

Chapter 12

Preventing Infection

Infection

- Infection is a major safety and health hazard.
- The health team follows certain practices and procedures to protect patients, residents, visitors, and staff from infection.

Microorganisms

- A microorganism (microbe) is a small living plant or animal seen only with a microscope.
 - Pathogens are microbes that are harmful and can cause infections.
 - Non-pathogens are microbes that do not usually cause an infection.
- Microbes need a reservoir (host) to live and grow.

Microorganisms, cont'd.

- Multidrug-resistant organisms (MDROs) can resist the effects of antibiotics.
 - Antibiotics are drugs that kill microbes that cause infections.
 - MDROs are caused by:
 - Doctors prescribing antibiotics when they are not needed
 - Not taking antibiotics for the prescribed length of time
 - Two common MDROs are resistant to many antibiotics:
 - Methicillin-resistant *Staphylococcus aureus* (MRSA)
 - Vancomycin-resistant *Enterococcus* (VRE)

Infection

- An infection is a disease state resulting from the invasion and growth of microbes in the body.
 - A local infection is in a body part.
 - A systemic infection involves the whole body.

The Chain of Infection

- The chain of infection is a process.
 - It begins with a source (a pathogen).
 - It must have a reservoir where it can grow and multiply.
 - To leave the reservoir, the pathogen needs a portal of exit.
 - After leaving the reservoir, the pathogen must be transmitted to another host.
 - The pathogen enters the body through a portal of entry.
 - A susceptible host is needed for the microbe to grow and multiply.

Resisting Infection

- The ability to resist infection relates to:
 - Age
 - Nutrition
 - Stress
 - Fatigue
 - Health
 - Drugs
 - Disease
 - Injury

Healthcare-Associated Infection (HAI)

- Healthcare-associated infection (HAI)
 - An HAI is an infection that develops in a person cared for in any setting where health care is given.
 - HAIs are caused by:
 - Microbes normally found in the body
 - Microbes transmitted to the person from other sources
 - Microbes can enter the body through equipment and supplies.
 - Staff can transfer microbes from one person to another and from themselves to others.
 - HAIs are prevented by:
 - Medical asepsis (including hand hygiene)
 - Standard Precautions and Transmission-Based Precautions
 - The Bloodborne Pathogen Standard

Medical Asepsis

- Asepsis is being free of disease-producing microbes.
- Medical asepsis (clean technique) is the practices used to:
 - Remove or destroy pathogens
 - The number of pathogens is reduced.
 - Prevent pathogens from spreading from one person or place to another person or place

Contamination

- Contamination is the process of becoming unclean.
 - In medical asepsis, an item or area is clean when it is free of pathogens.
 - In medical asepsis, an item or area is contaminated if pathogens are present.
 - A sterile item or area is contaminated when pathogens or non-pathogens are present.
 - Sterile means the absence of all microbes.

Common Aseptic Practices

- Common aseptic practices

- To prevent the spread of microbes wash your hands:
 - After urinating or having a bowel movement
 - After changing tampons or sanitary pads
 - After contact with your own or another person's blood, body fluids, secretions, or excretions
 - After coughing, sneezing, or blowing your nose
 - Before and after handling, preparing, or eating food
 - After smoking a cigarette, cigar, or pipe

Prevent the Spread of Microbes

- To prevent the spread of microbes, also do the following:
 - Provide all persons with their own linens and personal care items.
 - Cover your nose and mouth when coughing, sneezing, or blowing your nose.
 - Bathe, wash hair, and brush your teeth regularly.
 - Wash fruits and raw vegetables before eating or serving them.
 - Wash cooking and eating utensils with soap and water after use.

Hand Hygiene

- Hand hygiene is the easiest and most important way to prevent the spread of infection.
- Practice hand hygiene before and after giving care.

Supplies and Equipment

- Supplies and equipment
 - Most health care equipment is disposable.
 - Single-use items are discarded after use.
 - A person uses multi-use items many times.
 - Non-disposable items are cleaned and disinfected.
 - Then they are sterilized.
 - Cleaning reduces the number of microbes present and removes organic matter.
 - Disinfection is the process of destroying pathogens.
 - Sterilization is the process of destroying all microbes (non-pathogens and pathogens).
 - Very high temperatures are used.

Other Aseptic Measures

- Other aseptic measures include:
 - Controlling reservoirs (hosts—you or the person)
 - Controlling portals of exit
 - Controlling transmission
 - Controlling portals of entry
 - Protecting the susceptible host

Isolation Precautions

- Blood, body fluids, secretions, and excretions can transmit pathogens.
 - Sometimes barriers are needed to prevent their escape.
- Recommendations described in the *Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007* are followed.
 - The guideline was issued by the Centers for Disease Control and Prevention (CDC).

Isolation Precautions, cont'd.

- Isolation precautions prevent the spread of communicable diseases (contagious diseases).
 - They are diseases caused by pathogens that spread easily.
- Isolation precautions are based on determining what is clean and what is dirty.
 - Clean areas or objects are free of pathogens.
 - Dirty areas or objects are contaminated with pathogens.
 - Clean and dirty also depend on how the pathogen is spread.

Standard Precautions

- The CDC's isolation precautions guideline has two tiers of precautions:
 - Standard Precautions
 - They reduce the risk of spreading pathogens and known and unknown infections.
 - They are used for all persons whenever care is given.
 - They prevent the spread of infection from:
 - Blood
 - All body fluids, secretions, and excretions (except sweat) even if blood is not visible
 - Non-intact skin
 - Mucous membranes

Transmission-Based Precautions

- Transmission-Based Precautions
 - Understanding how certain infections are spread helps you understand the 3 types of Transmission-Based Precautions.
 - Contact precautions
 - Droplet precautions
 - Airborne precautions

Protective Measures

- Protective measures

- Isolation precautions involve wearing personal protective equipment (PPE).
 - Gloves, a gown, a mask, and goggles or a face shield
- Removing linens, trash, and equipment from the room may require double-bagging.
- Follow agency procedures when collecting specimens and transporting persons.

Gloves and Gowns

● Gloves

- Wear gloves whenever contact with blood, body fluids, secretions, excretions, mucous membranes, and non-intact skin is likely.
- Wearing gloves is the most common protective measure used with Standard Precautions and Transmission-Based Precautions.

● Gowns

- Gowns protect your clothes and body from contact with blood, body fluids, secretions, and excretions.
- They protect against splashes and sprays.
- Gowns must completely cover you from your neck to your knees.
- Gowns are used once.
- A wet gown is contaminated.

Masks and Respiratory Protection

- Masks and respiratory protection
 - Masks prevent contact with infectious materials from the patient or resident.
 - Masks are disposable.
 - A wet or moist mask is contaminated.
 - Practice hand hygiene before putting on a mask.
 - When removing a mask, touch only the ties or the elastic bands.
- Goggles and face shields protect your eyes, mouth, and nose from splashing or spraying of blood, body fluids, secretions, and excretions.
 - The outside of goggles or a face shield is contaminated.

Bagging Items

- Bagging items

- Contaminated items are bagged to remove them from the person's room.
 - Leak-proof plastic bags are used.
 - Bags have the *BIOHAZARD* symbol.
- Biohazardous waste is items contaminated with blood, body fluids, secretions, or excretions.
- Bag and transport linens following agency policy.
- Trash is placed in a container labeled with the *BIOHAZARD* symbol.
- Follow agency policy for bagging and transporting trash, equipment, and supplies.
- Double-bagging is not needed unless the outside of the bag is soiled.

Collecting and Transporting

- Collecting specimens

- Blood, body fluids, secretions, and excretions often require laboratory testing. Specimens are transported to the laboratory in *BIOHAZARD* specimen bags. Follow agency procedures to collect and transport a specimen when a person is on Transmission-Based Precautions.

- Transporting persons

- Persons on Transmission-Based Precautions usually do not leave their rooms, but sometimes they go to other areas for treatments or tests.

Meeting Basic Needs

- Meeting basic needs

- Often love, belonging, and self-esteem needs are unmet when Transmission-Based Precautions are used.
- You need to:
 - Remember, the pathogen is undesirable, not the person.
 - Meet love, belonging, and self-esteem needs.

Bloodborne Pathogen Standard

- The Bloodborne Pathogen Standard protects against the human immunodeficiency virus (HIV) and the hepatitis B virus (HBV).
 - It is a regulation of the Occupational Safety and Health Administration (OSHA)

Bloodborne Pathogen Standard, cont'd.

- HIV and HBV are found in the blood.
- They are bloodborne pathogens.
- They are spread to others by blood and other potentially infectious materials (OPIMs).
- OPIMs are contaminated with blood or with a body fluid that may contain blood.
- Semen, vaginal secretions, and saliva
- Needles, suction equipment, soiled linens, dressings, and other care items

Bloodborne Pathogen Standard, cont'd.

- Staff at risk for exposure to blood or OPIMs receive free training:
 - Upon employment
 - Yearly
 - For new tasks involving exposure to bloodborne pathogens
 - For changed tasks involving exposure to bloodborne pathogens

Hepatitis B

● Hepatitis B vaccination

- Hepatitis B is a liver disease caused by HBV.
- HBV is spread by blood and sexual contact.
- The hepatitis B vaccine produces immunity against hepatitis B.
 - Immunity means that a person has protection against a certain disease.
- You can receive the hepatitis B vaccination within 10 working days of being hired.
 - The agency pays for it.

Engineering and Work Practice Controls

- Engineering and work practice controls
 - Engineering controls reduce employee exposure in the workplace.
 - Special containers for contaminated sharps and specimens remove and isolate the hazard from staff.
 - Containers are:
 - Puncture-resistant
 - Leak-proof
 - Color-coded in red
 - Have the *BIOHAZARD* symbol
 - Work practice controls also reduce exposure risks.
 - All tasks involving blood or OPIMs are done in ways to limit splatters, splashes, and sprays.
 - Producing droplets is avoided.

PPE

- Personal protective equipment (PPE)

- Blood or OPIMs must not pass through PPE.
 - They protect your clothes, undergarments, skin, eyes, mouth, and hair.
- PPE is free to employees.
- OSHA requires special measures for the safe handling and use of PPE.

Contaminated Equipment

- Contaminated equipment is cleaned and decontaminated.
 - Decontaminate work surfaces with a proper disinfectant:
 - Upon completing tasks
 - At once when there is obvious contamination
 - After any spill of blood or OPIM
 - At the end of the work shift when surfaces have become contaminated since the last cleaning
 - Use a brush and dustpan or tongs to clean up broken glass.
 - Discard broken glass into a puncture-resistant container.
- OSHA requires special measures for handling contaminated laundry.

Exposure Incidents

- Exposure incidents

- An exposure incident is any eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or OPIMs.
 - Parenteral means piercing the mucous membranes or the skin barrier.
- Report exposure incidents at once.
- You are told of any medical conditions that may need treatment.
- The source individual is the person whose blood or body fluids are the source of an exposure incident.