

NOROVIRUS

Also known as: Norwalk-like virus, viral gastroenteritis

Responsibilities:

Hospital: Report all potential outbreaks, send stool specimens with specific request for norovirus testing. State Hygienic Laboratory (SHL) is the only laboratory in the state that can test for Noroviruses.

Lab: Report all potential outbreaks; send stool specimens with specific request for norovirus testing. State Hygienic Laboratory (SHL) is the only laboratory in the state that can test for Noroviruses.

Physicians: Report all potential outbreaks,

Local Public Health Agency (LPHA): Report all potential outbreaks of norovirus, send stool specimens with specific request for norovirus testing.

Iowa Department of Public Health

Disease Reporting Hotline: (800) 362-2736

Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Noroviruses (genus *Norovirus*, family *Caliciviridae*) are a group of related, single-strand RNA, nonenveloped viruses that cause acute gastroenteritis in humans. Norovirus was recently approved as the official genus name for the group of viruses formerly described as "Norwalk-like viruses" (NLV), or "small round viruses."

B. Clinical Description

Symptoms: The symptoms of norovirus illness usually include nausea, vomiting, diarrhea, and some stomach cramping. Sometimes people have a low-grade fever, chills, headache, muscle aches, and a general sense of fatigue. The illness often begins suddenly, and the infected person may feel very sick. The illness is usually brief, with symptoms lasting only about 1 - 2 days. In general, children experience more vomiting than adults.

Onset: Symptoms of norovirus illness usually begin about 24 - 48 hours after ingestion of the virus, but they can appear as early as 12 hours after exposure.

Complications: Dehydration may result in persons with norovirus disease, which may require hospitalization. There are no known long-term effects.

C. Reservoirs

Humans are the only known reservoir.

D. Modes of Transmission

Noroviruses are very contagious and spread easily from person to person. It is believed that an inoculum of as few as 10 viral particles may be sufficient to infect another individual.

Norovirus may be transmitted in a variety of ways:

- most commonly through the fecal-oral route, either by consumption of fecally contaminated food or water or by direct person-to-person spread
- by environmental and fomite contamination acting as a source of infection
- by transmission due to aerosolization of vomitus that presumably results in droplets contaminating surfaces or entering the oral mucosa and being swallowed.

E. Incubation period

The symptoms of norovirus appear about 24 - 48 hours after ingestion of the virus, but can appear as early as 12 hours after exposure.

F. Period of Communicability or Infectious Period

People infected with norovirus can be contagious from the moment they begin feeling ill, until several days after symptoms end. The virus can be shed for two weeks or more after recovery, although it is unclear whether virus shedding during this time is infectious. Infected people do not become long-term carriers of norovirus.

G. Epidemiology

Norovirus is common worldwide, and is mostly associated with sporadic outbreaks. All age groups are affected. Norovirus is the most common cause of acute gastroenteritis in the United States. Each year, it causes 19-21 million illnesses and contributes to 56,000-71,000 hospitalizations and 570-800 deaths. Norovirus is also the most common cause of foodborne-disease outbreaks in the United States.

In Iowa, noroviruses cause the majority of foodborne illness outbreaks. Rough, wet, uncooked foods are at highest risk of transmission. Most foodborne outbreaks of norovirus illness arise from direct contamination of food by those who handle the food before it is eaten. Outbreaks have frequently been associated with consumption of cold foods, including salads, sandwiches, and bakery products.

There have been also been outbreaks associated with persons vomiting and aerosolizing virus in public settings. Waterborne outbreaks of norovirus have been caused by sewage contamination of wells and recreational water. Diapered children playing in "kiddie" pools filled with tap water (pools that have not been chlorinated) have also been associated with norovirus outbreaks.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To determine the cause of illness
- To implement appropriate disease control measures

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must immediately report suspected or confirmed outbreaks.

- The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736.
- To reach CADE after business hours, call the Iowa State Patrol Dispatch Office at (515) 323-4360. They will page a member of the on-call CADE staff.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) performs PCR testing for Norovirus. The preferred specimen is stool.

- Stool specimens should be collected in a clean collection container for transport.
 - It is best to not have stool specimens in Cary Blair medium when testing for norovirus.
- Specimens should be shipped with ice packs (not wet ice).
- Specimens should be sent by overnight delivery, and the lab notified of their expected arrival time.
- Samples are best collected within two days after onset of symptoms, but may be tested up to one week after the onset of symptoms.
- A completed non-respiratory disease laboratory requisition form (found at www.shl.uiowa.edu/kitsquotesforms/) is required.
 - A contact person and telephone number must be included along with a brief explanation of the reason for sending the specimens (e.g., suspected foodborne outbreak at School, in Atro City, IA).
- For additional information contact the SHL at (319) 335-4500.

If stool specimens are sent to a laboratory using typical clinic/hospital procedures, tests for norovirus will not be performed. If norovirus testing is indicated, specimens should be sent to SHL.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation:

- Individual norovirus infections are not reportable.
- Disease reporting regulations require that suspected or confirmed outbreaks, including norovirus, be reported to local public health agencies by the most rapid means available within 24 hours.
- When an outbreak is first reported, the disease-causing agent and specific exposure may not be known.
 - An investigation is initiated to identify the causative organism and source of illness, with the goal of preventing further spread.
 - Investigation should begin as soon as the outbreak is identified.
 - Since this illness is mild, cases may not seek medical care.
 - The LPHA may be responsible for collecting stool specimens.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Standard and Contact Precautions should be taken when caring for diapered or incontinent persons for the duration of illness or to control institutional outbreaks.

B. Protection of Contacts of a Case

- Frequent and thorough handwashing
- Cleaning contaminated surfaces, including carpets.

C. Managing Special Situations

Child care

General recommendations for prevention of norovirus spread in child care settings include:

- Children with suspected or confirmed norovirus infection who have diarrhea or are vomiting should be excluded until 24 hours after both diarrhea and vomiting have ceased.
- Most staff members in child care programs would be considered food handlers.
 - Child care staff members who handle food and have diarrhea and/or vomiting must be excluded from food handling duties until 48 hours after their diarrhea and vomiting cease.
 - Child care staff can go back to non-food handling activities 24 hours after diarrhea and vomiting have ceased.
- Child care staff members who do not handle food should be excluded until 24 hours after diarrhea and vomiting have ceased.
- Educate child care staff members, parents, and children on proper hand washing technique.
 - There is scientific uncertainty over the effectiveness of alcohol-based hand gels against norovirus.
 - Thus, IDPH always recommends washing hands with soap and warm water.
 - Alcohol based hand gels should only be used in situations where soap and warm water are not available.

During norovirus outbreaks in child care settings, consider the general guidance listed above, as well as, the following recommendations.

- Consider providing notification (i.e. send letter, post a notice) on norovirus and recommendations for how parents, staff, and children can prevent spread of the disease.
 - Refer to IDPH *Parent Letter for Child care Center Norovirus Outbreaks*.
- Increase frequency of routine cleaning.
 - Examples of areas to disinfect include: doorknobs, fountains, sinks, toilets, phones, counters, desks, handrails, and light switches.
 - Toys should be cleaned and disinfected daily.
 - Refer to IDPH *Norovirus Environmental Cleaning Fact Sheet* for appropriate cleaning methods.
- Ensure restrooms are adequately stocked with soap, paper towels, and warm running water.
- Local public health agencies should request stool specimens from 3-5 of the ill individuals to send to SHL to confirm the cause of the outbreak.
- Cohorting ill and well children may be indicated in special circumstances; contact CADE for consultation prior to making this decision.

School

General recommendations for prevention of norovirus spread in school settings include:

- Students and staff with suspected or confirmed norovirus infection who have diarrhea or are vomiting should be excluded until 24 hours after both vomiting and diarrhea have ceased.
- Any staff (or students who may assist with food preparation or serving) who handles food and has diarrhea and / or vomiting must be excluded from food handling activities until 48 hours after diarrhea and vomiting have ceased.
 - Staff can go back to non-food handling activities 24 hours after diarrhea and vomiting have ceased.
- Educate staff members, parents, and students on proper hand washing technique.
 - There is scientific uncertainty over the effectiveness of alcohol-based hand gels against norovirus.
 - Thus, IDPH always recommends washing hands with soap and warm water.

- Alcohol based hand gels should only be used in situations where soap and warm water are not available.

During norovirus outbreaks in school settings, consider the general guidance listed above, as well as, the following recommendations.

- Consider sending a letter home with students for parents that provides basic information on norovirus and recommendations on how they can help prevent spread of the disease.
 - Refer to the sample IDPH *Parent Letter for School Norovirus Outbreaks*.
- Increase frequency of routine cleaning.
 - Examples of areas to disinfect include: doorknobs, fountains, sinks, toilets, phones, counters, desks, handrails, and light switches.
 - If applicable, toys should be cleaned and disinfected daily.
 - Refer to IDPH *Norovirus Environmental Cleaning Fact Sheet* for appropriate cleaning methods.
- Temporarily stop using self service foods for school breakfast/lunch.
- Ensure restrooms are adequately stocked with soap, paper towels, and warm running water.
- Local public health agencies should request stool specimens from 3-5 of the ill individuals to send to SHL to confirm the cause of the outbreak.

Community Residential Programs

Actions taken in response to a norovirus outbreak in a community residential program will depend on the type of program and the level of functioning of the residents.

General recommendations for the prevention of disease spread include:

- Residents with suspected or confirmed norovirus should be placed on enteric precautions until their symptoms subside.
- Staff members with suspected or confirmed norovirus infection should not work until 24 hours after vomiting and diarrhea have ceased.
- Staff and clients with suspected or confirmed norovirus must refrain from handling or preparing food for other residents until 48 hours after vomiting or diarrhea has stopped.
- Educate staff members, residents, and visitors on proper hand washing technique.
 - There is scientific uncertainty over the effectiveness of alcohol-based hand gels against norovirus.
 - Thus, IDPH always recommends washing hands with soap and warm water.
 - Alcohol based hand gels should only be used in situations where soap and warm water are not available.

Consult CADE at (800) 362-2736 regarding additional actions that can be considered during outbreaks in community residential programs.

Hospital and Long-term Care Facility Recommendations

General recommendations for prevention of norovirus spread in hospital and long-term care facilities include:

- Place ill patients in private rooms or cohort ill patients in the same room.
- Consider grouping ill patients in the same area or wing of the facility.
- Minimize un-necessary movement of residents.
- Consider temporarily discontinuing group activities until the outbreak has resolved.
- Consider serving meals in resident rooms versus the dining hall.
- Educate staff members, residents, and visitors on proper hand washing technique.
 - There is scientific uncertainty over the effectiveness of alcohol-based hand gels against norovirus.

- Thus, IDPH always recommends washing hands with soap and warm water.
- Alcohol based hand gels should only be used in situations where soap and warm water are not available.
- Send all ill staff home immediately.
- Staff should not return to duties for 24 hours following cessation of diarrhea and/or vomiting.
 - Education on proper hand hygiene should be emphasized upon return to work.
- Staff should wash their hands when entering and leaving every resident room.
- Patients with suspected norovirus infection should be managed with standard and contact precautions with careful attention to hand hygiene practices.
- Contact precautions should be used when caring for diapered or incontinent persons, during outbreaks in a facility, and when a splash could occur.
- Persons cleaning areas heavily contaminated with vomitus or feces should wear surgical masks.
- Food handlers who are ill with gastrointestinal symptoms SHOULD NOT prepare or serve food until 48 hours following cessation of diarrhea and/or vomiting.
- Educate staff members, residents, and visitors on proper hand washing technique.
 - There is scientific uncertainty over the effectiveness of alcohol-based hand gels against norovirus.
 - Thus, IDPH always recommends washing hands with soap and warm water.
 - Alcohol based hand gels should only be used in situations where soap and warm water are not available.
- Medical equipment used for care of norovirus infected patients, should be either dedicated to that patient for the duration of patient's isolation or be thoroughly disinfected when removed from the patient's room.
 - Selection of appropriate cleaning agent should be consistent with the equipment manufacturer's recommendation for compatibility.
 - Refer to IDPH *Norovirus Environmental Cleaning Fact Sheet* for appropriate cleaning methods.

During norovirus outbreaks in hospital and long-term care facilities, consider the general guidance listed above, as well as, the following recommendations.

- Collect stool specimens from 3-5 residents/patients to confirm norovirus is the cause of the outbreak.
- Staff should be assigned to work with well residents or with sick residents, and should not care for both groups.
 - Staff who go back and forth between ill and well residents play an important role in transmitting the virus from resident to resident.
- Limit staff from moving between affected and unaffected areas or units of the facility and limit any nonessential personnel from affected areas or units.
 - To the extent possible, keep staff from "floating" between areas or units.
- Consider limiting new admissions to the affected areas or units until all patients are well and no new cases are occurring.
- Inform visitors about a possible disease outbreak in your facility.
 - Consider limiting or stopping visitation to the facility until there have been no new cases for at least 48 hours.
- Post extra hand washing signs in various visible areas in the facility.

Note: Refer to [Iowa's Foodborne Illness Outbreak Investigation Manual](http://www.idph.state.ia.us/idph_universalhelp/main.aspx?system=IdphFoodborneDiseaseManual) available at www.idph.state.ia.us/idph_universalhelp/main.aspx?system=IdphFoodborneDiseaseManual

D. Preventive Measures

Environmental Measures

Implicated food items should be removed from the environment. A decision about testing implicated food items should be made in consultation with the Department of Inspections and Appeals, CADE, and the SHL. The general policy of the SHL is to test only food samples implicated in suspected outbreaks, not in single cases (except in unusual circumstances). If individuals want food tested that does not meet these criteria, refer them to a commercial laboratory, where they will be responsible for payment.

The Department of Inspections and Appeals (DIA), or their contracted agency, will facilitate additional environmental investigations at restaurants or food processors that they regulate.

Preventive Measures/Education

There is scientific uncertainty over the effectiveness of alcohol-based hand gels against norovirus. Thus, IDPH always recommends washing hands with soap and warm water. Alcohol based hand gels should only be used in situations where soap and warm water are not available.

The following preventive steps should be encouraged to decrease the risk of contracting and spreading noroviruses:

- Wash hands frequently, especially after using the toilet or changing diapers (wash the child's hands after diapering too), and before eating or preparing food.
- Carefully wash fruits and vegetables.
- Steam or otherwise cook oysters before eating them.
- Thoroughly clean and disinfect contaminated surfaces immediately after an episode of illness using a solution of 1/4 cup bleach per gallon of water, or other household cleaner.
- Immediately remove and wash clothing or linens that may be contaminated with virus after an episode of illness.
- Flush or discard vomitus and/or stool in the toilet, and make sure the surrounding area is kept clean.

See Fact Sheet – **Norovirus Environmental Cleaning** for detailed information.

Persons who are infected with norovirus should not prepare food until 48 hours after the last bout of vomiting or diarrhea.

4) ADDITIONAL INFORMATION

References

CDC website: www.cdc.gov/norovirus/

Heymann, D.L., ed. *Control of Communicable Diseases Manual, 20th Edition*. Washington, DC, American Public Health Association, 2015.