Terms you should know:

- primary pathogen
- opportunist
- pathogenicity
- virulence factors
- reservoir
- carrier
- zoonosis
- transmission
- respiratory route
- fomite
- fecal-oral route
- vector
- invasion
- exotoxin
- endotoxin
- hyaluronidase

Questions you should be able to answer:

- What is a pathogen? What is the difference between a primary pathogen and an opportunist?
- What are some virulence factors that bacteria might have?
- What are the seven characteristics of a pathogenic interaction?
- What are some common ways that pathogens may be transmitted?
- What kinds of reservoirs might a pathogen have?
- How do pathogens damage tissues?

Lecture outline:

I. Pathogens and pathogenesis
   A. Primary pathogens: capable of causing disease in a healthy host
   B. Opportunists: can cause disease only under certain circumstances
   C. Virulence factors: structures or functions that enable pathogens to produce disease

II. Seven requirements for pathogenesis:
   A. Reservoir: human, animal (zoonosis), environmental
   B. Transmission: pathogen must find and enter a host
      1. Respiratory route
      2. Fomites
      3. Sexual transmission
      4. Fecal-oral route
      5. Vectors (insects or arthropods)
   C. Adherence: may require virulence factors such as capsules or pili
   D. Invasion: penetration into deeper tissues (not required for all pathogens)
   E. Evasion of body’s defenses
      1. Avoid phagocytosis with capsule, etc.
      2. Change surface molecules to “disguise” pathogen
      3. Attack defensive system
   F. Multiply in host and damage host tissues
      1. Exotoxins
      2. Endotoxin (LPS in Gram-negative outer membrane)
      3. Enzymes such as hyaluronidase
   G. Exit (by same route as entry or by a different route)