Chapter 40
The Immune System and Disease
Pg. 1028 - 1053

Germ Theory of Disease
- Believed that diseases were caused by curses, evil spirits, or foul smelling air.
- A new explanation developed based on the work of Robert Koch (mid-19th century).
- Concluded - microorganisms or germs caused infectious diseases.

Koch’s Postulates

Disease
- **Disease**- any change, other than an injury, that disrupts the normal functions of the body
  - Causes:
    - inherited (sickle cell anemia)
    - pollutants (asbestos, smoke)
    - harmful lifestyle (alcohol, tobacco, drug use)
    - pathogenic microbes (bacteria, virus)

Pathogen/Infectious Disease
- **Pathogen**- disease-causing organism
  - also called infectious disease
  - types
    - bacteria
    - viruses
    - parasites (some protists and worms)
    - fungi

1. Bacteria
- Single celled organisms with no nucleus.
- Release toxins, poisoning the body
  - Example: Lyme Disease, Strep Throat, Salmonella, Tuberculosis
2. Virus
- Made of organic particle consisting of genetic material.
- Microbe that reproduces when it invades a living cell.
- Cell bursts releasing thousands of new viruses.
  - Example: Chicken pox, Flu, Common Cold, HIV

3. Parasites: protists, worms
- Microbes that live and feed on other organisms
  - Examples: Malaria, Tapeworm

4. Fungi
- Heterotrophs that eat by absorbing organic substances
  - Examples: Athlete’s Foot, Ringworm

Non-Infectious Disease
- Disease not caused by pathogens
  - Examples: lung cancer, heart disease, sickle cell anemia

What may increase the likelihood of developing a Non-Infectious Disease?

How Infectious Diseases are Spread
- Coughing, sneezing

Coughing/Sneezing (airborne)
How Infectious Diseases are Spread

- Coughing, sneezing
- Physical or direct contact

Physical Contact

Hand Shaking

Contaminated Food/Water

responsible for food poisoning

Salmonella

Sexual Contact

How Infectious Diseases are Spread

- Coughing, sneezing
- Physical contact
- Contaminated water or food
- Sexual contact
How Infectious Diseases are Spread

- Coughing, sneezing
- Physical contact
- Contaminated water or food
- Sexual contact
- Vectors = infected animals give or transmit disease to another animal (person)
  - Ticks transmit Lyme disease organism to humans

Disease Prevention

- Cover mouth when sneeze
- Wash hands often before eating
- Cook food well kill bacteria
- Kill vectors using pesticides
- Avoid unprotected sex, limit partners, abstinence

If Prevention Fails… Antibiotics

- Medications that destroy bacteria while not harming human cells
- Work by interfering with the cellular processes of microorganisms
- Produced naturally and synthetically
- Ex: Penicillin, Streptomycin
- DOES NOT WORK ON VIRUSES

How To Prevent Antibiotic Resistance

- Do not demand antibiotics.
- Do not skip doses.
- Do not save unused meds.
- Do not take other peoples medication.
THE END!