

Objectives

The purpose of this document is to:

- Explain professional responsibilities for monitoring infection control practices and intervention for compliance and safety.
- Explain the chain of infection and describe the way infection control concepts are applied.
- Identify barriers and personal protective equipment (PPE) for protection from exposure to potentially infectious material.
- Define engineering controls, work practice controls, and environmental controls.
- Explain the importance of reprocessing methods (cleaning, disinfection, and sterilization of client care equipment).
- Identify occupational health strategies for preventing the transmission of blood borne pathogens and other communicable diseases through health care workers.

Professional Responsibilities for Monitoring Infection Control Practices

Infection control measures are designed to combat everything from the spread of colds and flu to Hepatitis B and C, SARS, HIV/AIDS and other life threatening diseases. Home health care clients are vulnerable to infection either because of illness and lowered resistance, or because they receive numerous types of invasive therapies which increase their risk of infection. Standard Precautions are required by good science and by federal law, the OSHA Bloodborne Pathogens Standard.

Procedures frequently performed in home health care that put both the client and health care worker at risk for infection include but are not limited to tracheostomy site cares, gastrostomy site cares and suctioning

Prevention of transmission of an infectious agent is the responsibility of every health care employee.

The Chain of Infection

To understand how to prevent the transmission of an infectious agent, it is important to understand how the chain of infection works.

If you can break any link of the Chain of Infection, you can prevent the occurrence of new infection.

Chain of Infection

1. Pathogen or Causative Agent - A biological agent or organism capable of causing disease that invades a reservoir.
2. Reservoir - A place for an agent to live such as human beings, animals, plants, soil, etc.
3. Portal of Exit - A place where the agent leaves the reservoir. This could include skin, respiratory tract, urinary tract, intestinal tract, etc.
4. Transmission – A way for the agent to travel such as airborne, droplet spread, contact (i.e. doorknobs, pens, telephones.)
5. Portal of Entry - A place where the agent enters the susceptible host. Common portals of entry include mouth, nose, eyes, rashes, cuts, needle stick injuries, wounds, and IV sites.
6. Susceptible Host - Another reservoir for the agent to enter and create an infection.

Breaking the Chain of Infection

One way to break the chain of infection is the use of Standard Precautions. Standard Precautions is a method of dealing with:

- Blood
- All body fluids, secretions and excretions (except sweat)
- Non-intact skin and mucous membranes

Using Standard Precautions reduces the risk of transmission of microorganisms from both recognized and unrecognized sources of infection.

Breaking the Chain of Infection: Hand-Hygiene Techniques

The single most effective way to interfere with the chain of infection is frequent and effective hand-hygiene techniques. Although hand hygiene may seem simple and a matter of common sense, 34 studies have shown that the mean rate of compliance with current hand hygiene guidelines among health care workers is only 40 percent.

The Indications for Handwashing and Hand Antisepsis (CDC, 2018) are:

Wash hand with soap & water for:

- When hands are visibly dirty
- After known or suspected exposure to clostridium difficile
- After known or suspected exposure to patients with diarrhea during norovirus infection
- After known or suspected exposure to bacillus arthracis
- Before eating
- After using restroom

Use an alcohol-based hand sanitizer for:

- Everything else

Decontaminate hands:

1. Before having direct contact with clients.
2. Before donning sterile gloves when inserting a central intravascular catheter.
3. Before inserting indwelling urinary catheters, peripheral vascular catheters, or other invasive devices that do not require a surgical procedure.
4. After contact with a client's intact skin (e.g., when taking a pulse or blood pressure, and lifting a client.)
5. After contact with body fluids or excretions, mucous membranes, non-intact skin, and wound dressings if hands are not visibly soiled.
6. If moving from a contaminated body site to a clean body site during client care.
7. After contact with inanimate objects (including medical equipment) in the immediate vicinity of the client.
8. After removing gloves.

Antimicrobial-impregnated wipes (i.e., towelettes) are not as effective as alcohol-based hand rubs or washing hands. They are not a substitute for using an alcohol-based hand rub or antimicrobial soap.

Proper Handwashing and Hand Antisepsis Techniques

When washing hands with soap and water:

1. Wet hands first with water.
2. Apply an amount of product recommended by the manufacturer to hands.
3. Rub hands together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers.
4. Rinse hands with water and dry thoroughly with a disposable towel.
5. Use a towel to turn off the faucet.

Avoid using hot water, because repeated exposure to hot water may increase the risk of dermatitis. Multiple-use cloth towels of the hanging or roll type are not recommended for use in health care settings.

When decontaminating hands with an alcohol-based hand rub:

1. Follow manufacturer's recommendations regarding the volume of product to use.
2. Apply product to palm of one dry hand and rub hands together.
3. Cover all surfaces of hands and fingers with product and rub until hands are dry.

Alcohol-based hand hygiene products are preferred over soap and water when hands are not visibly soiled. Alcohol based products are better in three ways:

1. They kill germs better.
2. They leave skin in better condition.
3. They are quicker and easier to use, so people use them more.

The use of gloves does not eliminate the need for hand hygiene. Likewise, the use of hand hygiene does not eliminate the need for gloves.

Other Aspects of Hand Hygiene: Artificial Nails & Jewelry

Even after careful hand washing or the use of surgical scrubs, health care workers often harbor substantial numbers of pathogens in the subungual spaces. Health care workers who wear artificial nails are more likely to harbor gram-negative pathogens on their fingertips than those who have natural nails. Several studies have also demonstrated that skin underneath rings is more heavily colonized than comparable areas of skin on fingers without rings. Health care workers should avoid wearing artificial fingernails or extenders and keep natural nails unpolished and less than one quarter of an inch long.

Breaking the Chain of Infection: Barrier Techniques

Health care workers should treat as infections any blood or moist substances from any patient. There are barrier devices available for health care workers to protect themselves in the event they may come in contact with blood or moist body substances. Barrier devices including gloves, facial protection, and impervious gowns, etc. are all considered ways to interfere with the chain of infection by preventing transmission.

Gloves

The Occupational Safety and Health Administration (OSHA) mandates that gloves be worn during all client care activities that may involve exposure to blood or body fluids that may be contaminated with blood. The Center for Disease Control (CDC) has recommended that health care workers wear gloves to:

1. Reduce the risk of acquiring infections from clients.
2. Prevent health care workers' flora from being transmitted to patients.
3. Reduce transient contamination of the hands of health care workers by flora that can be transmitted from one client to another.

Glove Reminders and Safety Tips

- Clean, non-sterile gloves support Standard Precautions.
- Hand hygiene is critical before and after glove use.
- Change gloves between tasks within the same client as needed (suctioning, cleaning up incontinent episodes.)
- Gloves are removed when leaving the client room.
- Gloves need to be changed if they become cracked, torn or show signs of wear.
- Don't touch your face or adjust PPE with contaminated gloves.
- Don't touch environmental surfaces except as needed during client care.
- Never wash or reuse disposable gloves.

Procedure for Removing Gloves

1. Grab outside edge near wrist
2. Peel away from hand, turning glove inside out
3. Hold in opposite gloved hand
4. Slide ungloved finger under the wrist of the remaining glove
5. Peel off from inside, creating a bag for both gloves
6. Discard

Facial Protection

Masks and eye protection face shields are worn to protect mucous membranes of eyes, nose, and mouth while performing procedures and client care activities that may cause splashes of blood and

body fluids, excretions, secretions (e.g. suctioning a patient), or if you are within three feet of a client that is coughing uncontrollably, spitting, etc.

Gowns

Gowns are worn to protect skin and prevent soiling of clothing during procedures that may contaminate the health care worker. The gown should be fluid resistant at a minimum. If the activity to be performed will involve large amounts of body fluids, an impervious suit should be worn.

Soiled gowns or suits need to be removed in the client room; immediately wash hands to avoid transfer of microorganisms to other clients and environments.

Breaking the Chain of Infection: Other Methods

Additional ways to interfere with the chain of infection are through the use of drugs and vaccines. Drugs attack the agent in the chain. Viruses cannot effectively be treated with drugs so other means of interference need to be used. Overuse of antibiotics, however, has the risk of contributing to drug-resistant organisms. Vaccines alter a person's immunity to decrease susceptibility to the disease for which they have been vaccinated.

Work Practices, Engineering Controls and Environmental Controls

1. Immediately clean up blood or body fluid spills using gloves, a disposable towel or wipe, and an intermediate level disinfecting cleaner.
2. Dispose of contaminated sharps in a puncture-resistant container immediately after use. Do not bend, break, or manipulate sharps by hand. Do not recap needles unless a one-handed technique is used. Use a tong, forceps, or brush and dust pan for pick up.
3. Handle soiled linen in a manner that prevents skin and mucous membrane exposure and contamination of clothing. Place soiled linen in an impermeable bag. Close or tie shut.
4. Discard infectious waste into a red bio-hazardous waste container.
5. Perform cleaning procedures in a manner that minimizes the splashing or spraying of potentially infectious body fluids.
6. Do not eat, drink, apply lip balm, or handle lenses in areas where exposure is likely.
7. Clean and disinfect or sterilize contaminated equipment between uses and before sending for repairs.

Reprocessing Methods

Reprocessing methods include the cleaning, disinfection and sterilization of equipment and the environment.

Key Terms

- Contamination - The presence of microorganisms on inanimate objects (clothing, surgical instruments, environmental surfaces such as floors and tables) or in substances (water, food, milk.)
- Cleaning - Removal of visible foreign material (soil, organic debris) from an object. This can be done with soap and water or with low-level (environmental) disinfectant.
- Decontamination - Removal of disease-producing microorganisms rendering the object safe for handling.
- Disinfection - A process that results in the elimination of many or all pathogenic microorganisms on an inanimate object, with the exception of bacterial endospores.
- Sterilization - A process that completely eliminates or destroys all forms of microbial life including bacterial spores.

Key Procedures

1. When handling and cleaning contaminated items, wear approved gloves.
2. Follow professional recommendations for frequency and method of cleaning medical equipment.
3. Always clean items before reprocessing. First rinse with cold water to remove blood or body fluids, then wash with hot soapy water and rinse again to remove the soap before disinfecting or sterilizing. Cleaning methods may require a rinse or presoak depending on the nature and amount of blood or body fluids.
4. Always follow the device/equipment manufacturers recommendations for reprocessing to ensure that the method chosen is compatible with the components and materials in terms of heat and pressure tolerance and time required for processing.
5. Once cleaned, avoid cross-contamination by other articles or surfaces (e.g. do not store respiratory equipment with GI equipment.)
6. Once devices/equipment have been disinfected, proper handling and storage are required to maintain these items in ready to use conditions. Store in a clean dry container.

According to CDC, when cleaning medical equipment prior to disinfecting or sterilization, items that have been wet for several hours may have developed biofilm. Biofilm is complex colonies of bacteria protected by “slime” which protects the bacteria from contact disinfecting chemicals. Biofilm must be removed by mechanical action (scrubbing) before disinfection or sterilization.

Prevention of Exposure to Blood Borne Pathogens

Health care workers are at risk for occupational exposure to blood borne pathogens, including hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV).

OSHA regulations require the use of engineering controls to help prevent sharps and needle stick injuries, and a number of safer medical devices have been developed. According to NIOSH:

- Device should be needleless.
- Safety feature should be an integral part of the device.
- The device should work passively.
- If user activation is needed, it should be able to be done with one hand, and allow the hands to remain behind the exposed sharp.
- The user can tell if the safety feature is activated.
- The safety feature must remain active and protective through disposal.
- The device must be reliable, easy to use, practical, safe and effective for client care.

Preventing Needlestick Injuries

- Avoid use of needles where safe and effective alternatives are available.
- Use devices with safety features.
- Avoid recapping needles.
- Plan for safe handling and disposal of needles before using them.
- Promptly dispose of used needles in appropriate sharps disposal containers.
- Never remove a needle from a disposable syringe.
- Do not bend, break, or otherwise manipulate used needles by hand.

If an Exposure Occurs

Immediately following an exposure to blood:

1. Wash needlesticks and cuts with soap and water.
2. Flush splashes to the nose, mouth, or skin with water.
3. Irrigate eyes with clean water, saline, or sterile irrigants.
4. Report the exposure to your supervisor. Prompt reporting is essential because in some cases, post-exposure treatment may be recommended and it should be started as soon as possible.

Additional Transmission-based Precautions

In addition to Standard Precautions, some clients with suspected or known organisms may require other practices in addition to, but never in place of, Standard Precautions. These categories include:

- Contact Precautions - Used for clients known or suspected to be infected or colonized with microorganisms that can be spread by the contact route of transmission. Examples of these organisms are MRSA, VRE and lice. The appropriate PPE are gloves and gowns.
- Droplet Precautions - Used to prevent transmission of all communicable diseases that are spread by the droplet route of transmission. Possible diseases include Neisseria Meningitis, Mumps, Pertussis, Rubella and Haemophilus Influenzae. The appropriate PPE is a surgical mask if you are within three feet of the client.
- Airborne Precautions - Used to prevent transmission of all communicable diseases that are spread by the airborne route of transmission. Airborne precautions are used for clients with measles and chickenpox. The appropriate PPE is a surgical mask.

- Special Respiratory Precautions - This category has the same mode of transmission as airborne, but differs in the type of negative pressure ventilation and type of protection worn by health care workers. This category is used for the patient with known or suspected Pulmonary Tuberculosis.

Protecting others from infections of health care workers is the responsibility of the facility and the individual health care worker. If you suspect that you have been exposed on the job to a communicable disease, let your supervisor and infection control practitioner know without delay. Employees should also report to their supervisor any signs or symptoms of a communicable disease.

Symptoms That Should be Reported and Evaluated

- Fever
- Unusual rash
- Unexplained blister
- Purulent skin lesions
- Exudative (weeping) dermatitis
- Sore throat and fever
- Gastrointestinal symptoms (vomiting, diarrhea)
- Recent onset of unexplained cough or congestion suggesting an acute respiratory infection
- Jaundice
- Symptoms suggesting active tuberculosis (chronic productive cough, unexplained weight loss, fever, night sweats, hemoptysis (blood in sputum))

Tuberculosis

Purpose

The purpose of this training is to train Communities of Care nurses on proper procedure for a suspected or confirmed case of Tuberculosis (TB). Communities of Care is considered low-risk by the Center for Disease Control (CDC) standards; these measures are set in accordance with CDC and the Minnesota Department of Health (MDH).

When Tuberculosis is Suspected or Confirmed in a Client

There are three steps for dealing with a case of suspected or confirmed TB: identification, containment, and referral.

1. Identification: All COC nurses should understand the signs and symptoms of active TB, in themselves or their clients. These include weight loss, night sweats, a persistent cough lasting more than three weeks, and hemoptysis. It is also reasonable to educate clients and client families regarding the importance of early TB symptom detection and reporting.
2. Containment: According to the CDC, COC Health Care Workers (HCWs) “should not perform cough-inducing or aerosol-generating procedures on clients with suspected or confirmed infectious TB disease, because recommended infection controls probably will not be in place. Sputum collection should be performed outdoors, away from other persons, windows, and ventilation intakes.”

Further, “Health Care Workers who provide medical services in the homes of patients with suspected or confirmed infectious TB disease should instruct TB patients to observe strict respiratory hygiene and cough etiquette procedures. HCWs who enter homes of persons with suspected or confirmed infectious TB disease or who transport such persons in an enclosed vehicle should consider wearing at least an N95 disposable respirator.”¹

3. Referral: Any COC nurses who suspect that a client has TB should refer the client to the primary care physician immediately for diagnosis and treatment. Likewise, any COC HCW who exhibits signs or symptoms consistent with TB must be evaluated by a physician within 72 hours. These HCWs must not return to work until determined to be non-infectious.

¹Centers for Disease Control and Prevention, *Morbidity and Mortality Weekly Report*. “Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Settings, 2005.” December 30, 2005/Vol. 54/No. RR-17. Page 27.

Resources

Centers for Disease Control and Prevention

www.cdc.gov

National Institute for Occupational Safety and Health

www.cdc.gov/niosh/

Occupational Safety and Health Administration

www.osha.gov

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