

Cleaning and Disinfection Strategies for Non-Critical Surfaces and Equipment



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Learning Objectives

Outline activities that constitute appropriate cleaning and disinfection in healthcare settings

Explain special circumstances that may require heightened disinfection

Describe components of an effective competency-based training program for environmental services staff

Discuss auditing strategies to measure effectiveness of cleaning practices



Role of Environmental Services in Infection Prevention

Improvement in cleaning and disinfection practices can prevent pathogen transmission

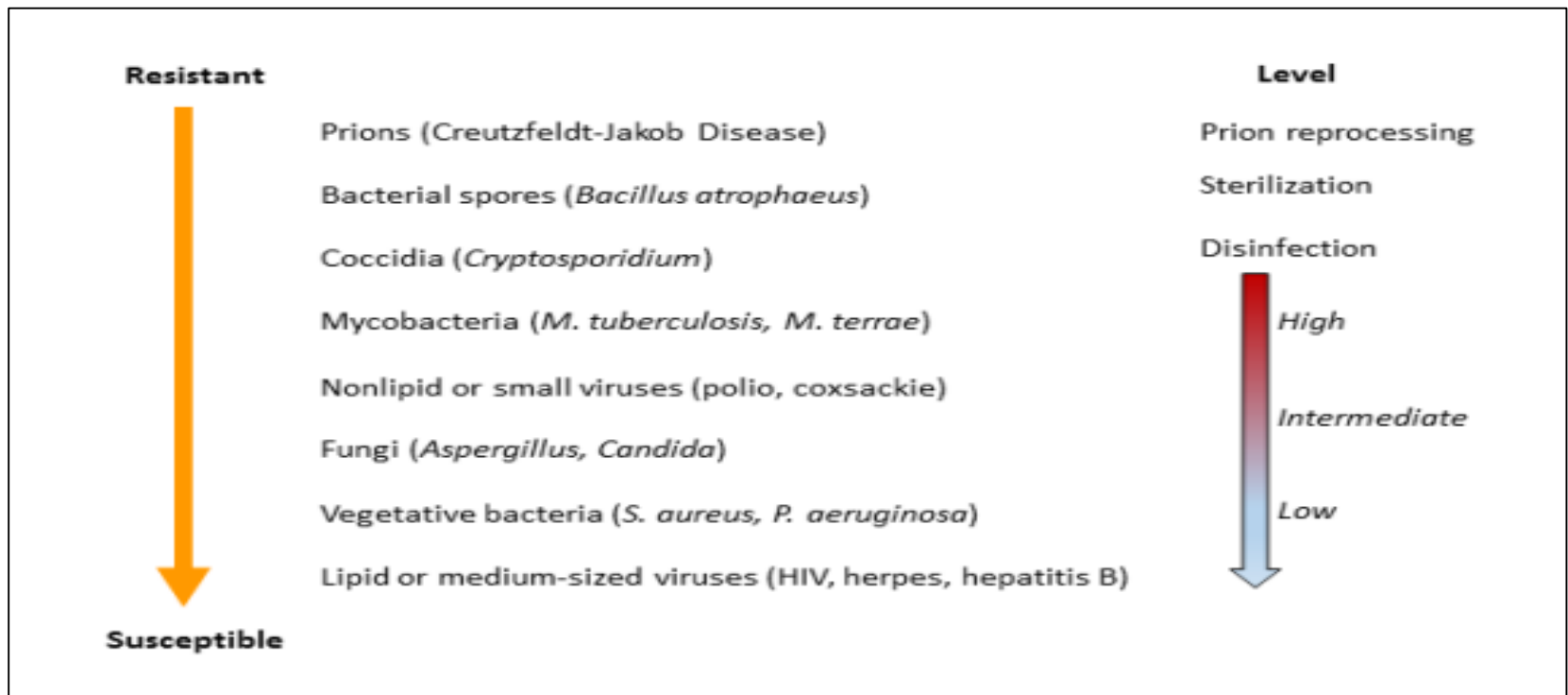
Environmental services team plays a central role in low- and intermediate-level disinfection

Cleaning and disinfection is a critical component of any infection prevention program



Daily Cleaning and Disinfection

Per your facility's policy, follow the manufacturer label's instruction for proper disinfection product use



(Practice Guidance for Healthcare Environmental Cleaning, 2nd Edition, AHA, 2012; Rutala WA, CDC, 2008)



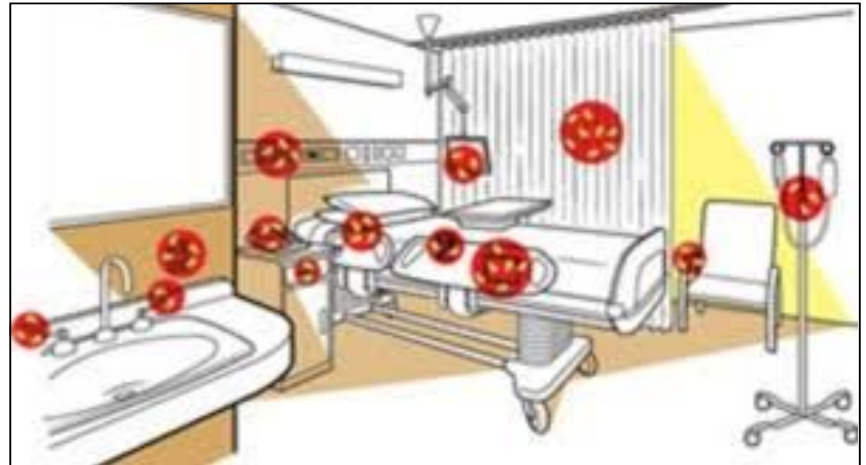
Daily Cleaning and Disinfection

Follow label's instruction for proper disinfection product use

Clean and Disinfect all surfaces. This includes horizontal, vertical and contact surfaces

Disinfect all “high-touch” surfaces daily and upon discharge

- Cleaned surfaces should remain wet and air dry per the label's instruction
- Clean floors on a regular basis, when spills occur and when visibly soiled

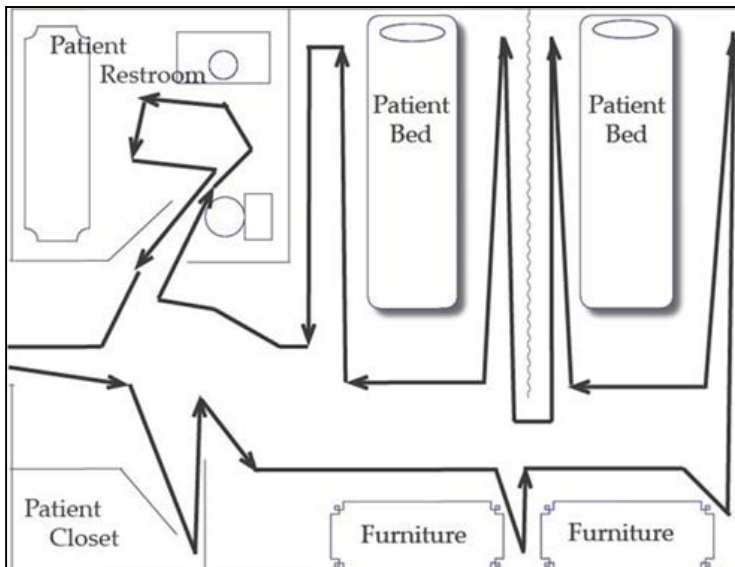


(Practice Guidance for Healthcare Environmental Cleaning, 2nd Edition, AHA, 2012; Rutala WA, CDC, 2008)



Daily Cleaning and Disinfection

Plan a logical cleaning pattern to be followed that accounts for room variation



Restroom should always be cleaned last

Follow guidelines for an optimal cleaning path

- For example: clockwise, top to bottom
- Cleanest to dirtiest

Change cleaning cloths frequently

Clean walls, blinds and window curtains when they are visibly contaminated or soiled

Change microfiber mop after each room, after isolation room and after cleaning blood and bodily fluid spills

(Practice Guidance for Healthcare Environmental Cleaning, 2nd Edition, AHA, 2012; Rutala WA, CDC, 2008)



Special Isolation Procedures

Low- or intermediate-level disinfectants are specific to the type of isolation

Consider potential contamination of privacy curtains

Do not bring equipment carts into isolation rooms

Only leave the room when cleaning is completed

Remove PPE before leaving the patient environment

Immediately perform hand hygiene

Disinfect cleaning equipment and return to the cart

(Practice Guidance for Healthcare Environmental Cleaning, 2nd Edition, AHA, 2012; Trillis F, Infect Control Hosp Epidemiol, 2008; Rutala WA, Am J Infect Control, 2014)



Use of “No-Touch” Method Technology

Ultraviolet light (UV)

- Reliable biocidal activity against a wide range of healthcare-associated pathogens
- Residual-free
- Useful for disinfection room surfaces and equipment



Hydrogen peroxide

- Reliable biocidal activity against a wide range of healthcare-associated pathogens
- Residual-free
 - Aeration unit converts hydrogen peroxide into oxygen and water
- Useful for disinfection complex equipment and furniture



Both may pose occupational safety concerns if not used properly.

(Rutala WA, Am J Infect Control, 2014)



Daily Cleaning Sheets and Checklists

3 EAST ALL		SCOPE OF SERVICE				MIN
BREAK A 9:45a B 10:00a		CLOCK IN:	Clock in & report to coordinator	break		15
LUNCH A 12:30P B 1:00P		GET:	Phone:6663;Recap Sheet;Keys	lunch		30
		LOG IN:	Section: # Zone: 31	HUDDLE		15
		SET UP	CART # 5 In EVS 3150	SETUP		10
#	RM #	DAILY	ROOM NAME	D/C	ISOL	
1	Charge Nur.	A	GET REPORT			1
2	HALLS	A	POLICE 3 EAST HALLS			3
3	LOBBY	A	PUBLIC SIDE ELEVATOR LOBBY			5
4	LOBBY	A	PUBLIC SIDE ELEVATOR FRONT			3
5	3167 F	A	NURSES STATION FRONT			10.6
6	3147	A	Clean Supply FRONT			3
7	3145	A	TEAM BATHROOM BY 3101			5
8	3101	A	Patient Room & Bath			10.6
9	3102	A	Patient Room & Bath			10.6
10	3103	A	Patient Room & Bath			10.6
11	3104	A	Patient Room & Bath			10.6
12	3105	A	Patient Room & Bath			10.6
13	3106	A	Patient Room & Bath			10.6
14	3107	A	Patient Room & Bath			10.6
15	3108	A	Patient Room & Bath			10.6
16	3109	A	Patient Room & Bath			10.6
17	3110	A	Patient Room & Bath			10.6
18	3111	A	Patient Room & Bath			10.6
19	3112	A	Patient Room & Bath			10.6
20	3113	A	Patient Room & Bath			10.6
21	3114	A	Patient Room & Bath			10.6
22	3115	A	Patient Room & Bath			10.6
23	3116	A	Patient Room & Bath			10.6
24	3117	A	Patient Room & Bath			10.6
25	3118	A	Patient Room & Bath			10.6
26	3119	A	Patient Room & Bath			10.6
27	3120	A	Patient Room & Bath			10.6
28	3167 B	B	NURSES STATION BACK			10.6
29	3166 A	B	Office BACK			3
30	3166 B	B	Office BACK			3
31	3164 F	B	Clean Supply BACK			3

Ensures all room surfaces are cleaned and disinfected daily

Ensures all areas of the hospital are cleaned daily



Responsibility of Equipment Cleaning

- Collaborative effort to determine responsibility for cleaning of non-critical equipment
- Staff should be trained on who is responsible for cleaning equipment and how and when cleaning should occur
- Non-Critical Equipment:
 - Infusion pumps
 - Sequential compression device pumps
 - Glucometers
 - Blood pressure monitors
 - Mobile computers and workstations
 - Tablets or smartphone
 - Ventilators



Non-Critical Equipment

Use dedicated disposable devices when available

If a dedicated, disposable device is not available, disinfect all non-critical patient care equipment before removing the device from the room and before using it with another patient

Disinfect non-critical medical devices with an EPA-registered hospital disinfectant following the label's instructions

- Assure staff responsible for device cleaning receive training on cleaning procedures that follow the equipment manufacturer's instructions



(Rutala WA, CDC, 2008)



Competency-Based Training for Environmental Services

New Hire Competency Assessments

Training and Retraining

Classroom training, with written quizzes

Conduct trainings and administer written exams at monthly meeting

Preceptor training

Deliver trainings for team members that fail audits

Observation of PPE donning and doffing

New policy implementation

Observation of daily cleaning

Review necessary cleaning procedures at daily huddles

Observation of discharge cleaning

Review competencies tested during new hire training annually

Observation of *C. difficile* isolation discharge



Maintaining Competency through Annual Assessments

Annual Competency Checks

- Successful attendance at monthly training and pass written exams
- Pass PPE donning and doffing observed by management
- Pass three observed cleanings by management
 - Daily cleaning
 - Discharge cleaning
 - *C. difficile* discharge Isolation cleaning

Certification for Healthcare Environmental Services Technician,

- e.g. CHEST
- Offered by Association for Healthcare Environment (AHE)
- Frontline staff certification
- Complete required training
- Pass certification exam



Auditing the Effectiveness of Cleaning

Visual assessment: is not a reliable indicator of surface cleanliness

Direct observation: measures individuals' adherence to processes

Fluorescent marker: determines if a particular area was wiped

- **ATP bioluminescence:** measures actively growing microorganisms through detection of adenosine triphosphate (ATP)
 - Each unit has own reading scale, <250-500 RLU



What to Test

CDC Environmental Checklist for Monitoring Terminal Cleaning¹

Date:	
Unit:	
Room Number:	
Initials of ES staff (optional): ²	

Evaluate the following priority sites for each patient room:

High-touch Room Surfaces ³	Cleaned	Not Cleaned	Not Present in Room
Bed rails / controls			
Tray table			
IV pole (grab area)			
Call box / button			
Telephone			
Bedside table handle			
Chair			
Room sink			
Room light switch			
Room inner door knob			
Bathroom inner door knob / plate			
Bathroom light switch			
Bathroom handrails by toilet			
Bathroom sink			
Toilet seat			
Toilet flush handle			
Toilet bedpan cleaner			

Evaluate the following additional sites if these equipment are present in the room:

High-touch Room Surfaces ³	Cleaned	Not Cleaned	Not Present in Room
IV pump control			
Multi-module monitor controls			
Multi-module monitor touch screen			
Multi-module monitor cables			
Ventilator control panel			

Mark the monitoring method used:

- Direct observation Fluorescent gel
 Swab cultures ATP system Agar slide cultures

¹Selection of detergents and disinfectants should be according to institutional policies and procedures

²Hospitals may choose to include identifiers of individual environmental services staff for feedback purposes.

³Sites most frequently contaminated and touched by patients and/or healthcare workers

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion



(Guh A, CDC, 2010)



Available at: <https://www.cdc.gov/hai/pdfs/toolkits/Environmental-Cleaning-Checklist-10-6-2010.pdf>



Summary

Follow best practices for environmental disinfection

Properly train and educate environmental service technicians on proper cleaning and disinfection processes

Have nursing, respiratory therapists, infection preventionists and environmental services agree upon a list of equipment that are to be cleaned and disinfected by Nursing and by Environmental Services

Audit cleaning and disinfection practices and provide feedback to environmental services technicians to ensure proper disinfection of surfaces



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Speaker Notes



Speaker Notes: Slide 1

Hello, and welcome to the second module Environmental Cleaning course. This module, entitled Cleaning and Disinfection Strategies for Non-Critical Surfaces and Equipment, will provide an overview of strategies to consider when training environmental services technicians about cleaning and disinfection policies and procedures, and to identify tools to assist with monitoring and auditing practices.



Speaker Notes: Slide 2

This module was developed by national infection prevention experts devoted to improving patient safety and infection prevention efforts.



Speaker Notes: Slide 3

After completing this module you will be able to:

- Outline activities that constitute appropriate cleaning and disinfection in healthcare settings;
- Explain special circumstances that may require heightened disinfection ;
- Describe components of an effective competency-based training program for environmental services staff; and
- Discuss auditing strategies to measure effectiveness of cleaning practices.



Speaker Notes: Slide 4

As we discussed in module one, cleaning and disinfection of the patient care environment is an important aspect of preventing transmission of microbes that can lead to patient and staff harm. The environmental services team plays an essential role in ensuring that low-level and intermediate disinfection is performed properly.

For this module we will focus on recommended cleaning and disinfection processes that, when performed by environmental services technicians, provides a critical component of any infection prevention program.



Speaker Notes: Slide 5

To begin, let's discuss daily practices that should be followed for cleaning and disinfection. Cleaning and disinfection, as a one-step process, use a disinfectant detergent that doesn't require pre-cleaning of surfaces unless grossly contaminated or if a spill occurred. You should recall from the first module on environmental cleaning and disinfection that there are different levels of disinfectants. Low level disinfection kills most vegetative bacteria, some viruses, and some fungi, but cannot be relied upon to kill mycobacteria or bacterial spores.



Speaker Notes: Slide 5 Continued

Intermediate level disinfection kills vegetative bacteria, most viruses and most fungi, but does not reliably kill bacterial spores. High level disinfection, often referred to as HLD, completely eliminates all microorganisms except for small numbers of bacterial spores. The environmental services technician should select the level of disinfectant required per their hospital's policy. All disinfectants should be used according to the manufacturer's label instructions.



Speaker Notes: Slide 6

Manufacturer's label instructions indicated dilution, contact time (the time it should remain wet), surface compatibility and other safe use instructions. For both daily cleaning and discharge cleaning, all surfaces should be cleaned and disinfected with a damp wipe with a microfiber or disposable cloth saturated with the disinfectant-detergent solution. The diagram on the slide highlights common "high-touch" surfaces the environmental services technician should pay special attention to, focusing on these areas and the surfaces that are in the immediate vicinity of the patient. This may include the bedrail, the over bed table and call button to name a few.



Speaker Notes: Slide 6 Continued

Environmental services management, in conjunction with the infection control team, should determine what surfaces your hospital considers “high-touch” as it can vary from facility to facility. These and other surfaces should remain wet for the amount of time specified on the label’s instructions. Floors should also be cleaned on a regular basis, when spills occur, and when they are visibly soiled.



Speaker Notes: Slide 7

Environmental leadership should plan a consistent pattern staff should follow to maintain quality and adherence among technicians. Environmental services technicians should follow that cleaning path to ensure nothing in the room is skipped. Cleaning should always occur cleanest to dirtiest, with the restroom always cleaned last to reduce the likelihood of spreading contamination. On this slide we have an example of what a cleaning path might look like. Cleaning cloths should be replaced after every room and frequently while cleaning the room; typically five to seven cloths are used per room. And remember, if you are using the bucket system, do not place the cleaning cloth back into the disinfectant solution after using it to wipe a surface.



Speaker Notes: Slide 7 Continued

Walls, window blinds and privacy curtains in patient areas should be cleaned when they are visibly soiled, and on a regular schedule determined by the environmental services management and infection control team. For mopping floors it is recommended to use microfiber mops and to change the mop-head after each room including, after isolation room cleaning and after cleaning blood or bodily fluid spills. Now that we have reviewed the daily cleaning and disinfection practices, let's talk about some special considerations when cleaning an isolation room.



Speaker Notes: Slide 8

When performing cleaning for an isolation room, follow the same procedures as used for a regular room cleaning. In addition, you will need to follow a few more detailed steps. First, don appropriate personal protective equipment (PPE) for the particular isolation precaution before entering the room and check for proper fit. To review PPE use for transmission-based precautions, you can review the modules on PPE.



Speaker Notes: Slide 8 Continued

You will need to use specific disinfectant for the type of isolation, for example, quaternary ammonium compounds are often recommended for multidrug-resistant organisms (MDROs) such as methicillin-resistant *Staphylococcus aureus*, MRSA, and vancomycin-resistant enterococcus, VRE, while sodium hypochlorite or an Environmental Protection Agency (EPA)-registered sporicidal disinfectant is recommended to kill *C. difficile* spores. Remember to follow your hospital's policy on use of bleach for patient settings contaminated with *C. difficile*. Some organisms may require an EPA-registered disinfectant labeled as a tuberculocidal.



Speaker Notes: Slide 8 Continued

It's important to remember to clean and disinfect patient privacy curtains in isolation rooms. Privacy curtains have shown to be contaminated, and a study by Trillis in 2008 demonstrated that curtains can be a source of pathogens on healthcare providers' hands. Rutala and colleagues recommend cleaning the grab area with an improved hydrogen peroxide (1.4 percent) product sprayed three times from six to eight inches away. They found that this practice reduced contamination of MDROs by over 90 percent. For rooms under *C. difficile* isolation remove the curtain and properly launder it prior to re-hanging the curtain. Equipment carts should not be brought into isolation rooms.



Speaker Notes: Slide 8 Continued

Once the technician begins cleaning an isolation room, they should only leave that room when the cleaning is completed or if requested by a nurse or doctor. Proper PPE removal is critical to avoid pathogen contamination and transmission outside of the room. Avoid touching the outside of your PPE, as infectious organisms may have settled there, and follow proper doffing technique before leaving the patient environment. If the technician is wearing a respirator or powered-air purifying respirator (PAPR), remove it after leaving the room and immediately perform hand hygiene.



Speaker Notes: Slide 8 Continued

Once the technician has removed their PPE and performed hand hygiene, the technician must don new gloves and clean any environmental cleaning equipment that was used in the room, including wiping down the mop handle, before returning to the equipment cart and moving on to the next task.



Speaker Notes: Slide 9

It is important for environmental services team to collaborate with infection control to stay current on new cleaning and disinfection processes, including new technology. Several new “no-touch” technologies have been developed over the past few years. Two of the most common no-touch systems used are ultraviolet light (UV) and vapor hydrogen peroxide (VHP). UV light breaks down the molecular bonds in DNA, thereby destroying the organism; the efficacy of UV is affected by intensity, exposure time, and lamp placement. Vapor Phase (VHP) is the aerosolization of dry-mist hydrogen peroxide or vapor to decontaminate a room.



Speaker Notes: Slide 9 Continued

To use VHP, the air vents, doors and windows must be isolated and sealed after the room has been cleaned. The room is required to be actively monitored with the sensors to check for leaks and to ensure it is safe for personnel to enter.

The major disadvantage to UV disinfection, is that it will not disinfect an area that does not have a direct or indirect line of sight. The major disadvantage to hydrogen peroxide systems is they require more time for decontamination, about 90 minutes as compared to 20 to 50 minutes for UV or conventional cleaning and disinfection.



Speaker Notes: Slide 9 Continued

Additionally, both devices require a high level of training, are expensive to purchase and maintain, and can be only used for terminal and discharge room decontamination. Currently, these technologies can only supplement, not replace, standard cleaning and disinfection practices. Environmental cleaning management and infection control teams should work together to assess the need and application of these new technologies in their hospital setting.



Speaker Notes: Slide 10

Daily checklists and assignment sheets help environmental services technicians properly complete cleaning and disinfection tasks. Checklists are useful tools to standardize daily cleaning and disinfection practices and encourages technicians to adhere to cleaning processes, policies and procedures. Cleaning checklists should include low- or intermediate-level disinfectants specific to the type of isolation the technician may encounter. Daily assignment sheets should have all areas listed for that assignment and have the amount of time the technician has to complete the cleaning in that area.



Speaker Notes: Slide 10 Continued

The time for completing each area should be sufficient to allow thorough cleaning and account for adequate contact time for cleaning agents. One area that can cause confusion is equipment cleaning—specifically, who is responsible for cleaning certain patient care equipment. So let's dive into that area next.



Speaker Notes: Slide 11

When it comes to assigning responsibility for cleaning equipment, Environmental Services, Nursing and Infection Control should collaborate to decide who is going to clean and disinfect specific non-critical equipment. Examples of non-critical equipment to consider may include: infusion pumps, sequential compression device pumps, glucometers, blood pressure monitors, mobile computers or workstations, and handheld tablets or smartphones. Once all parties agree on who will be responsible for cleaning each type of equipment, compile a list. The list should have the following outlined on it— the equipment name, the standard of cleaning (e.g., after use, when visibly soiled), method of cleaning and type of disinfectant, the group responsible for cleaning and any additional comments.



Speaker Notes: Slide 11 Continued

The standard of cleaning should be determined by the infection control committee, while the method of cleaning should be determined by the manufacturer's instructions and, at a minimum, non-critical equipment should be disinfected when visibly soiled and on a regular basis. Incorporate this list of responsibilities into new hire orientation and training for environmental services technicians, nursing, and other clinical staff when a new product or device is introduced, to prevent confusion about who is responsible for cleaning specific equipment.



Speaker Notes: Slide 12

Other factors to consider related to use and cleaning of non-critical equipment include:

- Use disposable devices whenever possible. If disposable devices are not available, disinfect all non-critical devices that are used for a patient on contact isolation, before moving the device from the room and before using it on another patient.
- All non-critical medical devices should be disinfected with an EPA-registered disinfectant following the label's instructions.
- And the appropriate training should be given to the team responsible for cleaning of a particular piece of equipment. Training should be documented and done on at least an annual basis.



Speaker Notes: Slide 13

Ensuring competence of environmental services staff is critical, and a hospital should have a competency-based training program in place. The CDC recommends “structured education,” where the training includes the technician’s role in improving patient safety. The program should reinforce the importance of cleaning and disinfection and be specific about the expectations and the necessary skills. New hire training should include classroom training that covers department policies and procedures and should include a knowledge assessment, such as a written quiz. Training should define how the quality and consistency of their work will be monitored and audited on both a daily and yearly basis.



Speaker Notes: Slide 13 Continued

Once classroom training is completed, new hires should train with a preceptor for five to seven days. Once preceptor training is complete, a direct observation assessment should be conducted by Environmental Services Management.

Management should ensure new hires follow facility procedures, donning and doffing of PPE, daily room cleaning, a standard discharge room cleaning and a *C. difficile* discharge isolation cleaning. New hires should perform two discharge cleanings on their own. One approach to assessing competency is to have the technician pass an ATP assessment.



Speaker Notes: Slide 13 Continued

After Environmental Services Management conducts the assessment, new hires can work an assignment on their own or may need to go back for more training based on the assessment outcomes. Ongoing monitoring of cleaning should be used for retraining purposes and should not be done as a punitive measure.



Speaker Notes: Slide 14

In addition to new hire training, hospitals should provide ongoing training to maintain competency of existing environmental services staff. The training program should include yearly competencies to measure the technicians' technical skills. This training should be held monthly, include written exams and attendance should be tracked by management. Improved training and better education make a more competent team, while continuous training and competencies ensure your team's performance stays at a high level. Achieving a professional certification is one way for staff to demonstrate expertise. The Association for the Healthcare Environment offers one such certification.



Speaker Notes: Slide 15

Once staff have been properly trained and roles and responsibilities for cleaning of equipment have been assigned, auditing and monitoring of the effectiveness of cleaning is essential to assess how effective the processes are.

- Direct visual assessment after a room has been cleaned can only assess visible cleanliness such as removal of organic debris and dust, not the microbial contamination. Visual assessment alone is not adequate and another method for measuring surface cleaning needs to be selected.
- Direct observation, or covertly monitoring environmental services technicians during actual cleaning will provide an assessment of the individual technician's adherence to cleaning processes.



Speaker Notes: Slide 15 Continued

- Another monitoring practice is the use of invisible fluorescent markers. Advantages of fluorescent markers are that they are inexpensive, they are easy to implement and they provide immediate feedback for environmental services management.
- Adenosine triphosphate, or ATP, monitoring is commonly used as a tool to monitor environmental cleanliness because it detects the presence of organic debris on surfaces. It is easy to use, can provide direct, rapid feedback for on-the-spot education to environmental services technicians. ATP monitoring systems also have software to help environmental services managers analyze trends and generate reports.



Speaker Notes: Slide 16

As we discussed earlier, checklists can be a helpful tool for environmental services teams. Checklists can also be helpful for management, as they are auditing environmental services processes and procedures. Here is an example of a monitoring checklist from the CDC.



Speaker Notes: Slide 17

In summary, cleaning and disinfection surfaces is a fundamental principle of preventing infections. Hospitals should follow established guidelines like those from the Association for the Healthcare Environment and CDC to guide their environmental cleaning and disinfection.

Competency-based training should be provided on a regular basis for environmental services staff and should address proper cleaning and disinfection processes.



Speaker Notes: Slide 17 Continued

Nursing, RTs, IPs, and environmental services should work together to ensure that there are clear lines of responsibility for cleaning of non-critical equipment.

And finally, auditing or monitoring effectiveness of cleaning and disinfection practices is an important part of the overall strategy to reduce transmission of healthcare-associated infections.



Speaker Notes: Slide 18

No notes.

