

The Cycle of the Infection

OBJECTIVES/RATIONALE

Infection control is an increasingly important aspect of health care for both the client and the health care professional. Health care providers must be able to protect themselves and clients by using standard precautions to control the spread of infection. The student will identify the cycle of the infectious process.

TEKS 121.3 10A

TAKS ELA 1, 4
Science 1, 2, 3

KEY POINTS

Infection Cycle PowerPoint Presentation

The Chain of Infection PowerPoint

- I. Infection cycle is well defined
 - A. Infective agent: pathogen such as a bacteria or virus
 - B. Reservoir
 - 1. Place where causative agent can live
 - 2. Common reservoirs include human body, animals, environment, and fomites or objects contaminated with infectious material that contains the pathogens
 - C. Portal of exit
 - 1. Way for causative agent to escape from the reservoir
 - 2. Pathogens can leave the body through urine, feces, saliva, blood, tears, mucous discharge, sexual secretions, and draining wounds
 - D. Means of transmission
 - 1. Pathogen must be transmitted to another reservoir or host where it can live
 - 2. Can be transmitted in different ways
 - a. Direct Contact
 - 1. Person-to-person spread by physical contact
 - 2. Contact with the body secretions containing pathogen
 - b. Indirect contact
 - 1. Pathogen is transmitted from contaminated substances (i.e. food, air, soil, insects, feces, clothing, instruments, and equipment)
 - 2. Touching contaminated equipment
 - 3. Breathing in droplets carrying airborne pathogens
 - 4. Receiving the bite of an insect carrying pathogen
 - E. Portal of entry
 - 1. Way to enter a new reservoir or host
 - 2. Means of entry

- a. Breaks in the skin or mucous membrane
- b. Respiratory tract
- c. Digestive tract
- d. Genitourinary tract
- e. Circulatory system

F. Susceptible host

- 1. Individual who can contract the disease
- 2. Humans may fight off causative agents and do not contract disease if
 - a. Defense mechanisms of body are intact
 - b. Immune system functioning
- 3. Human becomes susceptible host in some instances
 - a. Large numbers of the pathogen invade the body
 - b. Body defenses are weak

II. The cycle of infection can be broken at any link of the chain

- A. The infectious agent can be neutralized or destroyed by treatment
- B. The reservoir host must maintain personal hygiene
- C. The portal of exit is closed by the use of proper attire (gowns, gloves, other clothing), control of body secretions, and proper handwashing
- D. The route of transmission is minimized through proper handwashing, disinfection and sterilization and proper disposal of contaminated materials.
- E. The portal of entry is blocked by asepsis, disinfection, and sterilization procedures.
- F. Host susceptibility is broken when the health and wellness of an individual is maintained.

III. Microorganisms and Disease

- A. Microorganism: an organism that is too small to be seen by the human eye
 - 1. Fungi: simple plants such as molds and yeasts, some of which cause disease
 - 2. Protozoa: the only group of microorganisms classified as an animal
 - 3. Virus: microorganisms that are so small they cannot be seen with an ordinary light microscope. They are not destroyed by antibiotics.
 - 4. Bacteria: microorganisms first seen under the microscope by Antoni van Leeuwenhoek in 1693. The classification is determined by the shape of the bacteria and whether it grows with or without oxygen. Only a few bacteria, such as staphylococcus and streptococcus cause disease.
 - a. Aerobic bacteria: live and multiply in the presence of oxygen
 - b. Anaerobic bacteria: live and multiply without oxygen
 - c. Cocci: round bacteria
 - Staphylococci: round bacteria in clusters like grapes; cause boils, impetigo, and osteomyelitis
 - Streptococci: round bacteria arranged in chains; cause rheumatic fever, streptococcal pneumonia, and scarlet fever
 - Diplococci: round bacteria arranged in pairs; cause gonorrhea and meningitis
 - d. Bacilla: rod shaped bacteria
 - e. Spirilla: shaped like spirals

- 5. Rickettsiae: smaller than bacteria, barely visible under light microscope; cause typhus, Rocky Mountain spotted fever
- B. Pathogen: a disease causing microorganism
- IV. Asepsis is the absence of infection.
 - A. Medical asepsis: practices and techniques that are designed to protect individuals from the spread of disease
 - a. Antiseptic: substances that inhibit the growth of bacteria. Some of these substances can be used on the skin.
 - b. Disinfectant: substances or practices that cannot be used on the skin. This includes chemicals and boiling.
 - c. Sterile: absence of all microorganisms
 - B. Surgical asepsis: the use of sterile technique to handle equipment, maintain sterile fields, change dressings and dispose of contaminated materials without introducing harmful microorganisms
- V. Epidemiology: tracing the occurrence of health related events in society
- IV. Nosocomial infections: infections acquired while receiving treatment in a health care facility

ACTIVITY

- I. Create mobiles of various microorganisms. (Each should have identifying information telling about the microbe, what disease(s) it causes, epidemiology, treatment, and treatment success rate).
- II. Design a multimedia project that identifies a microorganism and its passage through the chain of infection.

MATERIALS NEEDED

Art supplies.
Internet accessibility
Library resources
Outbreak
The Hot Zone
Add Web page – The anatomy of an infection

ASSESSMENT

Team Rubric

ACCOMMODATIONS

For reinforcement, students will draw a poster showing the chain of infection and identify strategies to break the chain.

For enrichment, students will research an infectious outbreak (such as the Ebola virus) that may be a threat to world health and present that information to the class.

REFLECTIONS
