

Getting Children to Wash Their Hands



A 2010 shigellosis outbreak originating in an Illinois fast food restaurant infected 21 people and hospitalized 7. Health investigators suggested the source was an ill food handler who worked while sick and did not practice proper handwashing after visiting the restroom.

Public Health Reasons

Fecal-oral transmission is the primary pathway for the spread of enteric pathogens with contaminated hands playing a significant role in this transmission route. Infants (under 12 months old) and toddlers (1-4 years old) have the highest age-specific attack rates of enteric pathogens because they frequently place contaminated objects and hands in their mouths. This can be illustrated by the results of a study conducted by Jiang et al. These researchers showed that after the introduction of a DNA marked toy ball, the marker spread within 1 to 2 hours and reached its peak by hour 6. The high frequency of detection of markers on the hands of children and teachers indicated that hands played a major role in transmission. Highly contaminated surfaces included toy balls, windows, walkers, cabinets, and doors. Researchers observed that children frequently touched these surfaces.

Hand washing is an essential component in disease prevention programs and can reduce the incidence of gastrointestinal illness rates, as well as sickness and absenteeism, by as much as 30% to 40%. In fact, hand washing is cited as a “Method of Control” for nearly 30% of the 142 communicable diseases in the American Public Health Association (APHA) *Control of Communicable Diseases Manual*. Washing one’s hands is the best way to prevent the spread of pathogens, but it is often difficult to get children to comply. In Vietnam and Peru, researchers and governmental agencies initiated handwashing programs targeting children through educational entertainment, such as short TV programs. The research showed that children would wash their hands if an influential person in their lives, such as a teacher or their mother, encouraged them. It also showed that in some cultures, children are often messengers driving change in their communities by reporting on what they learned in school.

Furthermore, younger children may need assistance washing their hands. Some may not have the motor skills to wash their own hands, while others may not be able to reach the sink in order to properly wash their hands. A stool can be used to help children reach the sink, but care needs to be taken to ensure the safety of the child. Most children under 18 months of age are not coordinated enough to safely stand on a stool without assistance. However, not all children develop coordination and motor skills at the same pace, so each child must be evaluated individually.

Practices

Set a good example

Staff should wash their hands thoroughly and at all the appropriate times (See “Practicing Good Hand Hygiene for Care Providers” fact sheet).

Conduct a needs assessment

- Determine how hand washing can be improved throughout the child-care facility.
- Identify the challenges that hinder good handwashing habits.
- Find out:
 - why children are not washing their hands
 - if handwashing sinks, soap, and paper towels are available
 - if children can reach the sinks, the soap, and the paper towels
 - if there is adequate time available for children to wash their hands
 - if children use the proper skills to wash their hands
 - if the reasons for proper handwashing have been communicated
- Use the answers to these questions to develop programs and policies that promote handwashing.

Communicate handwashing messages in the child-care facility

- Decide on your handwashing message.
- Develop your handwashing promotion plan.
- Get participation by involving others in activities, such as:
 - asking children to help hang handwashing posters; and
 - helping children develop a handwashing collage to display at the facility.

Form strategies to promote handwashing

- Display handwashing posters (perhaps student-created posters) in strategic locations, such as restrooms and eating areas.
- Arrange for a voice-recorded message in restrooms, such as “Did You Wash Your Hands?”
- Create a bulletin board or posters on hand washing.
- Create a handwashing puppet show.
- Do a hands-on demonstration to learn proper handwashing procedures.

- Create handwashing cheers and spirited dance routines.
- Make and wear handwashing armbands.

Assess the success of the educational effort

- Observe handwashing practices before, during, and after the effort.
- Determine if the usage of soap and paper towels has changed.
- Review changes in student absences.

Assist younger children with hand washing

- Caregivers and teachers must provide assistance for children:
 - who can stand but not wash their hands by themselves; and
 - who may not be able to stand on their own but can safely be supported at the sink with one arm and without pressing the child against the sink.
- For a child who is unable to stand or be safely held at the sink to wash hands under running water, the following method must be used:
 - Wipe the child's hands with a damp paper towel moistened with a drop of liquid soap, and discard the towel.
 - Wipe the child's hands with a clean, wet paper towel until hands are free of soap, and discard the towel.
 - Dry the child's hands with a clean paper towel.
- Child-care providers must wash their own hands after assisting children with hand washing (See "Practicing Good Hand Hygiene for Care Providers" fact sheet).

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Practicing Good Hand-Hygiene for Care Providers



A 2010 shigellosis outbreak originating in an Illinois fast food restaurant infected 21 people and hospitalized 7. Health investigators suggested the source was an ill food handler who worked while sick and did not practice proper handwashing after visiting the restroom.

Public Health Reasons

Child-care providers must pay special attention to preventing the spread of microorganisms in the child-care facility. Infectious organisms can be spread:

- in human waste (urine, stool); and
- in bodily fluids (saliva, nasal discharge, secretions from open injuries, eye discharge, blood, and vomit); and
- through cuts or skin sores; and
- by direct skin-to-skin contact; and
- by touching an object that is contaminated with infectious organisms; and
- in droplets of bodily fluids, such as those produced by sneezing, coughing, or vomiting, that travel through the air.

In many cases, there are enough harmful microorganisms in an infected child's oral or nasal secretions, even before the child has visible symptoms, to potentially cause illness in a provider coming in contact with the child. Children in child-care centers commonly excrete intestinal pathogens even in the absence of symptoms. For example, noroviruses can be shed in the feces of children for at least 25 days after symptoms have stopped. Similarly, rotavirus can be shed for 25-57 days after the onset of diarrhea in children. Sick individuals can produce about 30ml of vomit per vomiting episode with a minimum of 10^6 norovirus particles present in a milliliter of vomit. Adult workers who do not practice proper hand-hygiene may spread illnesses to children or other workers. Montville et al. stated, "Proper hand washing has been recognized as one of the most effective measures to control the spread of pathogens, especially when considered along with the restriction of ill workers."

Nadel et al. conducted an observational study in 134 child-care centers in Pennsylvania. They found that of 114 food preparation or food consumption observations, 88 (77%) of the adults washed their hands. Of 181 diapering or toileting observations, 78 (83%) of the adults washed their hands. The researchers concluded that many child-care centers lack adequate health and safety practices.

Practices

By exposing their hands to contaminated items or bodily fluids, child-care providers can increase the risk for transmitting pathogens to the child-care environment. Therefore, routine hand hygiene is the safest practice.

Child-care providers must wash their hands:

- when they arrive for the day;
- after breaks;
- when moving from one child-care group to another;
- before and after:
 - preparing food or beverages
 - eating or handling food
 - feeding a child
 - giving medication
 - applying a medical ointment or cream in which a break in the skin may be encountered (e.g., sores, cuts, or scrapes)
 - diapering
- after:
 - using the toilet or helping a child use a toilet
 - handling bodily fluids (mucus, blood, or vomit), from sneezing, wiping and blowing noses, mouths, or sores
 - handling animals or cleaning up animal waste
 - cleaning or handling the garbage
 - using chemicals

Child-care providers must wash their hands using the following procedure:

- Remove any jewelry and roll up sleeves.
- Turn on water to a warm, comfortable temperature between 60°F and 120°F (16°C and 49°C).
- Moisten hands with water and apply soap to hands.
- While hands are out of the water stream, rub hands together vigorously until a soapy lather appears and continue for 10 to 15 seconds.
 - Pay particular attention to removing soil from underneath the fingernails during the cleaning procedure.
 - Create friction on the surfaces of the hands, arms, surrogate prosthetic devices for hands and arms, fingertips, and areas between the fingers.

- Rinse hands under running water, between 60°F and 120°F (16°C and 49°C), until they are free of soap and dirt. Leave the water running while drying hands.
- Immediately following handwashing, thoroughly dry hands with one of the following:
 - single-use paper towels
 - a continuous towel system that supplies the user with a clean towel
 - a heated-air hand drying device
 - a hand drying device that employs an air-knife system that delivers high velocity, pressurized air at ambient temperatures
- If taps do not shut off automatically, turn them off with a single-use towel.
- Throw the single-use towel into a lined trash container. Use hand lotion to prevent chapping of hands, if desired.
- Staff members who need to open a door to leave a bathroom or diaper-changing area must open the door with a disposable towel to avoid possible recontamination of clean hands.

When running water and soap are not available, use hand sanitizer as an alternative

- The use of alcohol-based hand sanitizers is an alternative to traditional handwashing with soap and water for adults whose hands are *not* visibly soiled.
- For guidelines on the proper use of hand sanitizer, see “Using Hand Sanitizers” fact sheet.

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Practicing Good Hand-Hygiene for Food Workers



A 2010 shigellosis outbreak originating in an Illinois fast food restaurant infected 21 people and hospitalized 7. Health investigators suggested the source was an ill food handler who worked while sick and did not practice proper handwashing after visiting the restroom

Public Health Reasons

The U.S. Centers for Disease Control and Prevention estimates that human noroviruses (HuNoV) are responsible for 58% of foodborne illness cases of known etiology. The U.S. Food and Drug Administration has classified human noroviruses, hepatitis A virus, *Salmonella* Typhi, enterohemorrhagic and shiga toxin-producing *Escherichia coli*, and *Shigella* spp. as “the big five” microorganisms of greatest concern in foodservice establishments. These microorganisms, as well as most other common enteric pathogens, frequently make their way into food through the poor hygiene practices of infected or colonized food workers.

Observational studies of foodservice worker behavior have shown relatively poor compliance with recommended hand-hygiene practices. For example, Green et al. observed the handwashing practices of 321 food workers in conjunction with their work activities, such as food preparation and handling dirty equipment. They found that workers made handwashing attempts (i.e., removed gloves, if worn, and placed hands in running water) in only 32% of these activities and washed their hands appropriately only 27% of the time. The rates for both attempted and appropriate hand washing were highest when related to food preparation and lowest when related to touching the body, as compared to other work activities.

Practices

All employees who handle food must use the following procedure in the order stated to clean their hands and exposed portions of their arms including surrogate prosthetic devices for hands and arms.

- Turn on water to a warm, comfortable temperature, between 60°F and 120°F (16°C and 49°C).
- Moisten hands with water and apply soap to hands.
- While hands are out of the water stream, rub hands together vigorously until a soapy lather appears and continue for 10 to 15 seconds.

- Pay particular attention to removing soil from underneath the fingernails.
- Create friction on the surfaces of the hands, arms, surrogate prosthetic devices for hands and arms, fingertips, and areas between the fingers.
- Rinse hands under running water, between 60°F and 120°F (16°C and 49°C), until they are free of soap and dirt. Leave the water running while drying hands.
- Immediately following handwashing, thoroughly dry hands with one of the following:
 - individual, disposable, paper towels;
 - a continuous towel system that supplies the user with a clean towel;
 - a heated-air hand drying device; and
 - a hand drying device that employs an air-knife system that delivers high velocity, pressurized air at ambient temperatures.
- If taps do not shut off automatically, turn them off with a single-use towel.
- Throw the single-use towel into a lined trash container. Use hand lotion to prevent chapping of hands, if desired.
- Kitchen workers who need to open a door to leave a bathroom or enter the kitchen must open the door with a single-use towel to avoid possible recontamination of clean hands.

Kitchen workers must clean their hands:

- immediately before engaging in food preparation including working with exposed food, clean equipment and utensils, and unwrapped single-service and single-use articles;
- after touching bare human body parts other than clean hands and clean, exposed portions of arms;
- after using the restroom;
- after caring for or handling service animals or aquatic animals;
- after coughing, sneezing, using a handkerchief or disposable tissue, using tobacco, eating, or drinking;
- after handling soiled equipment or utensils;
- during food preparation, as often as necessary to remove soil and contamination and to prevent cross contamination when changing tasks;
- when switching between working with raw food and working with ready-to-eat food;
- before donning gloves for working with food;
- after handling cleaning chemicals; and
- after engaging in any other activities that contaminate the hands.

It is also important to emphasize that in a child-care setting, food workers should not perform any task that involves coming in contact with feces or other bodily fluids, such as diapering, cleaning soiled clothing, or cleaning up vomit. In addition, diapering or cleaning of anything soiled should not be performed on surfaces where food is stored, prepared, or served.

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Using Hand Sanitizers



A 2010 shigellosis outbreak originating in an Illinois fast food restaurant infected 21 people and hospitalized 7. Health investigators suggested the source was an ill food handler who worked while sick and did not practice proper handwashing after visiting the restroom.

In another Illinois outbreak, a fast-food worker who prepared food while ill was likely the cause of 20 infections of hepatitis A. The worker reported the disease to her manager, but was still allowed to work.

Public Health Reasons

Using hand sanitizers, here after called alcohol-based hand rubs (ABHRs), in place of handwashing is recommended by some and questioned by others. In 2010, Jabbar et al. conducted research comparing the effectiveness of ABHRs to handwashing with water and soap for removal of *Clostridium difficile* spores from hands. They concluded that handwashing with soap and water was more effective at removing *C. difficile* spores from the hands of participants than were ABHRs. The results were not surprising as current formulations of ABHRs are not effective against bacterial spores (i.e. *C. difficile*), protozoan oocysts, and certain non-enveloped (nonlipophilic) viruses (i.e. noroviruses). However, ABHRs can be effective against a number of bacteria, fungi, and viruses, but the activity is affected by concentration and type of alcohol included and by preservatives and other ingredients. Alcohol concentrations usually range from 60-70%, and higher concentrations of alcohol are generally associated with greater *in vitro* antimicrobial activity. Isopropanol has slightly greater activity than ethanol against bacteria, but N-propanol, which is present in some products sold outside the United States, appears to have the greatest *in vitro* activity against bacteria. For antiviral activity ethanol has greater activity against viruses than isopropanol. Many ABHRs are likely to be effective against enveloped viruses such as herpes simplex virus, human immunodeficiency virus, hepatitis B virus, and respiratory syncytial virus, while non-enveloped viruses such as norovirus, rhinoviruses, adenovirus and rotavirus tend to be somewhat more resistant to alcohols. At present, there are no ABHRs available in the U.S. market that can make claims against noroviruses on their labels.

The U.S. Food Code also prohibits the use of ABHRs as an alternative to hand washing in foodservice settings because it is believed that ABHRs will not adequately reduce important foodborne pathogens on food workers' hands. Therefore, food workers in child-care settings *cannot* use ABHRs in place of hand washing.

On the other hand, in child-care classrooms, there are times when ABHRs can be used. Sometimes adults and children need to clean their hands quickly, but they may not have the time to stop what they are doing to engage in a full hand wash. The use of ABHRs might be an acceptable alternative to full hand washing under certain circumstances, such as when the hands have come in contact with a contaminated surface, but there is no visible soil on the hands. In a randomized clinical trial of over 6,000 elementary school students, groups using hand sanitizers were paired with control groups receiving no intervention. The data showed a 19.8% reduction in infection-related absenteeism among the intervention group. It is important to note, that while ABHRs can be used under certain circumstances, they must not be used in place of hand washing when there is visible dirt on the hands. If the hands have soil on them, one *must* engage in a thorough hand washing.

Another concern regarding the use of ABHRs is whether they are safe for use with children. Therefore, special care must be given when children use them. In 2011, Joseph et al. reported an acute ethanol poisoning in a 6-year-old girl that was caused by ingesting ABHRs. The child was brought to the emergency department with hypothermia, altered mental status, periods of hypoventilation, and vomiting. Further investigation revealed that the child had gone frequently to the class restroom for ingestion of unknown quantities of ABHRs during the day. The patient was admitted for one day for intravenous fluid hydration and close observation of her mental status. Because of this, concerns were raised over the safety of ABHRs because they can contain up to 90% ethanol. However, one study showed that normal use of hand sanitizer by children (3.5 to 7.2 years) did not cause any significant change in their blood alcohol levels. To insure proper use, children *must* be supervised when using the ABHRs and they must be assisted in following the manufacturer's directions.

Practices

Alcohol-based hand rubs reduce the number of microorganisms on the hands, but they do not kill all types of microorganisms. According to the Centers for Disease Control and Prevention, alcohol-based hand rubs with at least 60% alcohol must be used.

Hand Sanitizers and Adults

- Only use hand sanitizers when there is no visible debris on the hands.
- Always review the directions on the product being used as there are slight variations in suggested procedures for different products.
- Apply the required volume of the product to the palm of one hand and rub hands together. The required volume must keep the hand surfaces wet for at least 15 seconds or as indicated by the manufacturer.
- Be sure to rub all surfaces of the hands and fingers.
- Allow hands to air-dry. Do not use paper towels to dry hands.

Assisting Children with Use of Hand Sanitizers

Children must be constantly supervised when using hand sanitizers to avoid over dispensing, consumption, or eye contact with the sanitizer.

- Have children hold out their hand or place hands under the dispenser and then dispense the appropriate amount of hand sanitizer into the child's hands.
 - Have the child rub hands together. The required volume must keep the hand surfaces wet for at least 15 seconds or as indicated by the manufacturer.
 - Be sure that the child rubs all surfaces of the hands and fingers.
 - Allow the child's hands to air-dry before dismissing them; do not use paper towels to dry hands.

Hand Sanitizer Equipment

Check the dispenser systems on a regular basis to ensure they contain the hand-hygiene rub, deliver the required volume of the product, and do not become clogged or malfunction.

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