





Proper Handling and Transport of Soiled Medical Devices

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LEARNING OBJECTIVES

1. Understand the transmission of infection
2. Identify critical factors to consider before handling and transporting soiled medical devices
3. Review different scenarios and challenges Sterile Processing personnel can experience when transporting soiled medical devices

Sterile Processing (SP) professionals perform multiple tasks that are crucial to patient safety and optimal procedural outcomes. Safe handling and transport of soiled instruments and medical devices are essential functions that are, unfortunately, commonly overlooked by facilities—or at least not prioritized effectively. This lesson plan reviews basic principles of infection transmission and explains how appropriate infection prevention practices can mitigate the risks of transmission. This lesson also provides examples of and best practices for real-life device handling and transport scenarios regularly encountered by SP professionals.

Objective 1: Understand the transmission of infection

To better understand the transmission of infection, it is important to first become familiar with the chain of

infection and the role the mode of transmission plays within that chain. The chain of infection is a way of gathering and applying information to interrupt or prevent an infection. Each link in the infection chain must be intact for an organism to grow and infection to develop. Breaking any link in the chain can disrupt transmission of and potentially prevent an infection.

According to the Centers for Disease Control and Prevention's (CDC's) *Guidelines for Isolation Precautions*, there are six elements involved in disease transmission and the chain of infection: a causative agent, reservoir, portal of exit, mode of transmission, portal of entry, and susceptible host. The causative agent is the microorganism that causes an infectious disease. The reservoir is the place where an infectious agent (microorganism) can survive. The portal of exit is the path by which an infectious agent leaves the reservoir, and



the mode of transmission is the method an infectious agent uses to transfer from the reservoir to a susceptible host. The portal of entry is the path used by an infectious agent to enter a susceptible host, and the susceptible host is a person or animal that lacks the ability to resist infection by the infectious agent.

SP professionals have the greatest opportunity to interrupt the chain of infection by breaking the transmission link and preventing the transfer of the infectious agent to a susceptible patient. Two especially important transmission routes that must be understood in the Sterile Processing department (SPD) to break the link in the chain and stop disease transmission are direct and indirect contact. Direct contact refers to the person-to-person spread of disease, with hands being the most common form of direct transmission. Direct transmission can also occur through transmission of blood and bodily fluids or because of a breakdown in skin integrity. Failing to perform proper hand hygiene when examining patients, for example, can be a source for direct contact transmission. The best method for preventing the spread of disease and breaking the transmission link through direct contact is to wear protective gloves and, more importantly, perform hand hygiene appropriately.

Indirect contact is the transfer of infection that can include inanimate objects, contaminated fingers, water and food. In the SPD, pathogens can be transmitted through instrumentation that is not cleaned, disinfected or sterilized. Medical devices, such as feeding pumps, sequential compression devices and intravenous pumps that are inadequately cleaned between patients, can also transmit harmful microorganisms. Further, instruments that are not properly cleaned or sterilized can transfer infection

from one patient to another. One example is an improperly cleaned duodenoscope used in an endoscopic retrograde cholangiopancreatography (ERCP) procedure that can transmit a multidrug-resistant organism from one patient to another patient or multiple patients. Breaking the transmission link is the key to prevention. Cleaning instrumentation and medical devices consistently and according to the manufacturers' instructions for use (IFU)—and performing hand hygiene and wearing personal protective equipment (PPE) properly—are the most effective ways to prevent the spread of infection.

Objective 2: Identify critical factors to consider before handling and transporting soiled medical devices

Before SP personnel transport contaminated items, they must first undergo comprehensive education, training and competencies specific to handling and transporting soiled medical devices, including the need to obtain and follow the manufacturers' IFU.

Training in safe handling should include steps for loading and unloading devices within a cart. Items should be placed securely in or on a cart, in a manner that prevents them from spilling, falling or sliding during transport. Fluids should also be emptied from containers. *Note: If instruments are placed in a soaking basin or container with a large amount of fluid, the fluid should be removed and disposed of prior to transport.* Heavier items, such as metal containers and equipment, should be placed near the bottom of the cart and never on top of lighter, more delicate items. Plastic, lighter and more delicate items should always be placed near the top of the cart to prevent damage.

Sterile or clean items should never be transported in the same cart as soiled items. Transporting sterile or clean items with soiled items is considered an event that affects sterility, and any sterile or clean items transported with soiled items should be considered contaminated. Contaminated single-use items must always be discarded.

SP professionals should also be aware of the appropriate PPE for each task associated with handling of soiled items. Some situations only require the use of gloves (e.g., when retrieving fluid pumps from the general surgical floor). Other situations may require complete PPE coverage, including hair covering, gown, gloves, mask, and eye and face protection. Complete PPE coverage would be required when unloading surgical instrumentation from a transport cart in the decontamination room. Education and training of PPE should follow the Occupational Safety and Health Administration's (OSHA) guidance on PPE, which includes:

1910.132(d)(1) – The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of PPE. If such hazards are present, or likely to be present, the employer shall:

1. Select and have each affected employee use the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment.
2. Communicate PPE selection decisions to each affected employee.
3. Select PPE that properly fits each affected employee.



1910.132(f) (1) – The employer shall provide training to each employee who is required by this section to use PPE. Each such employee shall be trained to know at least the following: When PPE is necessary; which PPE is necessary; how to properly don (put on), doff (remove), adjust, and wear PPE; the limitations of the PPE; and the proper care, maintenance, useful life and disposal of PPE.

Engaging in proper hand hygiene practices is among the most critical activities individuals can perform to break the chain of infection. Hand hygiene training should be provided for all personnel involved in handling and transporting soiled items. Gloves should be worn anytime soiled items are handled. After handling soiled items, gloves should be removed, and hand hygiene should be performed. Wearing gloves does not replace the need for hand hygiene. According to the World Health Organization (WHO), hands should be cleaned by rubbing them with an alcohol-based formulation (if hands are not visibly soiled). Washing hands with soap and water should be performed when hands become visibly dirty or soiled. An assessment should be conducted by a multidisciplinary team that includes an infection preventionist to assess each location where soiled instrumentation will be handled and transported and to ensure enough hand hygiene stations are available.

Before transporting soiled instrumentation and medical devices throughout the facility, SP personnel should evaluate the method of transport. The method must be able to contain all contaminated items to minimize the spread of microorganisms. Using an enclosed cart is one of the best methods for safely transporting medical devices. An enclosed cart allows personnel to

transport items in a closed system, which decreases the potential for direct and indirect contact transmission of microorganisms.

If using an open cart, it should have a solid bottom shelf to prevent contamination (including dripping) from soiled items. An open cart system must be able to be covered; this provides a barrier between the soiled items and the clean areas the cart must pass through to reach the decontamination room or designated cleaning area. If the cart cover is reusable, the cover must be decontaminated after each use, and the user should refer to the IFU for cleaning and disinfection instructions. Single-use covers must be discarded after each use.

Instruments and medical devices may also be transported by hand, in metal or plastic containers. When using these types of containers, ensure the container has a tight-fitting lid to prevent spillage if the container falls or is jostled. When transporting soiled, contaminated or biohazardous items in a container or cart, the container or cart should be clearly identified or labeled as containing biohazardous items (such as with a “biohazard” sticker, label or tag that is attached to the cart or container). It is the responsibility of the facility to decide which identification method is appropriate for the transportation system in use.

All carts or containers used to transport soiled medical devices must be decontaminated after each use to prevent blood and bodily fluids from drying on internal and external surfaces. Decontamination of carts and containers also reduces the risk of environmental contamination and personnel exposure to contaminants. When transporting soiled medical devices and instrumentation to the decontamination area, employees should use a route with the least amount

of traffic and patient interaction; busy hallways and corridors should be avoided. Carts containing soiled items should never be left unattended because they could be opened by unauthorized personnel or other individuals, allowing them to be exposed to infectious microorganisms. Carts should be transported slowly and in a manner that avoids accidents such as running into patients, visitors, other employees, or even walls or other structures that could damage the cart and its contents. Mirrors can be installed at corridor intersections to help avoid accidents and allow employees to see around corners and blind spots. Using an employee-only service elevator is also preferred (instead of general-service patient elevators). *Note: Even facilities with dedicated cart-only elevators must ensure the instruments and devices are completely contained, and the elevator must be cleaned regularly. In the event of cart spillage or contamination, the elevator (dedicated cart elevator or general-service elevator) should be taken out of service and thoroughly cleaned.*

Handling and transporting soiled medical devices can increase the risk for musculoskeletal injuries. Repetitive tasks increase those risks. Musculoskeletal injuries can strain or stress muscles, nerves, blood vessels, ligaments and tendons and, ultimately, lead to injuries, such as carpal tunnel syndrome, tendinitis and back, neck or shoulder problems. SPD education and training should emphasize proper body mechanics and ergonomics. Ergonomics is the process of changing work or working conditions to reduce employee fatigue or discomfort. Each area in the transportation route should be evaluated for potential ergonomic improvement, and education should demonstrate good body mechanics when lifting heavy items, twisting, bending, reaching, and



pushing or pulling heavy loads. Training should also include examples of how to safely lift or move an object. Such steps can include:

- Spreading feet apart to give the body a wider base of support
- Standing as closely as possible to the object being lifted
- Bending at the knees instead of at the waist or with the back
- Tightening stomach muscles when lifting or lowering an object
- Holding the object as closely to the body as possible
- Lifting slowly (using your muscles in your hips and legs)
- Avoiding bending forward when standing up with the object
- Not twisting the back while bending to reach, lift or carry an object
- Squatting to set an object down, using the leg and hip muscles, and keeping the back straight

SP employees should be observed while lifting to ensure the proper mechanics are being followed. Employees should also be able to demonstrate competency in performing lifting and other tasks safely and ergonomically. Ergonomic principles should also be followed to prevent injuries when hand-carrying items. A rolling cart, for example, can help protect personnel from unnecessary muscle strain.

Objective 3: Review different scenarios and challenges Sterile Processing personnel can experience when transporting soiled medical devices

Scenario 1: Transporting soiled instruments from the Operating Room to the decontamination area – In many facilities, transporting soiled instrumentation from the Operating

Room (OR) is performed with the help of a nurse, surgical technician or other OR staff member. Regardless of who is responsible for transporting soiled items, those performing these tasks must be educated, trained and have competencies around loading and unloading of soiled items.

Prior to transporting soiled items to the decontamination area, the devices should undergo point-of-use treatment. Early point-of-use treatment is vital for removing blood and bioburden. When soiled instruments are left untreated and allowed to dry, they can become difficult to clean, impeding the disinfection or sterilization processes and, potentially, leading to device damage. Soil that dries on an instrument can harden and create biofilm formation, a collection of microorganisms that attach to a surface and each other to form a colony that is difficult to clean and remove; once biofilm forms, the instrument may need to be sent out for repair or discarded.

To help prevent biofilm formation, instruments should be kept moist and/or pretreated with a wetting agent, enzymatic or instrument cleaning solution (saline is corrosive and should never be used). Before using a pre-treatment solution, the solution manufacturer's IFU should be reviewed and followed. In some facilities, the decontamination area is located adjacent to the OR, and in other facilities, it is located above or below the surgical suite. Regardless of its location, soiled devices must be contained during transport to prevent direct, indirect and airborne transmission of microorganisms.

Scenario 2: Transporting instrumentation and medical devices from clinical areas – When transporting soiled instrumentation and medical devices from clinical areas, such as the Emergency Department, Labor

and Delivery or clinical offices, it is important to communicate effectively and establish a process and routine schedule for device pickup. A schedule creates accountability and helps ensure soiled items are collected as soon as possible after procedures. Collection times should be established for each area depending on usage and item availability; a multidisciplinary team can assist with establishing collection times and procedures.

Employees in all areas that rely on medical devices should be educated and trained about point-of-use treatment and the required processes for preparing instrumentation for collection and transport to the decontamination area. The route to clinical areas and back to the decontamination area should be reviewed with all personnel to maximize efficiencies and identify potential hazards, such as blind spots, that could jeopardize patient, visitor and employee safety. When collecting soiled devices from several different user areas, personnel must pay special attention to hand hygiene practices, and hand washing sinks or hand sanitizing stations must be available. SP professionals must review and use the required PPE for each area where soiled items will be collected and perform hand hygiene after doffing PPE. PPE and hand hygiene practices should be monitored and audited for compliance.

Employees in some clinical areas may transport soiled instrumentation or medical devices. In these situations, the clinical staff member must still participate in education and training and perform the task according to SP expectations. SP personnel should always be involved in the soiled instrument and medical device transporting process and ensure the process is performed according to regulations, policies and recommended practices.



Scenario 3: Offsite transportation – Some SPDs are the central processing center for multiple off-site locations. When transporting soiled items from offsite locations, it is important to review the U.S. Department of Transportation (DOT) guidelines and follow any applicable state and local requirements for transporting biohazard materials. Again, all personnel involved in the transport of soiled items should participate in the same education and training as SP professionals and know how to perform proper point-of-use treatment and manage hazardous spills. SP professionals should work in collaboration with the offsite facilities to evaluate the point-of-use treatment and preparation and determine if gross decontamination of the items will be required. The evaluation should consider the amount of time between the use of the item and the arrival of soiled items in the centralized decontamination area. This evaluation will determine the appropriate level of cleaning needed prior to transportation.

If the location of soiled items is in an adjacent building and the instrumentation can be transported within a reasonable time frame—

which can be determined by the multidisciplinary team—it may be possible to pretreat the instrumentation with a wetting, enzymatic or instrument cleaning solution before transporting; however, if the location is offsite and transporting soiled items only occurs once a day, then gross cleaning may be required to remove blood and bioburden.

It bears repeating that removing bioburden as soon as possible helps prevent biofilm formation and mitigates infection risks. Soiled items should be contained in a cart or bin in a manner that prevents the soiled items from spilling or contaminating personnel during transport. Any time personnel transport soiled, contaminated and biohazard items, the container or cart must be identified or labeled as containing biohazardous items.

Conclusion

Safe handling and transport of soiled medical devices helps prevent the transmission of infectious organisms within and across healthcare facilities. Understanding the basic principles of infection transmission and how to break the links in the chain of infection

plays a vital role in stopping the spread of infection. Education, training and competencies specific to handling and transporting of soiled items are essential for providing a safe environment for patients, visitors and employees.

RESOURCES

- Association of periOperative Registered Nurses. *AORN Guidelines for Hand Hygiene*. 2017.
- Guideline for Disinfection and Sterilization in Healthcare Facilities*, 2008. Atlanta, GA: Center for Disease Control and Prevention; 2008.
- Healthcare Sterile Processing Association. *Sterile Processing Technical Manual*, 9th ed. 2023.
- National Library of Medicine. <https://medlineplus.gov/ency/patientinstructions/000414.htm>.
- Siegel, J.D., Rhinehart, E., Jackson, M., Chiarello, L., and the Healthcare Infection Control Practices Advisory Committee. *2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings*.
- U. S. Department of Labor, Occupational Safety and Health Administration. *Ergonomics*. www.osha.gov/SLTC/ergonomics/.
- World Health Organization. *Hand Hygiene: Why, How & When*. 2009. http://who.int/gpsc/5may/Hand_Hygiene_Why_How_and_When_Brochure.pdf.
- Occupational Safety and Health Administration. 29 CFR 1910.1030. Hazardous Substances. Bloodborne Pathogens. 2013.



CRCST Self-Study Lesson Plan Quiz

Proper Handling and Transport of Soiled Medical Devices

Lesson No. CRCST 194 (Technical Continuing Education – TCE) · Lesson expires February 2027

- Which of the following is not a link in the chain of infection?
 - Susceptible host
 - Portal of entry
 - Direct contact
 - Mode of transmission
- Mode of transmission refers to:
 - The path used by an infectious agent to enter a susceptible host
 - The method of transfer of an infectious agent from the reservoir to a susceptible host
 - A person or animal that lacks the ability to resist infection by an infectious agent
 - The microorganism that causes an infectious disease
- Transferring an infectious organism person to person is referred to as:
 - Portal of entry
 - Airborne transmission
 - Direct contact
 - Indirect contact
- Repetitive tasks like bending, twisting, and pulling heavy items increase the risk for musculoskeletal injuries.
 - True
 - False
- Which of the following describes the process of changing work or working conditions to reduce employee fatigue or discomfort?
 - Ergonomics
 - Economics
 - Autonomics
 - None of the above
- Which federal agency provides guidance about PPE?
 - EPA
 - HIPAA
 - FDA
 - OSHA
- Which situation requires the use of complete personal protective equipment (PPE)?
 - Picking up instruments from the Emergency Department
 - Unloading a full instrument cart in the decontamination area
 - Loading fluid pumps into an enclosed cart on a patient floor
 - Transporting a cart filled with instruments through a patient corridor
- The best way to break the transmission link in the chain of infection is donning PPE.
 - True
 - False
- Which of the following is **not** required training as discussed in OSHA 1910.132(f)(1)?
 - When PPE is necessary
 - Hand hygiene
 - PPE limitations
 - How to don, doff, adjust and wear PPE
- The best method for transporting soiled medical devices within a healthcare facility is using an enclosed cart with the heaviest devices placed on top to secure the lighter, more delicate devices below.
 - True
 - False
- Which of the following is **not** a consideration when handling and transporting soiled devices?
 - The type of cart or bin being used to transport instrumentation
 - Traffic patterns and patient interaction
 - The type of PPE to be worn
 - Documentation of biological indicator results
- When hands become visibly soiled, employees should:
 - Use an alcohol-based formulation
 - Wash hands with soap and water
 - Use an alcohol-based formulation, followed by a water rinse
 - Don a new set of gloves
- Upon entering an elevator, a co-worker is seen transporting soiled instrumentation in a closed cart with the doors open. What is the most appropriate action to take?
 - Close the cart doors to contain the soiled items
 - Nothing as there are no issues with this transport method
 - Re-educate the co-worker
 - Close the cart doors, ensure the elevator is cleaned, and re-educate the co-worker
- Soiled devices and unused single-use supplies from the case are both included in the cart. What is the most appropriate action?
 - Return the unused supplies to the Operating Room to be restocked
 - If the unused supplies appear uncontaminated, they may be repackaged for reuse
 - Donate the unused supplies
 - Dispose of the supplies because they have been compromised
- Bioburden refers to:
 - The number of microorganisms on a contaminated object
 - A collection of microorganisms that attach to surfaces and each other to form a colony
 - The migration of contaminants from one person, object or work location to another
 - A specific type of multidrug-resistant organism

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