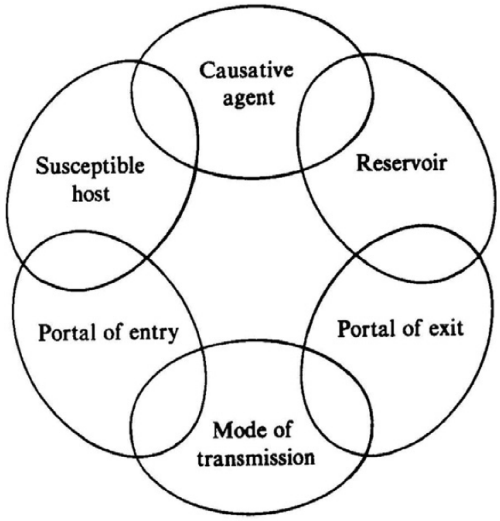
Lecture Notes: How Does Infection Occur?

1. Microorganisms = small, living organisms not visible to the naked eye
2. Pathogens = microorganism that cause disease
3. Susceptible Host = an organism capable of contracting a specific disease
4. Disease results if the invading pathogen causes impairment in the host
5. Types of Pathogens
    a. There are different types of pathogens, including:
        i. Fungi
        ii. Bacteria
        iii. Viruses
        iv. Protozoans
        v. Prions
    b. Bacteria
        i. Single-celled organisms
        ii. Live in a variety of environments
        iii. Only 1% cause disease
        iv. Usually killed by antibiotics
        v. Examples of diseases caused by bacteria:
        1. Pneumonias 2. Strep throat 3. Tuberculosis
    c. Viruses
        i. Smallest of pathogens
        ii. Viruses can reproduce only by invading a host cell
        iii. NOT cured by antibiotics
        iv. Examples of diseases caused by viruses:
        1. Chicken pox 2. Colds 3. Flu (influenza)
        4. Small pox 5. HIV

6. Types of Infection
    a. Endogenous = infection or disease originates within the body, Examples:
        i. Metabolic disorders
        ii. Birth defects
    b. iii. Tumors
    c. Exogenous = infection or disease originates outside the body, Examples:
        i. Pathogenic organisms
        ii. Radiation
        iii. Chemicals
        iv. Trauma
        v. Electric shock
        vi. Temperature extremes
    d. Nosocomial = infections acquired by an individual in a healthcare facility
    Usually present in the facility and transmitted by healthcare workers to the patient
    e. Opportunistic = infections that occur when the body's defenses are weak
7. Common Body Defenses
    a. Mucous membrane: lines the respiratory, digestive, and reproductive tracts
    b. Cilia: tiny hair-like structures that line the respiratory tract to propel pathogens out of the body
    c. Coughing and sneezing
    d. Hydrochloric acid: destroys pathogens in the stomach
    e. Tears in the eye: contain chemicals that kill bacteria
    f. Fever: kills pathogens via heat
    g. Immune response: body produces white blood cells and antibodies to fight pathogens

Chain of Infection

Chain of infection = conditions that must exist for disease to occur and spread



Six parts of the chain:

1. **Causative Agent** = a pathogen such as a bacterium or virus that can cause disease
2. **Reservoir** = the place where a causative agent can live Common reservoirs:
    a. Human body
    b. Animals
    c. Environment
    d. Fomites = nonliving objects such as doorknobs, cups, utensils, needles
3. **Portal of Exit** = the way for a causative agent to escape from the reservoir Pathogens can leave the body through ...
   Urine, feces, saliva, blood, tears, mucous discharge, sexual secretions, and wounds
4. **Mode of Transmission** = the way that causative agent can be transmitted to a host
    a. Direct contact = person-to-person
       Examples include: sex, saliva/kissing, handshake/touching
    b. Indirect contact = contaminated substances
       Examples include: food, air, soil, insects, animals, feces, equipment
5. **Portal of Entry** = a way for the causative agent to enter a new host Different portals of entry include:
    a. Breaks in the skin

b. Respiratory tract

c. Digestive tract

d. Genitourinary tract

e. Circulatory system

6. **Susceptible Host** = an individual who can contract the disease Humans become susceptible if ...

a. Large numbers of pathogens invade the body

b. Body defenses are weak