

## Session 10 - Medical Microbiology

Text:	Chapters 30 through 39
Anticipated time:	Whatever we have left
Basic Objectives:	You should be able to discuss the basic concepts that explain the parasitic relationships that exist between microorganisms and humans. We will emphasize general concepts, and use specific examples to help us understand the role that microorganisms play in disease. We will not try to cover the entire spectrum of infectious diseases, the complexity of our immune defense mechanisms, or the diverse spectrum of antibiotic treatments that are available as cures. Instead, we will emphasize basic principles of microbial pathogenicity.

---

### Chapter 30 – Microbial Interactions

Overview This chapter covers the diversity of mo's that inhabit our body and the beneficial roles they play in our body

#### 30.1 Microbial Interactions

*Skip, please.*

#### 30.2 Human-Microbe Interactions

Introduction *Read carefully* and understand the language.  
Gnotobiotic *Read. Are they healthy?*

#### 30.3 Normal Microbiota of the Human Body

Introduction *Read carefully.* Review Fig 30.17.  
Skin through Genitourinary Tract  
*Review for perspective.*  
Relationship *Read carefully, including Box 30.3*

### Chapter 31 – Non-Specific (Innate) Immunity

This chapter introduces mechanisms of nonspecific immunity to infectious agents of disease. This includes the normal microbiota that stray from their appropriate locations in the body as well as exogenous agents that we are exposed to.

Introduction *Read*

#### 31.1 Overview of Host Resistance

Introduction *Read.*  
Immunity *Read, and Review Fig 31.1.*

#### 31.2 through 31.6

Introduction *Read* the introduction to each of these sections to get a perspective on the components and actions of innate defense mechanisms of immunity. *Skip* the rest of the chapter unless you have interest in the contents.

### Chapter 32 – Specific (Adaptive) Immunity

Overview This chapter is an introduction to specific immune responses.

Introduction *Read*

#### 32.1 Overview of Specific (Adaptive) Immunity

Introduction *Read, and Review Fig 32.1.*

#### 32.2 through 32.11

Introduction *Read* the introduction to each of these sections to get a perspective on the components and actions of specific defense mechanisms of immunity. *Skip* the rest of the chapter unless you have interest in the contents.

## Chapter 33 - Pathogenicity of Microorganisms

- Overview This chapter covers the basic principles of medical microbiology that are most important to us. Specifically, it involves discussion of the host-parasite relationship from the perspective of the parasite. It details the important features of microbial pathogenicity, i.e. the genetically determined features of mo's that result in tissue damage to the host when they replicate in that host.
- Introduction *Read.*
- 33.1 Host-Parasite Relationship  
*Read very carefully. Define: Parasite (Review Tab 33.1), Host (Read carefully and understand Figs 33.1 & 33.2), Infection & Infectious Disease, Pathogen, Opportunistic Pathogen and Pathogenicity, Virulence, Invasiveness and Toxicity.*
- 33.2 Pathogenesis of Viral Diseases
- Introduction *Read carefully.*
  - Reservoir *Read carefully. Define: Reservoir.*
  - Contact *Read. Define: Vectors.*
  - Release *Read.*
  - Spread *Read. Define: Viremia and Tropism.*
  - Interactions *Read carefully. Define: Cytopathic effect.*
  - Immunity *Read.*
  - Recovery *Read.*
  - Virus Shedding *Read.*
- 33.3 Overview of Bacterial Pathogenesis
- Introduction *Read carefully.*
  - Reservoir *Read.*
  - Transport *Read. Define: Fomite.*
  - Attachment *Read. Define: Colonization. Review Tab 33.2.*
  - Invasion *Read carefully, including Tab 34.4.*
  - Growth *Read. Differentiate: Bacteremia and Septicemia.*
  - Leaving the Host *Read.*
  - Clonal... *Read.*
  - Regulation *Read.*
  - Pathogenicity *Read, including Tab 33.3 and Review Fig 33.4.*
- 33.4 Toxigenicity
- Introduction *Read carefully. Define: Intoxication, toxigenic infection and toxemia. Differentiate and understand: Exotoxins and Endotoxins (Read Tab 33.4).*
  - Exotoxins *Read very carefully. Develop an understanding of how exotoxins work: Read Tab 33.5 and understand Figs 33.5 & 33.6.*
  - Endotoxins *Read very carefully. Understand the nature of Endotoxins and their biological activity: Review Fig 33.7 for concepts and Review Techniques Box 33.1.*
- 33.5 Host Defense Against Microbial Invasion
- Introduction *Read.*
  - Primary *Review.*
  - Secondary *Review.*
  - Factors *Review.*
- 33.6 Microbial Mechanisms for Escaping Host Defenses
- Introduction *Read.*
  - Evasion-Viruses *Review.*
  - Evasion-Bacteria *Review.*

## Chapter 34 - Antimicrobial Chemotherapy

- Overview This chapter discusses the theory of antimicrobial chemotherapy. It explains the basis of antibacterial, antifungal and antiviral therapy using common antibiotics. It is wealth of practical information.
- Introduction *Read.*
- 34.1 The Development of Chemotherapy  
*Read* for concepts, including Techniques Box 34.1.
- 34.2 General Characteristics of Antimicrobial Drugs  
*Read* for perspective. Understand the language. *Review* Tab 34.1.  
Note that there are 5 categories of antimicrobial effects.
- 34.3 Determining the Level of Antimicrobial Activity  
*Skip.*
- 34.4 Antibacterial Drugs  
*Summarize* , only if you wish to learn something of specific interest to you.
- 34.5 Factors Influencing the Effectiveness of Antimicrobial Drugs  
*Read* for concepts.
- 34.6 Drug Resistance
- Introduction *Read.*
  - Mechanisms *Review* for concepts, including Figs 34.17 & 34.18.
  - Origin *Review* for concepts, including Fig 34.19.
- 34.7 Antifungal Drugs *Review* for concepts.
- 34.8 Antiviral Drugs *Read* for concepts.
- 34.9 Antiprotozoal Drugs  
*Skip.*

## Chapter 35 - Clinical Microbiology

- Overview This is a detailed chapter that covers clinical procedures for identifying microorganisms in clinical specimens. We will not cover this in class. You should page through this chapter and look at the photographs.

## Chapter 36 - The Epidemiology of Infectious Disease

- Overview This chapter covers the incidence, distribution, spread and control of infectious diseases.  
There is a lot of language here, but there are also significant concepts.
- Introduction *Read.* Define Epidemiology. *Read* Box 36.1.
- 36.1 Epidemiological Terminology  
*Read. Differentiate:* Endemic, epidemic and pandemic. *Define:* Epizootic and zoonosis.
- 36.2 Measuring Frequency: The Epidemiologist's Tools  
*Read.* Define: Morbidity and mortality rates.
- 36.3 Recognition of an Infectious Disease in a Population  
*Read.*
- 36.4 Recognition of an Epidemic  
*Review* for concepts. *Read* Box 36.2. What a gal! *Understand:* Fig 36.6.
- 36.5 The Infectious Disease Cycle: Story of a Disease
- Introduction *Read. Understand* Fig 36.7.
  - What Pathogen *Review*, including Tab 37.1.
  - Source *Review*, including Tab 36.1.
  - Transmitted *Review*, including Fig 36.8..
  - Susceptible *Review.*
  - Leaving *Review.*
- 36.6 Virulence and the Mode of Transmission  
*Read.*
- 36.7 Emerging and Reemerging Infectious Diseases and Pathogens  
*Read* and *Review* Fig 36.11.
- 36.8 Control of Epidemics
- Introduction *Review.*
  - Vaccines *Review*, including Fig 36.4, and Tabs 36.5 & 36.6.
  - Public Health *Review.*
- 36.9 Bioterrorism Preparedness  
*Read carefully*, including Tab 36.7. *Read* Box 36.5 for fun.
- 37.11 Global Travel and Health Considerations  
*Read.*
- 37.12 Nosocomial Infections
- Introduction *Read.*
  - Source *Review.*
  - Control *Review.*
  - Epidemiologist *Review.*

## Chapter 37 - Human Diseases Caused by Viruses and Prions

Overview      *Review* the chapter as your interest dictates. This chapter covers virus diseases of man. The agents are listed by the Route of Transmission. *Read* about a few of the diseases that are of interest to you, e.g.: Chicken pox and shingles, Influenza, Measles, viral pneumonias, hemorrhagic fevers (see Box 37.2), AIDS (Fig 37.7), cold sores and genital herpes, common colds, Mononucleosis, rabies, viral hepatitis, viral gastroenteritis, polio, and “slow” viral diseases.

## Chapter 38 - Human Diseases Caused by Bacteria

Overview      *Review* the chapter as your interests dictate. *Read* about a few of the specific diseases/agents that interest you, e.g.: diphtheria (Fig 38.1), meningitis, pertussis, streptococci (especially pneumonia, Fig 38.7), tuberculosis (Fig 38.3), lyme disease, plague (Fig 38.9), gonorrhea, ulcers, staphylococci (Figs 38.16 & 36.17 and Tab 38.4 and Box 38.3), syphilis (Fig 38.21 and Box 38.4), tetanus, cholera, botulism (Fig 38.23), campylobacter, salmonellosis (see Tab 39.5), shigella, staphylococci, *E coli* and septic shock (Fig 38.26), typhoid, chlamydial pneumonia, urethritis and trachoma, mycoplasmal pneumonia, Rickettsial Rocky Mountain Spotted Fever, tooth and gum diseases (Fig 38.28), and, burn wounds.  
Also: *Read* Box 38.2, Tab 38.5, Tab 38.6, Box 38.7

## Chapter 39 - Human Disease Caused by Fungi and Protozoa

Overview      We will not cover this chapter. You should *Review* it as your time permits.