

# Cleaning and Disinfecting During an Outbreak



*A child-care center in Dane County, Wisconsin had three outbreaks of *Giardia lamblia* in a 19 month period. After the first outbreak a public health nurse provided prevention and hygiene education. However, no change was made to cleaning practices of toys. Even with improved control measures, two additional outbreaks of *Giardia* occurred at the same facility in the following 17 months.*

## Public Health Reasons

Children are particularly vulnerable to the rapid spread of infectious diseases for several reasons. Young children and infants (under 12 months old) have a natural curiosity that leads to frequently handling objects and surfaces, and putting their hands and objects in their mouths. During an outbreak, the facility's normal cleaning and disinfecting procedures must be increased in extent and frequency. For example, in an *Acinetobacter baumannii* outbreak, Denton et al. found a significant correlation between the number of positive environmental sites and the number of individuals infected with *A. baumannii*. When environmental contamination was high, the number of infected individuals was also high, and failure to follow strict cleaning protocols tended to make the outbreak worse.

High-touch items, restrooms, and diaper-changing areas are the most likely places for contamination, so they must be frequently cleaned and disinfected. In a review of multiple norovirus outbreaks, Matthews et al. showed that just being in a close quartered space (like a child-care setting) during an outbreak is a risk factor for acquiring the virus, and that the spread of virus often occurs through environmental contamination. For example, an outbreak of noroviruses was linked to unclean computer keyboards and mice even after the implementation of interventions, including cleaning of all shared environmental surfaces with a chlorine bleach solution. As well, an investigation of a Florida *Shigella* outbreak in multiple child-care facilities found the most important risk factor for illness to be having a diaper changed. Fabric-covered furniture, carpets, and toys must be cleaned, as well. During the investigation of a norovirus outbreak, Cheesbrough et al. found 6 of 144 environmental swabs were positive. Of the six, five positive samples were from carpet that had already been cleaned by shampooing followed by vacuuming. Fleming and Randle showed that even in a pediatric intensive care unit, 85% of toys had viable bacteria on them.

# Practices

*NOTE: There are three levels of cleaning and sanitizing/disinfecting. In increasing rigor, they are routine cleaning, vomit/fecal episode cleaning, and outbreak cleaning. This section covers the third level, cleaning during an outbreak. The following methods must be used in addition to routine cleaning and vomit/fecal episode cleaning.*

When an outbreak of gastrointestinal illness has been identified (a cluster of two or more children/staff members showing symptoms), the facility must heighten cleaning and sanitation protocols. Since it may take several days for confirmation from the local health department, these practices should be put into action immediately after a suspected outbreak has been identified. If there is vomit or fecal matter, clean it up immediately. (Refer to the “Vomiting and Fecal Episodes” fact sheet for detailed cleaning methods of various surfaces.)

## Cleaning and Disinfecting

- Use the procedures, such as how to scrub sinks and clean floors, outlined in these fact sheets: “Cleaning and Disinfecting Restrooms”, “Cleaning and Disinfecting High-touch Surfaces”, “Cleaning Housekeeping Surfaces”. The following is a brief overview:
  - clean surfaces with warm water and a detergent to remove soil
  - rinse surfaces with warm water to remove cleaning products and suspended debris
  - apply enough disinfecting solution to thoroughly cover the surface
  - let the solution stand for the contact time given on the label
  - let the surface air dry before using
- With these procedures, use the recommended cleaning solutions in the table below.
- Food preparation/food contact areas must be washed, rinsed, and sanitized using standard protocol (See “Cleaning and Sanitizing Food Contact Surfaces” fact sheet).

### Recommended Cleaning Dilutions for Bleach during an Outbreak (Adapted from SCDHEC)

Surface	Cleaning Method	How to Make (1 cup = 240ml)	Strength (parts per million)
porous surfaces, such as wood floors, or surfaces visibly soiled with vomit/feces	chlorine bleach*	1 1/2 cup bleach in 1 gallon water	5000ppm (1:10 dilution)
non-porous surfaces Examples: handrails, tile floors, counter-tops, sinks, toilets, and doorknobs	chlorine bleach*	1/3 cup bleach in 1 gallon water	1000ppm (1:50 dilution)
food-contact items and items children commonly use in mouthing Examples: cutting boards and teething rings	chlorine bleach* OR dishwasher at 170°F (77°C)	1 Tbsp. bleach in 1 gallon water	200ppm (1:250 dilution)
carpet & upholstered fabrics	hot water and detergent or steam clean ( <i>never dry vacuum if there has been a fecal matter or vomit episode</i> )	N/A	N/A

*\*Bleach solution must: contain 5.25% sodium hypochlorite, be prepared fresh daily, and have 10-20 minute surface contact time. Use unopened bleach for outbreak-related disinfecting (open bottles lose effect after 30 days). EPA-registered disinfectants may also be used, but the effectiveness in outbreaks has not been evaluated.*

### When Cleaning and Disinfecting the Facility:

- Wear protective masks and heavy-duty gloves.
- Prepare fresh bleach solutions for use within 24 hours because bleach will evaporate and lose its activity.
- While chemicals are being applied, use appropriate ventilation in areas being disinfected.
- For chemicals, use a pour or pump bottle that does not produce aerosols, instead of a spray bottle. This reduces the respiratory irritation that can be caused by aerosols.
- Never enter the foodservice area with items soiled by vomit or fecal matter.
- Clean areas from the lowest incident rate/likelihood of contamination (classroom with no vomit or fecal incidents and hallways) to the highest (bathrooms and classrooms where multiple children have vomited).

### Items to Clean and Disinfect

*NOTE: While all recommendations state to increase cleaning and disinfecting during an outbreak, there is no universal standard for the number of times that a facility should clean per day during an outbreak. However, the DeKalb County Board of Health (Georgia) recommends increasing the cleaning of bathrooms to once every hour during high frequency use and the cleaning of high-touch surfaces to once every two hours during high frequency use. Administrators and staff members of the facility must form a group that will decide how to increase cleaning. They must consider the highest traffic times in restrooms and other areas in order to determine how often to clean each area.*

- Give particular attention to the areas of the greatest likely environmental contamination, such as bathrooms and high-touch surfaces.
- Increase the frequency of bathroom and toilet cleaning, especially high touch areas, including faucets, door handles, toilet handles, and light switches.
- Launder bedding, linens, toys, and fabrics. (See “Cleaning High-touch Surfaces” fact sheet).

### Items to Clean and Disinfect by Room Type\* (adapted from DHEC)

*NOTE: Fabrics cannot be disinfected, so they must be sanitized. All hard surfaces must be disinfected.*

Kitchen/Food Areas	Bathroom	Classrooms	Offices	Hallways/other
<ul style="list-style-type: none"> <li>• cafeteria tables and chairs</li> <li>• countertops</li> <li>• doorknobs</li> <li>• floors-hard surfaces/wood</li> <li>• food contact surfaces</li> <li>• light switches</li> <li>• paper towel/napkin dispensers</li> <li>• push doors</li> <li>• salt and pepper shakers</li> <li>• sink hardware</li> <li>• soap dispensers</li> <li>• tabletops</li> </ul>	<ul style="list-style-type: none"> <li>• bathroom stalls</li> <li>• countertops</li> <li>• doorknobs</li> <li>• floors-hard surfaces/wood</li> <li>• handrails</li> <li>• light switches</li> <li>• paper towel/napkin dispenser</li> <li>• sink hardware</li> <li>• sinks</li> <li>• soap dispensers</li> <li>• toilets</li> <li>• water fountains</li> </ul>	<ul style="list-style-type: none"> <li>• books</li> <li>• carpets</li> <li>• chairs</li> <li>• computer keyboards and mice</li> <li>• countertops</li> <li>• diaper changing pads</li> <li>• diaper changing tables</li> <li>• doorknobs</li> <li>• floors- hard surfaces/wood</li> <li>• games</li> <li>• hard toys</li> <li>• light switches</li> <li>• mats</li> <li>• paper towel/napkin dispensers</li> <li>• pillows</li> <li>• plush toys</li> <li>• rugs</li> <li>• sink hardware</li> <li>• sinks</li> <li>• soap dispensers</li> <li>• tabletops/desktops</li> <li>• water fountains</li> </ul>	<ul style="list-style-type: none"> <li>• carpets</li> <li>• chairs</li> <li>• common telephones</li> <li>• computer keyboards and mice</li> <li>• countertops</li> <li>• doorknobs</li> <li>• floors- hard surfaces/wood</li> <li>• light switches</li> <li>• rugs</li> <li>• shared office equipment</li> <li>• tabletops/desktops</li> <li>• water fountains</li> </ul>	<ul style="list-style-type: none"> <li>• carpets</li> <li>• diaper-changing pads</li> <li>• diaper-changing tables</li> <li>• doorknobs</li> <li>• floors- hard surfaces/wood</li> <li>• handrails</li> <li>• light switches</li> <li>• playground equipment</li> <li>• rugs</li> <li>• water fountains</li> </ul>

*\* This is not an all-inclusive list. There may be other items in the facility that need to be cleaned and disinfected. Any shared items, high-touch items, and items that have been or likely have been contaminated by vomit or fecal matter must be cleaned and disinfected.*

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# Contacting and Working with the Local Health Department



*According to the CDC Data on Foodborne Illness, there were 51 foodborne outbreaks in child-care centers from 1998-2008.*

## Public Health Reasons

Early detection of a disease outbreak is critical to containing the disease and preventing additional cases. According to the U.S. Centers for Disease Control and Prevention (CDC), an outbreak is defined as the occurrence of two or more cases of a disease, injury, or other health condition in a given area or among a specific group of people during a specific period. Notifying the appropriate health authorities as soon as an outbreak is suspected will help stop the spread of pathogens to others and help those who are ill recover more quickly, by enabling the facility to take steps to control the outbreak.

One way outbreaks come to the attention of health authorities is a phone call from an individual or a facility that is concerned enough to call the health department. For example, on February 8, 2007, a school nurse contacted the District of Columbia Department of Health about a possible outbreak of acute gastroenteritis in an elementary school (pre-kindergarten through sixth grade). The nurse reported that 27 students and two staff members had become ill between February 4<sup>th</sup> and 8<sup>th</sup> with nausea, vomiting, and diarrhea.

Once contacted, staff at the health department must decide whether or not to investigate the possible outbreak. Factors affecting the decision include the severity of the illness, the number of cases, the source, mode or ease of transmission, and the availability of prevention and control measures. Most local health departments are more likely to investigate an apparent outbreak when:

- a large number of people are exposed
- the illness carries high risks of hospitalization, complications, or death
- effective control measures exist
- the outbreak has the potential to affect others unless prompt control measures are taken

In the 2007 Washington, DC elementary school outbreak, the health department conducted a site visit *only after* two pre-investigation interventions (more thorough hand washing and cleaning of all shared environmental surfaces with a 1:50 bleach solution) did not eliminate the illnesses.

Once an investigation starts, public health officials will be able to confirm suspected disease agents, review likely sources of the illness, and suggest specific control strategies. During the investigation of the Washington, DC elementary school outbreak, the Department of Health collected stool specimens from two ill persons and samples from 25 environmental surfaces on

February 9<sup>th</sup>. Laboratory results showed that both stool samples and one (4%) environmental swab were positive for noroviruses. The outbreak was linked to the use of an unclean computer keyboard and computer mice in a first grade classroom. On February 18<sup>th</sup>, the department of health recommended the following additional interventions: clean computer equipment (e.g., mice and keyboards) and other shared surfaces that were overlooked during the February 8<sup>th</sup> cleaning with a 1:50 concentration of household bleach solution, and exclude ill persons from the school for at least 72 hours after the resolution of illness because of continued fecal shedding of the infectious virus.

## Practices

Child-care providers must have the local health department's information readily available and easy to access. Important telephone numbers can be kept on a laminated sheet posted by the phone, in a directory kept near the phone, or in an electronic file/contact list. The most important thing is that all staff members know where the numbers are located and can easily access them.

The most important telephone number is the number for the local health department or the agency that handles infectious disease outbreaks in the area. This can be a county agency or a state agency. The agency varies by the geographic location and state in which the child-care facility is located. This is why it is important to have this information ahead of time. To find the telephone number, look in the government pages of a phonebook for the county/district health department, or state health department. Online, check the state health department's website for the local health department's contact information.

When contacting health authorities, the right person to speak with will vary depending upon the regulatory system in that jurisdiction. In most instances, ask for a member of a department with a title such as Environmental Health, Infectious Disease, or Public Health Response. When illnesses are suspected, the child-care facility must provide the following information to the health department:

- number of children ill
- number of childcare providers ill
- symptoms, onset, and duration of illness
- any events that might have been linked to the illnesses (meals, field trips, animal contact) and the dates they occurred

*The CDC also recommends taking a sample if a food or a water source is suspected as the source of an outbreak. Samples must be kept and provided to local public health investigators who will then contact the CDC or the US Food and Drug Administration for further guidance on testing. Ensure that food and water samples are properly collected and do not become contaminated during storage. Handle all food and water suspected of causing an outbreak with single-use gloves, cleaned and sanitized utensils, and store in clean, sanitized containers. Food samples must be stored frozen at -4°F (-20°C) and water stored at 4°F (-15.5°C), until investigators can pick them up. For a list of nationally notifiable diseases, visit the CDC's website at: [www.cdc.gov](http://www.cdc.gov)*



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# Notifying Parents, Guardians, and Staff Members



## Public Health Reasons

If an outbreak is identified at a child-care facility, it is critical that parents and guardians be notified as soon as possible. According to the Center for Disease Control and Prevention's (CDC) FoodNet database, from 1998-2008 there were 51 recorded foodborne disease outbreaks in child-care facilities in the U.S. Of those, 17.6% were due to viruses, 54.9% were due to bacteria, and 27.5% were due to other factors. As a result of these outbreaks, 1,947 children became ill and 77 were hospitalized.

Child-care facilities must have set policies for communicating with parents and guardians in the time of an outbreak or emergency. Parents will require concise and helpful information on the outbreak, such as the symptoms and pathogen, if known, and what they must do. For this reason, it is often helpful to ask the local health officials for assistance in communicating with parents.

At the onset of the outbreak, staff of the facility must also be notified. In many cases, these employees will be the first to identify and record symptoms and may notice unusual patterns. Staff will also need to be trained on what the procedures are for exclusion/segregation of sick children (See "Excluding Ill Children" fact sheet) and monitoring children's health so that this information can be quickly relayed to parents (see "Monitoring Sick Children's Health" fact sheet).

A foodborne disease outbreak is classified as a public health crisis. There are three recognized phases of a crisis: prevention, preparedness, and recovery. Each of these phases requires planned communication strategies. An outbreak often creates a high-emotion, low-trust situation. To mitigate this, it is important to be clear, forthcoming, and transparent in communications to parents, guardians, and staff members.

## Practices

A plan for managing an outbreak and communicating outbreak information between child-care center staff members, parents, and guardians must be established prior to a crisis event. Inform parents and guardians of this procedure when they first enroll their child at the facility. It can also be helpful to remind parents about policies and procedures once a year.

After the occurrence of an outbreak, child-care providers can seek help from local health officials on developing messages for parents, guardians, and staff. Messages must be provided as soon as possible in order to increase chances of isolating the illness and to decrease the amount of people who come in contact with the illness.

### Guidelines for Message Development

- Be balanced and honest (do not assess blame outside of the organization).
- Focus on the specifics of the outbreak.
- Pay attention to what the parent or staff member already knows to reduce redundancy.
- Be tailored to the specific needs of the audience. For example, staff may want to know whether they will be paid.
- Place the risk in appropriate context.
- Provide the specific information needed to resolve the decisions that the parent, guardian, or staff member will have to make.

### Common Methods for Communicating

- Letter or other written communication. This form of communication will likely be the most efficient and effective for communicating with parents. These must be written in a manner that is concise, organized, and contains accurate information that parents and guardians can understand.
- Telephone call or in-person meeting. If the center is large, this may not be the best method because it can be time consuming. However, this may work best for staff members. The benefit is that the parents, guardians, and staff members can ask questions.
- Communication using e-mails, text messages, social media, and company websites. This is a quick method of communication, but it requires up-front work to be ready for use during an outbreak.

Before an outbreak, each facility must decide which of the above methods provides rapid, reliable, and effective communication to parents, guardians, and staff members. For example, a large center with multiple clients may choose to use e-mail and text messages to alert parents and guardians once an outbreak has been identified, and direct them to a staff member for more information. Some facilities may not have this technology readily available, and some parents may not be responsive to this type of message, so a letter may be best. In a small home-based setting, a quick round of phone calls directly to parents and guardians may be more suitable. The best communication method for staff members may be different than the best method for parents and guardians.

### Communicating with Parents/Guardians

- Describe the outcomes associated with the pathogen (symptoms, duration of illness, and further transmission within the family).
- Explain what is currently known (number of illnesses, investigation, clean-up, and exclusion) in a way that is easily understood.
- Provide parents and guardians with information for monitoring their child, including the identified and recorded symptoms.
- Provide information on what to do if one suspects that their child is ill.
- Provide information for parents and guardians who have an ill child, including how long the child must stay out of child-care.

- Inform the parents and guardians of the measures that have been taken to slow or stop the outbreak. (e.g. increased cleaning procedures, disposal of questionable foods, etc.)
- Provide parents and guardians an opportunity to ask questions. This can be the name and phone number of a staff member to contact if they have questions.
- Explain the vaccination recommendations (applicable in hepatitis A outbreaks).
- Ensure parents that follow-up communication will be made to keep them informed.
- Provide after-hours contact information, and be responsive. As well, provide them with a health department contact and telephone number.
- Include any information the public health official has provided as guidance that may be beneficial to the parents' and guardians' understanding.

### Communicating with Employees

Child-care staff must always be notified of potential illnesses as soon as they are recognized. A plan for communicating outbreak information to child-care employees must be established prior to an outbreak. Child-care staff must become familiar with this plan at the time that they are hired. Child-care staff must also complete the following:

- If the causal agent is Hepatitis A, staff must be immunized according to the recommendations at the local health office.
- Be familiar with the center's policies and procedures and state laws regarding hygiene and sanitation in child-care centers, including hand washing, waste disposal, cleaning and disinfecting, diapering, general hygiene, and food safety.
- Do *not* work while sick. Sick pay and sick leave policies that do not penalize ill workers might help to facilitate such staff exclusion.

An employee meeting is the best practice to use because it ensures that all employees are provided with the same information at the same time and allows for questions to be answered.

- Explain what is occurring in a way that employees can easily understand.
- Tell employees everything that is known about the cause of the outbreak, including any suggestions made to the child-care center by the local public health officials.
- Provide employees with information on isolating the illness, including monitoring the children in their classrooms, information about the identified and recorded symptoms, and specific classrooms where illness has occurred.
- Provide information for what employees must do if they suspect a child is ill.
- Inform the employees of the measures that will be taken to slow or stop the outbreak (increased cleaning procedures, disposal of questionable foods, etc.). Ensure that each employee understands their role, as well as its importance.
- Provide employees with an opportunity to ask questions.
- Prepare employees to answer questions parents may have. Provide employees with the name of someone to contact in the event that they are unable to answer a parent's question.
- Sometimes a local health official will either recommend or require closure as a precaution or in an attempt to avoid spread of illness. In the event of closure, inform child-care employees immediately with a plan for how the center may be ready for reopening.

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