnosis of Meningitis.
- e) At the end of Phase II session, MBBS students must be able to describe characteristics features of Cerebral spinal fluid in different types of Meningitis.
- f) At the end of Phase II session, MBBS students must be able to describe Tuberculosis Meningitis.
- g) At the end of Phase II session, MBBS students must be able to describe Pyogenic Meningitis.
- h) At the end of Phase II session, MBBS students must be able to describe Aseptic Meningitis.

<b>MI5.2</b>	<b>Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of Encephalitis</b>
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### **Objectives**

1. At the end of Phase II session, MBBS students must be able to list the etiological of Encephalitis
2. At the end of Phase II session, MBBS students must be able to describe pathogenesis of Encephalitis.
3. At the end of Phase II session, MBBS students must be able to describe the clinical course of Encephalitis.



4. At the end of Phase II session, MBBS students must be able to discuss the laboratory diagnosis of Encephalitis.

<b>MI5.3</b>	<b>Identify the microbial agents causing meningitis</b>
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### Objectives

1. At the end of Phase II session, MBBS students must be able to perform undersupervision Gram's Staining.
2. At the end of Phase II session, MBBS students must be able to perform independently Gram's Staining.
3. At the end of Phase II session, MBBS students must be able to perform undersupervision Ziehl- Neelsen Staining.
4. At the end of Phase II session, MBBS students must be able to perform independently Ziehl-Neelsen Staining.
5. At the end of Phase II session, MBBS students must be able to document different culture media used for inoculation of Cerebral spinal fluid specimen.
6. At the end of Phase II session, MBBS students must be able to document different culture media used for inoculation/culture of Blood specimen.
7. At the end of Phase II session, MBBS students must be able to identify different culture media used for Cerebral spinal fluid culture.
8. At the end of Phase II session, MBBS students must be able to identify different culture media used for Blood culture.
9. At the end of Phase II session, MBBS students must be able to interpret Gram's Stain slides.
10. At the end of Phase II session, MBBS students must be able to interpret Ziehl-Neelsen Stain slides.

### Topic: Respiratory tract infections

<b>MI6.1</b>	<b>Describe the etiopathogenesis, laboratory diagnosis and prevention of infection of upper &amp; lower respiratory tract</b>
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### Objectives

1. At the end of Phase II session, MBBS students must be able to enumerate the microbial agents causing infection of upper respiratory tract.
2. At the end of Phase II session, MBBS students must be able to enumerate the microbial agents causing infection of lower respiratory tract.
3. At the end of Phase II session, MBBS students must be able to describe the pathogenesis of infection of upper respiratory tract.
4. At the end of Phase II session, MBBS students must be able to describe the pathogenesis of infection of lower respiratory tract
5. At the end of Phase II session, MBBS students must be able to laboratory diagnosis of infection of upper respiratory tract.
6. At the end of Phase II session, MBBS students must be able to laboratory diagnosis of infection of lower respiratory tract.
7. At the end of Phase II session, MBBS students must be able to describe the prevention of infections of upper respiratory tract.
8. At the end of Phase II session, MBBS students must be able to describe the prevention of infections of lower respiratory tract.

<b>MI6.2</b>	<b>Identify the common etiologic agents of upper respiratory tract infection (Gram Stain)</b>
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### Objectives

1. At the end of Phase II session, MBBS students must be able to make a smear of upper respiratory tract sample ( Throat swab, sputum).
2. At the end of Phase II session, MBBS students must be able to to perform undersupervision the Gram's staining.
3. At the end of Phase II session, MBBS students must be able to to perform independently the Gram's staining
4. At the end of Phase II session, MBBS students must be able to identify the common etiological agents causing Upper respiratory tract infection.

<b>MI6.3</b>	<b>Identify the common etiologic agents of lower respiratory tract infections (Gram Stain Acid fast stain)</b>
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### Objectives

1. At the end of Phase II session, MBBS students must be able to make a smear of lower respiratory tract sample ( Broncho alveolar lavage, Endotracheal secretions, Transtracheal secretions etc.)
2. At the end of Phase II session, MBBS students must be able to perform undersupervision the Gram's staining .
3. At the end of Phase II session, MBBS students must be able to perform independently the Gram's staining .
4. At the end of Phase II session, MBBS students must be able to perform undersupervision Acid fast staining.
5. At the end of Phase II session, MBBS students must be able to perform independently Acid fast staining.
6. At the end of Phase II session, MBBS students must be able to identify common etiological agents causing Lower respiratory tract infection in both the stains.

**Topic: Genitourinary & Sexually transmitted infections**

<b>MI7.1</b>	<b>Describe the etiopathogenesis, laboratory diagnosis of infection in Genitourinary system</b>
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**Objectives**

1. At the end of Phase II session, MBBS students must be able to describe the etiological of infections of Genito-urinary system.
2. At the end of Phase II session, MBBS students must be able to describe the pathogenesis of infections of Genito-urinary system.
3. At the end of Phase II session, MBBS students must be able to discuss the laboratory diagnosis of infections of Genito-urinary system.

<b>MI7.2</b>	<b>Describe the etiopathogenesis, laboratory diagnosis of infection in Sexually transmitted infections. Recommend preventive measures.</b>
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**Objectives**

1. At the end of Phase II session, MBBS students must be able to define Sexually transmitted disease.

2. At the end of Phase II session, MBBS students must be able to enumerate the etiology of Sexually transmitted disease.
3. At the end of Phase II session, MBBS students must be able to describe the pathogenesis of Sexually transmitted disease.
4. At the end of Phase II session, MBBS students must be able to discuss the laboratory diagnosis of sexually transmitted disease.
5. At the end of Phase II session, MBBS students must be able to recommend the preventive measures for Sexually transmitted disease.

<b>MI7.3</b>	<b>Describe the etiopathogenesis, clinical features, the appropriate method of specimen collection, and discuss the laboratory diagnosis of Urinary tract infections.</b>
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### **Objectives**

1. At the end of Phase II session, MBBS students must be able to define Urinary tract infection.
2. At the end of Phase II session, MBBS students must be able to enumerate the etiology of Urinary tract infection.
3. At the end of Phase II session, MBBS students must be able to describe the pathogenesis of Urinary tract infection.
4. At the end of Phase II session, MBBS students must be able to describe the clinical feature associated with Urinary tract infection.
5. At the end of Phase II session, MBBS students must be able to discuss the appropriate method for specimen collection in cases of Urinary tract infection.
6. At the end of Phase II session, MBBS students must be able to discuss the laboratory diagnosis of Urinary tract infection.
7. At the end of Phase II session, MBBS students must be able to recommend the prevention measures for Urinary tract infections.

### **Topic: Zoonotic diseases and miscellaneous**

<b>MI8.1</b>	<b>Enumerate the microbial agents and their vectors causing zoonotic diseases. Describe the morphology, mode of transmission, pathogenesis and discuss the clinical course, laboratory diagnosis</b>
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	<b>and prevention.</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to enumerate microbial agents causing Zoonotic diseases.
2. At the end of phase II session, MBBS students must be able to list the vectors causing Zoonotic diseases.
3. At the end of phase II session, MBBS students must be able to describe the morphology of different microbial agents causing zoonotic diseases.
4. At the end of phase II session, MBBS students must be able to describe the mode of transmission of different Zoonotic diseases.
5. At the end of phase II session, MBBS students must be able to enumerate the pathogenesis of Zoonotic diseases.
6. At the end of phase II session, MBBS students must be able to discuss the clinical course of different Zoonotic diseases.
7. At the end of phase II session, MBBS students must be able to discuss the laboratory diagnosis of Zoonotic diseases.
8. At the end of phase II session, MBBS students must be able to list the prevention of Zoonotic diseases.

<b>MI8.2</b>	<b>Describe the etio-pathogenesis of opportunistic infections (OI) and discuss the factors contributing to the occurrence of OI, and the laboratory diagnosis</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to define Opportunistic infections.
2. At the end of phase II session, MBBS students must be able to list etiology of Opportunistic infections.
3. At the end of phase II session, MBBS students must be able to describe pathogenesis of Opportunistic infections.
4. At the end of phase II session, MBBS students must be able to discuss the factors contributing to the occurrence of Opportunistic infections.

5. At the end of phase II session, MBBS students must be able to discuss the laboratory diagnosis of Opportunistic infections.

<b>MI8.3</b>	<b>Describe the role of oncogenic viruses in the evolution of virus associated malignancy</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to list the names of Oncogenic viruses.
2. At the end of phase II session, MBBS students must be able to describe the pathogenesis of Oncogenesis viruses.
3. At the end of phase II session, MBBS students must be able to classify Virus associated Malignancies.
4. At the end of phase II session, MBBS students must be able to enumerate/describe role of Oncogenic viruses in the evolution of virus associated Malignancies.

<b>MI8.4</b>	<b>Describe the etiologic agents of emerging infectious diseases. Discuss the clinical course and diagnosis</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to describe the etiological agents of Emerging Infectious diseases.
2. At the end of phase II session, MBBS students must be able to list the Emerging infectious diseases.
3. At the end of phase II session, MBBS students must be able to discuss the clinical course of Emerging infectious diseases.
4. At the end of phase II session, MBBS students must be able to discuss the lab diagnosis of Emerging infectious diseases.

<b>MI8.5</b>	<b>Define Healthcare Associated Infections (HAI) and enumerate the types. Discuss the factors that contribute to the development of HAI and the methods for prevention</b>
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## Objectives

1. At the end of phase II session, MBBS students must be able to define Hospital Acquired infections.
2. At the end of phase II session, MBBS students must be able to enumerate types of Hospital Acquired infections.
3. At the end of phase II session, MBBS students must be able to discuss the factors that contribute to the development of Hospital Acquired infections.
4. At the end of phase II session, MBBS students must be able to discuss the methods for prevention of Hospital Acquired infections.

<b>MI8.6</b>	<b>Describe the basics of Infection control</b>
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## Objectives

1. At the end of phase II session, MBBS students must be able to define infection control.
2. At the end of phase II session, MBBS students must be able to describe basics of infection control.

<b>MI8.7</b>	<b>Demonstrate Infection control practices and use of Personal Protective Equipments (PPE)</b>
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## Objectives

1. At the end of phase II session, MBBS students must be able to describe infection control practices.
2. At the end of phase II session, MBBS students must be able to demonstrate infection control practices.
3. At the end of phase II session, MBBS students must be able to present use of Personal protective equipments.

<b>MI8.8</b>	<b>Describe the methods used and significance of assessing the</b>
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	<b>microbial contamination of food, water and air.</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to describe the methods used for assessing the microbial contamination of Food, Water, Air.
2. At the end of phase II session, MBBS students must be able to discuss the significance of microbial contamination of Food, Water, Air.

<b>MI8.9</b>	<b>Discuss the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing infectious diseases</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to describe appropriate methods of sample collection for detection of microbial agents causing infectious diseases.

<b>MI8.10</b>	<b>Demonstrate the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing infectious diseases</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to demonstrate the appropriate method of collection of samples in the performance of laboratory tests in detection of microbial agents causing infectious diseases.

<b>MI8.11</b>	<b>Demonstrate respect for patient samples sent to the laboratory for performance of laboratory tests in the detection of microbial agents causing infectious diseases</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to demonstrate the importance of patient samples sent to the laboratory for performance of laboratory tests in detection of microbial agents causing infections disease.

<b>MI8.12</b>	<b>Discuss confidentiality pertaining to patient identity in laboratory results</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to discuss confidentiality pertaining to patient identify in laboratory results.

<b>MI8.13</b>	<b>Choose the appropriate laboratory test in the diagnosis of the infectious diseases</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to choose appropriate laboratory test in the diagnosis of the infections diseases.

<b>MI8.14</b>	<b>Demonstrate confidentiality pertaining to patient identity in laboratory results</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to demonstrate confidentiality pertaining to patient identity in laboratory results.

<b>MI8.15</b>	<b>Choose and interpret the results of the laboratory tests used in diagnosis of the infectious diseases</b>
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### Objectives

1. At the end of phase II session, MBBS students must be able to choose the laboratory tests used in diagnosis of the infectious diseases.

2. At the end of phase II session, MBBS students must be able to interpret the results of the laboratory tests used in diagnosis of the infectious diseases.

<b>MI8.16</b>	<b>Describe the National Health Programs in the prevention of common infectious disease (for information purpose only as taught in CM)</b>
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### **Objectives**

1. At the end of phase II session, MBBS students must be able to describe National Health programmes in the prevention of common infectious diseases.