

Infection Control

Healthy Green Schools & Colleges



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When it comes to infection control, the first priority is education.

Your school should promote hygiene best practices and educate students and staff on how they can help prevent outbreaks by staying home when they are sick. Secondly, a thorough green cleaning program executed by trained cleaning crews will reduce the risk for potential outbreaks. Finally, a proper infection control strategy aimed at high-risk areas will ensure that schools stay healthy and open for classes even during periods of extra concern.

Schools can prevent panic in the community during outbreaks by continuously employing a proactive strategy to control and contain risks. In some cases, such as with blood-borne pathogens, federal, state and local regulations have specific cleaning and disinfecting requirements that must be followed.

Step 1: Prevent Infection Through Hygiene Education

The first step is to educate everyone about how diseases are spread. Ultimately, school officials should empower each individual to understand his or her role in containing outbreaks. Students and staff who are feeling sick should be sent home.

Hand washing

Students, teachers, coaches and school staff must all be educated about the importance of personal hygiene and frequent, thorough hand washing. Recent studies show that through proper hand hygiene, schools can actually decrease student absenteeism. Whenever possible, students and school employees should have access to sinks with soap and warm water.

When soap and warm water hand washing is not an option, HSC recommends following the CDC best practices of using alcohol-based hand sanitizers. When choosing hand sanitizers and soaps, avoid products that contain Triclosan. This ingredient is not more effective than soap and warm water and may contribute to the development of resistant strains of bacteria. Wall-mounted alcohol based sanitizer stations are important for areas where

handwashing is not available and during times of outbreaks.

[Refer to our Hand Hygiene Guide for more information.](#)

Respiratory Hygiene

Students and staff will need to be reminded to cover their hands and mouths with a tissue or a sleeve while sneezing or coughing. The tissue should be disposed of after use. This information may be communicated via flyers that can be posted around school.

School nurses and staff should be trained to comply with standard U.S. Centers for Disease Control operating procedures regarding respiratory hygiene issues and the treatment of wounds.

Step 2: Develop and Follow a Thorough Green Cleaning Program

Infection control is the natural byproduct of an effective green cleaning program. The idea is that infection control naturally ensues because the building is already being maintained to prioritize health and safety.

During times of flu outbreak or other illnesses, schools should increase cleaning frequency and then additionally add sanitizing or disinfecting of high touch point areas such as phones, light fixtures, stair railings, door knobs and push bars, elevator buttons and water fountains.

Disinfectants and Sanitizers

Sometimes these two terms are used interchangeably, but they are technically, and legally, different.

The actual legal definitions of these terms are:

Disinfectant

A product that completely destroys all specific test organisms in 10 minutes under conditions of the AOAC Dilution Test.

Sanitizer

A product that destroys 99.999 percent of specified test bacteria within 30 seconds under conditions of the Official Detergent Sanitizer Test, also known as the Weber and Black Test.

As a general rule, disinfectants are used in settings like hospitals that need 100 percent certainty, and sanitizers are used for effective safety that takes real-world time requirements into account. Always check with your local department of health to find out the regulations you should follow and which type of product you should be using.

Disinfectants and sanitizers are designed to kill microorganisms on high-risk, non-porous surfaces, such as tables, doorknobs, bathrooms and keyboards. In a truly green cleaning program, the use of disinfectants is only the final step in infection control. Using these products should be a well-thought-out component of a larger green cleaning program rather than a hasty reaction. Proper training of all staff on the correct and safe handling of disinfectants and sanitizers is essential. Always refer to the Safety Data Sheets (SDS) supplied by the manufacturer to ensure staff is using chemicals at the right dilution rate and in the right circumstances.

Choose the Right Chemical Disinfectants and Sanitizers

Disinfectants have a higher kill capacity than

sanitizers at a specified use dilution. Different pathogens require varying sanitizing and disinfectant treatments, so cleaning staff should follow local health guidelines to ensure compliance. Products may indicate activity against one or several target micro-organisms (i.e. CA - MRSA), so you may need to closely check the label or materials supplied by the manufacturer since many products are effective against too many pathogens to list on the label alone.

Disinfectants and sanitizers are considered pesticides and fall under the U.S. Environmental Protection Agency's (EPA) regulation under the Federal Insecticide Fungicide and Rodenticide Act (FIFRA). Only EPA-registered disinfectants and sanitizers may be used by schools. Many disinfecting devices are also subject to EPA oversight. Hand sanitizers are regulated by the U.S. Food and Drug Administration.

There are a number of attributes to consider when selecting an environmentally preferable disinfectant or sanitizer.

A general rule of thumb is to choose products with the ingredients hydrogen peroxide, citric acid or lactic acid and avoid products with chlorine bleach or phenolics. Quaternary ammonium compounds may still be the best option under certain circumstances, and they are still less-toxic than bleach and phenolics.

Since all disinfectants and sanitizers are toxic by definition, none are completely harmless. Because of this, the EPA does not allow manufacturers to label disinfectants with third-party certifications such as those from Green Seal or EcoLogo. However, the EPA's Design for the Environment (Dfe) program, in collaboration with EPA's Office of Pesticide Programs, has launched a pilot to label antimicrobial products that are designed for human health and the environment.

Other areas to consider when purchasing disinfectants and sanitizers include toxicity, concentration, pH, 2-butoxyethanol, flashpoint, fragrance, VOCs, enzymes and regulations.

Toxicity

EPA-registered disinfectants are categorized according to their acute toxicity. This relates to how the chemicals affect humans and does not cover toxic effects on the environment. In general, the least toxic disinfectants are preferable:

- Category I (most toxic) - Labeled with the word "Danger."
- Category II - Labeled with the word "Warning"
- Category III- Labeled with the word "Caution"
- Category IV (least toxic) Not required to display signal words, but may have "Caution" on the label

Concentrate vs. RTU

When purchasing disinfectants, keep in mind that concentrates will frequently be labeled as more toxic than their RTU counterparts. But concentrates have the environmental benefit of less packaging and once diluted, generally have the same safety labeling as their RTU form. Workers can reduce concentrate exposure with closed system dilution controls. If closed system dilution controls fail, custodial crews should consult their vendors and not try to mix products themselves.

pH

Some disinfectants have extreme pH levels (closer to 1 or 14), which can increase irritation to eyes and skin. A greener alternative has a more neutral pH (closer to 7).

Fragrance

Try a product with no fragrance. Some disinfectants have extremely strong fragrances that can cause respiratory irritation and trigger asthmatic episodes.

Volatile Organic Compounds (VOCs)

Try a product with no or low VOCs. VOCs can

cause respiratory irritation and trigger asthma. In addition, VOCs contribute to environmental issues such as smog formation.

2-butoxyethanol

This is a solvent in the ethylene glycol ethers family that should be avoided. It absorbs through the skin and can attack major organs and cause reproductive problems. Check a product's MSDS to see if 2-butoxyethanol is listed. This solvent has other names as well, so a good identifier is its CAS number, 111-76-2. Manufacturers may also use other solvents in the ethylene glycol ethers family. For a fairly comprehensive list of ethylene glycol ether solvents, see Section 2 of the EPA Toxics Release Inventory for Glycol Ethers.

Flashpoint

Choose products with a high flashpoint, as they are less likely to combust. Flammability data is viewable on product SDSs.

A Note on Bleach

For years, chlorine bleach was the disinfectant of choice in schools because it is relatively inexpensive, readily available, and effective. Many of us grew up associating the smell of clean with chlorine bleach and think that if it doesn't smell like bleach, it isn't clean.

Yet almost everyone who has used chlorine bleach is familiar with the hazards. Its caustic properties erode surfaces and burn the skin and eyes. Mixing chlorine bleach with other chemicals can create a toxic gas that in the past has caused schools to close and sent students to the hospital.

If regulation does not require the use of bleach, consider alternative disinfectants with active ingredients such as hydrogen peroxide, citric acid or lactic acid.

Use a Bacterial Enzyme Instead of a Disinfectant

These eliminate restroom odors caused by urine on grouted floors and non-touch areas around toilets or

urinals. Paradichlorobenzene (1,4 dichlorobenzene), a chemical compound found in some air fresheners, toilet-bowl cleaners, cakes, mothballs and other deodorizing products, is considered a probable carcinogen by the World Health Organization and the EPA.

Cleaning Regulation

Even if your district does not mandate Occupational Safety and Health Administration (OSHA) compliance, you will need to demonstrate that your own guidelines are on par with OSHA. Following OSHA guidelines will help keep staff safe. Most EPA-registered disinfectants perform the dual requirements of both cleaning and disinfecting. Check the label to determine if pre-cleaning is a requirement of the product you are using. Only use bleach (sodium hypochlorite) if regulations require. Instances include infectious disease or blood contamination clean-ups.

Step 3: Clean, Sanitize, or Disinfect as Appropriate with the Right Equipment and Procedures

There are three main areas of a school that would require regular use of sanitizing and disinfection: health services areas, food service areas and bathrooms. For the rest of the school, except during times of outbreak, infection control should focus on cleaning.

Equipment

Developments in cleaning technology have made the cleaning process easier and more effective. Some developments include:

Dual bucket systems: Dual bucket systems keep dirty water separate from clean water to prevent the spread of germs. Some microfiber systems use only one bucket for the cleaning solution, so you may

need to switch to a clean mop before you head for the next room.

Microfiber mops with cleaning product dispensing systems on the handles: These systems do not require the use of bucket water, reducing contamination.

Vapor technologies: Vapor systems use a high-temperature water vapor and pressure to clean, sanitize and even disinfect a variety of surfaces. These systems can be used without any chemicals at all, saving on transportation, storage and health impacts associated with chemical purchases.

Water-based cleaning technologies: A number of products are emerging in the marketplace that generate cleaning, sanitizing and even disinfecting solutions from a water stream. These options eliminate transport of chemicals while producing disinfecting options that may be safer than traditional options.

Procedures

When we talk about procedures, we mean how your staff is cleaning (or disinfecting) the school. This could include the dwell time used for disinfection, the way cloths are used to wipe surfaces or the time of day bathrooms are cleaned. When it comes to infection control, green cleaning procedures should include:

Appropriate dwell time. Most disinfectants require dwell time to kill microorganisms. Make sure to read label instructions and always follow the proper dwell time recommendations.

Sparing use of disinfectants and sanitizers. A green cleaning program will use disinfectants and sanitizers wisely, and sparingly. This means disinfecting only high-touch areas like light switches, doorknobs, bathrooms and keyboards regularly and using other green cleaners to clean the rest of the surfaces.

Color-coding. Color-coded systems for mops and cleaning cloths will reduce cross contamination between critical areas.

Vacuums over dust mops. Vacuums with micro-filtration bags can do a much better job of capturing and retaining small particles than dust mops.