Notes 37.1 and 37.2 Infectious and Noninfectious Diseases

**Infectious & Noninfectious Diseases**
Sections 37.1 & 37.3

**Infectious vs. Noninfectious**
- infectious disease can be passed from 1 person to another caused by germs ex. flu, chicken pox, HIV/AIDS
- noninfectious disease cannot be passed from person to person caused by genetics or lifestyle ex. heart disease, cancer

**Louis Pasteur**
- before Pasteur, people thought evil spirits (miasmas) caused disease
- germ theory (1850s) specific microorganisms cause disease pathogens - disease causing agents
- not immediately accepted

**Lister & Koch (1861-1864)**
- Joseph Lister started using weak acid to clean his surgical tools and patient wounds infections and death after surgery dropped dramatically
- Robert Koch infected healthy animals with pathogens Koch's postulates - rules for demonstrating that an organism causes a disease

**Types of Pathogens**
- bacteria single-celled organisms release toxic chemicals or destroy healthy body cells ex. food poisoning, strep throat, anthrax
- viruses DNA or RNA surrounded by a protein coat take over healthy cells and turn them into virus making factories ex. influenza, herpes, small pox
- fungi multicellular or single-celled organisms pierce healthy cells and steal nutrients ex. athlete's foot

**Types of Pathogens**
- protozoa single-celled organisms need healthy cells to complete their life cycle ex. malaria, african sleeping sickness
- parasites organisms that grow and feed on a host some kill the host, most use the host for nutrients and do NOT kill ex. malaria, traveler's diarrhea, lice
Notes 37.1 and 37.2 Infectious and Noninfectious Diseases

**Spread of Disease**
- pathogens need a reservoir and a way to spread to survive
- reservoir - source of the pathogen in the environment
  - human - carrier (can pass on the disease before they show symptoms)
  - animals
  - other - soil, water, food
- methods of spreading direct or indirect

![Image of a mosquito](mosquito.png)

**Direct vs. Indirect Contact**
- direct contact
  - infected person or animal physically touch a healthy person
  - ex. rabies, HIV, mono, herpes, STDs
- indirect contact
  - survive on nonliving surfaces, airborne, food, vectors
  - vector - anything that carries a pathogen and transmits it into healthy cells (ex. insects)
  - ex. salmonella, West Nile, SARS, cold

![Image of people interacting with a mosquito](interaction.png)

**Disease Patterns**
- endemic diseases - always affects a small portion of the population
  - ex. common cold
- epidemic - a rapid outbreak of an infection that affects many people
  - ex. Kuru
- pandemic - an epidemic over a wide geographic area that affects a large proportion of a population
  - ex. HIV/AIDS

![Image of a world map](world_map.png)

**Kuru - Epidemic**
- found only among the Fore people of the New Guinea highlands
- means “shiver”
- symptoms
  - tremors, wobbly gait, slurred speech, sudden maniacal laughter
- reached epidemic levels in ’50s and ’60s
- cause - mortuary cannibalism
  - family members ate dead relatives as a way of absorbing them back into the family
- now the gov’t discourages the practice and there has been a steady decline of the disease

![Image of Kuru victims](kuru_victims.png)

**Antibiotics**
- antibiotic - chemical that kills or slows the growth of bacteria by destroying their ability to make cell walls
- since animals/viruses do NOT have cell walls, the chemicals will not damage their cells
- antibiotics should NOT be the first line of defense against bacteria...PREVENTION should overuse of antibiotics wipes out the body’s good bacteria which can make you sick

![Image of antibiotics](antibiotics.png)
**Notes 37.1 and 37.2 Infectious and Noninfectious Diseases**

**Bacterial Resistance**
- Abuse and misuse of antibiotics has become a serious public health issue
- Resistance occurs as a result of natural selection; more resistant bacteria are more likely to survive and reproduce
- Resistance has led to the evolution of "superbugs" that are almost impossible to treat
  - MRSA: Methicillin-resistant Staphylococcus aureus
  - Resistant to broad spectrum antibiotics
  - Outbreaks are increasing yearly; can be fatal

**Resistance Factors/Causes**
- Overuse - if used when not needed
- Underuse - failure to take entire prescribed course
- Misuse - use in healthy livestock to increase growth
  - H. pylori
    - Normal (produces enzymes)
    - Mutant (produces NO enzymes)
    - Continuous to reproduce and produce offspring that resist antibiotics used to treat it

**Noninfectious Diseases**
- Genetic disorders
  - Can be triggered by environmental factors (like diet and exercise)
  - Ex. Sickle cell anemia, coronary artery disease
- Degenerative diseases
  - Result as a body wears out
  - Some have genetic component
  - Ex. Arthritis, arteriosclerosis
- Metabolic diseases
  - Error in biochemical pathway
  - Some genetic and environmental component
  - Ex. Type I diabetes
- Cancer - abnormal cell growth
  - Some genetic and environmental component

**Inflammatory Diseases**
- Body attacks a common substance not helpful to the body
- Allergies - immune system overreaction to an environmental factor (allergen)
  - Body releases histamine which causes itching, runny nose, swollen eyes
  - Anaphylactic shock - severe allergic reaction that restricts air flow into and out of the lungs
  - Bee stings, pollen, peanuts, dust, foods, pets
- Autoimmune - body attacks its own proteins
  - Ex. Lupus, rheumatoid arthritis