Healthcare Associated Infections Antimicrobial Resistance Program

Environmental Services Toolkit

West Virginia Department of HEALTH
BUREAU FOR PUBLIC HEALTH

Introduction and background

West Virginia Bureau for Public Health's Healthcare Associated Infections Antimicrobial Resistance Program is dedicated to protecting patients and healthcare personnel by promoting safety and quality. Preventing healthcare associated infections (HAIs) and reducing antimicrobial resistance (AR) are top priorities. HAIs are infections that people acquire while they are receiving treatment for medical or surgical conditions in a healthcare setting and can be acquired anywhere healthcare is delivered. HAIs have been a recognized public health threat for many years associated with morbidity, mortality, and increased healthcare costs, yet many are preventable. Environmental contamination is often a factor in the transmission of HAIs and has been associated with outbreaks of multidrug-resistant organisms (MDROs) including methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant enterococci (VRE), *Clostridioides difficile* (*C. diff*), and *Acinetobacter baumannii*. Therefore, environmental cleaning is an essential component for infection prevention and control and must be incorporated and executed within the infrastructure of the IPC program. This, along with training, monitoring, audit and feedback, and the support of leadership are crucial to combating healthcare associated infections and improving overall patient safety.

(CDC HAI www.cdc.gov/healthcare-associated-infections/about/index.html)

Competency

The competence of the Environmental Service Department (EVS) in a healthcare facility is crucial to the success of their Infection Prevention and Control Program (IPCP). Although everyone should contribute to maintaining a clean environment, it is the role of the EVS employee to provide an overall safe and sanitary care setting. This can be accomplished by ensuring that the EVS staff and other employees are competent to perform the related IPC interventions appropriate to their position and remain up to date on policies and procedures. The Centers for Disease Control and Prevention (CDC) recommends that education and training be conducted at the time of hire and then at least annually. It is also important to provide education and training when implementing new processes, new equipment or when any procedural gaps are identified. Once the education and training are completed, a competency assessment should be conducted to test the knowledge and observe the ability of the employee to proficiently perform the skills. While direct observation is preferred, if it is not an option then other methods should be incorporated to demonstrate that an employee is competent to perform the job responsibilities.

Must know Terms

Cleaning: the physical removal of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents, and mechanical action.

Contact time: The time that a disinfectant must be in contact with a surface or device to ensure that appropriate disinfection has occurred. For most disinfectants, the surface should remain wet for the required contact time.

Disinfection: A thermal or chemical process for inactivating (i.e., kill) microorganisms on inanimate objects.

Hazardous waste: Waste that is dangerous or potentially harmful to health or the environment. Hazardous waste can be liquids, solids, gases or sludges. They can be discarded commercial products, like cleaning fluids or pesticides, or the byproducts of manufacturing processes.

High-level disinfection: Kills all microorganisms, except for small numbers of bacterial spores.

High-touch surfaces: Surfaces, often in patient care areas, that are frequently touched by healthcare workers and patients (e.g., bed rails, overbed table, IV pole, call light, TV remote control, phone, doorknobs, medication carts).

Low-level disinfection: Inactivates most vegetative bacteria, some fungi, and some viruses in a practical contact time, but does not kill more hardy viruses (e.g. non-enveloped), bacterial genus (e.g. mycobacteria), or bacterial spores.

Low-touch surfaces: Surfaces that are minimally touched by healthcare workers and patients (e.g., walls, ceilings, floors).

Personal protective equipment (PPE): Devices or clothing designed to protect against workplace hazards. Hazards in the workplace may be electrical, chemical, physical or biological. Personal protective equipment includes safety glasses, goggles, face shields, gloves, protective clothing and respirators.

Routine cleaning: The regular cleaning (and disinfection, when indicated) when the room is occupied to remove organic material, reduce microbial contamination, and provide a visually clean environment. Emphasis is on surfaces within the patient zone.

Safety data sheet (SDS): A document by the supplier or manufacturer of a chemical product that contains information on the product's potential hazards (health, fire, reactivity, and environmental) and how to work safely with it. It also contains information on the use, storage, handling, and emergency procedures.

Standard Precautions: Are used for all patient care. Based on a risk assessment and make use of common-sense practices and personal protective and other equipment that protects healthcare providers from infection and prevent the spread of infection from patient to patient.

Transmission-Based Precautions: Are used in addition to Standard Precautions for patients with known or suspected infections. There are three categories:

- **Contact:** Intended to prevent the transmission of infectious agents, including epidemiologically important microorganisms, that are spread by direct or indirect contact with the patient or the patient's environment.

- **Droplet**: Intended to prevent transmission of pathogens spread through close respiratory or mucous membrane contact with respiratory secretions.

- **Airborne**: Intended to prevent transmission of infectious agents that remain infectious over long distances when suspended in the air (e.g., rubeola virus [measles], varicella virus [chickenpox], M. tuberculosis, and possibly SARS-CoV).

- **Terminal (discharge) cleaning**: Cleaning and disinfection after the patient is discharged or transferred. Includes the removal of organic material and significant reduction and elimination of microbial contamination.

Project Firstline [3]

Project Firstline was developed by the CDC in October of 2020 as a working collaborative to help fill educational gaps in healthcare systems on Infection Control and Prevention. Project Firstline is an easily accessible online learning platform that supports education for all healthcare workers. There are a variety of educational resources including videos, interactive scenarios, toolkits and webinars to help meet the learning needs of all healthcare professionals.

Risks and Environment Reservoirs–Education [13]

The healthcare environment is considered a reservoir or place where germs live. Common healthcare environment reservoirs include water and wet surfaces, dry surfaces, dirt and dust, and devices. Transmission can occur when appropriate infection prevention and control practices, such as cleaning and disinfection, are not followed. This infection prevention and control practice is part of standard precautions and is one way we can stop the spread of germs. Staff understanding of environmental reservoirs facilitates the importance of their role within the healthcare team. CDC's Project Firstline provides free educational materials on recognizing risks related to reservoirs. Environmental Services Managers can use these materials to form their own training programs.

Cleaning VS Disinfection [15]

Environmental Staff performing environmental surface cleaning should know and understand the difference between cleaning and disinfection. Both are important in eliminating germs and the spread of infection.

Cleaning removes visible dust, debris, and spills. Cleaning will eliminate some germs by wiping them away in debris or material but usually does not involve certain disinfectants and contact times.

Disinfecting kills germs on surfaces. A disinfectant specifically for eliminating specified germs are sprayed on surfaces and required contact time per manufacturer's directions are observed.

Transmission Based Precautions [1,2]

Transmission Based Precautions are the next step after Standard Precautions in the prevention of healthcare associated infections or HAI. All healthcare encounters should include Standard Precautions, regardless of the setting or patient. Transmission Based Precautions are exactly what they sound like - precautions to be taken based on how a disease or condition is transmitted or passed on to another person. It is important to remember that Transmission Based Precautions are in addition to Standard Precautions **AND** that more than one type of Transmission Based Precaution may be needed, based on the person's condition or disease. It is also important to remember that all needed personal protective equipment, or PPE should be donned or put on before or at the entry to the room and be doffed or removed before exiting the room for Contact and Droplet Precautions. There are specific instructions for Airborne Precautions that will be discussed in the Airborne section and in the PPE Donning and Doffing section. Hand Hygiene is required before **ALL** donning and doffing of PPE.

- **Contact** - Contact precautions are used when the mode of transmission is contact with the person or objects in their immediate environment, these objects are called fomites. Contact precautions require a protective gown and gloves to be worn when in contact with the patient or their environment. These items should be worn upon entry into the room, regardless of if contact is expected or not. Some common examples of reasons for contact precautions include Methicillin Resistant Staphylococcus Aureus or MRSA, Vancomycin Resistant Enterococcus or VRE, diarrheal illnesses, wounds, and Respiratory Syncytial Virus or RSV.

- **Enhanced Barrier** - Enhanced Barrier precautions are used in Long-Term Care Settings **Only**. These precautions require a protective gown and gloves to be worn in certain situations in the person's environment, specifically, high-contact care activities. While most of these circumstances involve direct care, it also includes changing linens. Some common examples of reasons for enhanced barrier precautions include persons known to be infected or colonized with a Multidrug Resistant Organism or MDRO or persons at increased risk for contracting an MDRO, such as those with a wound or an indwelling medical device.

- **Droplet** - Droplet precautions are used when the mode of transmission is through a droplet produced by coughing, sneezing, talking, or even singing. These droplets are heavier than air and a face mask and gloves are needed if within three (3) to six (6) feet of the person or their environment. Again, it is essential that these items are worn upon entry into the room, even if close contact is not anticipated. Some common examples of reasons for droplet precautions include Influenza or flu, Pertussis or whooping cough, or Neisseria Meningitidis.

- **Airborne** - Airborne precautions are used when the mode of transmission is through the air. What makes airborne conditions different from droplets is that airborne particles are smaller and lighter and travel further than droplets. These particles travel easily through the air for another person to breathe in and they can also contaminate surfaces greater distances away. Airborne precautions require a properly fitted and placed, the National Institute for Occupational Safety and Health (NIOSH) approved N-95 or higher-level respirator that is donned prior to entry to the room and doffed after exit (with the door closed). All other PPE (gown, gloves, face mask, eye protection) should be worn as needed depending on the anticipated contact or activity being performed. Some common examples of reasons for airborne precautions include tuberculosis or TB, Varicella Zoster or Chickenpox, Measles, and disseminated shingles.

PPE [7]

'Donning' means to put on and use PPE properly to achieve the intended protection and minimize the risk of exposure. 'Doffing' means removing PPE in a way that avoids self-contamination. The type of PPE used will vary based on the level of precautions required, such as standard, contact, droplet, or airborne infection isolation precautions.

Sequence for Donning PPE:

1. Perform hand hygiene before donning PPE
2. Gown
3. Mask or respirator
4. Goggles or face shield
5. Gloves

How to don a gown:

1. The torso from the neck to the knees and arms from the shoulders to the wrists should be completely covered.
2. The gown should go completely around the back and is able to tie without any gaps at the neck and waist.

PPE best practices:

- Keep gloved hands away from face.
- Avoid touching or adjusting PPE.
- Remove gloves if they are torn. Perform hand hygiene before donning new gloves.
- Remove PPE in appropriate areas:
    - At the doorway before leaving the patient room.
    - Remove the respirator outside of the room, after the door has been closed.

Safely remove PPE:

- Contaminated PPE areas are likely to have been in contact with body sites, materials, or surfaces with infectious organisms. Includes the outside and front of PPE.

- Clean PPE areas are not likely to have been in contact with an infectious organism including the inside and the outside back of PPE.

Sequence for Doffing (Removing) PP:

1. Remove gloves
2. Remove gown
3. Remove face shield/goggles
4. Remove mask or respirator

Perform hand hygiene between steps if hands become contaminated and immediately after removing all PPE.

Hand Hygiene [5,6]

Often, environmental workers (EVS) are not acknowledged as one of the first line of workers to help decrease the transmission of potentially infectious organisms. Because EVS workers are throughout all areas of healthcare, environmental contamination is always a possibility throughout their cleaning process. Proper hand hygiene limits environmental contamination and the spread of MRDO's, in turn protecting other personnel and patients. Unless hands are visibly soiled, or EVS has been in contact with certain pathogens, alcohol-based hand rub is preferred over soap and water.

Protect yourself and others by practicing proper hand hygiene:

- Use alcohol-based hand rub (ABHS), or soap and water.
- Clean hands before and after entering patient rooms and patient care areas.
- Clean hand after removal of gloves when moving from a soiled to a clean task.
- Clean hands after touching patient belongings or items in the patient care area.
- Clean hands after using the restroom.
- Clean hands before and after eating.
- Clean hands before going home.

When to wash with soap and water:

- When hands are visibly soiled.
- Before eating.
- After using the restroom.
- During the care of patients with suspected or confirmed infection during outbreaks of *C. difficile* and norovirus.

How to wash hands with soap and water:

1. **Wet** your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
2. **Lather** your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails.
3. **Scrub** your hands **for at least 20 seconds**. Need a timer? Hum the "Happy Birthday" song

from beginning to end twice.
4. **Rinse** your hands well under clean, running water.
5. **Dry** your hands using a clean towel or an air dryer.

When to use ABHS:
The decision to use ABHS versus soap and water can be determined by several factors.
Unless hands are visibly soiled, ABHS is preferred over soap and water in most clinical situations because it:

- It is more effective at killing germs on hands than soap.
- It is easier to use when providing care, especially when moving from soiled to clean activities on the same patient or when moving between patients care of patients in shared rooms.
- Results in improved skin condition with less irritation and dryness than soap and water.
- Improves hand hygiene adherence.

How to use ABHS
1. Put the product on your hands and rub together. The effectiveness of the ABHS depends on the amount of sanitizer used. Use enough sanitizer products to cover all surfaces of your hands.
2. Cover all surfaces of your hands and continue to rub for at least 20 seconds until your hands feel dry.
3. Make sure to cover all surfaces including the thumbs, fingertips, and between fingers that are frequently missed.

Maintain Hand Skin Health:
ABHS is less irritating and drying to skin than soap and water. Use ABHS in most clinical situations.
- Lotion and creams can prevent and decrease skin dryness that happens from cleaning your hands:
    - Use hand lotions approved by your healthcare facility because they won't interfere with hand sanitizing products.
- When washing hands, use techniques to promote healthy hand skin, such as:
    - Avoiding hot water.
    - Patting rather than rubbing hands dry.
- Healthcare personnel with hand irritation should use cotton glove liners and follow guidance when:
    - Laundering.
    - Discarding.

Cleaning Products [10-11]

When facilities are deciding about which cleaning and disinfecting products to use at their facility a product selection process is recommended. Ideally, the facility's Infection Preventionist is involved in the selection process. Some examples of factors to consider includes:

- Spectrum of activity following guidance from EPA registered lists:
  - Selected EPA-Registered Disinfectants.
- Ease of use.
- Compatibility with environmental surfaces.
- Safety.

Once a selection has been made on which cleaning and disinfecting products are to be used, the facility is encouraged to develop and maintain a master list of their approved environmental cleaning products and who supplies the product. CDC recommends minimizing products being used in facilities to ease cleaning processes, minimize staff training, and reduce the potential for errors in preparation and use.

CDC provides recommendations on common low and intermediate level disinfectants that can be used on environmental surfaces in healthcare settings that includes:

- Quaternary ammonium compounds
- Alcohol
- Chlorine releasing agents (bleach)
- Improved hydrogen peroxide

Staff who are using cleaning and disinfecting products should be educated on the products instructions for use. If staff use products that are not effective for a particular pathogen this could lead to continued transmission by direct and indirect contact. Staff should understand contact times for products and the kill list. This could lead to variations in their day-to-day routines if they must clean a room that is under transmission-based precautions.

In addition to environmental surface cleaning, facilities may have equipment that is considered reusable and need to be reprocessed. The facility should follow the instructions for use, according to the manufacturer's guidelines, for the reusable equipment to ensure the recommended cleaning and disinfecting product is being used. Staff performing reprocessing of reusable equipment should understand who is assigned to perform the reprocessing, how often to clean and disinfect the equipment, level of disinfection (low, intermediate, or high), personal protective equipment that is to be worn while cleaning and disinfecting, where to perform reprocessing, and how to keep clean and dirty separated.

Reading a Disinfectant Label [3]

The Office of Safety and Health Administration (OSHA) aligned with the Globally Harmonized System (GHS) to regulate the Hazard Communication Standard (HCS) internationally. HCS mandates that all chemicals are universally labeled and are protected by law.

All chemical labels must contain the following:

- Active Ingredients
- Signal Word
- EPA Registration Number
- Directions for Use
- Contact Time
- Precautionary Statements
- First Aid
- Storage and Disposal

The infographic below was developed by CDC's Project Firstline that provides further information on reading a disinfectant label. This document is also included in the resource section of the toolkit.

It is also important to choose the appropriate antimicrobial product to ensure it is approved for the intended site or pest. The EPA maintains the following product lists:

- ***EPA's Registered Antimicrobial Products Effective as Sterilizers [List A]***
- ***EPA's Registered Antimicrobial Products Effective Against Mycobacterium tuberculosis (TB) [List B]***
- ***EPA's Registered Antimicrobial Products Effective Against Norovirus (Feline calicivirus) [List G]***
- ***EPA's Registered Antimicrobial Products Effective Against Methicillin-resistant Staphylococcus aureus (MRSA) and/or Vancomycin Resistant Enterococcus faecalis or faecium (VRE) [List H]***
- ***EPA's Registered Antimicrobial Products for Medical Waste Treatment [List J]***
- ***EPA's Registered Antimicrobial Products Effective Against Clostridium difficile Spores [List K]***
- ***EPA's Registered Antimicrobial Products Effective Against Ebola Virus [List L]***
- ***EPA's Registered Antimicrobial Products Effective Against Avian Influenza [List M]***
- ***Disinfectants for Use Against SARS-CoV-2 [List N]***
- ***Disinfectants for Use Against Rabbit Hemorrhagic Disease Virus (RHDV2) [List O]***
- ***EPA's Registered Antimicrobial Products Effective Against Candida auris [List P]***
- ***Disinfectants for Emerging Viral Pathogens (EVPs) [List Q]***
- ***EPA's Registered Antimicrobial Products Effective Against Bloodborne Pathogens (HIV, Hepatitis B and Hepatitis C) [List S]***

For more detailed information regarding EPA -Registered disinfectants, please visit:
www.epa.gov/pesticide-registration/selected-epa-registered-disinfectants

Preparing Cleaning Products [10-12]

Cleaning and disinfecting products should be prepared according to the manufacturer's instructions. If prepared solutions are not prepared according to the manufacturer's instructions, they may not perform as expected. This could result in damage to surfaces or increase risks to staff and others. Facilities should ensure that standard operating procedures are available for the preparation, use, and disposal of environmental cleaning products.

Facilities may use containers to store prepared solutions. However, they should be clean, clearly labeled and have an expiration date based on the manufacturer's instructions for stability. Also, they should be clean and dried before refilling and new solutions should not be added to old solutions.

Supplies and Equipment Needed for EVS Cleaning and Cart Setup [10]

To perform environment cleaning procedures, supplies and equipment are needed to reduce risks. To simplify, it requires surface and floor cleaning supplies and equipment:

- Portable containers for storing environmental cleaning products
- Surface cleaning cloths preferably color coded
- Mops preferably microfiber
- Buckets
- Wet floor signs

All the above can be easily organized by using a cleaning cart. This is not an all-inclusive list and will vary by facility type.

When setting up your cleaning cart consider safety, convenience, and efficiency. To set up your cart you will need to review what your work assignment is for your shift. For instance, cleaning isolation rooms may determine what specific cleaning solutions you need or what PPE you are required to don prior to entering a room.

Do's:

- Clean EVS cart at the beginning and the end of your shift
- Only store items that are needed for your shift on the cart
- Cleaning containers and solutions should always be locked
- Clean and soiled items are to be separated (e.g., cleaning cloths or mop heads)

Don'ts:

- Never leave the cart unlocked when unattended
- Never store personal items on carts (e.g., food, drinks, or cosmetics)

Standard Cleaning Processes - Cleaning a Patient Room [11]

Routine cleaning in EVS refers to the regular, systematic process of cleaning and disinfecting surfaces within a healthcare facility, focusing on high-touch areas and prioritizing the removal of dirt, dust, and potential pathogens, typically done daily or as per established cleaning schedules; key steps include: preparing cleaning supplies, wearing appropriate PPE, cleaning from clean to dirty areas, thoroughly wiping down frequently touched surfaces, proper disposal of waste, and following disinfection protocols when necessary; always adhering to facility-specific guidelines and infection control practices.

A **deep clean** in EVS involves a thorough cleaning process that goes beyond routine cleaning, including removing dirt, grime, and debris from all surfaces within a healthcare facility, with a particular focus on high-touch areas and thorough disinfection to prevent the spread of infection; key steps include: clearing clutter, pre-cleaning, damp wiping all contact surfaces, disinfecting with appropriate chemicals, cleaning hard-to-reach areas, and finally, checking for complete cleanliness; this process is often used when a room is vacant or between patient stays.

Terminal cleaning in EVS refers to a thorough cleaning process performed in a patient room or healthcare area after a patient is discharged, aiming to completely remove dirt, debris, and potential pathogens from all surfaces, including hard-to-reach areas, to minimize the risk of infection transmission; this typically involves removing all disposable items, cleaning and disinfecting all surfaces, floors, and equipment within the room, and disposing of soiled materials properly.

Special cleaning in EVS refers to a more thorough cleaning procedure than routine cleaning, often required for specific situations like isolation rooms, heavily soiled areas, or after a spill of bodily fluids, and typically involves additional steps like deep scrubbing, specialized disinfectants, and meticulous attention to detail to achieve a high level of sanitation; key steps include: pre-cleaning to remove debris, applying a dedicated cleaning solution based on the contaminant, thorough scrubbing, rinsing, disinfecting with a high-level disinfectant, and final inspection; always follow facility protocols and safety guidelines when performing special cleaning procedures.

Bloodborne Pathogens [2]

Bloodborne pathogens are microorganisms that can be present and carried in blood that can infect a host and cause disease in humans. Common pathogens include but are not limited to the following:

- Hepatitis B (HBV)
- Hepatitis C (HCV)
- Human Immunodeficiency Virus (HIV)

Occupational Safety and Health Administration (OSHA) provides Bloodborne Pathogen Standards that employers must do to protect employees that are at risk to bloodborne pathogens or other potentially infectious materials (OPIM). In general, the standard requires employers to do the following:

- Establish an exposure control plan
- Update the plan annually
- Implement universal precautions
- Identify and use engineering controls
- Identify and ensure the use of work practice controls
- Provide personal protective equipment (PPE)
- Make available hepatitis B vaccinations to all employees at risk
- Make available post exposure evaluation and follow-up
- Use labels and signs to communicate hazards
- Train employees and provide them with information

- Maintain medical and training records for employees

C-Diff [4,8]

Clostridioides difficile (*C. diff*) is a spore-forming, gram positive anaerobic bacillus that can produce toxins known as toxins A and B and can shed in feces; thus, the primary mode of transmission is the fecal-oral route. Surfaces including hands, devices, or materials (commodes, bathtubs, rectal thermometers) that become contaminated with feces can serve as a reservoir for C. diff spores. The C. diff spores have a protective coating allowing them to live for months and are resistant to alcohol and many other disinfectants. People may become infected if they touch contaminated items or surfaces then touch their mouth or mucous membranes. It is estimated that C. diff causes almost a half a million infections each year and about one in eleven people over age 65, diagnosed with a healthcare-associated C. diff infection, die within a month.

CDC has labeled C. diff as an urgent threat level pathogen. Environmental Services play an extremely important role in preventing the spread of C diff by following the recommendations from the CDC.

Recommendations include:

- Develop and utilize environmental cleaning and disinfection education with an emphasis on C. difficile:
    - Provide education to all staff, with a more in-depth focus and training relevant to the staff's duties
- Develop and utilize daily and terminal cleaning protocols and checklists for patient-care areas and equipment
- Standardize cleaning practices by attempting to routinely assign the same staff members to targeted areas
- The Environmental Services Supervisor or designee should routinely, and as indicated review cleaning products in use or to implement with the following considerations:
    - The EPA provides "lists" of registered antimicrobial products that are effective against common pathogens:
        - Registered products to be used for C. diff are located under "List K"
        - Consider using 10% sodium hypochlorite (bleach) for disinfecting patient rooms and terminal cleaning
        - Effectiveness against targeted organisms
        - Expertise and training requirements needed to use
        - Compatibility with all affected device manufacturer's instructions
        - Effect on surfaces or devices after repeated exposure
        - Contact time is reasonable and achievable for the setting
        - Possible health risks to the patient, visitors and the staff
- A suspected or confirmed CDI patient's room should:
    - be cleaned and disinfected at least once a day to include the high touch areas and the bathroom

    - be cleaned and disinfected after the cleaning of other patient rooms and or areas
    - clean and disinfect all furniture and/or equipment, such as beds, portable scales, bedside tables, chairs, etc. that are removed from the room for any reason
    - receive a thorough terminal cleaning and disinfection after the patient is transferred or discharged
- All departments and areas that may be contaminated by a patient with suspected or confirmed CDI should be cleaned and disinfected immediately after departure or as indicated, such as Physical Therapy, Emergency, Radiology Departments, etc.
- The cleaning solution(s) should be discarded, and cleaning equipment (cleaning cloth, mop, bucket, etc.) should be cleaned and disinfected per manufacturer's instructions:
    - Consider using disposable cleaning products such as wipes, mop heads, toilet brushes, etc.
- Routinely monitor and audit the effectiveness and compliance with the cleaning and disinfection protocols and practices:
    - Review the collected data to:
        - Validate the effectiveness of the cleaning and disinfection protocols
        - Disseminate the data to the appropriate leadership, staff members and other stakeholders:
            - identify issues
            - develop interventions to improve protocols or compliance, as indicate
            - Provide education and training, as necessary
- Continue to routinely monitor and audit the effectiveness and compliance with the cleaning and disinfection protocols and practices, accordingly

Linens [9]

An often-overlooked item in healthcare that has infection control and prevention implications is linen or laundry. The Occupational Safety and Health Administration (OSHA) defines contaminated laundry as "laundry which has been soiled with blood or other potentially infectious materials or may contain sharps." Fomites, or inanimate objects such as towels, sheets, curtains, gowns, and other textiles, can serve as reservoirs for microorganisms that can be transferred to patients, providers, and the environment. This transference can result in hospital-acquired infections (HAIs) unless appropriate precautions are in place.

Prevention - Laundry workers should wear appropriate PPE while sorting soiled fabrics and textiles. Equipment used to launder linens should be used and maintained according to manufacturer's instructions. Otherwise, risk of microbial contamination of the system is present. Handling of contaminated linens should be done in a way that minimizes agitation and potential release of lint aerosols in areas where patient care occurs. Once collected, contaminated linens should be placed into bags or other appropriate containers, then securely tied or otherwise closed to prevent leakage. If using a chute to send bagged linens to another area, that chute should be maintained under negative air pressure to prevent the contents from falling out into

the chute. Further, microbial contaminants can become airborne and be propelled throughout the facility as they pass through chutes.
The laundering process must follow manufacturers' instructions regarding water temperature, use of chlorine bleach or other cleaning agents, and so on. After washing, cleaned and dried linens should be handled in such a way that the risk of contamination is minimized. Clean and/or sterile textiles should be kept separate from contaminated items. For example, carts containing clean linen should be covered and remain so except when items are being taken from the carts for use.

Storage of Equipment and Supplies [11]

Cleaning and disinfecting products should be stored in a manner that reduces the risk of contamination and degradation along with minimizing contact with personnel through skin contact or inhalation. Facilities should manage environmental cleaning products according to the Safety Data Sheet (SDS). Copies of SDS should be readily available where these products are stored and prepared.

CDC recommends having at least one designated area within the facility for preparation, storage, and reprocessing of reusable cleaning equipment and supplies. For larger facilities, consider having one area on every floor. Considerations for this area includes:

- Be well-ventilated and illuminated (lighting or window access)
- Be labeled with a biohazard sign on the door
- Have an appropriate water supply (hot and cold-water access, if feasible)
- Have a utility sink/floor drain for safe disposal of used solutions
- Be designed so that, whenever possible, buckets can be emptied into utility sink/floor drains without lifting them or creating splashes
- Have a dedicated handwashing sink, used only for handwashing
- Have access to an eyewash station
- Have appropriate PPE available
- Have enough space to keep reprocessing (dirty areas) separate from storage areas for cleaned equipment
- Be easily accessible in relation to the areas it serves (i.e., easily accessible throughout the facility)
- Be appropriately sized to the number of materials, equipment, and chemicals stored in the room/area
- Have printed copies of the SDS for all environmental cleaning products, manufacturer's instructions, and job aids for preparation of cleaning and disinfectant solutions
- Never contain personal clothing or grooming supplies, food, or beverages:
    - Have a separate area for cleaning staff to store these items
- Have safe chemical storage and access
- Have locks fitted to all doors to restrict access only to cleaning staff
- Be free from clutter
- Have washable surfaces (floors, walls, shelves)

To maintain the integrity of the supplies, equipment, and personal protective equipment (PPE) used for environmental services proper care and maintenance of these items is essential. Best practices for reprocessing reusable cleaning supplies and equipment includes:

- Send all reusable supplies and equipment (e.g., buckets, rubber gloves) for reprocessing:
  - Directly after use in a transmission-based precaution area
  - When soiled with blood or body fluids
- Thoroughly clean, disinfect, and rinse equipment such as buckets and containers whenever solution is replaced and daily. Store them upside down to allow complete drying
- Launder mop heads, floor cloths, and soiled cleaning cloths at least daily (e.g., at the end of the day) and allow them to fully dry before storage and reuse
- Reprocess all reusable supplies and equipment in a dedicated area that is not used for other purposes (i.e., reprocessing of cleaning equipment should never be conducted in handwashing sinks)
- Reprocess (e.g., launder) all reusable supplies and equipment according to manufacturer's instructions

Audit and Feedback for the Infection Preventionist [13-14]

As part of the CDC Core Infection Prevention and Control Practices, it is recommended to "Identify and monitor adherence to infection prevention practices and infection control requirements". When regular auditing is conducted, this can alert the Infection Preventionists to lapses in practice that require additional staff training. There is no recommended number of audits to be completed but should include infection control practices associated with common tasks being performed. Through direct observations, Infection Preventionists or their designees can conduct audits in recommended areas of Infection Prevention and Control practices. By using a standardized tool and setting aside time to conduct audits Infection Preventionist or their designees can achieve this core practice category. Below are recommended areas to audit with guidance on content to be assessed:

- **Cleaning and disinfection of environmental surfaces:** The Infection Preventionist or their designee is encouraged to assess and be familiar with, by direct observation, the process of cleaning and disinfecting. This includes how staff protect themselves from chemical exposure, where to access information about chemicals, how to use the product, which product to use which surfaces and equipment, contact times, kill lists, who is responsible for cleaning surfaces and reusable medical equipment, how to clean and disinfect rooms, how to dispose of chemicals, and high-touch surfaces.

- **Reprocessing reusable medical equipment:** The Infection Preventionist is encouraged to be familiar with the manufacturer's guidelines for reprocessing of any reusable medical equipment in the facility. These guidelines will assist the Infection Preventionist in monitoring adherence to the manufacturer's guidelines.

After an audit has been conducted, the Infection Preventionist is encouraged to review their findings for lapses in practice and decide the next steps. It is recommended to "Provide prompt, regular feedback on adherence and related outcomes to healthcare personnel and facility leadership". Based on the findings the Infection Preventionist will need to decide if just in time training is needed at the time the lapse is observed or share the aggregated data by unit. The Infection Preventionist will need to decide if the lapses identified could lead to potential infection transmission. This will assist in how feedback is provided.

Monitoring and Feedback for the Environmental Services Manager [13-14]

Implementing a monitoring program allows facilities to better understand if environmental cleaning procedures are being followed according to the policies and procedures. The results from the monitoring program can lead to program improvement. CDC provides suggestions on methods facilities can use to assess cleaning practices and the level of cleanliness. Methods to assess cleaning practices include direct performance observations, visual assessment, and fluorescent markers. Methods to assess the level of cleanliness includes measuring the residual bioburden, i.e. adenosine triphosphate (ATP), and taking a bacteriological culture of the surface itself using a swab or contact agar plate method. CDC considers it best practice to routinely monitor at least weekly.

Training and Certification [1]

Association for Health Care Environment

The Association for the HealthCare Environment (AHE) is a Professional Membership Group of the American Hospital Association. AHE is the organization of choice for professionals responsible for establishing and maintaining health care environments that are free of surface contamination and that support safety, service, and efficient and effective operations. AHE is the go-to resource for best-in-class tools, products, education and training that raise the standard of the health care environmental services field and shape the future workforce for over 2,300 professionals committed to pathogen-free, healing environments across all care settings. Membership is required and there are different levels of membership. Some of the resources AHE offers are certification programs, health care EVS job descriptions, and core competencies for health care EVS professionals.

Links To Training

Training: EVS and the Battle Against Infection
www.cdc.gov/infection-control/hcp/training/training-evs-and-the-battle-against-infection.html?CDC_AAref_Val=https://www.cdc.gov/infectioncontrol/training/evs-battle-infection.html

CDC Strive Environmental Cleaning 101
www.cdc.gov/infection-control/media/pdfs/strive-ec101-508.pdf?CDC_AAref_Val=https://www.cdc.gov/infectioncontrol/pdf/strive/EC101-508.pdf

CDC Strive Environmental Cleaning 102
www.cdc.gov/infection-control/media/pdfs/strive-ec102-508.pdf?CDC_AAref_Val=https://www.cdc.gov/infectioncontrol/pdf/strive/EC102-508.pdf

U.S. Department of Labor, Occupational Safety and Health Administration. Occupational Exposure to Bloodborne Pathogens: final rule (29 CFR 1910.1030). Federal Register 1991;56:64004–182.

Project Firstline: Episode 16: Cleaning? Disinfection? What is the Difference?
www.youtube.com/watch?v=dIuRI9OpjnY&list=PLvrp9iOILTQZQGtDnSDGViKDdRtIc13VX&index=19

Project Firstline: Episode 20: Why Do Cleaning and Disinfection Matter in Healthcare?
www.youtube.com/watch?v=WpV_dsKQDMg&list=PLvrp9iOILTQZQGtDnSDGViKDdRtIc13VX&index=23

Project Firstline: Episode 22: Why Does Contact Time Matter for Disinfection?
www.youtube.com/watch?v=TCa7Gg1NUD4&list=PLvrp9iOILTQZQGtDnSDGViKDdRtIc13VX&index=25

CDC Project Firstline: Interactive Scenario: Where Germs Live in Healthcare
www.cdc.gov/project-firstline/hcp/training/Infographic.html

CDC Project Firstline: Training Toolkits: Recognizing Risks Using Reservoirs and Introduction to Reservoirs: Where Germs Live
www.cdc.gov/project-firstline/hcp/training/index.html

Resources and Tools

CDC: Healthcare-Associated Infections: Considerations for Reducing Risk: Surfaces in Healthcare Facilities
www.cdc.gov/healthcare-associated-infections/hcp/infection-control/?CDC_AAref_Val=https://www.cdc.gov/hai/prevent/environment/surfaces.html

CDC: Healthcare-Associated Infections: Environmental Cleaning in Global Healthcare Settings
www.cdc.gov/healthcare-associated-infections/hcp/cleaning-global/index.html

CDC: Infection Control: CDC's Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings
www.cdc.gov/infection-control/hcp/core-practices/

CDC: Infection Control: Environmental Infection Control Guidelines
www.cdc.gov/infection-control/hcp/environmental-control/index.html

CDC: Infection Control: Disinfection and Sterilization Guide
www.cdc.gov/infection-control/hcp/disinfection-and-sterilization/?CDC_AAref_Val=https://www.cdc.gov/infectioncontrol/guidelines/disinfection/index.html

CDC: Infection Control: Options for Evaluating Environmental Cleaning
www.cdc.gov/infection-control/php/evaluating-environmental-cleaning/index.html

CDC Project Firstline: How to Read a Disinfectant Label
www.cdc.gov/project-firstline/media/pdfs/howtoreadalabel-infographic-508.pdf?CDC_AAref_Val=https://www.cdc.gov/hai/pdfs/HowToReadALabel-Infographic-508.pdf

CDC Project Firstline: Germs can live in dirt and dust.
www.cdc.gov/project-firstline/media/pdfs/Healthcare-Germs-Environment-DirtAndDust-508.pdf

CDC Project Firstline: Germs can live on devices.
www.cdc.gov/project-firstline/media/pdfs/Healthcare-Germs-Environment-Devices-508.pdf

CDC Project Firstline: Germs can live on dry surfaces.
www.cdc.gov/project-firstline/media/pdfs/Healthcare-Germs-Environment-DrySurfaces-508.pdf

CDC Project Firstline: Germs live in water and on wet surfaces.
www.cdc.gov/project-firstline/media/pdfs/Healthcare-Germs-Environment-WaterAndWetSurfaces-508.pdf

CDC Project Firstline: Infection Control Training and Education
www.cdc.gov/project-firstline/index.html

Clean Hands: About Handwashing
www.cdc.gov/clean-hands/about/

EPA: Selected EPA-Registered Disinfectants
www.epa.gov/pesticide-registration/selected-epa-registered-disinfectants

Infection Control Assessment and Response Tool: Module 4 Environmental Services
www.cdc.gov/infection-control/media/pdfs/IPC-mod4-EVS-508.pdf

Infection Control Assessment and Response Tool: Observation Form Environmental Services
www.cdc.gov/infection-control/media/pdfs/icar-ipc-obs-form-evs-508.pdf

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10. Healthcare-Associated Infections: Cleaning Programs. Centers for Disease Control and Prevention. 2024. Section 6, 2.5, 3.3 www.cdc.gov/healthcare-associated-infections/hcp/cleaning-global/supplies-and-equipment.html

11. Healthcare-Associated Infections: Cleaning Supplies and Equipment. Centers for Disease Control and Prevention. 2024 www.cdc.gov/healthcare-associated-infections/hcp/cleaning-global/supplies-and-equipment.html

12. Healthcare-Associated Infections: Environmental Cleaning Procedures. Centers for Disease Control and Prevention. 2024. Section 10, 4.8 www.cdc.gov/healthcare-associated-infections/hcp/cleaning-global/procedures.html#cdc_generic_section_10-4-8-methods-for-assessment-of-cleaning-and-cleanliness

13. Infection Control: Options for Evaluating Environmental Cleaning. Centers for Disease Control and Prevention. 2024 www.cdc.gov/infection-control/php/evaluating-environmental-cleaning/index.html

14. Infection Control in Health Care: An Overview. Centers for Disease Control and Prevention. 2024 www.cdc.gov/projectfirstline/about/?CDC_AAref_Val=https://www.cdc.gov/infectioncontrol/projectfirstline/healthcare/germs-environment.html

15. Project Firstline: Cleaning? Disinfection? What's the difference? Centers for Disease Control and Prevention. 2021 Episode 16 www.cdc.gov/project-firstline/hcp/training/covid-19/index.html

16. Project Firstline: Environmental Cleaning Procedures. Centers for Disease Control and Prevention. 2024 www.cdc.gov/healthcare-associated-infections/hcp/cleaning-global/procedures.html