Norovirus Toolkit for School or Childcare Center Outbreaks

This is a modified version of a toolkit originally developed by the California Department of Public Health
Introduction

This is an adapted version of a toolkit developed by The California Department of Public Health to assist local health department employees who investigate suspected and confirmed norovirus outbreaks in schools and childcare settings. While the intended audience is local health departments, parts of the toolkit may also be useful for school and childcare staff as well.
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General Norovirus Information

What is norovirus? Norovirus is a very contagious virus that causes acute vomiting and diarrhea. As few as 18 virus particles can cause an infection. Norovirus can survive for weeks on surfaces, such as desks, doorknobs, and toys, if not properly cleaned and disinfected. Norovirus can spread quickly from person to person in places such as schools and childcare centers. It is sometimes called the “stomach flu” but is not related to influenza (flu) viruses, which primarily cause respiratory infection.

How common is norovirus infection? Norovirus is the most common cause of acute viral gastroenteritis in the United States, and causes an estimated 19–21 million illnesses each year. The Centers for Disease Control and Prevention estimate that norovirus contributes to 56,000-71,000 hospitalizations and 570-800 deaths each year in the United States.

When does norovirus infection occur? It is possible to become infected with norovirus any time of the year, but infections are most common between November and April.

Can a person get norovirus infection more than once? A person can get norovirus more than once in their lifetime, because there are many different strains, which can circulate at different times and in different geographic areas. When new strains emerge, there can also be an increase in norovirus cases.

How do people get norovirus infection? Norovirus is found in the vomit and feces of infected people. When an infected person vomits, norovirus can be sprayed into the air and contaminate nearby surfaces. Contamination of surfaces with fecal matter from unwashed hands can also occur. Norovirus can spread easily from person to person, through contaminated food or water, or by touching contaminated surfaces. Typically, a person is contagious as soon as they begin feeling sick and remain contagious until a few days after they recover. However, sometimes an ill person can remain contagious for two weeks or longer after symptoms have ended by shedding it in their feces. People can become infected in several ways, including:

- Having direct or indirect contact with an infected person (for example, by holding hands, or sharing foods or eating utensils with an infected person, or by changing diapers of a sick child).
- Eating food or drinking liquids contaminated with norovirus, such as food touched by an ill person, or undercooked shellfish from contaminated waters.
- Touching contaminated surfaces or objects, and then touching one’s mouth before handwashing.
- Sharing toilet facilities with an ill person.
- Cleaning up vomit or diarrhea from an infected person without proper protective equipment, such as gloves, masks, and gowns.
What are the symptoms of norovirus infection? Symptoms usually begin 12 to 48 hours after a person has been exposed to the virus and last for 1 to 3 days. The most common symptoms are vomiting, diarrhea, nausea, and stomach cramps. Other symptoms can include a low-grade fever, headache, and body aches. People with norovirus can feel very ill, and may vomit or have diarrhea many times a day. This can lead to dehydration, especially in young children, older adults, and people with underlying medical conditions. Symptoms of dehydration include decreased urination, dry mouth and throat, and feeling dizzy when standing up. Young children who are dehydrated may cry with few or no tears and be unusually sleepy or fussy.

How is norovirus infection diagnosed? Norovirus infection can be diagnosed by testing a person’s stool for the presence of norovirus. Confirmation of the cause of illness by a public health laboratory during an outbreak is important in determining what prevention and control methods to take.

How is norovirus infection treated? There are no specific treatments for norovirus. It cannot be treated with antibiotics because it is not a bacterial infection. A person should drink plenty of fluids to prevent dehydration due to vomiting and diarrhea.

How can you prevent norovirus infection? Things you can do to reduce the risk of getting or spreading norovirus infection include:

- Practice good handwashing techniques using soap and water; hand-sanitizers are not usually effective against norovirus.
- Use safe food-handling techniques, such as washing fruits and vegetables and cooking shellfish thoroughly.
- If you’re sick, STAY HOME! Isolate yourself and do not participate in group activities until after you are well.
- Do NOT prepare food or care for others when you are sick with norovirus or any diarrheal illness.
- Clean and disinfect contaminated surfaces or objects with bleach as soon as possible.

For more information, please see the “Control Measures” section.
Checklist for Responding to a Norovirus Outbreak

If a norovirus outbreak is suspected, affected facilities should immediately employ infection control measures to help prevent the spread of illness. To ensure a comprehensive outbreak response, the following steps are recommended:

☐ **Notify the Local Health Department:** Report the outbreak to the local health department immediately. Refer to [Outbreak Detection and Case Definition](#) for more information.

☐ **Assign School Staff Roles and Responsibilities:** Designate facility staff to handle duties related to outbreak management.
  - Coordinating communications.
  - Providing medical care to ill persons.
  - Obtaining additional cleaning supplies.
  - Tracking illnesses.
  - Cleaning and disinfecting contaminated areas.
  - Overseeing meals and group activities for good dining and hygiene practices.

☐ **Track Ill Persons:** Track the number of ill persons using a log sheet such as the [Sample Norovirus Line List](#).

☐ **Educate Staff, Students, and Parents:** Inform staff, students, and parents or guardians about the outbreak, symptoms of norovirus, and suggested prevention measures to use at home and school (that is, frequent handwashing and staying home when ill), during and even after the outbreak to reduce transmission. Useful tools which could be employed together include:
  - Centers for Disease Control and Prevention “[Norovirus Illness: Key Facts](#)”
  - Centers for Disease Control and Prevention “[Norovirus: Facts for Food Workers](#)”
  - [Clean-up and Disinfection for Norovirus (“Stomach Bug”)](#)
  - [Sample Notification Letter](#)
  - [Sample Press Release](#)
  - Post outbreak notices and [handwashing signs](#) throughout the facility (for example, entrances, restrooms, dining areas) to remind all students and staff to practice frequent handwashing.

☐ **Implement Facility-Wide Control Measures:**
  - Restrict sick students and staff from coming to the school or facility until at least 48 hours after their vomiting and diarrhea have ended.
  - Clean and disinfect frequently-touched surfaces and all possibly contaminated areas. Please see the “[Cleaning and Disinfection Guidelines](#)” section for more information.
  - Enforce strict handwashing policies for all students and staff (have staff supervise the handwashing of younger students). For more information, please see the “[Control Measures](#)” section.
  - Consider cancelling or postponing group activities. Consult with the local health
department if you plan to have an event at your facility.

☐ **Consider Limiting Visitors from Accessing Affected Areas of Facility:** If possible, limit visitor access, especially to areas that may be contaminated (for example, encourage parents or guardians to pick children up at the front of the facility rather than coming inside).

☐ **Consult with the Local Health Department on Laboratory Testing:** Work with the local health department to coordinate stool specimen collection and laboratory testing. For more information, please see [Norovirus Laboratory Testing Information](#).

☐ **Work with the Local Health Department to Assess How the Outbreak is Evolving:** Outbreaks can be prolonged, sometimes lasting months. An outbreak that begins at one school or childcare center can continually spread through the community by person-to-person transmission. Students, staff, family, and friends can become infected and further spread the virus to other facilities. It is important to keep the local health department informed about the spread of norovirus infections within your facility and to other facilities, localities, or regions.

☐ **Determine When the Outbreak is Over:** In general, an outbreak in a facility may be over if no new illnesses have occurred after two incubation periods (that is, 4 days, since the average incubation period for norovirus infection is 2 days). However, it is important to work with the local health department to determine when the outbreak is over.
Control Measures

Because norovirus is highly contagious, it is critical that infection control measures are carried out as soon as an outbreak is suspected.

Handwashing and Personal Hygiene: It is critical that students and staff wash their hands often. It may be helpful to schedule handwashing breaks for students and staff to encourage frequent handwashing. During outbreaks, facilities may consider periodically broadcasting public announcements to remind students and staff to practice frequent handwashing, especially before lunch and snack times. Proper handwashing includes covering all parts of the hands, including fingernails, with soap; rubbing lathered hands together vigorously for at least 20 seconds; thoroughly rinsing hands with water; and drying hands with a paper towel. Placing handwashing signs in restrooms and at other locations throughout the facility can be helpful to remind students and staff to wash their hands frequently, and to provide guidance on proper handwashing techniques. Staff should supervise the handwashing of young students to ensure that hands are thoroughly washed. Of note, hand-sanitizers are not an acceptable substitute for handwashing because they are usually not effective against norovirus. Students and staff should always:

- Wash hands after using the restroom, changing diapers, sneezing or coughing, cleaning up vomit or diarrhea, handling soiled items, or helping students in the restroom.
- Wash hands before eating, preparing or serving food, or feeding children.

Exclusion: Exclusion of sick and recovering persons will reduce the likelihood that more students and staff will be exposed. Students and staff who are sick with either vomiting or diarrhea should not come to school, should be sent home, and should not participate in group activities for a minimum of 48 hours after symptoms have ended. (For example, if Mary last vomited at noon on Tuesday, then she should not return to school until Friday.) If ill students are to be sent home, parents or guardians should be contacted immediately and asked to pick up their children as soon as possible; ill students should be held in an isolated area until they are picked up. Ill students and staff should not eat in areas with well persons.

Grouping: Try to keep all staff who worked with sick students in the same classroom or area to limit the spread of infection. (For example, if there is an outbreak in the “Toddlers” room, then keep the same staff working in the “Toddlers” room until the outbreak is over, rather than allowing them to work in the “Infants” or “Preschool” rooms.) In settings such as boarding schools or college dormitories, sick students should use separate toilets and be housed separately from well students if possible. Be sure to keep sick persons who are waiting to be picked up away from others. Sick persons should not be sitting in common areas such as hallways.

Cleaning: Wearing gloves and a mask, immediately remove vomit or diarrhea, and use
Soap and water to wash any surfaces that may be contaminated. Norovirus can remain on surfaces that have been cleaned and can still cause infection. Be sure to disinfect all surfaces after cleaning.

Machine wash and dry laundry soiled by vomit or diarrhea with hot water and detergent right away. Wear disposable gloves and masks when cleaning contaminated surfaces or handling contaminated items. Handle items carefully to avoid spreading the virus. For more information on proper cleaning practices, please see the “Cleaning and Disinfection Guidelines” section.

**Disinfection:** Bleach is widely recommended because it is the most effective disinfectant for norovirus; however, it may be an irritant to some persons and may damage textiles or vulnerable surfaces. Quaternary ammonia solutions (which are often found in schools) are not effective against norovirus. Alternatively, an Environmental Protection Agency (EPA)-approved disinfectant can be used (see this list of EPA-approved disinfectants for norovirus). For more information on proper disinfection practices, please see the “Cleaning and Disinfection Guidelines” section.

**Food Handling and Dining:** Norovirus can spread through contaminated food or water, so it is critical that facilities employ safe food-handling techniques, including:

- Excluding ill food service staff from work until at least 48 hours after symptoms have ended.
- Requiring food service staff to wear personal protective equipment (such as disposable gloves and masks) when handling, serving, or preparing food.
- Ensuring that clean water, soap, and paper towels are available in dining areas and other areas where eating may occur.
- Throwing away all potentially contaminated food.
- Cleaning and disinfecting food preparation equipment and surfaces.
- Ensuring that all food service staff have access to a dedicated bathroom facility that is not shared with students or other non-food service staff.
- Ensuring that all food service staff wash their hands thoroughly before food handling and immediately after using the restroom.
- Prohibiting students from participating in meal preparation, table-setting, and food service.
- Providing individual meals to students and staff instead of family-style meals, self-serve buffets, or communal food items.
- Prohibiting the use of shared dining items, such as serving utensils, water pitchers, salt and pepper shakers, and cups.
- Running dishes, utensils, and cups through a dishwasher (using hot water and dishwasher detergent) immediately after use; consider using single-use dining materials if reusable ones are not available and cannot be thoroughly cleaned.

For more information on proper food handling practices, see the Centers for Disease Control and Prevention “Norovirus: Facts for Food Workers”.
**Postponing or Canceling Group Activities**: Consider postponing or canceling group activities, such as communal meals, sporting events, or social/recreational groups, until the outbreak is over. This will minimize person-to-person contact and transmission risk.

**Facility Closures**: In general, facilities are not required to close during a norovirus outbreak but it is important to consult with the local health department. In some situations, closures may be considered on a case-by-case basis if a large number of illnesses are occurring, recommended control measures have not been effective, and closure is needed to perform effective environmental cleaning. A school may be closed by a public health order from a Local Health Officer per their discretion. Your state may also have a mechanism for recovery of school attendance funds lost due to epidemic-related absences.
Cleaning and Disinfection Guidelines

**General Principles:** Remove vomit or diarrhea right away! Remember that norovirus particles can settle on and contaminate objects and surfaces, especially if an ill person has vomited nearby. All areas, items, and surfaces, especially in classrooms, restrooms, hallways, and kitchens that may have been contaminated (within a 10- to 25-foot radius of the vomit incident) must be cleaned and disinfected in order to kill norovirus. Cleaning removes visible dirt and debris on objects and surfaces, and results in the removal of some germs. Disinfection kills any remaining germs on the objects and surfaces. If possible, increase the frequency of cleaning and disinfection to at least twice a day. High-touch surfaces may need to be cleaned multiple times a day. In addition, facilities may need to bring in additional cleaning staff to manage the outbreak. Make sure rooms are well ventilated. Students and staff should stay away from contaminated objects and areas until proper cleaning and disinfection has occurred. Refer to the [Clean-up and Disinfection of Norovirus](#) for more information.

Be careful and wear protective materials (such as disposable gloves, masks, safety goggles, and gowns) when handling anything contaminated with vomit or diarrhea, and when cleaning and disinfecting contaminated areas. Start by cleaning and disinfecting surfaces with a lower likelihood of norovirus contamination (such as light switches or door handles) then moving to surfaces likely to be highly contaminated (such as, bathroom surfaces or desks). Consider using disposable mop heads and change mopping water often. Wash hands with soap and water after any cleaning.

**Cleaning:** First, soak up vomit and diarrhea using disposable absorbent materials, such as cloth, baking soda, paper towels, sawdust, or kitty litter. Do not vacuum material; using gloves, pick it up using paper towels. Then, use soap and water to wash and rinse the area or object. Wipe dry with paper towels. Dispose of all waste in a plastic trash bag or biohazard bag, immediately close, and dispose of the bag.

**Disinfection:** After an area or object has been cleaned, it must be disinfected. Although there may be health concerns with using bleach because it can be an irritant, a bleach solution is recommended for norovirus outbreaks. Please note that bleach should never be mixed with other cleaners/disinfectants as it can create poisonous gases. Bleach may damage metal surfaces, floor finishes, carpets, clothing, and other textiles.

To prepare a bleach solution, use 3/4 cup concentrated bleach (or 1 cup of regular strength bleach) to one gallon of water; the disinfection method will vary depending on the type of surface or material being disinfected (see below). Be sure to prepare fresh bleach solutions daily, because bleach can lose effectiveness if left out and exposed to air. When disinfecting, leave bleach on the surface for at least 5 minutes covering the entire surface and then rinse thoroughly with clean water.

An [Environmental Protection Agency (EPA)-approved disinfectant for norovirus](#) can be used in certain situations. However, these disinfectants were tested against a different virus similar to norovirus and may not be as effective as bleach. The
use of a bleach solution is recommended for use during norovirus outbreaks whenever possible. Be sure to read the product labels, as there may be separate directions for using the products as disinfectants versus as cleaners. Follow the manufacturer’s instructions to ensure appropriate dilution and contact time, which will vary depending on the type of surface.

**Cleaning Specific Surfaces/Items:**

- **High-Touch Surfaces**: Objects that are frequently touched include door handles, hand rails, light switches, toilets, faucets, tables, counters, chairs, walls, toys, phones, playground equipment, activity centers, and shared items. Carefully remove any vomit and diarrhea, and clean contaminated objects and surfaces with soap and hot water. Then, disinfect with the bleach solution. Be sure to clean nearby objects that may also have been contaminated by vomit or diarrhea. This should be done multiple times a day if possible.

- **Non-Porous (Hard) Surfaces**: For toilets, sinks, furniture, walls, floors and other hard, non-porous surfaces, carefully remove vomit and diarrhea, and clean contaminated objects and surfaces with soap and hot water. Then, disinfect with the bleach solution.

- **Porous Surfaces (Carpets/Upholstery)**: For carpets, upholstery, and other porous surfaces, carefully remove vomit and diarrhea, and clean with soap and hot water. Then, steam clean at a temperature of 158° F for five minutes or 212° F for one minute. To minimize aerosolization of particles, do not vacuum.

- **Food/Mouth Contact Items**: For objects that may come in contact with food or the mouths of people (such as toys or dishes), carefully remove vomit and diarrhea. Then, disinfect with the bleach solution. Rinse thoroughly with clean water afterwards. Alternatively, dishes, utensils, and cups can be cleaned with a dishwasher (using hot water and dishwasher detergent) immediately after use.

- **Cloth and Plush Items**: For clothing/linens/textiles and plush items, including stuffed animals, bedding, curtains, and mattress covers, carefully remove vomit and diarrhea. Then, wash items in a pre-wash cycle, followed by a regular wash cycle with detergent. Dry items at a temperature greater than 170° F. Do not mix contaminated and uncontaminated items in one load; it is better to discard soiled materials than to risk exposure during cleaning. If there are no on-site laundry facilities, double wrap soiled items in plastic bags, and take them to an off-site facility to be washed and dried. If soiled items are sent home, be sure to provide guidance on proper washing and drying procedures to parents or guardians.

- **Diaper Changing Surfaces and Potty Chairs**: For diaper changing stations and potty chairs, clean with soap and hot water, and disinfect using the bleach solution after each use (including equipment or supplies that were touched). Rinse thoroughly with clean water afterwards.

**Objects Not Easily Cleaned**: Items that are difficult to clean, like puzzle pieces, chalk, crayons, and clay, should be discarded.

**References**

