Chapter 7

Asepsis and Infection Control

Asepsis

- Microorganisms
  - Tiny microscopic entities capable of carrying on living processes
  - Nonpathogenic – harmless, do not produce disease
  - Pathogenic – cause specific diseases or infections

Asepsis (Cont.)

- Infection control and prevention
  - Minimizing spread of health care–associated (nosocomial) infections or community-acquired infections to patients or staff
Asepsis (Cont.)

- Asepsis
  - Absence of pathogenic microorganisms
- Medical asepsis
  - Techniques that inhibit growth and transmission of pathogenic microorganisms
  - Clean technique
- Surgical asepsis
  - Techniques that destroy all microorganisms and their spores
  - Sterile technique

Infection

- Chain of events take place for infection to develop
  - Infectious agent – pathogen
  - Reservoir – where pathogen grows
  - Portal of exit – exit route from reservoir
  - Mode of transportation – method or vehicle of transportation
  - Portal of entry – entrance through skin, mucous lining, or mouth
  - Host – person or animal susceptible to the pathogen

Question 1

Medical asepsis is:
1. absence of pathogenic microorganisms.
2. technique used to destroy all microorganisms and their spores.
3. clean technique.
4. sterile technique.
Infection (Cont.)

- Cycle must be broken to interrupt the transmission of infection

Infection (Cont.)

- Infectious agent
  - Bacteria
    - Aerobic
    - Anaerobic
    - Spores
  - Viruses
    - Smallest known agents
    - Self-limiting
    - Exceptions – rabies and HIV

Infection (Cont.)

- Infectious agent
  - Fungi
    - Belong to plant kingdom
    - Invade deeper tissues of the body
    - Responsible for coccidioidomycosis (valley fever) and histoplasmosis (systemic fungal respiratory disease)
  - Protozoa
    - Single-celled
    - Responsible for malaria, amebic dysentery, African sleeping sickness
Infection (Cont.)

- **Reservoir**
  - Supports organism growth and reproduction
  - Need food and proper atmosphere to survive
  - Examples: soiled dressings, medical equipment

Infection (Cont.)

- **Portal of exit**
  - Point of escape from the reservoir
  - Proper hand hygiene and covering nose and mouth when coughing/sneezing help prevent spread of infection

Infection (Cont.)

- **Mode of transmission**
  - **Vehicle** — method by which microorganism carried and transported to next host
  - **Vector**
    - Living carrier
  - **Fomite**
    - Inanimate (nonliving) object
Infection (Cont.)

- Portal of entry
  - The microorganism finds a way into the host
  - When defense mechanisms are reduced – enter host and produce infection
  - Examples: skin punctured with contaminated needle, Foley catheter, IV site

Infection (Cont.)

- Host
  - An organism in which another organism is nourished and harbored
  - Infection will not develop unless host is susceptible to the microorganism’s strength and numbers
  - Immunizations have proven effective in reducing susceptibility to some types of infectious diseases

Question 2

Which element is considered part of the chain of infection?
1. antiseptic
2. reservoir
3. standard precautions
4. incubator
Infectious Process

- Progressive stages
  - Incubation
  - Prodromal
  - Acute
- Localized (superficial wound infection)
- Systemic (infection affects entire body instead of single organ or part)

Infectious Process (Cont.)

- Inflammatory response
  - Body's response to injury or infection
  - Protective vascular reaction delivering fluid, blood, and nutrients to interstitial tissues in injured area
  - Neutralizes and eliminates pathogens or necrotic tissues and establishes a means of repairing body cells and tissues

Infectious Process (Cont.)

- Inflammatory response
  - Signs of inflammation
    - Edema, rubor, heat, pain or tenderness, and loss of function in affected part
  - Systemic signs and symptoms
    - Fever, leukocytosis, malaise, anorexia, nausea, vomiting, and lymph node enlargement
Question 3

Which is/are indicative of an initial inflammatory response? (Select all that apply.)

1. Rubor
2. Headache
3. Nausea
4. Dizziness

Health Care–Associated Infections

● Nosocomial infections
  ➢ Infection acquired while in the hospital or other health care agency
  ➢ Develops at least 48 hours after hospitalization
  ➢ Hospital setting harbors some virulent organisms, making it easier to acquire an infection

Health Care–Associated Infections (Cont.)

● Exogenous
  ➢ Growing outside the body – caused by another person
● Endogenous
  ➢ Growing within the body – caused by own normal microorganisms
● Most commonly transmitted by direct contact between health care workers and patients or from patient to patient
Infection Prevention and Control Team

- Infection control nurse
  - Specialty professional in infection control and prevention
  - Duties

Infection Prevention and Control Team (Cont.)

- Occupational health service
  - Important in prevention or control of infection in healthcare by taking measures to protect healthcare workers and patients from certain infections.
  - Federal law requires making available hepatitis B vaccine and vaccination series to all employees

Standard Precautions

- Centers for Disease Control and Prevention (CDC) provides guidelines to interrupt the chain of infection and transmission of blood-borne pathogens and other potentially infectious materials
Question 4

The best action to prevent infection in patients in the health care system is:
1. don gloves.
2. wear gowns and shoe protectors.
3. hand hygiene.
4. wear gloves, gowns, and shoe protectors.

Standard Precautions (Cont.)

- Hand hygiene
  - Single most important and basic preventive technique used to interrupt the infectious process
  - Wash hands before and after patient care; touching body fluids, secretions, excretions, and contaminated equipment; between patient contact; and immediately after removing gloves
  - Skill 7-1

- Glowing
  - Wear only once
  - If contaminated during care – remove gloves, wash hands, and apply a new pair
  - If perforated during use – remove gloves, wash hands, and apply a new pair
  - Demonstrate donning and removing gloves
Standard Precautions (Cont.)

- Latex allergy
  - Suspect allergy if person develops red, watery, itchy eyes; sinus or nasal congestion; tachycardia; or hypotension after exposure to latex

Standard Precautions (Cont.)

- Gowning
  - Don to protect clothing from being soiled and protect against unknown infectious microorganisms
  - Aids in preventing spread of infection
  - Visitors need to follow procedure

Standard Precautions (Cont.)

- Mask and protective eyewear
  - Protect from inhaling airborne microorganisms
  - Prevent inhaling pathogens if resistance is reduced
  - Eye shields – protect membranes and conjunctiva of eye
Standard Precautions (Cont.)

- Disposing of contaminated equipment
- Handling linen

Isolation Technique

- Standard precautions
  - First tier of CDC’s isolation guidelines
  - Second-tier is disease-specific isolation
    - Transmission categories: airborne, droplet, and contact precautions
- Isolation considerations
  - Psychosocial/emotional deprivation

Isolation Technique (Cont.)

- Specific diseases
  - Pulmonary tuberculosis (TB)
    - Negative-pressure room
    - HEPA respirator mask (N-95 mask) or PAPR mask
Question 5

Prior to caring for a patient in a negative pressure room with the medical diagnosis of tuberculosis, the nurse must:

1. be fitted with a respirator mask (N-95) or a PAPR mask.
2. understand the disease process of tuberculosis.
3. maintain standard precautions.
4. be tested for tuberculosis.

Surgical Asepsis

- Complete removal of all microorganisms including spores
- Technique and use
- Teaching patients

Surgical Asepsis (Cont.)

- Principle of sterile technique
  - See Box 7-11
- Purpose of surgical hand scrub
  - Skill 7-6
Surgical Asepsis (Cont.)

- Opening sterile packaging
  - Prepare the patient prior to any procedure

Surgical Asepsis (Cont.)

- Sterile field
  - Skill 7-7
- Pouring sterile solutions

Surgical Asepsis (Cont.)

- Donning sterile gown
  - Skill 7-8
- Donning sterile gloves (open and closed)
  - Skill 7-9
Surgical Asepsis (Cont.)

- Cleaning, disinfection, and sterilization
  - Aseptic and bacteriostatic
  - Cleaning
    - Removing foreign materials

Surgical Asepsis (Cont.)

- Cleaning, disinfection, and sterilization
  - Disinfection
    - Used to destroy microorganisms
    - Skill 7-10

Surgical Asepsis (Cont.)

- Cleaning, disinfection, and sterilization
  - Sterilization
    - Method of killing all microorganisms including spores
    - Two types: physical and chemical
Patient Teaching for Infection Prevention and Control

- Patients and families have to learn to use infection prevention and control practices at home
- Need to be aware of how infection is spread and ways to prevent transmission
- Educate about techniques used to control spread of infection

Infection Prevention and Control for Home and Hospice Settings

- Home settings
  - Basic principles of hygiene
  - Educate about hand hygiene, food preparation, tube feedings, linens, waste containers, body fluid spills

Nursing Process

- Assessment
- Nursing diagnosis
  - Impaired tissue integrity
  - Risk for infection
  - Social isolation
Nursing Process (Cont.)

- Expected outcomes and planning
- Implementation
- Evaluation

Question 6

When teaching patients and families about preventing infection at home, the nurse needs to include:

1. the importance of hand hygiene, preparation of food, and proper disposal of body fluid spills.
2. it is not important that families and patients understand how infection is spread.
3. it is not important to control the spread of infection.
4. when caring for the patient, families need to sterilize the equipment prior to every use.