



## Controlling the Spread of Norovirus in Schools & Child Care Settings

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Outbreaks of norovirus infection are more likely to occur during winter months within institutions such as residential facilities, hospitals, long-term care facilities, schools, and child care settings. The virus is easily spread from person-to-person through direct contact, contact with contaminated surfaces, and ingestion of contaminated food. This information is provided by Contra Costa Public Health, Communicable Disease Programs, to assist with the recognition and control of norovirus infections in schools and child care facilities.

### Norovirus Characteristics

Norovirus is a highly contagious virus. Norovirus infection causes gastroenteritis, inflammation of the stomach and intestines. The typical symptoms of norovirus are nausea, vomiting, low-grade fever, abdominal cramps, and watery, non-bloody diarrhea. Vomiting is more common in children. Symptoms usually develop within 24 to 48 hours after exposure, but can appear as early as 12 hours. Illness typically lasts 12 to 60 hours and usually will resolve on its own. Individuals are most contagious when sick with norovirus and during the three days after recovery.

Norovirus is spread very easily from person-to-person, and people can become infected with the virus in several ways, including:

- Eating food or drinking liquids that are contaminated with norovirus.
- Touching surfaces or objects contaminated with norovirus, and then eating or placing their hand in their mouth.
- Having direct contact with another person who has norovirus. Examples include, caring for someone with illness, or sharing foods or eating utensils with someone who is ill.

The virus can persist on surfaces in the environment for weeks and is not destroyed by many disinfecting products. When an individual with norovirus handles or prepares food and drinks improperly, they can contaminate those items and can cause infections in people who consume those products; therefore, food handlers with diarrhea or vomiting should not work until at least 72 hours after their symptoms have stopped.

Re-infection can occur multiple times during a lifetime. An outbreak of norovirus infection is suspected when more than two students and/or staff in a facility or classroom have symptoms of this virus, starting within a 48 hour period. Report any suspected outbreaks to Contra Costa Public Health, Communicable Disease Programs at 925-313-6705.

### Diagnosis and Treatment

Individuals with diarrhea and vomiting should drink plenty of fluids and follow the control measures on the next page to prevent spread in their households. There is no vaccine, specific medication, or therapy for norovirus infection; treatment is supportive and focuses on preventing dehydration. If symptoms do not improve, individuals should contact their primary care physician. Confirmatory laboratory testing for norovirus during an outbreak can be arranged through the Public Health Laboratory by contacting Contra Costa Public Health Communicable Disease Programs. During community-wide outbreaks or periods of high norovirus transmission, laboratory diagnosis may not be necessary.

## Control Measures

Strict infection control practices are necessary to control norovirus spread. Necessary infection control practices are:

- Hands should be washed vigorously with soap and warm water for more than 20 seconds:

### Wash Hands AFTER:

- Toilet visits
- Cleaning up vomit or diarrhea
- Changing diapers
- Handling soiling clothing or linens
- Sneezing and coughing

### Wash Hands BEFORE:

- Eating
- Feeding children
- Food preparation
- Serving food
- Providing healthcare services

- Effective handwashing technique:
  - + Lather hands with soap and warm water for 20 seconds,
  - + Scrub entire hands including beneath fingernails,
  - + Rinse hands well with warm running water, and
  - + Dry hands with disposable paper towel or under air dryer.
- Adults should observe younger children washing hands after using the toilet and before eating.
- Each sink should be supplied with soap and access to paper towels.
- Educate students and staff about good hand washing techniques.
- If soap and water are not available, use an alcohol-based hand sanitizer with at least 60% alcohol; although alcohol-based hand sanitizer is not as effective as soap and water.
- Post signs to remind all persons in the facility to practice frequent hand washing.
- Persons cleaning areas that are heavily contaminated with vomit or feces should wear disposable gloves and face masks.
- Clean up vomit and fecal spillages promptly and carefully so that the release of virus into the air is minimized. Properly dispose of vomit or feces in a toilet and disinfect the surrounding area with a bleach-based cleaner (see next page for cleaning and disinfecting).
- If it is possible, immediately remove and wash clothing or linens that may be contaminated with vomit or feces. Handle soiled items as little as possible, without agitating them. Launder with an approved detergent in hot water of at least 160°F for at least 25 minutes. Dry in a hot dryer if fabric allows. If laundry is not done at your facility, place soiled linens in a plastic bag and seal or tie the bag.

## Recommendations for Administrators/Staff

- Any staff member with symptoms of norovirus infection should be sent home and must not return until they are no longer symptomatic for 48 hours. Kitchen staff (foodhandlers) should not return to work until they remain symptom-free for 72 hours.
- Symptomatic food handlers must not prepare or serve food for others under any circumstances.
- Staff who interact with or assist sick students or clean up vomit or feces must wash hands thoroughly after each encounter.
- Administrative or student health staff at the school should track the number of ill students and staff in a daily sick log.
- Post hand hygiene signage in the bathrooms for students and staff.
- Cancel or postpone group activities (i.e. outings, field trips, parties, etc.) until the outbreak is over.
- Maintain the same staff to assigned classrooms to limit the spread of infection. Floating staff should be assigned exclusively to either well or sick classrooms until the outbreak is over.
- Non-essential staff and parents should not visit the school until the outbreak is over.

## Recommendations for Students

- Any student with symptoms of norovirus infection should be sent home and must not return until they are no longer symptomatic for 48 hours.
- Students must wash their hands thoroughly after using the bathroom and before eating.

## Cleaning and Disinfecting Environmental Surfaces

During an outbreak, routine classroom, bathroom, and toilet cleaning should occur with increased frequency, especially common-use bathrooms.

- Before the disinfection process:
  - + Spot test disinfectant solutions; disinfectants can discolor or corrode surfaces.
  - + Protect yourself from norovirus aerosols and disinfectant by wearing personal protective equipment (PPE): disposable gloves and a facemask.
  - + Clean surfaces with visible debris
- After cleaning, disinfect with diluted chlorine bleach or a U.S. Environmental Protection Agency (EPA)-approved disinfectant.
  - + EPA-registered disinfectants should be used according to manufacturers' instructions, including the use of proper PPE recommended by the manufacturer when applying the product. For a list of EPA-registered disinfectants see: [http://www.epa.gov/oppad001/list\\_g\\_norovirus.pdf](http://www.epa.gov/oppad001/list_g_norovirus.pdf).
  - + Diluted chlorine bleach mixture (see next page for instructions on disinfecting with chlorine bleach).

### High-risk surfaces

- "High touch" surfaces such as faucets, toilets, floors, tables, toys, toilet rails, counters, phones, tables, chairs, sleeping mats, walls, hand rails, doorknobs, elevator buttons, phones, light switches, and ice machines require frequent cleaning.

### Non-porous surfaces/Hard surfaces

- Examples include: bath rails, chairs (all wooden, plastic, and steel parts), counters, doorknobs, elevator buttons, faucets, handrails, light switches, phones, tables, toilets, sinks, etc.)
- Disinfect with chlorine bleach; rinse with water for food preparation areas.

### Porous surfaces: Carpets/Upholstered Furniture

- Examples include carpets and upholstered chairs and sofas.
- Visible debris should be cleaned with absorbent material (double layer) and discarded in a plastic bag to minimize airborne particles.
- Steam clean (heat inactivation) 158° F for 5 minutes or 212° F for 1 minute for complete inactivation. Disinfecting with bleach may discolor carpets and/or upholstered furniture.

### Cleaning large spills of vomit or feces

- Visible/organic debris should be removed carefully to minimize airborne particles. Use double-layered absorbent material and discard in a sealed plastic bag.
- Liberally disinfect area and objects surrounding the contamination with an appropriate environmental disinfectant (multiple applications may be required).
- Ensure appropriate dilution and contact time for the environmental disinfectant.

### Disinfecting with Chlorine Bleach

#### Chlorine bleach concentrations and mixing instructions

Food/mouth contact items, toys	Most non-porous surfaces	Heavily contaminated non-porous surfaces
1 tablespoon of bleach in 1 gallon water (1:250 dilution)	1/3 cup bleach in 1 gallon water (1:50 dilution)	1 and 2/3 cups bleach in 1 gallon water (1:10 dilution)

#### Contact time

Leave bleach on surface for 10-20 minutes and then rinse thoroughly with clean water.

#### Stability of Chlorine Bleach

- + Once opened, bottles of household bleach will lose effectiveness after 30 days.
- + Use a new unopened bottle of bleach every 30 days for preparing diluted disinfectant solutions.
- + Prepare a fresh dilution of bleach daily and discard unused portions.

## Other disinfectants

- Phenolic-based disinfectants (e.g., Pinesol or Lysol) are effective but may require concentrations of 2-4 times the manufacturer's recommendations for routine use.
- Heat disinfection [to 140° F (60°C)] is suggested for items like upholstery and carpet that cannot be cleaned with chemical disinfectants such as chlorine bleach.
- Quaternary ammonium compounds, often used for sanitizing food preparation surfaces and disinfecting large surfaces such as countertops or floors, are **not** effective against noroviruses.

## Resources:

1. CDC. Norovirus in Healthcare Facilities – Fact Sheet, available at <http://www.cdc.gov/HAI/organisms/norovirus.html>, (accessed 16 August 2011).
2. CDC. Division of Viral Disease, Norovirus, available at <http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus.htm> (accessed 16 August 2011).
3. Philadelphia Department of Public Health, “Controlling the Spread of Norovirus in Schools and Childcare Settings– Interim Recommendations from the Philadelphia Department of Public Health, February 10, 2011”, available at [https://hip.phila.gov/xv/Portals/0/HIP/Disease\\_Info/Norovirus/PDPHGuidelines\\_ControllingSpreadNorovirus\\_SchoolsChildcareSettings\\_021011.pdf](https://hip.phila.gov/xv/Portals/0/HIP/Disease_Info/Norovirus/PDPHGuidelines_ControllingSpreadNorovirus_SchoolsChildcareSettings_021011.pdf) (accessed 16 August 2011).