Infection Prevention for Staff When Managing Manually Cleaned Items

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LEARNING OBJECTIVES

1. Identify three forms of infection transmission
2. Identify infection transmission concerns for manually cleaned medical devices
3. Establish policies and procedures to reduce potential exposure of staff when processing manually cleaned instrumentation

What do Ebola, bubonic plague, bacterial meningitis and hepatitis C infection all have in common? They are diseases that may be spread to healthcare workers through contact with blood or body fluids. Although these serious diseases are caused by infectious agents carried in blood and body fluids, they are not the only infectious materials that can come into the decontamination area. Shigellosis and Giardiasis are both diarrheal diseases spread by feces. Typhoid can be spread by urine, and methicillin-resistant *Staphylococcus aureus* (MRSA) can be found in the discharge from infected sites. The receiving, sorting and cleaning areas are hot spots for transmission of infectious materials to staff. Manually cleaned items that do not undergo disinfection prior to their hand-off to the clean side add to the complexity of exposure. Policies and procedures must take into consideration all points of potential exposure and identify appropriate personal protective equipment (PPE).

Objective 1: Identify three forms of infection transmission

An infection occurs when a person's body is invaded by disease-causing agents that are able to multiply within the person causing direct harm to that person. Some invaders cause direct damage, while other invaders produce toxins that then harm the person. Two things must happen for an invading organism to establish a successful infection. First, it must be able to enter the body. Second, the person's body must be susceptible to the invading organism.

For an infection to arise it must first come in contact with an entry point. Entry points include body orifices like the ear, nose and mouth. Infectious agents can also enter through the eyes, genitalia and breaks in the skin. Movement of infectious material from an infected person to the entry point of another person is called transmission.

The red biohazard circles show areas of potential staff exposure to infectious materials.

Transmission takes three forms: direct, airborne and indirect. Direct transmission occurs when the infected person physically transfers the infectious agent through direct contact or by ejecting body fluids containing infectious agents onto another person, such as by sneezing, coughing or vomiting. Airborne transmission occurs when very small particles of infectious materials are suspended in the air. Air currents carry the particles to the next person. *Note: This is not the same as sneezing. A sneeze creates a stream of infectious material, but the material does not remain suspended in the air. Think of sneezing as a mister bottle. Airborne particles are more like fog. Fog is suspended water particles in the air that can be moved by wind.* Indirect transmission uses a vehicle (e.g., food, door handles and contaminated medical devices) to carry the infectious agents. One should never forget that anything can become a vehicle once it is contaminated, including the human hand.

The primary means of transmission within the Sterile Processing department (SPD) is indirect transmission from contaminated objects and hands to the mouth, nose and eyes.

Objective 2: Identify infection transmission concerns for manually cleaned medical devices

Manual cleaning is necessary for all

medical devices that pass through the decontamination area. In some cases, manual cleaning is limited to removing large debris and pretreatment chemistries prior to placement in a washer-disinfector. In other cases, precleaning is a complex process that requires soaking, brushing, ultra-sonification and other critical steps. An opportunity for exposure to infectious agents exists through this process.

Transmission sources include:

- Contact points with contaminated devices and surfaces;
- Activities that cause splashing or spraying of contaminated fluids; and/or
- Activities which aerosolize fluids into the air (that is to say, create a mist).

Medical devices, transport trays and transport carts are examples of contact points for indirect transmission. These surfaces can become contaminated with blood, urine, feces, sputum and other bodily fluids. Direct contact with these contaminated surfaces can transfer infectious materials to hands or clothing. The infectious materials could then be transferred to the eyes, nose or mouth by the staff member's hands or clothing. The staff member can also contaminate other people or surfaces by touching them with contaminated hands or clothing.

Another source of indirect transmission is sink fluids. As devices are cleaned and rinsed, the infectious agents are transferred from the medical devices to the cleaning solution or rinse water in the sink. Rinsing and cleaning can create opportunities to splash contaminated sink fluids onto staff and the surrounding area, thereby spreading the contamination to new contact points. In addition to splash hazards, contaminated surfaces, brushes, cleaning clothes and gloved hands become contact points of contaminated materials.

The last means of transmission at the sink is aerosolization of cleaning fluids during brushing, flushing and ultra-sonification. The contaminated aerosolized fluids can allow surfaces and staff members to become contaminated. Aerosolization also presents an inhalation hazard as airborne fluid can be inhaled through the mouth and nose. Although cleaning removes organic and inorganic soils and some microbial bioburden, a significant number of microbes can still be present after cleaning. A secondary disinfection process is needed to make the medical device safe to handle with bare hands and, in some cases, ready for use.

Typically, automated washer-disinfectors and ultrasonic cleaner-disinfectors provide thermal disinfection. Washer-disinfectors typically have two doors. Once the cycle is complete, the door on the clean side opens, preventing recontamination of the medical devices. Ultrasonic cleaner-disinfectors do not have a two-door operation.

Devices that have been thermally disinfected are removed from the ultrasonic washer-disinfector while still in the decontamination space and they must be carried and passed to the clean side. These devices may be exposed to aerosols, fluids and contaminated gloves. The potentially contaminated medical devices could transmit infectious materials to the hands of the receiving clean-side staff.

Even though most medical devices undergo thermal disinfection, some devices are not compatible with thermal disinfection and must be passed through to the clean side while still contaminated. The devices, in turn, contaminate all surfaces they contact, including pass-through shelves, drying cabinet shelves, washer racks, preparation and packaging tables and any other items these devices touch. This opens the opportunity for transmission of infectious materials to the hands of the clean-side staff as they work with these devices and their contact points.

To truly identify all sources of potential exposure, supervisors – in conjunction with the Infection Preventionist – should follow the path of contaminated devices (upon receipt into decontamination, through cleaning, and ending with the final microbiocidal process that renders the device ready for patient use).

Objective 3: Establish policies and procedures to reduce potential exposure of staff when processing manually cleaned instrumentation

Preventing exposure begins by eliminating the sources of exposure. When the source can't be eliminated, the risk of exposure is reduced by employing engineering controls and appropriate work practices, and using proper personal protective equipment. Every facility must take appropriate actions and provide the equipment and materials needed to protect staff from exposure to infectious materials. The Occupational Safety and Health Administration (OSHA) provides guidance on the appropriate measures to be taken to protect staff from potentially infectious blood and other bodily fluids.

OSHA's Bloodborne Pathogens standard 1910.1030 provides this guidance. This standard requires employers to create an exposure control plan and make it readily available to staff who have the potential for being exposed. The exposure control plan identifies job functions at risk of exposure, the type of exposure anticipated, and the engineering controls, PPE and work practices that will be performed to prevent exposures.

The Bloodborne Pathogen standard lists a few specific examples to be considered. These include but are not limited to:

- PPE;
- Easily accessible handwashing stations;
- Appropriate containment of disposable contaminated sharps;
- Procedures and equipment that minimize splashing, spraying, spattering and generation of droplets with infectious materials;
- Clear identification of potentially hazardous materials or contaminated items;
- Cleaning and decontamination of all surfaces, equipment and reusable PPE that may become contaminated with infectious materials; and
- A means for safely disposing single-use PPE.

The Centers for Disease Control and Prevention (CDC) further recommends that employers utilize immunization programs appropriate for the associated exposure risks. These programs should be based on the US Public Health Service's Advisory Committee on Immunization Practices. The specific vaccinations to include in the program should be based on the likelihood of exposure, the job function and the likely diseases to be contracted by the patient population and brought to the healthcare facility.

Although the decontamination area and the staff members employed there have the highest potential of exposure to infectious materials, other job functions within the SPD are also susceptible. Any medical device that has been manually cleaned within the decontamination area requires chemical or thermal disinfection to render it safe to handle with bare hands. This includes items that may be manually cleaned and transferred to the clean side through a gate, window or door. Manually cleaned instruments often require sterilization following cleaning. Not all devices can handle the heat of thermal disinfection processes found in automated washer-disinfectors and some ultrasonic cleaners. Often, these items are dried in the decontamination area and passed to the clean side without disinfection. The receiver on the clean side should handle these devices in a way consistent for contaminated devices. This activity must be considered within the exposure control plan and appropriate PPE and work practices should be implemented to prevent exposure of clean-side staff to infectious agents. For example, it may be necessary to utilize a chemical disinfection process labeled for this use or staff members may need gloves and a dedicated preparation space.

Manually cleaned items that have been passed through without a disinfection process can contaminate a variety of surfaces with which clean side staff members can come in contact. Pass-through windows, drying cabinets and doors can become contaminated during the transfer of manually cleaned items. Preparation and packaging tables can become contaminated as the staff member prepares the item for sterilization. Wet, manually cleaned items represent a possible exposure to contaminated fluids.

No policy or procedure is effective without training. Training should be conducted regularly and include a discussion of the potential exposure related to staff members' work activities, as well as the engineering, PPE and work practices necessary to keep that employee safe. Staff members should also be educated on the importance of immunizations – in particular, those that the healthcare has deemed necessary. Finally, the education plan should include education of transient individuals who may interact with the department. It is important to also include anyone who would enter the decontamination area, including vendors, cart transporters and those that may deliver contaminated patient service materials from other departments or facilities. Policies and procedures should include PPE and work practices that reduce the potential of exposure to these departmental visitors.

Conclusion

Exposure to infectious materials is a risk faced by all SP staff members, but it does not have to lead to staff member infection. Employing a systematic approach that identifies potential exposure points and implements proper engineering, work practices and PPE will help staff and visitors stay safe.

RESOURCES

1. Occupational Safety and Health Administration (OSHA), Department of Labor. (2011). Occupational Exposure to Bloodborne Pathogens; Needlestick and Other Sharps Injuries; Final Rule. Retrieved from https://www.osha.gov/laws-regs/federalregister/2001-01-18.
2. ACIP Vaccine Recommendations and Guidelines, Advisory Committee on Immunization Practices (2011). Retrieved from https://www.cdc.gov/vaccines/hcp/acip-recs/index.html.
3. Bolyard, E. A., Tablan, O. C., Williams, W. W., Pearson, M. L., Shapiro, C. N., Deitchman, S.D, The Hospital Infection Control Practices Advisory Committee (1988). *AJIC*, 26, 289-354.
4. Advisory Committee on Immunization Practices. (2019). ACIP Recommendations. Retrieved from https://www.cdc.gov/vaccines/acip/recommendations.html.