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Chapter 3.A. Introduction to Writing a Procedure for Disinfection

The information in this chapter is provided to serve as guide in developing a school’s own set of protocols.

A written procedure should provide guidelines to the following questions:

1. Why disinfect?
2. What surfaces and objects need disinfection?
3. What is the schedule for disinfection?
4. What are the least toxic and most effective products, processes, and equipment that can be used?
5. Who should be doing the disinfecting?
6. What information, training, and personal protective equipment do personnel need to safely do the disinfecting?
7. How should workers and building occupants be protected during the disinfection process?
8. What is the proper way to manage disinfectants and equipment?
9. How should disinfectant products and by-products be disposed of?
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Chapter 3.B. Choosing the Right Level of Microbe Control

Introduction

Before choosing any type of cleaning or antimicrobial product, it must be determined what “level” of microbe control is most appropriate for the surface or object. See also Chapter 3.C. Managing Surfaces for Infection Control to determine which surfaces require microbe control and what types of products can be used on each type of surface.

For a detailed explanation of the following definitions, see Chapter 1.B. Handbook Definitions.

The three main levels of microbe control in schools are

1. **General surface cleaning** – physically removes visible dirt, organic matter, viruses, fungi, and bacteria. General surface cleaning is accomplished with water, detergent, and physical scrubbing of the surface. The guiding principal is to *remove* microbes if possible¹ rather than kill them (with a sanitizer or disinfectant). In addition, thoroughly cleaning a surface can reduce the need to disinfect because without the nutrients and moisture needed to survive and multiply, most microbes cannot live on a clean and dry surface for very long.

   High-quality microfiber mops and cloths can enhance this process. A study at the University of California Davis Medical Center found that cleaning with a microfiber mop removed up to 99% of microbes.² The quality of the microfiber will affect its ability to remove microbes, so select a product with a denier of at least 1.0 or smaller.

2. **Sanitizing** – reduces but does not necessarily eliminate all the bacteria on a treated surface. Sanitizers do not have claims for viruses or fungi. To be a registered sanitizer, the test results for a product must show a reduction of at least
   a. 99.9% in the number of each type of bacteria tested on non-food-contact surfaces.³ Examples of non-food-contact sanitizers include carpet sanitizers, air sanitizers, laundry additives, and in-tank toilet bowl sanitizers.
   b. 99.999% in the number of each type of bacteria tested (within 30 seconds) on most food-contact surfaces.⁴ Food-contact sanitizers are used in sanitizing rinses for surfaces such as dishes and cooking utensils, and in eating and drinking establishments.

3. **Disinfecting** – destroys or irreversibly inactivates infectious or other undesirable microbes, but not necessarily the spores (reproductive bodies similar to plant seeds) of bacteria and fungi. The number of microbes killed during a disinfecting process will vary, depending on the specific chemical and how it is used.

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Chapter 3.C. Managing Surfaces for Infection Control

Introduction

This section discusses key criteria that must be considered when determining whether to disinfect a surface for microbe control.

1. Know whether a surface is porous or nonporous. Manufacturers design their antimicrobial products—and the Environmental Protection Agency (EPA) registers them—on the basis of surface and use criteria. Different types of surfaces require different types of products and methodology for microbe management.

2. Determine whether it is likely that the surface will come in contact with broken skin or mucous membranes. If a surface is contaminated with microbes, but no one is touching it, what would be the point of disinfecting it?

3. Consider whether the surface is a type that would allow for the removal of most of the microbes with high-quality microfiber mops and cloths and an all-purpose cleaning product (third-party certified*) to the level of 99% deemed acceptable for the protection of public health, or whether a disinfectant (to kill virtually everything) is needed on those surfaces. See Chapter 3.B. Choosing the Right Level of Microbe Control and Using Chapter 6.C. Using Microfiber Cloths and Mops for Infection Control.

*Refers to cleaning products that have been certified by Green Seal™ or EcoLogo™, nonprofit organizations that provide independent third-party certification of products for environmental and human health criteria.

Evaluate the Need for Disinfection

There are typically two levels of disinfection in a school building:

1. **Routine disinfection**

This level of disinfection is used for those areas that the stakeholder team has determined need disinfecting on a regular basis (in addition to cleaning with a high-quality microfiber cloth and an all-purpose detergent). These areas would be evaluated using the following criteria:

   • Certain surfaces and items that are regulated, such as high chairs in preschools and/or food-contact items in food service settings.

   • Areas that are high-risk, such as some surfaces in restrooms, shower and locker rooms, the nurse’s office, and some athletic areas.

2. **Incidents and outbreaks** (see also Appendix A.3. Program Planning Handout: Cleaning for Healthier Schools and Infection Control Practices)

   • Identify and prepare for these types of events. Work with the school nurse, custodian, and classroom and athletic teachers to develop a protocol. These events may include
     - Outbreaks of contagious disease, such as MRSA, influenza, and other diseases.
     - Incidents involving blood and body fluids, such as fights, nosebleeds, and accidents on the playground or the athletic field.
     - Incidents involving feces, vomit, and saliva, such as in toileting areas in preschool, special education classrooms, and so forth.
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- Identify the location of incidents for each of the following sectors to provide supplies (e.g., spill kits) and training to relevant staff:
  - Elementary schools
  - Middle and high schools
  - Vocational and technical education
  - Buses/transportation
  - Athletic areas
  - Nurse’s office
  - Other

Types of Surfaces

There are two types of surfaces—porous and nonporous—that must be taken into consideration when selecting infection-control strategies and products. Porous surfaces are further categorized as carpet, laundry, or other such surfaces. Nonporous surfaces are categorized as food-contact or non-food-contact surfaces.

Please note that disinfectants are registered by the EPA to be used only on nonporous surfaces, and that sanitizers are registered to be used on porous and nonporous surfaces. The differences are as follows:\textsuperscript{1}

- **Food-contact sanitizers (sanitizing rinses)** are used on surfaces that would come into contact with food. These sanitizers are considered a final rinse. No water rinse following application is allowed.

- **Non-food-contact sanitizers** are used to reduce numbers of bacteria on surfaces that would not come into contact with food.

- **Some products can act as both a sanitizer and a disinfectant**, depending on the concentration specified on the label. Disinfectants that have claims for use on food-contact surfaces must be rinsed with potable water.

Surface Management Based on Type of Surface and Extent of Skin Contact

- **Nonporous surfaces** are smooth, nonpenetrable surfaces such as floors, walls, and desks that do not allow gases or fluids through.

  These surfaces can be cleaned on a routine basis with a high-quality microfiber cloth or mop and an all-purpose cleaning product that has been third-party certified as environmentally preferable, to reduce the number of microbes and to eliminate the conditions microbes need to thrive (dirt, oils, and moisture).

  Nonporous surfaces do not need to be disinfected on a routine basis unless there is blood, body fluids, vomit, or feces on these surfaces, or if required by law. When there is an outbreak of an infectious disease, and the surface is touched by a variety of hands, the frequency of cleaning will need to be increased.

  - Floors: Clean with a microfiber mop and a neutral floor cleaner during spring, summer, and fall, and a floor cleaner designed to remove salt in winter. Routine disinfection of floors is unwarranted. Studies have demonstrated that disinfection of floors offers no advantage over regular cleaning and has minimal or no impact on the occurrence of infections. In addition, newly
cleaned floors become rapidly re-contaminated from airborne microbes and those transferred from shoes.  

- **Walls:** Do not need to be disinfected on a routine basis.  
- **High-touch surfaces:** Need to be cleaned more frequently with microfiber and an all-purpose cleaner, especially during an infectious disease outbreak.

- **Staff Kitchen Areas/Break Rooms/Cafeterias**
  - Handles on cabinets, microwave doors, refrigerators, coffee pots, and vending machines  
  - Vending machines  
  - Tables and countertops  
  - Sink faucets  

- **Office Work Areas and Equipment**
  - Shared desks, chair arms, work tables, and public reception counters and logs  
  - Handles on cabinet and file drawers  
  - Shared computer keyboards and mice  
  - Shared telephones  
  - Shared staplers, staple removers, and scissors  
  - Controls on audiovisual and other equipment  
  - Copier/scanner machines, printer/fax machines, and laminating machines  
  - Light switches  

- **Classrooms**
  - Shared desks and worktables  
  - Shared computers, headphones, scissors, and toys  
  - Shared telephones  
  - Light fixtures  
  - Handles on doors, cabinets, and file drawers  

- **Hallways and Stairwells**
  - Stairwell handrails, doorknobs, and handles  
  - Elevator buttons  
  - Handles on water fountains  
  - Light switches  

- **Specialty Rooms** – Consider that the items in these rooms could be damaged by the use of disinfectants, and that a hand-washing strategy before and after the use of the following items might achieve the goal of infection control while minimizing the use of disinfectants.
  - Music room keyboards, instruments, and other equipment  
  - Computer lab keyboards, printers, scanners, and other equipment  

- **Bathroom, Shower, and Locker Rooms**
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- Fixtures – toilet handle, sink faucet, shower faucet
- Dispensers – towel, sanitary napkin
- Handles – bathroom stall, shower door, entrance door, locker door
- Switches – light, fan, hand dryer, hair dryer
- Disposal containers – trash, sanitary napkin
- Surfaces in locker rooms – locker, bench, shower floor

- Preschool and Childcare
  - Water fountains are common sources of rotavirus contamination within the childcare environment.\textsuperscript{3}
  - Water-play tables are common sources of rotavirus contamination within the childcare environment.\textsuperscript{3}
  - High chairs with trays are considered to be a food-contact surface. A food-contact sanitizer must be used, which is considered a final rinse. No water rinse following application is allowed.
  - Toys (each state provides regulations on disinfectant requirements).
    - The use of a sanitizer on toys is considered non-food-contact use. The EPA evaluates the use of antimicrobial products on toys, taking into account the mouthing contact and exposure. If the available data indicate that an additional margin of safety for infants and children is needed (susceptibility and sensitivity issues), then the EPA will apply it.
    - The use of a sanitizer on teething toys is considered food-contact use and requires a specific concentration of a sanitizer.

- Porous Surfaces are surfaces that contain pores and allow fluids and gases to move through them. These surfaces can harbor microbes but cannot be disinfected because disinfectants are not designed and registered to be used on porous surfaces. Although the EPA registers sanitizer products for use on some porous surfaces, sanitizers do not claim to kill viruses or fungi.
  - Carpet is a porous material that can provide an ideal environment for the growth of microbes.\textsuperscript{4} The moisture and nutrient material that can accumulate in carpet combines to form optimal conditions for microbes to thrive. Areas of contamination can be sanitized but must be dried within 24 to 48 hours to prevent the growth of mold.
  - Management of bloodborne pathogens (BBP): Because disinfectants are not registered by the EPA to be used on porous surfaces, carpet cannot be disinfected. Carpet should not be used in areas where there is a high risk of blood-related incidents; alternatively, modular carpet tiles may be used that can be pulled up and replaced. In cases in which a carpet or other plush surface has been contaminated, the
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Occupational and Safety Administration (OSHA) requires employees to make a reasonable effort to clean the surface with regular carpet detergent/cleaner products.\(^5\)

- **Products:** An EPA-registered non-food-contact surface sanitizer may be used. Check the label to determine whether it is effective on wool carpet. Products are designed and labeled to be one of the following:
  
  - Sanitizers for precleaned carpeting
  
  - One-step cleaner/sanitizers (the label will specify the amount of organic matter for which it is effective; because carpets tend to be reservoirs for dirt, best practices would require cleaning first)

- **Alternatives to sanitizer products:**
  
  - Carpet detergent that is rinsed thoroughly and dried within 24 hours to prevent the growth of microbes.
  
  - Steam cleaning/vapor technologies that sanitize carpets without added chemicals.

- **Laundry** items contaminated with blood that *can* be washed should be washed separately using an EPA-registered non-food-contact surface sanitizer as an additive in laundry detergent.\(^6\) The following EPA requirements apply to antimicrobial products that have label claims for sanitizing activity for fabrics and/or laundry water.

  - The directions for use of laundry additives will specify the
    
    - Machine cycle in which to add product, the water level, the temperature range, and the treatment time
    
    - Products compatibility with other common laundry additives such as soaps, detergents, bleach, starch, bluing, sours, and fabric softeners

- **Label claims** must distinguish between products for soaking treatments prior to laundering and product additives in laundry operations:

  - Presoaking treatment products are used for soaking soiled fabrics prior to routine laundering. Product directions will specify rinsing of the items to remove dirt prior to soaking, followed by immersion in an adequate volume of soaking solution at the recommended-use dilution (at least 5:1 weight per weight [w/w] solution-to-fabric ratio; e.g., half a wash load in a 3-gallon pail) for a specified contact time prior to the laundering operation.

  - Product directions for laundry operation additives will distinguish between products designed for household and coin-operated laundering and those designed for commercial/industrial/institutional laundering:
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- Home or coin-operated machines:
  - Water-to-fabric ratio is about 10:1 (w/w).
  - Dosage instructions will be different for front-loading automatics (e.g., 8- to 10-gallon water capacity) and for top-loading automatics and wringer-type washers (e.g., 12- to 15-gallon water capacity).

- Industrial laundering operations:
  - Water-to-fabric ratio is about 5:1 (w/w).
  - Dosage instructions for industrial laundering may be based on pounds of dry fabric.

**Sponges and dishcloths** are not recommended due to the cross-contamination risk and the fact that they can provide an ideal medium for microbial growth. The findings of a study by the University of Arizona on bacteria that were found on cellulose sponges and dishcloths concluded that these items may be an important source of bacterial contamination of surfaces, hands, and foods in home kitchens. Options to address this issue include the use of

- Microwave oven heat for decontamination. Microwave heat has been reported to be an efficient method for decontaminating cellulose sponges and cotton dishcloths and for preventing cross-contamination of other food-contact surfaces. Research found that exposures of 60 seconds in a common household microwave oven on the highest settings were sufficient to kill bacteria. Caution is advised, however, because the sponge or dishcloth will be extremely hot after microwaving.

- Microfiber cloths as an alternative to sponges. Microfiber cloths are an ideal substitute for sponges due to their ability to remove microbes and the conditions they need to thrive and to inhibit microbial growth within their fibers. See Chapter 6.C. Using Microfiber Cloths and Mops for Infection Control.

Consider the Surface Before, During, and After Disinfecting

1. **Compatibility of product with surface** – Always check the product label for compatibility because some products can permanently damage surfaces, such as the use of bleach on a metal surface.

2. **Orientation of surface (horizontal or vertical)** – Consider what application process and equipment would work the best to keep the surface wet long enough to meet the required contact time period.

3. **Final treatment of the surface: rinsed, wiped off, or air dried** – Always read labels for instructions. Several issues to consider when determining whether to rinse off the disinfectant or sanitizer:
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a. Regulatory requirements: Disinfectant and sanitizer products have rinse and no-rinse requirements depending on their end use.

b. Residual activity: This process happens when the disinfectant is not rinsed off and continues to work. Although some consider it an asset to have the product continue to work, residual activity may not be desirable because it has been linked to the creation of mutated microbes that can then lead to antibiotic resistance.

c. Toxic residue: Product residue left on a surface may be hazardous when it comes in contact with skin. Children have acquired rashes after sitting on a toilet seat that was not rinsed. Rinsing of all touchable surfaces is recommended when the label states that rinsing is required.

References


Introduction
Dispensing concentrated products through a dispensing system provides a number of opportunities to improve safety and conserve resources by (1) minimizing waste through accurate dilution rates and the use of concentrates, (2) preventing exposures and spills from product concentrates, and (3) improving efficacy due to accurate dilutions.

The ideal situation is to have a dispensing station that can dispense the disinfectant at the correct concentration. Product vendors will often provide dispensing equipment at no cost if sufficient product is purchased from them.

Preparing to Dispense Products
- Select the proper dilution rate for the task. Each disinfectant has a concentration that maximizes its ability to disinfect and for which it has been tested and approved by the EPA. The manufacturer cannot guarantee the effectiveness of the product if it is not diluted according to the rate on the label.

Adding more of the concentrate to the mixture will not necessarily cause the disinfectant to react more quickly or effectively. In fact, improper dilution of a disinfectant can increase the toxicity, the risk of injury, damage to equipment, contamination of drinking water sources, and the cost. Following the manufacturers’ directions for the lowest concentration of disinfectant achieves the highest level of disinfection.

- Mix only the amount needed. Some disinfectants lose their effectiveness and must be disposed of within a specified amount of time after mixing. An example is bleach that must be disposed of within 24 hours if not used.

Dispensing Products
- Without a dispensing station (this practice is not recommended—consider a ready-to-use product)
  - Use a measuring device and funnel, nozzle, or spigot for dispensing fluids from bulk containers to reduce the chance of spills and overflows.
  - Thoroughly wash and rinse dispensing equipment after use.
  - Dilute and mix the product in a well-ventilated space.

- With a dispensing station
  - Calibrate dispensing equipment carefully and often, at least every time a new container of disinfectant is opened. Check the equipment for leaks and malfunctions when calibrating. To prevent waste, calibrate equipment using water instead of the chemical product.
  - Use pumps and spigots to decrease the likelihood of spills and contact with skin.
  - Measure concentrates before adding them to the dilution tank.
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Chapter 3.E. Labeling Secondary Containers

Introduction
Secondary or portable containers are those into which chemical products are transferred from the original container or dispensing station for use throughout the building. Typically, custodial staff members fill spray bottles of each product from a dispensing station and put them on their cleaning cart. Some vendors provide labels for spray bottles with all of the required product information.

When labels are not supplied, these spray bottles are often haphazardly labeled with marker or tape, or not labeled at all. They can often be found inadequately labeled on the cleaning cart or in rooms throughout the building if they were left behind by the custodian or were distributed to teachers. This practice becomes an “accident waiting to happen.” In the case of exposure, there is no health and safety information and the chemical is essentially an “unknown.”

Requirements
The Massachusetts Right To Know Law and the OSHA Hazard Communication Standard require that secondary containers be labeled with the name of the product and the appropriate hazard warning as specified below. Copies of the product’s label, or spray bottles that have the manufacturer’s or distributor’s information printed on them may be obtained.

- Required label information for secondary containers:
  - The brand name of the hazardous chemical (if the container is original) or the name as listed on the material safety data sheet (MSDS; if the container is secondary).
  - Hazard warnings, listing health hazards such as effects on target organs and systems (heart, liver, kidneys, nervous system, etc.) and physical hazards such as whether the chemical is flammable, corrosive, or reactive.

- Optional label information for secondary containers:
  - The name, date, and initials of who diluted the solution to track its expiration date. Expiration dates can be found on the manufacturer’s label.
  - Hazardous Materials Identification System labels. These labels provide a good “at-a-glance” warning to alert workers of the degree of hazard, particularly for those who do not speak English.

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- Signal words. These provide a quick method of identifying the degree of hazard.

⚠️ **Danger:** Highest degree of hazard (red text). Description of imminent hazard and injuries that will result in death or serious injury if not avoided.

⚠️ **Warning:** Intermediate degree of hazard (orange text). Description of hazard that could result in death or serious injury if not avoided.

⚠️ **Caution:** Lowest degree of hazard (yellow text). Description of hazard that could result in minor or moderate injury if not avoided.

For example, the following warning is found on the MSDS for Clorox® bleach:

⚠️ DANGER: CORROSIVE. May cause severe irritation or damage to eyes and skin. Vapor or mist may irritate. Harmful if swallowed. Keep out of reach of children.

Some clinical reports suggest a low potential for sensitization upon exaggerated exposure to sodium hypochlorite if skin damage (e.g., irritation) occurs during exposure. Under normal consumer use conditions the likelihood of any adverse health effects are low.

Medical conditions that may be aggravated by exposure to high concentrations of vapor or mist: heart conditions or chronic respiratory problems such as asthma, emphysema, chronic bronchitis or obstructive lung disease.
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Chapter 3.F. Precleaning Surfaces and a Discussion on Using Disinfectant/Cleaners

Introduction
The cleaning step prior to disinfecting and sanitizing is often skipped for a number of reasons, including time constraints, a lack of understanding of the role cleaning has in preparing the surface, how materials on the surface can affect product efficacy, and the requirement for the disinfectant to be in contact with the microbes for a specified amount of time to kill them. This document and Chapter 3.G. Identifying Factors That Can Compromise Disinfectant Efficacy provide the reasons why cleaning can make a difference in efficacy.

There are several types of disinfectant products on the market, some of which claim to clean and disinfect. These dual-use products are appealing due to their potential time- and labor-saving advantages. The information provided here is to clarify the differences between the product types, when each may be appropriate to use, and what the potential health and efficacy issues are.

Preparing the Surface for Disinfection

Why preclean?
- For a disinfectant to be effective at killing microbes, all dirt, debris, and organic matter must first be removed from the surface so that the disinfectant can come into contact with the microbes and be absorbed. Soil renders disinfectants less effective because it can hide the microbes, absorb the disinfectant ingredients, and change the chemical nature of the disinfectant.\(^1\)
- Disinfectants cannot penetrate biofilm. Biofilm develops on wet surfaces over time as bacteria “communicate and colonize with other microbes.”\(^1\) The biofilm protects itself with a tough, thick matrix that must be broken down to make the microbes vulnerable. The best way to do this is to brush or scrub the surface to which the biofilm is attached.\(^1\) Another way to penetrate the biofilm is to use heat from a steam vapor device.\(^2\)

Key locations for a biofilm to form are those areas that are wet on a regular basis, such as (1) plumbing under the rims of toilets and urinals, in sinks, and in distribution pipes; and (2) wet areas that surround these locations, such as backsplashes, drain areas, and so forth.

Can I use the same product to clean and disinfect?
- Disinfectant/cleaner products – Although cleaners do not disinfect and disinfectants do not clean, there are products that are designed and registered by the EPA to clean and disinfect. They contain both a disinfectant and a detergent cleaning agent. All heavily soiled surfaces need to be cleaned first using a separate cleaning agent. Two types of products are available:
  - **One-step cleaner/disinfectants** work on surfaces with only a moderate amount of organic soil. They can be labeled as a one-step cleaner/disinfectant that is “effective in the presence of 5% body fluids”; however measuring 5% may be difficult.
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- **Two-step cleaner/disinfectants** are *not* “effective in the presence of 5% body fluids” and must be labeled and used only as a two-step process—that is, the product must be used twice, once to clean and once to disinfect.

  - All other disinfectants require that surfaces be precleaned using a detergent (an all-purpose cleaner) until they are free of dirt, grease, oil, and organic substances such as blood. Detergents disperse and remove organic materials and dirt from surfaces, reducing surface tension while increasing the penetrating ability of water. Proper cleaning with high-quality microfiber and a detergent will remove up to 99% or more of infectious material and render the surface visibly clean.

  - Because the cleaning step does not require a disinfectant, it is recommended to use two different products (one to clean and one to disinfect) to reduce the amount of toxic disinfectant used.

- *How will the use of microfiber assist in the disinfection process?*

  - High-quality microfiber cloths and mop heads serve several roles in preparing a surface to be disinfected. In addition to soaking up moisture and removing the nutrients that microbes need to survive, high-quality microfiber with dense fibers can remove microbes and bacterial spores.1 (See also Chapter 6.C. Using Microfiber Cloths and Mops for Infection Control.)

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**References**


Chapter 3.G. Identifying Factors That Compromise Disinfectant Efficacy

Introduction

There are many conditions that can affect how well a disinfectant works to kill microbes. Product-specific guidelines are located on a product’s label. A manufacturer can guarantee the effectiveness of its product only if the product’s instructions are followed.

The National Cleaning for Healthier Schools and Infection Control Workgroup has consistently observed that in practice, the lack of awareness of how disinfectants work leads to poor practices that result in inadequate disinfection and unnecessary exposure to disinfectants. Ultimately, it also leads to a false sense of security that the microbes have been killed.

Efficacy Criteria

The following factors can reduce the effectiveness of a disinfectant and should be kept in mind when selecting and using products:

1. \textit{Type of microbe to be killed}. Each disinfectant has unique properties that target specific microbes. The EPA registers each disinfectant on the basis of the target microbe(s) it is proven to kill. This information can be found on the disinfectant’s label. In addition, the EPA’s Web site, http://www.epa.gov/oppad001/chemregindex.htm, sorts disinfectants by the microbe(s) they are registered to kill.

2. \textit{Material on the surface to be disinfected}. One of the biggest mistakes in disinfecting practices is not cleaning a surface prior to disinfecting. The following materials could affect a disinfectant’s efficacy and must be removed prior to disinfecting:
   - Protein-containing material (e.g., food, blood). These materials may absorb and inactivate some chemical disinfectants.
   - Organic matter and soaps. The presence of organic matter and other compounds such as soaps left on the surface due to inadequate washing and rinsing may neutralize some disinfectants. An increase in pH improves the antimicrobial activity of some disinfectants (e.g., quaternary ammonium compounds [QACs]) but decreases the antimicrobial activity of others (e.g., hypochlorite [bleach]).

3. \textit{Cross-contamination issues}. Solutions of disinfectant should be changed for each room where disinfectants are used, and in some cases for different types of surfaces, such as the toilet and the sink. See Chapter 3.H. Preventing Cross-Contamination for details on the potential for and prevention of cross-contamination.

4. \textit{Concentration and quantity of product}. It is important to choose the proper concentration and quantity of chemical that is best suited for each disinfection situation. The product is guaranteed by the manufacturer only when used at the concentration listed on the label. Disinfecting requirements for routine tasks and special-event tasks such as a blood spill may require different strengths of the same product, or another product altogether.

5. \textit{Contact time (also known as kill time or dwell time)}. Contact time is the amount of time that the product must be \textit{in contact} with the microbes to kill them. Contact time is specified on the product label and varies from product to product. If the product is not left on the surface for a sufficient amount of time, the manufacturer cannot guarantee that the product will work effectively. The Workgroup has found this issue to be one of the biggest mistakes most staff
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members make when using disinfectants.

6. **Appropriate temperature.** The disinfectant must be stored at the correct temperature to maintain its viability and to ensure effective action when it is used. Improper temperatures can degrade a product during storage. During the use of most disinfectant types, the higher the water temperature, the faster and more effective the disinfectant activity.²-⁴ Too great an increase in temperature during storage and use, however, may cause the disinfectant to degrade and lose effectiveness.

7. **Compatibility of the product and the surfaces it is used on (e.g., fabric and metal surfaces).** Not all products are compatible with all surfaces, and using a product that is incompatible can damage the surface. For example, bleach can corrode metal surfaces, and scrubbing with bleach or corrosive (extremely high or low pH) products can remove some coatings on walls or floors. Floor finishes can be sensitive to the disinfectant pH. Chemical damage is irreversible and can be costly to repair. In most cases, floors do not need to be disinfected.

8. **The length of time the disinfectant sits in the bucket and the amount that is used.** When a solution of disinfectant is used on several rooms over a period of time, efficacy is reduced. As the solution temperature cools, it may lose its effectiveness. As the solution continues to be used, it can cross-contaminate other areas with the microbes that it does not kill and with those that proliferate in the bucket. In addition, microbes that do not die can develop resistance to disinfectants.

9. **Water hardness.** Some disinfectants, particularly the older formulations of quaternary compounds, do not work well in hard water. The newest quaternary compounds, however, work fairly well in hard water; hence, a quaternary compound formula label might read “effective in 400 parts per million (ppm) hard water.”⁵

References


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Chapter 3.H. Preventing Cross-Contamination

Introduction

Cross-contamination is the transfer of infectious microbes from one surface, object, or person to another. Preventing this transfer can help minimize the surfaces that need to be cleaned or disinfected for infection control. It is also counterproductive to what a cleaning program is trying to achieve.

Preventing cross-contamination begins with an understanding of where microbes live (reservoir), how they multiply, and how they move from location to location. See Chapter 2. The Science of Infection Control for information on how this “transmission” process works.

This document provides some common cross-contamination scenarios in schools and several strategies and work practices to prevent this from happening.

What are the common reservoirs of microbes that serve as sources of cross-contamination in schools, and what strategies can be used to eliminate them?

- **Reservoir:** A used cleaning cloth or mop head, especially if left soaking in dirty solutions.¹

  - **Strategies:**
    - Launder cloths and mop heads after use and allow them to dry before reuse to help minimize the degree of contamination.
    - Replace soiled cloths and mop heads with clean items each time a bucket of disinfectant is emptied and replaced with fresh, clean solution.¹

- **Reservoir:** A solution of disinfectants, especially if the working solution is prepared in a dirty container, stored for long periods of time, or prepared incorrectly. Gram-negative bacilli (e.g., *Pseudomonas* species and *Serratia marcescens*) have been detected in solutions of some disinfectants (e.g., phenolics and QACs).¹

  - **Strategies:**
    - Prepare disinfectant and detergent solutions in clean containers.
    - Make sufficient cleaning solution for daily cleaning, discard any remaining solution, and dry out the container.
    - Dispose of used solutions immediately.

- **Reservoir:** Contaminated hands or gloves.

  - **Strategies:** (in order of preference)
    - Wear and wash chemical-resistant gloves each time a mop head or cleaning cloth is changed for a new surface, or when the disinfectant solution is changed.
    - Wear and change disposable chemical-resistant gloves each time a mop head or cleaning cloth is changed for a new surface, or when disinfectant solution is changed.
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- Wash hands each time a mop head or cleaning cloth is changed for a new surface, or when the disinfectant solution is changed. (If skin exposure is likely, however, chemical-resistant gloves should be worn.)

What tools can be used to prevent cross-contamination?

- **Bathroom plumbing appliances and dispensers:**
  - Sink-faucet handles present one of the greatest risks of cross-contamination in the restroom. Touch-free toilets and faucets eliminate the possibility of making contact with potentially harmful microbes.
  - Touch-free dispensers in the bathroom allow users to touch only the soap or towel they need.

- **Facility equipment:**
  - Entryway walk-off mats trap pollutants such as dust, spores, and allergens before they enter the building and help to keep entryways clean.
  - Hands-free trash cans.

- **Cleaning and disinfecting equipment:**
  - Mop systems – use systems that require a new mop head or pad for each room.
  - Buckets – use dual-buckets that have separate dirty/clean water compartments.
  - Vacuums – use high-efficiency filtration equipment to prevent the introduction or spread of particulates that may carry microbes into the air while vacuuming.
  - Mops and cloths – use microfiber cloths and mops to capture more dirt and microbes than with paper or cloth towels. See Chapter 6.C. Using Microfiber Cloths and Mops for Infection Control for more information.
  - Other equipment – use no-touch cleaning equipment. An independent study on long-term cost savings conducted by John Walker, president of ManageMen and founder of Janitor University, found that no-touch cleaning equipment reduces restroom cleaning times by as much as 66%. Because these systems use a smaller amount of chemicals, savings are realized on the product and on labor.

- **Color-coded equipment (cloths and mops):**
  - The color-coded system prevents accidentally reusing a cloth or mop that has been used to clean areas such as bathrooms.
  - Some facilities managers and building service contractors devise their own color combinations to meet their specific needs, whereas others use the industry-standard color-coding system:
    - red for high-risk areas such as toilets and urinals
    - yellow for low-risk restroom areas including sinks and mirrors
    - blue for all-purpose cleaning (dusting, window cleaning, wiping desks, etc.) in other areas of a facility
    - green for food-service areas
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Strategies for transitioning to a color-coded system:

- Post a color-coding chart in an accessible area such as by the time clock, in the locker room, on the cleaning cart, in utility closets, or in other areas.
- Have enough quantity of each color to prevent employees from using, for instance, a red cloth if they run out of blue ones.
- For color-blind employees, an accommodation can be made by writing on cloths and mops with permanent markers. Several coding systems can be used: “U/T” for urinals and toilets, “S” for sinks and mirrors, and so forth; or “R” for red, “Y” for yellow, and so forth.

Excerpts from case studies of successful or challenging transitions:

- San Diego State University switched to color-coded mops in 1991. Before the change, the cleaning crew used the same mops for every task, “so there was no way to tell, other than perhaps by smell, where a mop had been used,” says Johnny Eaddy, Assistant Director of Physical Plant, Business, and Financial Affairs.
- Some employees may have trouble adjusting to the system of laundering and reusing color-coded products. “After using disposable rags for so long, cleaners may not always remember to throw the cloth in the laundry hamper rather than the trash can.”
- Custodians can also be assigned tasks based on the color systems. “Our bathroom [cleaning staff] only gets the right colors,” says Jimmy McKiernan, Director of Operations for First Quality Maintenance in New York. “We’re trying to take the guesswork out of it so there’s no way for [them] to mess up.”
- Custodians at Lynchburg City Schools in Virginia use a specific mop for every task: green for general cleaning, blue for restrooms, white for blood, and pink for stripper.

Practices to Prevent Cross-Contamination

- **Personal protection:**
  - As a friendly reminder, post hand-washing posters throughout buildings to reinforce the importance of clean hands for staff and building occupants. Tell staff to avoid touching their face, skin, or hair with cleaning cloths.
  - Have staff wear chemical-resistant gloves. After removing gloves, custodians should wash their hands with soap and water for 20 seconds.
- **Restrooms:**
  - Ensure that towel dispensers are dispensing properly. When users reach into a dispenser to unclog towels, they contaminate other towels for future users.
  - Install towel dispensers away from sink-splash zones to prevent contamination.
- **Custodial closets:**
  - Keep closets organized and clean so that microbes do not attach themselves to cleaning equipment and spread throughout the building.
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☑ Segregate tools to prevent them from touching each other. For example, items used to clean a restroom should not be side-by-side with those used in a kitchen.

References


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Chapter 3.1. Storing Disinfectant Products

Introduction

Disinfectants are usually stored with other cleaning products. This scenario can pose serious safety risks because some disinfectants have ingredients that are very reactive with other chemicals. Products such as bleach can form a toxic gas when mixed with ammonia. This problem is prevalent in almost all schools, even in those that ban products brought from home. A look under the sink in almost any classroom will reveal hazardous cleaning and disinfectant products stored haphazardly, unsecured, and in dangerous combinations. These extremely common scenarios are accidents waiting to happen.

Disinfectants are pesticides and are not appropriate to store in a classroom where there is no proper storage equipment and no designated and trained staff to use them. The recommendations in this section are designed to protect the staff and students in the classroom and the custodial and kitchen staff who use these products as part of their work.

Also of concern is the way that products are stored on custodial carts for use throughout the facility. It is essential that custodians handling these products understand which product combinations are compatible for storage on their carts and in their custodial closets to prevent reactions between incompatible products.

Managing Stock

- Use products on a first-in-first-out basis to reduce the chance of material deteriorating in storage.

Container Management (see also Chapter 3.E. Labeling Secondary Containers)

- Keep containers closed when not in use.
- Store disinfectants in original containers whenever possible.
- Ensure that all containers are labeled with the contents and percentage concentration information.
- Minimize the transfer of disinfectants from container to container.

Storage Locations and Conditions

- **Store disinfectants in a secure location out of the reach of students.** Examples are custodial closets and designated product storage areas, not classrooms.
- Store disinfectants on shelves located below eye level. Some disinfectants are corrosive and can cause severe eye damage and blindness if spilled into the eye.
- Store containers in well-ventilated storage areas.
- Store products in compatible hazard categories, and maintain a distance between those that are not compatible to prevent a hazardous reaction. Check the disinfectants’ MSDSs for specific storage compatibility guidelines. In general, hazardous products are separated into the following four hazard categories for storage:
  1. Flammables (e.g., alcohol-based products)
  2. Oxidizers (e.g., bleach)
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3. Corrosive bases (e.g., QACs)
4. Corrosive acids (e.g., citric acid– or lactic acid–based disinfectants)

- Ensure that flammable and combustible liquids like alcohol-based hand sanitizers are stored properly, such as in flammable storage cabinets. The Massachusetts Fire Prevention Codes require that flammable liquids and oxidizers (e.g., bleach) be stored in separate rooms. In case of a fire, the oxidizer will feed the fire and make it worse.
- Some disinfectants (e.g., bleach) lose stability quickly after being prepared for use or stored for long periods, especially in the presence of heat or light. To maximize product stability, store products in a dark, cool location.
- Check the label for the shelf life of a product concentrate.

Spill Control and Inspection

- Prepare for an incident by stocking spill clean-up supplies, including absorbents, tools, receptacles, personal protective equipment, and so forth.
- Clean up spills immediately. See the MSDS from the product distributor/manufacturer and the product label for spill-response guidelines.
- Use drip pans under spouts to catch and contain drips.
- Check containers regularly for leaks, breaks, rust, or other corrosion. If a leak or break occurs, transfer the product to another properly labeled compatible container.

Shelving

- Store disinfectants in compatible containers, on compatible shelving, and with compatible products as specified on the product’s MSDS and label. These precautions are particularly important for storing bleach and quaternary compounds because they can corrode metal containers and shelving. The shelving could eventually collapse.

Sources


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Chapter 3.J. Disposing of Disinfectant and Biological Waste

Introduction

This section addresses the following types of waste:

1. Biological waste (a biohazard) that is produced from cleaning up an incident
2. Used disinfectant solution
3. Chemical waste (a chemical hazard) that results from disposal of a disinfectant product concentrate or diluted solution

It is important to understand and follow the disposal instructions on the label. Because disinfectants are designed to kill microbes, the disposal of undiluted disinfectants may adversely affect a wastewater treatment plant (WWTP) or septic system that relies on biological digestion of waste by beneficial microbes. These beneficial microbes may be killed by the disinfectants. The handling and disposal of some biohazardous waste is regulated and must be managed by the guidelines referred to in Appendix A.4. Regulatory Categories and Definitions of Waste.

The chemical residue left in a container may also pose a hazard, and the label may provide requirements for “triple rinse” before disposal. Also, concentrated disinfectants are a regulated hazardous waste and must be managed by the guidelines referred to in Appendix A.4. Regulatory Categories and Definitions of Waste.

Disposal of Solid Waste

The following items can be disposed of in the trash. A safe practice is to double-bag these wastes and dispose of them immediately in the dumpster.

- Small bandages such as Band-Aids™ are generally NOT considered biohazardous because they do not release blood.
- Sanitary napkins are generally NOT considered biohazardous because they do not release blood.
- Diapers are NOT considered hazardous waste unless there is visible blood.
- Other body fluids without visible blood.

Disposal of Biohazardous waste

- Blood spill waste
  Free flowing blood must be placed in a red biohazard bag with the biohazard symbol.
  - Designate an area for biohazardous storage and pick up.
  - The transport of infectious waste is regulated by local Boards of Health, the Massachusetts Department of Telecommunications and Energy, or other local and state agencies, and by the U.S. Department of Transportation and must be done by a licensed agency.

  If the blood is not free flowing, it can be disposed of as solid waste.
  - A safe practice is to double-bag it and dispose of it immediately in the dumpster.
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- **Sharps and sharps disposal containers**
  - Store sharps in a rigid, puncture-proof sharps container facing down.
  - Bring the sharps container to the spill site to prevent having to carry a contaminated sharps through the building.
  - Dispose of the sharps container when three-fourths full.
  - Check with the local Health Department or Department of Public Works (DPW) for disposal requirements and options.

**Disposal of Hazardous waste**

Concentrated disinfectant that has expired or is designated for disposal for some reason may be considered hazardous waste. The local WWTP, DPW, the Massachusetts Department of Environmental Protection, or other appropriate agencies will have instructions for disposal. Concentrates poured down the drain may kill populations of microbes in septic tanks and in WWTPs that are designed to break down waste, thus interfering with these biological processes.

- Hazardous waste must be stored separately from hazardous products, in a secured labeled area, and in compatible categories. A fact sheet on the requirements for storing hazardous waste is available at [www.mass.gov/dep/recycle/laws/vsqgfcts.doc](http://www.mass.gov/dep/recycle/laws/vsqgfcts.doc).
- A container is considered empty if it has an inch or less of product in it and can be disposed of as trash. Although a legal option is to close the lid, double-bag the container, and dispose of it immediately in the dumpster, a best practice would be to bring the product that remains in the container to a municipal hazardous waste collection site where the best way to manage it could be determined. One exception is if the product is designated an *acutely hazardous waste*, which must then be disposed of hazardous waste.

---

**Sources**

Massachusetts Department of Public Health, *105 CMR 480.000 Minimum requirements for the Management of Medical or Biological Waste*. Available at: [http://www.lawlib.state.ma.us/source/mass/cmr/cmrtext/105CMR480.pdf](http://www.lawlib.state.ma.us/source/mass/cmr/cmrtext/105CMR480.pdf).


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Chapter 3.K. Taking Precautions: Personal Protective Equipment

Introduction to Selecting Personal Protective Equipment

Disinfectants are antimicrobial pesticides, and exposure to them can and should be prevented. Consider using less-toxic products and processes that have fewer requirements for personal protective equipment (PPE).

The Massachusetts Right To Know Law and the OSHA Hazard Communication Standard require that employers provide training to their employees on the use of required PPE. These requirements are listed on the product label and on the product’s MSDS.

An example of using PPE is to protect hands from biological hazards when cleaning up waste from an incident involving blood, vomit, or feces. In addition to the barrier protection that gloves provide for the biological hazard, an important consideration is to protect hands from the chemicals used to disinfect the surface after the spill is removed. Ready-made spill kits for blood clean-up may need to be supplemented if they include only barrier gloves and not chemical-resistant gloves for using the disinfectant.

Why Wear PPE?

Some disinfectants have an extremely high pH and are corrosive to skin and eyes and can cause blindness. Others are poisonous and can be absorbed through the skin.

What types of PPE are available?

<table>
<thead>
<tr>
<th>Type</th>
<th>Specifications</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective Apron</td>
<td>Chemically resistant depending on the type of chemical being used.</td>
<td></td>
</tr>
<tr>
<td>Vapor Respirator</td>
<td>The type of mask needed is determined by the chemical being used. Dust, particulate, and surgical masks do not prevent vapors from penetrating the mask.</td>
<td>The mask should fit well, without any leaks.</td>
</tr>
<tr>
<td>Splash Goggles</td>
<td>Goggles are tight-fitting eye protection that completely covers the eyes, eye sockets, and the facial area immediately surrounding the eyes. They provide protection from impact, dust, and splashes. There are two types: 1. Chemical splash goggles 2. Safety glasses for dust and particulates</td>
<td>Some goggles will fit over corrective lenses. Some goggles are designed to be used as both chemical splash goggles and safety glasses.</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Type</th>
<th>Specifications</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Criteria to select chemical-resistant gloves:</td>
<td>Gloves have a “break-through” time, at which point they are no longer protective.</td>
</tr>
<tr>
<td></td>
<td>Type of chemicals being handled</td>
<td>Disposable gloves are thinner than reusable gloves, and it must be determined whether they can withstand immersion in a chemical for any length of time.</td>
</tr>
<tr>
<td></td>
<td>Nature of contact (total immersion, splash, etc.)</td>
<td>Do not reuse disposable gloves.</td>
</tr>
<tr>
<td></td>
<td>Duration of contact</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Area requiring protection (hand only, forearm, arm)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Size and comfort</td>
<td></td>
</tr>
<tr>
<td>Boots</td>
<td>Chemically resistant depending on the type of chemical being used.</td>
<td>Some chemicals can penetrate footwear.</td>
</tr>
</tbody>
</table>

When should PPE be worn?

<table>
<thead>
<tr>
<th>If an employee could…</th>
<th>then…</th>
</tr>
</thead>
<tbody>
<tr>
<td>have contact with infectious materials</td>
<td>gloves are required</td>
</tr>
<tr>
<td>be splashed in the face</td>
<td>a mask is required</td>
</tr>
<tr>
<td>be splashed on the body</td>
<td>an apron is required</td>
</tr>
<tr>
<td>step in it and track it around</td>
<td>foot protection is required</td>
</tr>
</tbody>
</table>

What type of training should the school provide to employees?

Employers are required to train each employee who must use PPE on the following:

- When PPE is necessary
- What kind of PPE is necessary
- How to properly put on, adjust, take off, and wear PPE
- Limitations of PPE
- Proper care, maintenance, useful life, and disposal of PPE
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How should employees maintain PPE?

- Check the equipment for damage before and after use.
- Clean reusable PPE after every use in accordance with manufacturer’s instructions.
- Use disposable PPE only once. Throw it away after use.
- Store PPE in a clean place.
- Avoid contaminating the skin when taking off PPE.
- Try not to spread chemical residue around.
- Inform a supervisor of the need to repair or replace PPE.

Worksheet template to track requirements for PPE and emergency wash stations

Check the label and MSDS to complete the following chart for the disinfectants that are being considered or that are currently being used.

<table>
<thead>
<tr>
<th>Product Type (Ingredients)</th>
<th>Hazard Characteristics (corrosivity, toxicity, flammability, reactivity, etc.)</th>
<th>Eye Protection, Gloves, other PPE</th>
<th>Emergency Wash Station Required</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources


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Chapter 3.L. Preparing to Respond to a Chemical Exposure

Introduction

If the disinfectant and sanitizer products are corrosive in a concentrated form (e.g., QACs, bleach) or are flammable (e.g., alcohol, alcohol-based hand sanitizers), OSHA standards and Massachusetts Fire Prevention Regulations require the provision of an emergency eyewash facility.

A school’s protocol should address the location, selection, installation, maintenance, and testing of emergency eyewash and shower equipment. To minimize the number of emergency eyewash stations that are required,

1. Use products that do not require their use, such as water-based (nonflammable) and neutral PH (noncorrosive) products.
2. Implement engineering controls to reduce the potential for exposure; for example, the use of closed or automatic chemical-dispensing systems, splash guards, or long-handled spraying and cleaning tools.
3. Centralize facilities for storing and dispensing flammable and corrosive products.

If an eyewash station is not available in the area where the disinfectant is dispensed and used, a diluted, ready-to-use disinfectant product may be a better choice (if it does not require the use of an eyewash or PPE).

Plumbed Emergency Wash Stations: Eyewash and Emergency Deluge Shower

- Regulatory citations
  - For corrosives: OSHA Emergency Eyewash and Showers 29 CFR Part 1910.151(e)
  - For corrosives and flammables: MA Fire Prevention Regulations General Provisions 527 CMR 10

- General requirements for emergency wash stations
  - The station should be located within approximately 50 feet or a 10-second walk of the hazard and be easily accessible.¹
  - Water temperature should be kept between 70°F and 90°F.¹
  - All eyewashes and showers should be approved by the American National Standards Institute.
  - Signage (at least 70 square inches and in contrasting colors such as red and white or green and white) should be posted, indicating the location of each type of equipment: “Emergency Shower” or “Emergency Eyewash.”¹
  - When possible, the emergency wash system should trigger an alarm when activated to alert other people that there is an emergency.
  - The system should have a mechanism that enables it to stay on, allowing the hands to be kept free for cleaning off chemicals.
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- Equipment should be put in place and made operational before storing products and prior to staff and student use of hazardous materials.¹

- Deluge shower additional requirements
  - Water flow should be 30 gallons per minute.¹
  - Equipment should be available at all times, with the pull chain easily accessible.

- Eyewash station additional requirements
  - The station should treat both eyes at the same time.
  - Must provide a continuous flow of 0.4 gallons per minute for 15 minutes.¹
  - There are three types:
    1. Plumbed (best option): attachments can be obtained for converting existing faucets to an eyewash.
    2. Gravity-fed (portable): no plumbed unit with a 15-minute flush. May require water to be changed due to the potential for the water to become contaminated. Some units are sealed and have a longer shelf life.
    3. Handheld (portable): no plumbed unit with a 3-minute flush. This option is not a substitute for the required 15-minute flush. They can be used to minimize damage while accessing a plumbed eyewash station. In addition, the water in portable eyewashes can become contaminated and must be replaced.²

References


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Chapter 3.M. Assigning Roles and Responsibilities and Educating School Staff

Introduction

When the school has determined what the protocols should be, the person(s) responsible for each aspect of the infection-control program must be selected. Staff members should receive training for their own responsibilities but should also know what the other staff members’ designated responsibilities are. This practice will enable them to contact a trained staff person with the proper supplies and knowledge to do the assigned task. In addition to training, it is helpful for staff members to have reminders such as posters and memos to reinforce policies and procedures.

This document provides some suggested roles and responsibilities that can be assigned to school personnel so that they may participate appropriately in the infection-control program. These roles and responsibilities may be customized for each school or district.

Post written procedures for disinfectant use

- Identify locations for posting the procedures.
- Post guidelines and posters.
- Develop a system to revise the procedures and update staff when conditions, equipment, and products change, and when there is a new infectious disease.

Determine roles and responsibilities of staff and custodians

Every school will have its own system. In general, the Workgroup has observed the following designations of responsibilities within the school system:

<table>
<thead>
<tr>
<th>Department/Staff</th>
<th>Policy</th>
<th>Training</th>
<th>Purchasing*</th>
<th>Use</th>
<th>Incident Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>Assign roles and responsibilities</td>
<td>Ensure that a program is in place</td>
<td>Approve purchasing policy and criteria</td>
<td>Review reports</td>
<td></td>
</tr>
<tr>
<td>Facility Manager</td>
<td>Assign custodial roles and responsibilities</td>
<td>Organize training for custodians and possibly athletics department</td>
<td>Participate in developing purchasing criteria, vendor selection, and product ordering</td>
<td>Oversee custodial adherence to protocols</td>
<td>Disposal of spill waste, Follow-up to BBP exposure</td>
</tr>
<tr>
<td>Custodian</td>
<td>Implement policy</td>
<td>Attend training</td>
<td>Inventory supplies (PPE, cleaning supplies, spill)</td>
<td>Use products routinely and for incidents</td>
<td>Secure site, clean up, and complete report</td>
</tr>
<tr>
<td><strong>Department/ Staff</strong></td>
<td><strong>Policy</strong></td>
<td><strong>Training</strong></td>
<td><strong>Purchasing</strong></td>
<td><strong>Use</strong></td>
<td><strong>Incident Response</strong></td>
</tr>
<tr>
<td>----------------------</td>
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<td>--------</td>
<td>----------------------</td>
</tr>
<tr>
<td><strong>Athletics Director</strong></td>
<td>Assign and oversee staff roles and responsibilities</td>
<td>Organize training</td>
<td>Order disinfectant</td>
<td>Oversee staff use</td>
<td>Secure site, clean up or call custodian to clean up, and submit report</td>
</tr>
<tr>
<td><strong>Nursing Director</strong></td>
<td>Oversee nurse roles and responsibilities Coordinate policy with an Exposure Control Plan</td>
<td>Organize nurse training —as part of BBP, infection control, or orientation training</td>
<td>Participate in developing purchasing criteria, vendor selection, and product ordering</td>
<td>Oversee nurse use and information dissemination to school staff</td>
<td>Provide medical assistance Follow-up to BBP exposure</td>
</tr>
<tr>
<td><strong>Nurses</strong></td>
<td>Implement policy</td>
<td>Attend training Train classroom and office staff</td>
<td>Inventory supplies (PPE, disinfectants, spill kits)</td>
<td>Use products routinely and for incidents</td>
<td></td>
</tr>
<tr>
<td><strong>Food Service Director</strong></td>
<td>Assign and oversee staff roles and responsibilities</td>
<td>Organize training —independently or as part of other food-service training</td>
<td>Participate in developing purchasing criteria, vendor selection, and product ordering</td>
<td>Director – oversee staff use Staff – use products routinely and for incidents</td>
<td>Secure site, clean up or call custodian to clean up, and submit report</td>
</tr>
<tr>
<td><strong>Transportation Director</strong></td>
<td>Assign and oversee staff roles and responsibilities</td>
<td>Combine with other training Order and distribute spill kits</td>
<td>Use disinfectant for incidents only</td>
<td>Director – follow-up BBP exposure Driver – secure site, clean up, and submit report</td>
<td></td>
</tr>
</tbody>
</table>

* Determine whether all disinfectants will be ordered through one department or whether each department will order its own disinfectant. If the Facilities Department has a dispensing station, consider using it to provide product for all departments who can use the same formulation.
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Determine who is responsible for which daily and special-incident disinfection and sanitization tasks. The list below provides a brief sampling:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Staff Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughout the day</td>
<td>Typically, staff members perform sanitization/disinfection tasks that are required throughout the day.</td>
</tr>
<tr>
<td></td>
<td>• Nurses – disinfect after use of equipment and in between patient visits</td>
</tr>
<tr>
<td></td>
<td>• Food service – sanitize as part of the food preparation and clean-up routine</td>
</tr>
<tr>
<td></td>
<td>• Preschool teachers – use antimicrobials after diapering, for mouthed toys, and so forth</td>
</tr>
<tr>
<td></td>
<td>• Athletics department – use antimicrobials on wrestling mats to prevent transmission of MRSA</td>
</tr>
<tr>
<td>Once a day</td>
<td>• Custodians – disinfect toilet seats and handles, shower floors and handles, and so forth</td>
</tr>
<tr>
<td>Special events</td>
<td>Disinfectants are generally used for special events.</td>
</tr>
<tr>
<td></td>
<td>• Nurses – blood spill, vomit</td>
</tr>
<tr>
<td></td>
<td>• Food service – blood spill</td>
</tr>
<tr>
<td></td>
<td>• Preschool/classroom teachers – toileting accident, blood spill, vomit</td>
</tr>
<tr>
<td></td>
<td>• Custodians – blood spill, toileting accidents, vomit</td>
</tr>
<tr>
<td></td>
<td>• Bus driver – blood spill, toileting accidents, vomit</td>
</tr>
<tr>
<td></td>
<td>• Athletics – blood spill, toileting accidents, vomit</td>
</tr>
</tbody>
</table>

Develop a training or orientation program on the following topics, or incorporate the information into an existing training program. It is particularly important to train custodians, who are typically designated as responsible for routine and special-event disinfection. Whenever possible, this information should be added to existing training sessions such as annual BBP training, and/or disseminated at weekly staff meetings.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Annual Bloodborne Pathogen Training</th>
<th>Train the Trainer</th>
<th>Awareness of Policy/Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrators</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Teachers</td>
<td>May be required depending on the activities involved</td>
<td>Train students on personal hygiene practices</td>
<td>Yes</td>
</tr>
<tr>
<td>Custodians</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>
# Chapter 3: Development of Protocols

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Annual Bloodborne Pathogen Training</th>
<th>Train the Trainer</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Facility Manager</td>
<td>Yes</td>
<td>Train custodians</td>
<td>Yes</td>
</tr>
<tr>
<td>Athletics Director/Staff</td>
<td>Yes</td>
<td>Director can train staff</td>
<td>Yes</td>
</tr>
<tr>
<td>Nurses</td>
<td>Yes</td>
<td>Nurse can train staff</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>on BBP, first aid, hand washing, and life-threatening allergies</td>
<td></td>
</tr>
<tr>
<td>Food Service</td>
<td>Yes</td>
<td>Director can train staff</td>
<td>Yes (in addition to health department and food handler requirements)</td>
</tr>
<tr>
<td>Bus Drivers</td>
<td>Yes</td>
<td>Director can train staff</td>
<td></td>
</tr>
<tr>
<td>After-School Programs (follow same guidelines as day programs)</td>
<td>May be required depending on the activities involved</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Preschool</td>
<td></td>
<td>Director can train staff</td>
<td>Yes (in addition to state requirements)</td>
</tr>
</tbody>
</table>
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Additional Sources for Chapter 3


