

Cleaning May Not Be Glamorous...But It Is The Foundation For Successful Disinfection/Sterilization Of Devices

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****This in-service has been Approved by the CBSPD, Inc. for 1 CEU.**

Cleaning is defined as “the removal, usually with detergent and water, of adherent visible soil (i.e. blood, pus, protein) from the surfaces, crevices, serrations, jaws and lumens of instruments, devices and equipment, by a manual or mechanical process that prepares the items for safe handling and/or further decontamination.”¹The Occupational Safety and Health Administration defines **decontamination** as “the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use or disposal.”²

When one reads the definitions, it is easy to understand the objectives of cleaning and decontamination. It is also understood that cleaning and decontamination are the first and most critical steps in breaking the chain of disease transmission. Yet, because these processes are performed in a restricted area with personnel wearing personal protective equipment, they can be perceived as “a necessary evil” instead of a requirement for successful patient outcomes! We need to make sure that personnel performing the cleaning processes are the “super stars” of the department! We also should remember that successful sterilization begins with cleaning!

Issues with Cleaning and Decontamination:

Cleaning is important because the processes of disinfection and sterilization are dependent upon direct contact of the sterilant or disinfectant with the surface of the item. When items are not properly cleaned, visible soils as well as invisible soils (e.g. microbes) can remain on the devices interfering with the disinfection or sterilization process.

Device manufacturer’s instructions - It is essential that cleaning instructions be obtained from the manufacturer of every device processed to ensure the proper chemicals

¹ Association for the Advancement of Medical Instrumentation. “Safe handling and biological decontamination of medical devices in health care facilities and in non-clinical settings.” ANSI/AAMI ST-35. 1996.

² Occupational Safety and Health Administration. Blood Borne Pathogens Ruling. 29CFR 1910.1030. 1991.

(detergents) are being used, to identify if any special cleaning implements or equipment is needed and to make sure the person performing the cleaning can duplicate the cleaning process as described by the device manufacturer.

Pyrogen Formation - Pyrogens are fever inducing organisms. When bacteria and other microorganisms die; their cell wall may rupture releasing cellular material that can be highly toxic to patients if in contact with the bloodstream. "Limiting the bioburden before sterilization minimizes this debris".³

It is imperative to understand that sterilization is a multi-step process **that begins with thorough cleaning and decontamination**. In addition we need to be concerned about **biofilm** formation. Biofilms can be described as sticky, rigid structures of organic contaminants which produce a slime layer anchored firmly to a solid surface and provides a protective environment for microorganisms to grow. They generally form on any surface that is exposed to non-sterile water or other liquids and is consistently found in many environments including industrial and medical systems.⁴ Since biofilms like to grow in non-sterile liquids, it is important to know if your enzymatic detergent inhibits the growth of biofilms. There are also enzymatic gels and foams available today to eliminate the liquid environment that biofilms prefer.

Standard Precautions - requires that all used supplies and equipment are considered contaminated. Soiled items should be collected and transported to the Decontamination area in a manner that minimizes potential contamination of staff, patients or the environment. When received in the Decontamination Area, there is a specific process that should be followed to prevent damage and loss to instruments. This process includes:

- Containment of the contaminated items at the point of use
- Transportation to Decontamination Area
- Sorting of items (e.g. basins, instruments, non-immersible items, etc.)
- Soaking items (enzymatic pre-soak)
- Washing (manual or mechanical)
- Rinse/Dry

All transport carts must be cleaned/disinfected after each use and all carts/ bins used to transport soiled items should be identified with a Biohazard label.

Compliance Issues - It is essential that employees performing Decontamination activities wear personal protective equipment (PPE) which is consistent with the tasks at hand. This usually includes impervious gown, headcover, shoe covers, fluid resistant mask with goggles or face shield and cuffed gloves.

³ Association for the Advancement of Medical Instrumentation. "Safe handling and biological decontamination of medical devices in health care facilities and in non-clinical settings." ANSI /AAMI ST-35. 1996.

⁴ Biofilm Institute. Biofilm Online Report. Worldwide Web. 2002.

All body fluids should be contained to minimize spills. All sharps (including surgical instruments) should be transported in leakproof, rigid containers to prevent puncture injuries.

Cleaning Agents - The use of enzymatic detergents to loosen and facilitate removal of soils is common practice today. These products have proven their worth in the cleaning process. Basically there are two categories; proteolytic enzymes for protein soils and lipolytic enzymes for fatty/marrow soils. However, not all detergents are created equal. It is important to obtain the detergent manufacturer's written technical data to determine the effectiveness of the detergent. It is also important to know your tap water quality and its impact on the efficacy of the detergent being used. No single cleaning agent will remove all types of soils, or is safe to use with all types of reusable devices. In addition, the effectiveness of detergents is dependent upon concentration, use temperature and contact time. Therefore, follow the detergent manufacturer's instructions for dilution, water temperature and contact time carefully for optimum results. The available alkalinity of a detergent can impact on the material being cleaned. For example, anodized aluminum instrument containers require a neutral pH detergent to prevent corrosion.

Principles of Cleaning - In order for effective cleaning to take place, all items must be in the open position or disassembled position (the device manufacturer should provide instructions regarding the need to disassemble a device for proper cleaning). Instrument sets with large numbers of instruments may need to be separated into two or more pans when placing in the mechanical washer to ensure adequate exposure of the instruments to the cleaning action.

When instruments are placed in their respective baskets (in the OR, or wherever used) the delicate items should be placed on top and the heavier items on bottom to prevent damage to the instruments.

Washing - **Manual cleaning** is usually used for non-immersible and/or delicate items. Sometimes, it is the only cleaning process available. Items should be submerged and, if recommended by the device manufacturer, disassembled. It is preferable to use 3-sink method; wash, rinse, final rinse. Manual cleaning can also be used to remove deposits which were not removed during the pre-soak process. In addition, manual cleaning is required for devices with lumens or unusual design.

Manual Cleaning Implements - the implements used should be carefully selected for the process required. Generally, soft bristle brushes, of various sizes and lengths are needed to fit the lumens and all parts of devices being cleaned. In addition, soft cloths may be used. Selection of the proper size brush is important since a brush that is too small in diameter will not create the needed friction against the walls of the lumen to remove soils. A brush with bristles that are too long may bend back and also not provide the needed friction.

Abrasives should never be used as these can harm the passivation layer on surgical instruments. Sponges are not recommended because they cannot be adequately cleaned (unless single use). Nylon bristle brushes work well. Handles should be plastic, not wood.

One of the most effective mechanical cleaners is ultrasonic cleaning. This process uses sound waves transmitted through a solution producing a mechanical process known as cavitation. This process is very effective in removing soils in hard-to-reach areas (box locks, serrations, etc.) Generally, only use detergents specifically formulated for ultrasonic cleaners (usually low foaming). The ultrasonic chamber water should be changed whenever visibly soiled and the chamber cleaned and disinfected whenever the water is changed. The unit should have a cover to contain aerosols. Items should not be stacked inside the chamber. It is recommended that metal mesh baskets be used (no plastic) to permit the sound waves to reach all areas of the instrumentation. Since tap water contains air, there is a need to "de-gas" water whenever the chamber is refilled. Follow the ultrasonic cleaner manufacturer's instructions for de-gassing. Since the ultrasonic cleaner is part of the cleaning process, it should be located in the Decontamination area.

There are other options for mechanical cleaning including washer/sterilizers, washer/decontaminators, tunnel washers, washer/disinfectors, cart washers, endoscopic cleaners, etc. It is important to critically evaluate the equipment before purchasing by visiting other facilities with the equipment being considered.

SUMMARY:

Effective sterilization is dependent upon a total process. The foundation for that process is effective cleaning and decontamination. This process cannot and should not be rushed. The devices processed must be scrupulously cleaned following the device manufacturer's instructions **each and every time**.

It is also important to remember that when a device is released to the end user, the preparer of the device is, in effect, saying that the device is safe to use.

A good rule of thumb is to ask yourself, "Would I want this device used on me or a member of my family?"

If you answer "yes" you have done your job. If you hesitate or answer "no", then you owe it to the patient to re-clean the device.

REFERENCES:

American Society for Healthcare Central Service Professionals. Technician Training Manual. 2001. Chicago, IL.

Association for the Advancement of Medical Instrumentation. "Good Hospital Practice: Steam Sterilization and sterility assurance. ANSI /AAMI - ST-46. 2002.

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Biofilm Webpage. Worldwide web.

POST TEST QUESTIONS: Cleaning May Not Be Glamorous...But It Is The Foundation For Successful Disinfection/Sterilization Of Devices

This in-service is Approved by the CBSPD for 1 CEU. Complete this post test and follow the directions at the end of the test for payment and results.

1. Which of the following statements is correct?
 - A) Cleaning and Decontamination are the same process
 - B) You can clean an item without decontaminating it
 - C) You can decontaminate an item without cleaning it
 - D) Decontamination should occur before cleaning

2. Successful sterilization begins with
 - A) Cleaning
 - B) Decontamination
 - C) Packaging
 - D) Sterilization

3. The first thing to do when cleaning a device is to
 - A) use the correct detergent
 - B) use the correct disinfectant
 - C) follow the device manufacturer's instructions
 - D) follow the Supervisor's instructions

4. A pyrogen is a
 - A) fever inducing organism
 - B) antibiotic resistant organism
 - C) virus
 - D) prion

5. A biofilm can form in any
 - A) sterile water environment
 - B) non-sterile water environment
 - C) enzyme foam product
 - D) enzyme gel product

6. When transporting soiled materials, they should be
- A) contained in a closed cart, covered bin
 - B) contained in an open cart, clear plastic bags
 - C) contained in a closed cart or mesh pans
 - D) contained in a closed cart, covered bin and identified with a biohazard label
7. When loading mechanical washers in the Decontamination Area, which type of personal protective equipment is **not required**?
- A) Fluid resistant gown
 - B) Fluid resistant face mask
 - C) Extra protection gloves
 - D) Face shield
8. The detergent best suited for heavy orthopedic soils is
- A) neutral pH detergent
 - B) proteolytic enzyme detergent
 - C) lipolytic enzymatic detergent
 - D) acid detergent
9. One of the most important factors in successful cleaning of lumened devices is
- A) selection of an enzyme detergent
 - B) selection of the correct diameter and length cleaning brush
 - C) use of ultrasonic cleaner
 - D) use of peroxide
10. To remove stubborn stains from instruments it is recommended to use
- A) Bon Ami cleaner
 - B) Teflon cleaning sponge
 - C) Non-abrasive cleaner
 - D) Wire brush

Directions for Payment and Results

This in-service = \$10

Re-do's = \$10 each

No refunds (all sales are FINAL), prices subject to change.

Payment is accepted in the form of a Credit Card, Facility Check, or Money Order only.
Sorry, no personal checks.

Upon passing this in-service, your certificate will be mailed to you within 7-10 business days.

Please fill out the form below and submit it with your payment and the quiz to:

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If you have any questions, please email heidi@spdceus.com

Thank you!