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# CIS Self-Study Lesson Plan

Lesson No. CIS 253 (Instrument Continuing Education - ICE)

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# SURFACE DISINFECTION AND DEPARTMENTAL HOUSEKEEPING IN CENTRAL SERVICE

## LEARNING OBJECTIVES

1. Review the importance of cleaning and low-level disinfection of non-critical items
2. Review the use of disinfectants for low-level disinfection
3. Address environmental housekeeping in Central Service

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**H**EALTHCARE FACILITIES ARE FACING INCREASING PRESSURE to control healthcare-associated infections (HAIs), which cost facilities billions of dollars annually in increased patient stays and decreased reimbursement. In addition, hospitals are required to report patient outcomes, and consumers increasingly use this information to determine where their healthcare needs should be met. Certified Instrument Specialist (CIS) technicians must take an active role in helping to reduce the incidence of HAIs and they can do so by eliminating cross contamination risks by properly cleaning all surfaces. *Note: For the purpose of this lesson, a surface will be defined as patient care equipment; medical devices that are to be sterilized, but must be disinfected manually; and environmental surfaces, such as counters and shelving.*

## OBJECTIVE 1: REVIEW THE IMPORTANCE OF CLEANING AND LOW-LEVEL DISINFECTION OF NON-CRITICAL ITEMS

The first step in any decontamination, disinfection or sterilization process is cleaning, and it is important for CIS technicians to understand the differences in each step in the cleaning process. Cleaning is the removal of all visible and non-visible soil and other foreign material from medical devices being processed. It involves the physical actions of scrubbing and rinsing to remove organic matter that might interfere with disinfection. Detergents are used to facilitate cleaning because water alone cannot remove oily organic soil.

Decontamination involves removing or reducing contamination by infectious organisms or other harmful substances from a surface. This step is often accomplished during cleaning because

the scrubbing and rinsing removes large numbers of microorganisms. Further, disinfection kills nearly all pathogenic microorganisms on inanimate surfaces and can be accomplished by the use of high temperatures, such as in a mechanical washer, or with lower temperatures by the use of chemicals. Sterilization completely destroys all forms of microbial life, including bacteria, viruses, spores and fungi.

There is no single solution to address all Central Service (CS) cleaning, decontaminating and disinfecting needs. For example, surfaces that must be decontaminated include high-touch environmental areas, such as light switches, telephones, door knobs and keyboards found in almost every area of the hospital. Other items, such as intravenous (IV) poles, case carts, work surfaces and patient care equipment, can also cause cross contamination if they are



Figure 1

## The Road to Cross-Contamination

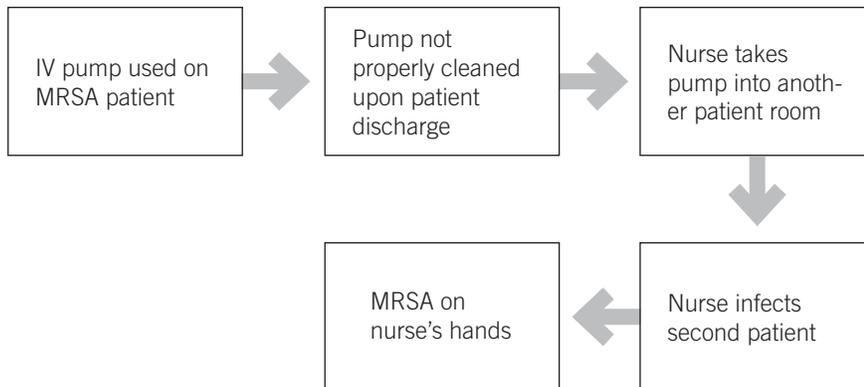


Figure 2



not properly disinfected.

According to the U.S. Centers for Disease Control and Prevention (CDC), cleaning and disinfecting environmental surfaces is essential to reduce their potential of contributing to the incidence of HAIs. In addition, the use of effective hand hygiene practices can help minimize the transfer of microorganisms caused by hand contact between contaminated surfaces and patients. Differentiating between clean and dirty equipment also reduces cross contamination and this can be accomplished by labeling clean equipment and designating areas where clean and dirty equipment are to be kept separate.

Figures 1 and 2 show, respectively, a graphic of cross contamination and a photo of clean, labeled equipment.

Other devices that require special attention from the CIS technician include power equipment and items with fiber optics that must be disinfected manually (because mechanical cleaning equipment cannot be used). After cleaning, these items should be disinfected in the

decontamination area before they are handled by CIS technicians in the preparation and packaging (prep and pack) area.

Healthcare facilities require a clearly defined cleaning process, including policies and procedures, thorough staff training, and competency assessments to ensure that cleaning, decontamination and disinfection processes are followed completely, accurately and without variation.

The Spaulding Classification System<sup>1</sup> divides medical devices into three categories (critical, semi critical and noncritical) based on the intended use of the device and the degree of risk of patient infection. Most CS departments are responsible for reprocessing devices that fall into each of these categories. CIS technicians must always consider how the medical device is to be used and consider the Spaulding Classification System, the device manufacturer's instructions for use (IFU) and ANSI/AAMI ST79<sup>2</sup> to ensure that all medical devices are adequately processed.

The Spaulding Classification System specifies that non-critical items are those that only contact intact skin, including patient care equipment and environmental surfaces. These devices and surfaces must be clean before disinfection; the reason is that organic matter can interfere with the efficacy of the disinfectants used to destroy any microorganisms other than bacterial spores remaining on a surface. Disinfecting multi-use patient care devices protects patients and healthcare providers when contaminated medical devices are cleaned before being transferred to the decontamination area.

Studies have shown that microorganisms can survive on surfaces for long periods of time. For example, *Clostridium difficile* can survive from weeks to months and *Staphylococcus aureus* can survive for months on a dry surface.<sup>3</sup> If surfaces are not properly cleaned and disinfected, these organisms can be a continuous source of contamination. A study of 23 acute care hospitals found that, on average, only 49%



A study of 23 acute care hospitals found that, on average, only 49% of surfaces that were thought to have been properly cleaned actually were cleaned.<sup>4</sup>

of surfaces that were thought to have been properly cleaned actually were cleaned.<sup>4</sup> Even the best hand hygiene practices become ineffective when healthcare workers with clean hands then touch contaminated surfaces.

### OBJECTIVE 2: REVIEW THE USE OF DISINFECTANTS FOR LOW-LEVEL DISINFECTION

Disinfectants used in the U.S. are regulated by the U.S. Environmental Protection Agency (EPA) and the U.S. Food and Drug Administration (FDA). Selection of a disinfectant is based on the intended use of the device, the level of disinfection required and the device's compatibility with the disinfectant. CIS technicians must always follow the manufacturer's written instructions for the device and the disinfectant.

Several factors impact the effectiveness of disinfectants, including the type and amount of microorganisms present, contact time, positioning of the device in the disinfectant, and the disinfectant's temperature. Other factors include water hardness and pH, material compatibility and the presence of organic matter. CIS technicians must refer to the disinfectant's label for information, including a list of organisms the disinfectant is approved to kill and the required wet contact time. Other label information includes the proper dilution rate and the need for personal protective equipment (PPE) and other precautions.

Not all disinfectants can be used

in all situations; one must have the right product for the intended job. Disinfectants developed for environmental use, for example, are not to be used on surgical instruments. All CS disinfectants should be approved by the hospital's infection control committee.

Several families of disinfectants are available and CIS technicians must be able to compare the characteristics of each prior to choosing the correct product for CS use. Families of disinfectants include:

- Quaternary ammonium compounds (quats) are low-level housekeeping disinfectants that are not well suited for CS use (these may be absorbed by materials, such as filter paper and cotton, which depletes the concentration). Quats are also inactive against tubercle bacilli and some other gram-negative *Pseudomonas bacilli*. Also, the action of quats is reduced in the presence of organic material, and this disinfectant is corrosive to stainless steel.
- Phenolics are low-level disinfectants effective against a broad spectrum of organisms (*Note: Phenolics are not sporicidal*). They are inactivated by organic material and can be corrosive to rubber and some plastics. Phenolics provide some residual activity, so they are a good choice for floors, walls and countertops; however, this type of disinfectant is inappropriate for cleaning devices that might come in contact with patients' wet skin. *Note: When using phenolics,*

*copious rinsing is recommended.*

- Chlorine is a low- to intermediate-level disinfectant that can be used in CS. The manufacturer's IFU for some patient care equipment may require cleaning with bleach. *Note: Bleach is recommended by the CDC for cleaning the rooms of patients with *Clostridium difficile*.*
- Alcohol is also frequently used as a disinfectant in CS. It is fast acting and nonstaining but requires a wet time of five minutes or more for complete disinfection. It provides no residual activity, so to its use in disinfecting countertops and work tables, alcohol can also be used to disinfect skin and some patient care equipment.

### OBJECTIVE 3: ADDRESS ENVIRONMENTAL HOUSEKEEPING IN CENTRAL SERVICE

According to ANSI/AAMI ST79, CS housekeeping standards should be the same as those for cleaning operating and delivery rooms, and the standards used should ensure a high level of cleanliness at all times. In addition, AAMI standards recommend that floors and horizontal work surfaces be cleaned daily, and that walls, storage shelves and air ducts be cleaned on a regularly scheduled basis or more often, if needed. Stained ceiling tiles should be changed and any leaks causing the stains should be repaired. Light fixtures or covers should be cleaned every six months, or as needed.

The decontamination area is the centralized location for handling contaminated devices and there is a high microbial count in the area. Special attention should be paid to the sequence of cleaning in CS areas to avoid transferring contaminants from dirty to clean areas. Clean areas should be cleaned before dirty areas, such as the decontamination area. AAMI also recommends having separate cleaning



utensils for the decontamination and clean areas. Cleaning equipment, such as mops and buckets that are used to clean decontamination areas, should not be used in any other location.

Departmental policies and procedures should be developed and cleaning staff should be adequately trained so the CS environment does not contribute to the cross contamination of medical devices. Staff must wear appropriate attire, including PPE while cleaning CS areas. In addition, floors must be cleaned with a wet mop or wet vacuum – never with a broom or dust mop. Spills should be cleaned up immediately and biohazardous waste should be frequently removed from departmental areas. Cleaning staff must also be aware of correct chemical dilution rate, wet contact time and surface compatibility for all of the cleaning chemicals used. The use of a checklist is helpful to ensure accountability in the cleaning process.

Event-related sterility is the concept that items are considered sterile until the integrity of the packaging is compromised. Each time a sterile package is handled, this is considered an “event,” and care is required to avoid compromising the integrity of packaging when sterile storage areas are cleaned. Carefully remove sterile items from the storage cart, rack or cabinet, place the items on a clean, dry surface before cleaning and allow the storage unit to dry before replacing items. Corrugated boxes and external shipping containers may harbor microorganisms and should not be used in CS work areas. Plastic shipping and storage bins and containers should be cleaned routinely.

## IN CONCLUSION

Close attention must be paid to all methods of HAI transmission. By properly low-level disinfecting patient care equipment and maintaining a clean

work area, CIS technicians can help control the spread of harmful bacteria within the hospital.

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# CIS Self-Study Lesson Plan Quiz - Surface Disinfection and Departmental Housekeeping in Central Service

Lesson No. CIS 253 (Instrument Continuing Education - ICE) • Lesson expires January 2019

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## OBJECTIVE 1

1. What is the first step in the decontamination process?
  - a. Disinfection
  - b. Cleaning
  - c. Rinsing
  - d. Washing
2. Cleaning removes:
  - a. Visible soil
  - b. Non-visible soil
  - c. Other foreign material
  - d. A and B above
  - e. All the above
3. Which kills all forms of microbial life?
  - a. Cleaning
  - b. Decontaminating
  - c. Disinfecting
  - d. Sterilizing
4. Why are detergents used to facilitate cleaning?
  - a. They destroy all microorganisms
  - b. They are required by AAMI
  - c. Water cannot remove oily or organic soil by itself
  - d. They reduce the time needed to kill microorganisms
5. Differentiating between clean and dirty equipment reduces cross contamination.
  - a. True
  - b. False
6. The Spaulding Classification System divides medical devices into \_\_\_\_\_ categories.
  - a. Three
  - b. Four
  - c. Five
  - d. Six

7. Items that must be manually disinfected must be disinfected after cleaning:
  - a. At the point of use
  - b. In the disinfection area
  - c. In the decontamination area
  - d. In the preparation and packaging area
8. Which kills nearly all pathogenic microorganisms on inanimate surfaces?
  - a. Cleaning
  - b. Washing
  - c. Disinfecting
  - d. All the above

## OBJECTIVE 2

9. Which disinfectant is not well suited for CIS use?
  - a. Quats
  - b. Phenolics
  - c. Chlorine
  - d. Alcohol
10. Use of which disinfectant requires copious rinsing?
  - a. Quats
  - b. Phenolics
  - c. Chlorine
  - d. Alcohol
11. Which is recommended by CDC for cleaning rooms of patients who have *Clostridium difficile*?
  - a. Quats
  - b. Phenolics
  - c. Alcohol
  - d. Bleach

12. Which is a good product to clean floors, walls and counter tops?
  - a. Quats
  - b. Phenolics
  - c. Alcohol
  - d. Bleach

## OBJECTIVE 3

13. Floors and horizontal work surfaces should be cleaned:
  - a. Hourly
  - b. Once each shift
  - c. Daily
  - d. Weekly
14. AAMI recommends having separate cleaning utensils for decontamination and clean areas.
  - a. True
  - b. False
15. Which is true when cleaning CS areas?
  - a. PPE should be used
  - b. Spills should be cleaned up immediately
  - c. Floor should be cleaned with a broom or dust mop
  - d. A and B above

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