CHAPTER 12
Medical/Surgical Asepsis and Infection Control

• Microorganisms
  – Microscopic.
  – Naturally present on and in the human body and environment.
  – Some microorganisms (pathogens) cause specific diseases or infections.
  – Many are harmless (nonpathogenic) and do not produce disease in most individuals.
  – If an individual is highly susceptible to infection, the nonpathogenic microorganisms could become infectious.

• What are the Goals for Infection Control
  – Institute nursing policies and procedures for a health care facility to **minimize the spread of microorganisms**
  – To prevent nosocomial or community-acquired infections to patients and other staff members.
  – **Control the spread of infection.**
Raise your hand please

- What are some nursing interventions which help stop the spread of infection?

Asepsis

- Free of Pathogenic Microorganisms
- Two types of asepsis
  1. Medical Asepsis
     - Inhibits growth and spread of pathogenic microorganisms
     - Clean technique
  2. Surgical Asepsis
     - Destroys all microorganisms and their spores
     - Sterile technique

Infection Process

- Infectious Agent
  - Bacteria
    - Aerobic: grows only in the presence of oxygen
    - Anaerobic: grows only in the absence of oxygen
  - Viruses
    - Smallest known agents that cause disease.
    - Examples: Rabies, common cold, flu, rabies, and AIDS/HIV
Infection Process

• Infectious Agent (continued)
  – Fungi
    • Fungi are responsible for some of the most common diseases found in humans.
    • Many are harmless, but some are responsible for infections.
  – Protozoa
    • These single-celled animals exist everywhere in nature in some form.
    • Disease-producing protozoa are responsible for malaria, amebic dysentery, and African sleeping sickness.
Infection Process

- What is a Reservoir
  - A reservoir is any natural habitat of a microorganism that promotes growth and reproduction.
  - Examples of reservoirs are soiled or wet dressings, hospital equipment, and carriers (person or animal who harbors and spreads an organism).
  - Food and proper atmosphere are required to thrive.
### Infection Process

**Exit Route**

- A microorganism cannot cause disease in another host unless it finds a point of escape from the reservoir.
- Human exit routes are gastrointestinal, respiratory, and genitourinary systems; tissue; and blood.
- **Handwashing** can prevent the spread of microorganisms or cross-contamination.

**Method of Transmission**

- There are many vehicles on or by which microorganisms can travel to the next host.
  - **Fomite**
    - Vehicle is inanimate (nonliving) object
    - Stethoscope, thermometer, bandage scissors, etc.
  - Can you name some more examples?
  - **Vector**
    - Living carrier

**Entrance of Microorganisms**

- The microorganism must find a way to enter the susceptible host.
- When the host’s defense mechanisms are reduced, the microorganism has a greater chance to enter.
- **The skin is the first line of defense and should be kept intact, lubricated, and clean.**
Infection Process

• Host
  – An microorganism must accept the host for it to continue to live and flourish
  – An infection will develop as the strength and numbers of the microorganism grow within the host.
  – Immunizations have proved effective in providing additional protection against infectious disease.

The cycle must be interrupted to prevent the spread of a microorganism.

Infection Process

4 Stages of the Infectious Process

**Incubation period:**
• Common cold 1 to 2 days

**Prodromal stage**
• Capable of spreading disease to others
• Mild s/s

**Illness stage**
More severe s/s

**Convalescence**
S/S disappear
Infection Process

- **Inflammatory Response**
  - The body's cellular response to injury or infection
  - Starts body's immunity process
  - Begins process of repairing body cells and tissues

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Infection Process (continued)

- **Signs of Inflammation**
  - Edema, redness, heat, pain or tenderness, and loss of function
  - Systemic signs: fever, leukocytosis, malaise, anorexia, nausea, vomiting, and lymph node enlargement

May be triggered by physical agents, chemical agents, or microorganisms

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Nosocomial Infections

- **Nosocomial Infection**
  - One that is acquired while in a hospital or other health agency
  - Acquired at least 12 hours after admission
  - Hospital harbors microorganisms that may be highly virulent, making it a more likely place to acquire an infection
Nosocomial Infections
• Nosocomial infections are most commonly transmitted by direct contact between health personnel and patients or from patient to patient or fomite contact.

Infection Control Team
• Infection Control Practitioner/Professional
  – Caregivers who are specially trained in infection control
  – Responsible for advising hospital personnel on safe aseptic practices and for monitoring infection outbreaks within the agency
• Employee Health Service
  – Plays a role in infection control by taking measures to protect the health care worker from disease carried by patients and to protect patients from disease carried by staff

Standard Precautions
• Handwashing
  – This is the most effective method, important and basic preventive technique for interrupting the infectious process.
  When should you wash your hands?
  – Wash hands before patient care
  – After touching blood, body fluids, secretions, excretions, and contaminated items
  – Immediately after gloves are removed
  – Between patient contacts
  – And when otherwise indicated.
Standard Precautions

• Gloving
  – **Don gloves if there is any possibility of contact with infectious material.**
    • Gloves are worn only once and then placed into infectious waste containers.
Standard Precautions

• Gowning
  – Wear a gown to protect skin and prevent soiling of clothing during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions or cause soiling of clothing.

Standard Precautions

• Mask/Protective Eyewear
  – Protects the wearer from inhaling microorganisms that travel on airborne droplets.
  – Prevents inhaling pathogens if resistance is reduced or during transport to another area.
  – Discourages the wearer from touching the mouth, nose, and eyes and from transmitting infectious material.

Figure 12-5


Nurse wearing protective goggles and mask.
**Standard Precautions**

- **Disposal of Contaminated Equipment**
  - Specially labeled bagging and either sanitary burial or incineration are required.
  - Disposal of sharps (needles, blades)
    - Must be put in a puncture-proof container
- **Double Bagging**
  - This infection control practice involves placing a bag of contaminated items into another clean bag that is held outside an isolation room by other personnel.
  - This is recommended when it is impossible to keep the outer surface of a single bag free from contamination.

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**Skill 12-5: Step 4**


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**Isolation Technique**

- The CDC issued isolation guidelines that contain two tiers of approach.
  - **First Tier**
    - STANDARD PRECAUTIONS
      - Precautions designed to care for all patients in health care facilities regardless of their diagnosis or presumed infectiousness
  - **Second Tier**
    - ISOLATION PERCAUTIONS
      - Airborne, droplet, and contact type precautions
Isolation Room

• Private rooms used for isolation have negative-pressure airflow to prevent infectious particulates from flowing out of the closed environment.
• All articles that come into contact with the patient are contaminated and should be handled appropriately to maintain protective asepsis.

Isolation Room

• Basic Principles (continued)
  – Contaminated equipment and articles are to be disposed of in a safe and effective manner to prevent transmission of pathogens to other individuals.
  – If the patient is transported to other areas in the facility, necessary measures should be taken to protect those who may be exposed. Have the patient wear a gown and mask.

Surgical Asepsis

• This requires the absence of all microorganisms, pathogens, and spores from an object.
• The caregiver working within a sterile field or with sterile equipment must understand that the slightest break in technique results in contamination.
Surgical Asepsis
• Principles of Sterile Technique
  – A sterile object remains sterile only when touched by another sterile object.
  – Only sterile objects may be placed on a sterile field.
  – A sterile object or field out of vision or an object held below the waist is contaminated.
  – A sterile object or field becomes contaminated by prolonged exposure to air.

Surgical Asepsis
• Principles of Sterile Technique (continued)
  – When a sterile surface comes in contact with a wet, contaminated surface, the sterile object or field becomes contaminated.
  – Fluids flow in the direction of gravity.
  – The edge of the sterile field or container is considered contaminated.

Surgical Asepsis
• Opening Sterile Packages
  – Sterile supplies have dated labels or chemical tapes that indicate the date when the sterilization expires.
  – If the integrity of the sterile package is questionable, the item should not be used.
Surgical Asepsis

• Opening Sterile Packages
  – Caregiver performs a thorough handwashing.
  – All students will be practicing sterile technique in the NVC nursing lab.

Cleaning, Disinfection, and Sterilization

• Sterilization
  – Method used to kill all microorganisms, including spores
  – Two types
    • Physical (uses heat or radiation)
      – Steam under pressure, boiling water, radiation, or dry heat
    • Chemical
      – Gas
      – Chemical solutions
        – Iodine, alcohol, and chlorine bleach

LECTURE IS OVER

• GO WASH YOUR HANDS