Decontamination Chemical Basics

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LEARNING OBJECTIVES
1. Understand the differences between detergents and disinfectants
2. Discuss the chemical selection process
3. List requirements for the successful use of disinfectants

For most people, the use of chemicals is a part of everyday life. From laundry detergent to disinfectants used in kitchens and bathrooms, chemicals are used to accomplish the most basic everyday tasks. Most people have used specific chemicals for so long that they rarely stop to think about which product to select to accomplish a task. For example, we wouldn't think of taking a shower with floor cleaner or using bar soap to wash our dishes. Around the house, selecting and using chemicals seems simple; however, in the decontamination area of Sterile Processing departments (SPDs), many find the chemical selection process confusing.

Understanding basic information about the products used in the decontamination area can help ensure the correct selection of chemicals. That understanding reduces apprehension when selecting and using chemicals and can also improve outcomes. As at home, there is no single chemical that is appropriate for all items and processes; therefore, it is essential to understand the differences between chemicals to ensure the selected chemical best fits the task.

Objective 1: Understand the differences between detergents and disinfectants

What is needed to help ensure that the correct chemicals are selected and used correctly? First, it is essential to understand fundamental differences in terminology. For example, detergents and disinfectants are not the same products. Detergents are designed for use in manual or mechanical cleaning processes to remove soil. Simply put, they are cleaners. The purpose of disinfectants is to kill most (but not all) bacteria on an object or surface.

When selecting a chemical, it is critical to recognize that detergents alone do not provide disinfection, and disinfectants alone do not provide cleaning. If the job calls for both cleaning and a biocidal process, such as disinfection, a two-step process is required when using standalone chemicals. Another option may be a germicidal detergent. Germicidal detergents provide both cleaning and disinfection in one step. Always select the chemical or chemicals identified in the item's instructions for use (IFU).

Perhaps the most important (and overlooked) step in working with detergents, disinfectants and germicidal detergents is reading each product's label. The manufacturer's information on the label will tell you precisely what the chemical is designed to do and how to use it. It is critical to remember that each chemical will only work for its intended function. If the user needs further guidance on a product's appropriate use, they should contact the manufacturer. Remember, no matter how long a facility has used a specific chemical, it is prudent to periodically verify that it is being used as intended, ensuring that the product's IFU and usage recommendations have not changed.

Objective 2: Discuss the chemical selection process

For most of us, the larger chemical selection process (choosing a specific brand or product) has been carried out through Infection Prevention, SP management, and adherence to the products' IFU. Most likely, the SP manager, along with colleagues from Materials Management and Infection Prevention, worked together to ensure that the chemicals selected for the facility were, above all, appropriate for their intended use and, secondly, as cost-effective as possible. All users must be familiar with the device's IFU and the differences between chemicals and proper chemical use.

The selection process can be a bit confusing at times, and understanding the differences between detergents, disinfectants and germicidal detergents is just the first step. For example, disinfectants and/or germicidal detergents are available in different levels of strength. Disinfectants are classified as low-, intermediate-, or high-level, and the required level depends on how the item being disinfected will be used. Regardless of the level of disinfection they provide, it is vital to remember that disinfection destroys most, *but not necessarily all*, bacteria on an object. Sterilization is the only process that provides that level of assurance, and not all items that come through the decontamination area require sterilization or can even safely undergo the process. For that reason, decontamination areas often handle items using some category of disinfection. Within the general categories (levels) of disinfection are several types of disinfectants, each with specific properties. The success of the entire decontamination process depends on making the correct selection for the job at hand.

Again, the decision for chemical selection has already been made for most of the items that SP technicians process. That decision is based on the type of item, how it has been (and will be) used, manufacturer's recommendations for decontamination, and any other contributing factors that could have an impact on outcomes. In other words, items are designated for decontamination with specific chemicals and processes for a reason. Part of the SP technician's job is to ensure proper selection and use of chemicals to achieve the desired level of biocidal activity while avoiding inadvertent damage to the items being processed.

It is never acceptable to substitute any chemical found in the decontamination area without ensuring the switch is safe, acceptable and approved for the intended purpose.

Objective 3: List requirements for the successful use of decontamination chemicals

The following steps are essential to help ensure chemicals in SP areas are selected and used properly:

Thoroughly read the label – Chemicals will only do what their label claims. Read the label carefully and ensure that the product you have selected is appropriate for the job and applied exactly as stated on the label.

Prepare items as necessary – Be sure that items are disassembled (if designed for disassembly), lumens are cleaned, and gross soil is removed. Chemical solutions cannot penetrate all surfaces of assembled instruments, and many are inactivated by significant amounts of gross soil.

Carefully measure the solution dilution – Most chemicals will be rendered ineffective if mixed incorrectly. Always follow the manufacturer's recommendations for dilution and mixing. Ensure sinks and basins are clearly marked to identify water volume. Technicians must also be aware that more product does not equate to better outcomes. Disinfectants do not become more effective when more is used than directed.

Using the recommended water temperature is also essential because some chemicals require a specific temperature to be effective. Always ensure that temperatures meet the IFU requirements and that sinks and basins are equipped with temperature markers.

Ensure direct contact and allow adequate time for chemicals to work – Chemicals can only be effective if they come into direct contact with every surface. Germicidal detergents and disinfectants, for example, require specific contact time to work effectively. Always read the label and ensure that each chemical is given the correct amount of time to do its job.

Follow safety protocols – Many chemicals used in the decontamination

area are several times stronger or more concentrated than those developed for home use. Be sure to always wear protective attire when handling decontamination chemicals in the facility. Employees should also know the proper safety steps to take in the event of chemical spills or splashes.

Conclusion

Chemicals used for decontamination pose safety risks and are only effective when used for their intended purpose and in strict accordance with the manufacturer's IFU. Selecting an inappropriate chemical or misusing it can cause the entire process to fail, putting patients and employees at risk. Those risks are reduced when SP professionals understand the chemicals that they work with every day, select them appropriately, and diligently follow the manufacturers' instructions. P

CRCST Self-Study Lesson Plan Quiz: Decontamination Chemical Basics

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1. Detergents and disinfectants:
   a. Do virtually the same thing
   b. Must be diluted with hot water
   c. Have different capabilities
   d. Can be modified to increase strength

2. Using more of a disinfectant solution than recommended on the label:
   a. Makes the chemical more effective
   b. Is unsafe and does not make the chemical more effective
   c. Is only effective for certain bacteria
   d. Extends the life of the solution

3. Grossly soiled items should be:
   a. Precleaned before using a chemical disinfectant
   b. Sent back to the user for point-of-use treatment
   c. Exposed to the disinfectant for an extended contact time
   d. Quarantined for three hours

4. For a disinfectant to be effective, it must
   a. Make direct contact with all surfaces being disinfected for a prescribed period of time
   b. Contain a nonfoaming detergent mixed with cold water
   c. Be applied liberally before cleaning
   d. All the above

5. Disinfectants used in the healthcare facility:
   a. Are all designed to function the same
   b. Must first be approved for use by Biomedical Engineering
   c. Can have different purposes, contact times and instructions for use
   d. Kill all microorganisms if used correctly

6. Germicidal detergents:
   a. Require at least a two-step process for decontamination
   b. May provide a one-step process for decontamination
   c. Are generally less expensive than disinfectants
   d. Are not commonly used in Sterile Processing departments

7. All items processed through the facility's decontamination area must be sterilized.
   a. True
   b. False

8. The success of the decontamination process depends on:
   a. Proper cleaning
   b. Correct chemical selection
   c. Correct chemical application
   d. All the above

9. Disinfectants used in the Sterile Processing decontamination area are typically the same as those used for home use.
   a. True
   b. False

10. Failure to use chemicals as directed:
   a. Slows the decontamination process
   b. Is against the law
   c. Can shorten turnaround times
   d. Can jeopardize the safety of patients and employees

11. When evaluating detergents and disinfectants for the SPD:
   a. The purchasing decision rests solely with Materials Management
   b. Manufacturers of chemicals currently in use must be notified at least 30 days in advance
   c. Infection Prevention can help with the decision
   d. The decision should always rest with the SP manager

12. Decontamination chemicals:
   a. Can usually be substituted for one another
   b. Should be mixed at a greater strength for heavily contaminated items or surfaces
   c. Must be used with warm water
   d. None of the above

13. To ensure that the water in sinks is the correct temperature for specific chemicals:
   a. The water should be changed every 20 minutes
   b. Sinks should be made of high-grade stainless steel
   c. Sinks should have temperature markers
   d. Technicians can often determine correct temperatures by touch

14. Items that are soiled when placed in a disinfectant solution:
   a. Will require additional exposure
   b. Will not be successfully disinfected
   c. May be damaged when soil interacts with the chemical
   d. Will require a high-temperature solution to break down the soil

15. The most overlooked step in using chemicals is:
   a. Not reading the label thoroughly
   b. Using the incorrect size sink or basin
   c. Not logging outcomes
   d. Not drying items thoroughly

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