

Healthful Cleaning

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It's inevitable: Every school year, parents, teachers and administrators must deal with overwhelming numbers of sick children. In fact, according to the Centers for Disease Control and Prevention (CDC), the average child catches at least eight colds in a year, and kids in the United States miss as many as 189 million school days each year because of colds.

Typically, precautionary measures have focused on flu shots and other preventive care. Although these actions are important, administrators also should concentrate on the way their schools are being cleaned. Many staff responsible for cleaning schools and removing germs are not trained properly and are using outdated cleaning methods that don't eradicate bacteria. By improving the way schools are cleaned, administrators can fight germs on the ground level and effectively keep kids and teachers in the classroom.



Good hygiene practices that emphasize handwashing or hand sanitizers, along with proper maintenance, can help reduce the number of infections in schools each year.

Hygiene is not a dirty word

The significance of good hygiene and cleaning often go unrecognized in controlling the spread of common diseases. In a recent survey of the medical profession, the British medical journal, *The Lancet*, reported that hygiene and sanitation have had the biggest influence on the spread of human diseases in the history of humankind, even more than antibiotics and vaccines. Even today, few people are aware that four out of five common infections (colds, flu, diarrhea, and skin infections) can be spread through the environment — air, water, food and contact with surfaces.

For most of these common illnesses, effective vaccines have not been developed, and we are subjected to these infections throughout our lifetime. Adults will experience two to three respiratory infections per year, and children double that. This results in almost 1 billion respiratory infections per year in the United States, and the cost to society is billions of dollars.

However, good hygiene practices that emphasize handwashing or hand sanitizers, along with proper cleaning of work and school environments, can reduce significantly the number of infections each year. They also can prevent school closures and other cancellations, such as sporting events or workshops.

The challenge

Germs continue to challenge our ability to control them. They can change rapidly and develop resistance to the antibiotics used to treat infections. These new variations are more likely to cause illness and result in more serious infections. Two examples challenging education institutions are the norovirus and MRSA (pronounced mersa), often referred to as a "superbug."

Norovirus is the most common cause of viral diarrhea in young children and adults. New variations became evident a few years ago, resulting in more people becoming susceptible and causing more serious illnesses than in previous years. The illness usually lasts only one to two days, and is spread easily by feces and

vomit. Some 70 to 80 percent of the people infected by the virus experience vomiting, so its spread can be difficult to control in institutions and public places.

It quickly became the curse of the cruise-ship industry. It spread rapidly among passengers, and some ships had to return to port and cancel cruises. It also has caused the closing of schools, childcare facilities, universities, residence halls, summer camps, and even emergency rooms in hospitals.

The virus can be transmitted only by swallowing it. It can spread easily by getting the virus onto your hands and placing them in your mouth. This happens by touching virus-laden surfaces, such as a tabletop, and then touching your mouth. Consider: Adults put their fingers in their mouth about six times an hour, and small children bring fingers to their face 40 to 60 times an hour. It has been found that when people vomit, the norovirus can spread many feet through the air and contaminate surfaces that people may touch later. Immunity is very short-lived for the norovirus, so children and teachers can become infected with the same virus every school year. The virus can lurk on surfaces for weeks or even months. Thus, it is not surprising that outbreaks have been traced to the use of public restrooms and other shared facilities.

MRSA is a bacterium capable of causing serious skin and other infections. MRSA, or methicillin-resistant *Staphylococcus aureus*, is a bacterium noted for its resistance to certain types of antibiotics. It initially was a problem only among persons being treated for other illnesses in hospitals, but a new type has spread among the general community and is referred to as community-acquired MRSA. This appeared in the late 1990s, and now has spread across the country to become the most common cause of skin infections among individuals seeking medical attention. This organism is a common cause of skin infections among athletes and children in the inner city. MRSA can invade other tissues of the body and cause life-threatening infections.

It is estimated that more than 17,000 people may die from MRSA infections each year in the United States, which is more than the number of fatalities attributed to AIDS. Most of these MRSA deaths result from infections acquired in hospitals or other healthcare institutions, serious infections also occurred in the general population. One recent study showed that 85 percent of MRSA infections are acquired in the community. Most are skin infections that are treated easily; however, it is a virulent organism and can spread easily to other organs.

One of the problems with combating the spread of MRSA is that a person who is not ill can carry it in his or her nose. It is estimated that 2 to 3 percent of adults and children carry MRSA. During a normal day, they can spread it with their hands to other individuals by skin-to-skin contact or through interaction with the things they touch during the day. It is a fairly hardy organism and can survive in the environment for long periods of time. For example, it has been found to survive on tabletops for 12 days and plastic surfaces for 11 days.

MRSA is an increasing problem among high school athletes. A recent survey of 186 high school athletic departments in Texas found that 60 had reported MRSA infections among their athletic departments.

Disease control

Proper hygiene and cleaning are effective mechanisms in controlling the spread of infections caused by norovirus and MRSA. The CDC lists five factors that make it easier for MRSA to spread in schools, which they refer to as the five Cs:

- Crowding.
- Frequent skin-to-skin contact.
- Compromised skin (cut and abrasions).
- Contaminated items and surfaces.
- Improper cleaning.

The agency emphasizes that to protect people from being exposed to MRSA, it is important to maintain a clean environment. Establish cleaning procedures for frequently touched surfaces that come into direct contact with people's skin. Sanitize surfaces with detergent-based cleaners and disinfectants to remove MRSA from the environment. Encourage frequent handwashing and the use of alcohol hand sanitizers.

Germy classrooms

So how germy are classrooms? A group at the University of Arizona has done a number of studies to answer that question. Although only a few types of bacteria cause illness, knowing where bacteria are in a classroom reveals where the greatest risk of exposure to potential disease causing microbes can occur. This is a reflection of how often areas are touched and cleaned. School teachers have more bacteria on their desks and work areas than any other professions that were studied (doctors, lawyers, accounts, news reporters, bankers) — more than 20 times anyone else. This probably is because of their repeated contact with children, who experience more infections than adults, and the amount of material that crosses their desks every day. In the study, bacteria were found in the greatest numbers on the following surfaces:

- Water-fountain toggle.
- Pencil sharpener.
- Computer keyboard.
- Faucet sink handle.
- Student desktop.
- Classroom entrance doorknob.

In these same classrooms, the influenza virus and the norovirus are found on student desktops most often, followed by sink faucet handles and entrance doorknobs. Influenza virus was detected on up to 50 percent and norovirus up to 22 percent of the surfaces throughout the day during the winter, when these viruses are common.

Can good hygiene and cleaning practices reduce illness in school children? There's no easy answer. Children may acquire infections at home or from playing with other children, or other activities outside school. This makes it difficult to prove the impact of proper cleaning and disinfection. However, in several studies, handwashing and the use of hand sanitizers have been shown to reduce illness and absenteeism rates among both children and adults by 30 to 50 percent.

To show the impact of proper cleaning and disinfecting, a study called for cleaning and disinfecting the classroom desks of first-, fourth- and fifth-graders after the end of each school day. Absenteeism was reduced by 50 percent compared with classrooms where this was not done. In another study, the impact of providing an alcohol-based sanitizer and disinfecting key surfaces in the classroom resulted in a reduction by more than 50 percent in the occurrence of noroviruses on surfaces. Thus, it was not surprising that student absenteeism because of diarrhea also was reduced (Sandora, T.J., M.C. Shih, and D.A. Goldmann. 2006. "Reducing absenteeism from gastrointestinal and respiratory illness in elementary school students: A randomized, controlled trial of an infection-control intervention." *Pediatrics*. 121:1555-1562).

However, it is important to emphasize the words "proper cleaning." Improper use of cleaning tools (mops, cloths) can result in additional contaminations of surfaces. After an outbreak of norovirus at a university, crews that were cleaning improperly increased the number of surfaces in residence hall rooms contaminated with norovirus. Thus, proper use of cleaning tools and use of disinfectants is essential in reducing the spread of disease-causing microbes.

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