Cleaning for Healthy Schools And Infection Control

Overview of Cleaning for Healthy Schools

Now that school is back in session, there are many questions on how to maintain our schools in a safe, healthy and effective manner and conduct infection control practices in the face of an infectious disease outbreak. A *Cleaning for Healthy Schools Program (CfHS)* will also help school facilities and staff be prepared for special infectious disease episodes. It is essential to have a *Disinfection Plan* in place as part of that program so that when H1N1 or any infectious disease is present in your school, pressure to totally disinfect the school by hand or to use a disinfectant bomb doesn't take the place of a common sense infection control protocol. **Disinfectants are EPA registered pesticides designed to kill or inactivate microbes (germs)**. **The overuse or misuse of disinfectants can pose a health hazard because they contain toxic ingredients. Some common disinfectant ingredients have been identified as respiratory irritants, others are considered asthmagens[1].**

Not all microbes are harmful (pathogenic), in fact most are harmless (non-pathogenic). Many are even helpful because they perform tasks such as helping our digestive system to function effectively and stimulating the development of a healthy immune system. Beneficial microbes such as bacteria are used in the fermentation process that creates bread, beer, cheese, and yogurt.

The CfHS Program was developed to assist school facilities to enhance their cleaning systems through the use of less-toxic cleaning products, state of the art supplies and equipment, and improved cleaning practices. It seeks to educate staff on the relationship between dirt, biological contaminants, cleaning products, cleaning equipment and practices and their impacts on human health. It offers cost effective successful cleaning and disinfecting strategies to protect against infectious disease, without adversely affecting the health of staff, building occupants and the environment.

Types of Infectious Diseases Commonly Found In Schools

- Common cold – spread by cough, sneeze and contact with objects where microbes have landed
- Diarrhea illnesses – spread by fecal-oral contact, consuming food or drinks contaminated with feces, touching diarrhea or vomit, or breathing air in the same room where someone has just vomited.
- Mononucleosis – spread by mouth to mouth contact - sharing drinks, drinking cups, and other shared objects.
- Strep throat – spread by cough, sneeze and contact with objects where microbes have landed.
- Flu strains – spread by cough, sneeze and contact with objects where microbes have landed.

[1] Association of Occupational and Environmental Clinics. Exposure Code List. http://www.aoecdata.org/ExpCodeLookup.aspx

Program Recommendations

1. Form an Environmental Health and Safety Committee or use an existing committee (Wellness, Safety etc.) made up of representatives from the school community, such as the school nurse, facilities manager, athletic director, teacher and an administrator.
2. Implement a Cleaning for Healthy Schools program and select cleaning products certified by an independent third-party such as Green Seal or EcoLogo.
3. Select the least hazardous product in their class for disinfecting. Although disinfectants are not currently evaluated by a certification program, some companies use the Hazardous Materials Identification System (HMIS) to rate their product on a spectrum from 0-4, with 0 the least toxic. You can use this rating system when available on the product label or material safety data sheet (MSDS) to identify a low hazard rating of 0-1.

   You can also look for signal words:

Danger Level	Signal Word	Meaning
most dangerous ↓ safest	Poison	*highly toxic*
	Danger	*extremely flammable, corrosive, or highly toxic*
	Warning	*moderate hazard*
	Caution	*mild/moderate hazard*

4. Practice state-of-the-art cleaning strategies and methods ("best practices").
   a. Green Seal GS-42 Standard for Cleaning Services provides a comprehensive program that can be customized by schools for their in-house staff.
5. Use advanced technology equipment to reduce the need for chemicals and improve indoor air quality.
   a. Microfiber mops/cloths
   b. High-filtration vacuums and vacuum attachments on floor care equipment
   c. Floor care equipment with stripping pads to reduce the use of chemical floor strippers
   d. Auto scrubbers, and hands-free cleaning equipment
   e. Chemical-free systems such as steam vapor devices or electrolyzed water.
   f. Walk-off mats to prevent dirt, pesticides and other debris from being tracked into and throughout the facility
6. Develop a disinfection policy and related protocols so that all school stakeholders understand the issues and the approved practices.
   a. School staff should not be allowed to bring in their own disinfectant products.
   b. Disinfection should be conducted by the custodial staff as part of their cleaning protocol, except in certain circumstances that should be delineated in the policy.
   c. Although we do not recommend staff possessing and using disinfectants, if staff other than the custodians, are allowed to disinfect, the school should; supply an approved disinfectant product in a properly labeled container, train staff in proper use and management, provide recommended personal protective equipment, and ensure that

disinfectants are stored securely with compatible products. We find the improper storage of disinfectants is a major problem in classrooms where toxic combinations of products are stored together and accessible to students.

Overview of Best Cleaning Practices

Cleaning with a detergent and a microfiber mop or cloth and friction removes organic matter (soil) and contaminants, including microbes (germs). Soil is a food source for bacteria and pathogenic microbes that can cause disease. Without a food and/or water source, these organisms cannot live. Frequent cleaning of high-risk or high-touch surfaces (see definition below) reduces the risk that occupants will come into contact with infectious microbes

Recognized experts in infection control now recommend that cleaning surfaces with microfiber cloths and mops and a detergent (such as an all-purpose cleaner) can be very effective at removing 99.9 % of microbes. One study found that "the microfiber system demonstrated superior microbial removal compared with cotton string mops when used with a detergent cleaner. The use of a disinfectant did not improve the microbial elimination demonstrated by the microfiber system."[1]

Overview of Best Disinfection Practices

Disinfectants are still needed on certain surfaces and under certain circumstances, but their use should be based on a policy that specifies when and where disinfecting is appropriate.

Many facilities choose to use a combination disinfectant/cleaner to minimize the number of products and number of steps required to clean and disinfect the building. Even though combination products have been developed to both clean and disinfect, the best practice is to **clean a surface first and then apply the disinfectant**. Some disinfectants lose effectiveness in the presence of dirt, dust and other organic matter. The disinfectant should be left on the surface for the recommended amount of dwell or kill time and then rinsed or wiped (if recommended). Since different products have specific dwell times, ranging from 30 seconds to 10 minutes; you must check the label's instructions.

Cleaning first and then applying the disinfectant for the recommended dwell time ensures that you are truly disinfecting the surface and not creating microbial resistance. When the disinfectant is not allowed the full dwell time, the microbes that survive may develop resistance to the disinfectant and become "super bugs" that cannot be controlled by that disinfectant. **Always follow the manufacturer's instructions found on the product label.**

Disinfecting Policy and Protocols

When illness breaks out in your school, you may be under pressure to try to eradicate the problem with disinfectants. Using them where they are not needed, at the wrong concentration, or incorrectly can result in unnecessarily exposing occupants to toxic pesticides.

Policy Criteria

- Identify school personnel (e.g. custodian, nurse) responsible for disinfecting.
- Develop cleaning and disinfecting guidelines that promote cleaning, and limit the use of disinfectants to: bloodborne pathogens cleanup, high-risk areas, and diapering areas and food preparation surfaces where disinfection or sanitization is required.
- Write a procedure for designated staff to follow, e.g. clean first, then disinfect, leave the product on the surface for the specified dwell time, etc.
- Disseminate the cleaning and disinfection policy and related protocols so that all the school stakeholders understand the issues and the approved practices.
- Allow only EPA-registered disinfectants that have been approved by the stakeholder committee for use in the facility. Prohibit the use of cleaning and disinfecting products that have been brought in by staff or parents without school review and approval.
- Avoid using products with a strong scent that may trigger asthma and allergy complaints. Scented products may also contain known hormone disruptors (substances that interfere with our endocrine system and can cause reproductive issues, early female development, thyroid disorders, polycystic ovarian syndrome, genital deformities in newborn boys, etc.)
- Microfiber is recommended for use with disinfectants and can help prevent cross-contamination. Avoid using sponges in a school setting, as they are difficult to disinfect. Launder your cleaning cloths and mop heads/pads daily.
- Disinfect only after school hours except in the case of an incident, such as vomit, feces, bloodborne pathogens clean-up, or as written in the protocol.

Disinfection Protocol

1. **Select** – Identify the least toxic product that will control the targeted microbes (H1N1, MRSA etc.). Look for an HMIS or NFPA Health Rating of 0-1 applied to the product as used. The rating may be found on the product's label and/or material safety data sheet (MSDS).
2. **Clean** – Clean the surfaces to be disinfected with a third-party certified all-purpose cleaner and a microfiber cloth first. Rinse or wipe the surface as required.
3. **Ventilate** - Make sure there is ventilation in the work area, e.g., an open window or an operating HVAC system.
4. **Protect Yourself** - Use personal protective equipment, such as chemically resistant gloves, if required by the label.
5. **Dilute the Product** - Follow the label instructions for the proper dilution ratio, if the product is a concentrate. Follow the manufacturer's instructions exactly. If using a concentrated product, do not add more concentrate hoping to create a more effective or stronger solution. This is wasteful, can actually be less effective and may leave a harmful residue behind that could cause skin rashes and other harmful health effects for students and staff.
6. **Apply to the Surface** - Use a pump-spray or squirt bottle to apply the product by:
    a. Saturating the microfiber cloth with the disinfectant and wiping the surface leaving a wet film. Make sure there is enough disinfectant on the cloth to cover the surface to be disinfected and ensure that it will remain wet for the required dwell time. Spraying into the cloth first minimizes the dispersion of product into the air where it can be inhaled.
    b. Directly squirting the solution on the surface and using a microfiber cloth to distribute evenly.
7. **Dwell Time** – Leave the disinfectant on the surface for the amount of dwell time (time needed for the disinfectant to kill the microbes) required on the product label.
8. **Remove Residue** - Rinse or wipe the surface, if the product label states this procedure is required. Rinsing removes any toxic residue that may be left on the surface that could be transferred to skin. Not all disinfectants leave a residue.
9. **Allow to Dry** – Allow the surface to dry before use.

Cleaning and Disinfection Protocols for Outbreaks of Infectious Disease

A 3-Pronged Strategy is the best way to prevent the transmission of disease in the school setting while minimizing exposure to hazardous infection control products:

1. A comprehensive Cleaning for Healthy Schools program.
2. A disinfection strategy and protocols.
3. Building Occupant Personal Hygiene – educate students and staff on the following:
    - Proper Hand Hygiene (see Hand Hygiene Fact Sheet)
    - Cough Etiquette and Respiratory Hygiene (see Posters)
    - Distancing Procedures – keep a 3' to 6' distance from others who are sneezing or coughing
    - Non-Sharing Practices – towels, food, drinks or drinking cups should not be shared

Expert Perspective for the H1N1 Virus:

- Since H1N1 is a new type of virus, we are learning about it as it develops. Check the Centers for Disease Control and Prevention website for the latest information at: http://www.cdc.gov/h1n1flu/qa.htm.
- Schools should continue to clean and disinfect the school buildings according to the regular schedule. "**Clean surfaces and items that are more likely to have frequent hand contact with cleaning agents that are usually used in these areas. Additional disinfection beyond routine cleaning is not recommended."**[2]
- Once deposited on the surfaces and objects, the H1N1 influenza virus can survive and infect a person for up to 2-8 hours[3] (other viruses can have a longer survival time). Thus, by the time students and staff come to the school in the morning, contaminated surfaces from the day before would no longer be infectious.
- As a result, it is not necessary to totally disinfect an entire school building during an H1N1 flu outbreak. If there is any additional cleaning or disinfection necessary during an outbreak, it would be in select high-risk, high-touch areas (as defined below).
- If there is an outbreak of the H1N1 virus in your school, consult with your local and state health departments for guidance.

Recommendations for Surfaces to be Cleaned and Disinfected:

- Use disinfectants (preferably when no students or staff members are present) as required by law and in high-risk areas.
- Clean high-touch surfaces or touch-points more often during the day with a third-party certified all-purpose cleaner and a microfiber cloth:

1. ***Common "High-Touch" Surfaces in Schools***

These are surfaces that are frequently touched by a ***variety*** of hands. For example, a surface such as a desk top that is only touched daily by one student might be touched often, but is not considered an area to be managed for infection control, since no one else would be exposed to those microbes. Examples of areas that might be touched frequently by many different hands include, but are not limited to:

- a shared computer mouse and keyboard
- shared musical keyboards and instruments
- shared desks
- doorknobs, elevator buttons, light switches, door push bars, handrails
- faucet handles, toilet handles, toilet stall door locks, towel dispensers, hand driers
- school bus doors and railings
- coffee pots, microwave doors, refrigerator doors, cafeteria trays and tables

2***. Common "High-Risk" Areas in Schools***

Some areas of the school building are of greater concern for possible transmission of disease because there is an increased likelihood of skin-to-skin, object-to-mouth or fecal-to-oral contact. Also, areas where food is prepared, sick or pre-school children are cared for or places where special incidents (such as blood spills, feces and vomit) occur. These areas would include, but are not limited to:

- athletic departments - gym mats, exercise equipment, shower and locker rooms
- bathrooms, kitchens and lunch rooms
- nurse's offices
- child care and preschool centers
- school buses

Protocols

Cleaning Desktops

1. Wash desks with a third-party certified all-purpose cleaner and a microfiber cloth.
2. Rinse and/or wipe desks if required.
3. Rinse cloth in clean water after each desk.
4. Reapply the cleaning solution for the next desk or surface.
5. After the cleaning process is complete, rinse out microfiber cloths and hang to dry, or leave for pick-up by the custodial staff.

Disinfecting Touch-Points by Custodians

1. Clean with a detergent and rinse or wipe surfaces first. (Some disinfectants lose effectiveness in the presence of soap residue.)
2. Uniformly apply disinfectant to the microfiber cloth (with a pump spray bottle or squirt bottle), and wipe surface with saturated cloth, or apply disinfectant directly to the surface (squirt bottle).
3. Ensure the surface stays wet for the length of the dwell time recommended on the label.
4. Rinse or wipe surfaces after dwell time has elapsed, (if required).
5. Rinse the microfiber cloths in clean water between uses on each touch-point, or if using the folding method, use a clean fold of the cloth for each touch-point.
6. Launder the microfiber cloths as recommended by the manufacturer.

Disinfecting in the Classroom by Teachers

If the Disinfection Policy includes the use of disinfectant products by teachers or other staff, the following guidelines apply:

1. Do not ask students to use disinfectant products. Children's developing bodies are much more susceptible to the effects of chemicals than the bodies of most adults. Disinfectant sprays and wipes can contain ingredients that are recognized as asthmagens and scented products can contain ingredients identified as hormone disruptors. Use disinfectant products only after students have left the building.
2. Train teachers on the proper use and storage of disinfectants and on the Hazard Communication Law which will help them interpret the product management and health and safety information provided in the product's material safety data sheet (MSDS). Provide copies of the MSDS in case of an accident in the classroom.
3. Use only non-scented disinfectant products because scented products can trigger asthma and allergy episodes.
4. Provide chemically resistant gloves as specified on the product's MSDS or label.

5. Ensure that the products are stored properly in a secured area away from students, with other compatible chemicals. Check the product's MSDS to determine how to safely store the disinfectant.

This document was prepared by Informed Green Solutions Inc. in collaboration with Lynn Rose and with review by and consultation with the National School Disinfection Workgroup.

References:

National Disinfectants Workgroup. *Disinfection Handbook for Schools*– to be released.

International Federation of Infection Control, 2007. *Basics Concepts of Infection Control.* http://www.theific.org/basiconcepts/default.htm

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[1] "Microbiologic evaluation of microfiber mops for surface disinfection.", November 2007 American Journal of Infection Control, http://www.ajicjournal.org/article/S0196-6553(07)00524-X/abstract.

[2] Centers for Disease Control and Prevention. Preparing for the Flu: A Communication Toolkit for Schools (Grades K-12). http://www.flu.gov/plan/school/index.html.

[3] Centers for Disease Control and Prevention. *Novel H1N1 (Swine Flu) and You*. http://www.cdc.gov/h1n1flu/qa.htm.