

DPHHS HAN

From: DPHHS HAN
Sent: Thursday, February 25, 2010 4:31 PM
Subject: DPHHS HAN ADVISORY 2010-9: VIRAL GASTROENTERITIS OUTBREAKS
Attachments: CDC noro-factsheet.pdf; DPHHS Norovirus LTCF Guidelines.pdf; NoroHealthcareFacilitiesFact Sheet.pdf; Chlorine Solution Updated 2008.pdf

State of Montana DPHHS HAN ADVISORY

Forwarding Instructions:

FORWARD to your local HAN contacts

DPHHS Information / Recommendations:

VIRAL GASTROENTERITIS OUTBREAKS

Montana is currently experiencing increased levels of norovirus activity, particularly among residents of long-term care facilities and assisted living centers. Since January 1, 2010, a total of 5 different outbreaks occurring in 5 separate Montana communities have sickened approximately 165 residents and staff. Additionally, there have been reports and confirmed cases in 6 counties around the state.

Recommendations

1. Increase active surveillance activities to detect outbreaks and clusters of gastrointestinal illness promptly
2. Share "Guidelines for the Control of Suspected or Confirmed Outbreaks of Viral Gastroenteritis (Norovirus) in Long Term Care Facilities with facilities in your jurisdiction.
3. Consider providing educational information regarding the prevention of norovirus information to the public.

Background

Montana typically incurs an average of seven outbreaks per year in healthcare facilities that can be attributed to either a norovirus or another viral agent. Diarrheal disease outbreaks occurring in an institutional setting are reportable to the local health department and DPHHS.

DPHHS has specific guidelines and recommendations for the control of suspected or confirmed outbreaks of viral gastroenteritis (e.g., norovirus) in long-term care facilities. You are encouraged to share this information among your staff, and to forward it healthcare facilities in your jurisdiction for their benefit. Additionally, local public health authorities may want to consider expanding their active surveillance efforts to include long-term care facilities and other group living settings.

For more information on norovirus: http://www.cdc.gov/ncidod/diseases/submenus/sub_norwalk.htm.

Attached for your information:

1. CDC Technical Fact Sheet on noroviruses

2. DPHHS Guidelines for the Control of Suspected or Confirmed Outbreaks of Viral Gastroenteritis (Norovirus) in Long Term Care Facilities
3. DPHHS Norovirus Healthcare Facility Fact Sheet
4. Updated DPHHS Chlorine Solution Dilution Recommendations.

DPHHS Subject Matter Expert (SME) Contact:

DPHHS Communicable Disease Epidemiology Program 406.444.0273

**Distributed by the Department of Public Health and Human Services
Health Alert Network (HAN) System**

DPHHS Health Alert Hotline: 1-800-701-5769

DPHHS HAN Website: www.han.mt.gov

You have received this message based upon the information contained within our emergency notification data base. If you have a different e-mail or fax address that you would like us to use please notify us as soon as possible by e-mail at hhshan@mt.gov.

The goal of Montana's Health Alert Network is to transmit information to local public health authorities as quickly as possible, and assign a suitable priority to the message. For questions or comments about Montana's HAN system you may contact the DPHHS HAN Coordinator, Gerry Wheat at gwheat@mt.gov.

Categories of Health Alert Messages:

Health Alert: conveys the highest level of importance; warrants immediate action or attention.

Health Advisory: provides important information for a specific incident or situation; may not require immediate action.

Health Update: provides updated information regarding an incident or situation; unlikely to require immediate action.

MIXING AND USE OF BLEACH AS A DISINFECTANT

	500 ppm (0.05%)	1,000 ppm (0.1%)	5,000 ppm (0.5%)
Exact Dilution Bleach* : Water	1:100	1:50	1:10
Household Measure Dilution	2 ½ tablespoons (1/6 cup) bleach in a gallon of water	1/3 cup (5 tablespoons T) bleach in a gallon of water	1 2/3 cup (25 T) bleach in a gallon of water
Usage	<input type="checkbox"/> Small blood spill <input type="checkbox"/> CPR training manikins <input type="checkbox"/> SARS environmental contamination	<input type="checkbox"/> Norovirus**	<input type="checkbox"/> Norovirus** <input type="checkbox"/> Large blood spill (after cleaning) <input type="checkbox"/> <i>Clostridium difficile</i>

* Based on use of 5.25% liquid bleach AND use within 24 hours

** Higher concentration for disinfection of environment contaminated with large amount of vomit / feces, *after cleaning*

Chlorine solutions in tap water at a pH >8 stored at room temperature in closed, opaque plastic containers can lose 40-50% of their free available chlorine level over 1 month. Therefore, in order to have a solution containing 500 ppm of available chlorine at 30 days, one must prepare a solution containing 1000ppm to start with.

Chlorine solutions should only be used on hard, non-porous surfaces

References

1. CDC Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008 (<http://www.cdc.gov/ncidod/dhqp/sterile.html>)
2. Norovirus Outbreak in an Elementary School – District of Columbia – February 2007 (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5651a2.htm>)



Noroviruses

Noroviruses (genus *Norovirus*, family *Caliciviridae*) are a group of related, single-stranded RNA, nonenveloped viruses that cause acute gastroenteritis in humans. Norovirus was recently approved as the official genus name for the group of viruses provisionally described as “Norwalk-like viruses” (NLV). This group of viruses has also referred to as caliciviruses (because of their virus family name) and as small round structured viruses, or SRSVs (because of their morphologic features). Another genus of the calicivirus family that can cause gastroenteritis in humans is *Sapovirus*, formerly described as “Sapporo-like virus” (SLV) and sometimes referred to as classic or typical calicivirus.

Noroviruses are named after the original strain “Norwalk virus,” which caused an outbreak of gastroenteritis in a school in Norwalk, Ohio, in 1968. Currently, there are at least four norovirus genogroups (GI, GII, GIII and GIV), which in turn are divided into at least 20 genetic clusters.

Clinical Presentation

The incubation period for norovirus-associated gastroenteritis in humans is usually between 24 and 48 hours (median in outbreaks 33 to 36 hours), but cases can occur within 12 hours of exposure. Norovirus infection usually presents as acute-onset vomiting, watery non-bloody diarrhea with abdominal cramps, and nausea. Low-grade fever also occasionally occurs, and vomiting is more common in children. Dehydration is the most common complication, especially among the young and elderly, and may require medical attention. Symptoms usually last 24 to 60 hours. Recovery is usually complete and there is no evidence of any serious long-term sequelae. Studies with volunteers given stool filtrates have shown that asymptomatic infection may occur in as many as 30% of infections, although the role of asymptomatic infection in norovirus transmission is not well understood.

Virus Transmission

Noroviruses are transmitted primarily through the fecal-oral route, either by consumption of fecally contaminated food or water or by direct person-to-person spread. Environmental and fomite contamination may also act as a source of infection. Good evidence exists for transmission due to aerosolization of vomitus that presumably results in droplets contaminating surfaces or entering the oral mucosa and being swallowed. No evidence suggests that infection occurs through the respiratory system.

Noroviruses are highly contagious, and it is thought that an inoculum of as few as 10 viral particles may be sufficient to infect an individual. During outbreaks of norovirus gastroenteritis, several modes of transmission have been documented; for example, initial foodborne transmission in a restaurant, followed by secondary person-to-person transmission to household contacts. Although presymptomatic viral shedding may occur, shedding usually begins with onset of symptoms and may continue for 2 weeks after

recovery. It is unclear to what extent viral shedding over 72 hours after recovery signifies continued infectivity.

Immunity to Norovirus

Mechanisms of immunity to norovirus are unclear. It appears that immunity may be strain-specific and lasts only a few months; therefore, given the genetic variability of noroviruses, individuals are likely to be repeatedly infected throughout their lifetimes. This may explain the high attack rates in all ages reported in outbreaks. Recent evidence also suggests that susceptibility to infection may be genetically determined, with people of O blood group being at greatest risk for severe infection.

Disease burden of Norovirus Gastroenteritis

CDC estimates that 23 million cases of acute gastroenteritis are due to norovirus infection, and it is now thought that at least 50% of all foodborne outbreaks of gastroenteritis can be attributed to noroviruses.

Among the 232 outbreaks of norovirus illness reported to CDC from July 1997 to June 2000, 57% were foodborne, 16% were due to person-to-person spread, and 3% were waterborne; in 23% of outbreaks, the cause of transmission was not determined. In this study, common settings for outbreaks include restaurants and catered meals (36%), nursing homes (23%), schools (13%), and vacation settings or cruise ships (10%).

Most foodborne outbreaks of norovirus illness are likely to arise through direct contamination of food by a food handler immediately before its consumption. Outbreaks have frequently been associated with consumption of cold foods, including various salads, sandwiches, and bakery products. Liquid items (e.g., salad dressing or cake icing) that allow virus to mix evenly are often implicated as a cause of outbreaks. Food can also be contaminated at its source, and oysters from contaminated waters have been associated with widespread outbreaks of gastroenteritis. Other foods, including raspberries and salads, have been contaminated before widespread distribution and subsequently caused extensive outbreaks.

Waterborne outbreaks of norovirus disease in community settings have often been caused by sewage contamination of wells and recreational water.

Diagnosis of Norovirus

Human. In the last 10 years, diagnosis of norovirus illness in outbreaks has improved with the increasing use of reverse transcriptase polymerase chain reaction (RT-PCR). Currently, 27 state public health laboratories have the capability to test for noroviruses by RT-PCR. RT-PCR can be used to test stool and emesis samples, as well as to detect the presence of noroviruses on environmental swabs in special studies. Identification of the virus can be best made from stool specimens taken within 48 to 72 hours after onset of symptoms, although good results can be obtained by using RT-PCR on samples taken as long as 5 days after symptom onset. Virus can sometimes be found in stool samples taken as late as 2 weeks after recovery.

Older methods for diagnosis include direct and immune electron microscopy of fecal specimens, and detection of a fourfold increase of specific antibodies in acute- and convalescent-phase blood samples. An enzyme-linked immunosorbent assay for detection of virus in stools is under development.

Sequencing of noroviruses found in clinical samples has helped in conducting epidemiologic investigations by linking cases to each other and to a common source and by differentiating outbreaks that were mistakenly connected. Sequences can be entered into CaliciNet, a database used to store the different sequences of norovirus that cause disease throughout the United States, thereby allowing rapid assessment of the relationships between strains.

In addition to microbiological techniques, several epidemiologic criteria have been proposed for use in determining whether an outbreak of gastroenteritis is of viral origin. Kaplan's criteria for this purpose are as follows: 1) a mean (or median) illness duration of 12 to 60 hours, 2) a mean (or median) incubation period of 24 to 48 hours, 3) more than 50% of people with and 4) no bacterial agent previously found." Although quite specific, these criteria are not very sensitive, and therefore the possibility of a viral etiology should not be discarded if the criteria are not met.

Environmental. Assays to detect virus in food need to be adapted for each food substance; these have been only rarely used, with the exception of assays to detect virus in shellfish. Water can be tested for noroviruses by using RT-PCR to detect virus when large volumes of water are processed through specially designed filters.

Management of Norovirus Infection

No specific therapy exists for viral gastroenteritis. Symptomatic therapy consists of replacing fluid losses and correcting electrolyte disturbances through oral and intravenous fluid administration.

Prevention

Prevention of foodborne norovirus disease is based on the provision of safe food and water. Noroviruses are relatively resistant to environmental challenge: they are able to survive freezing, temperatures as high as 60°C, and have even been associated with illness after being steamed in shellfish. Moreover, noroviruses can survive in up to 10 ppm chlorine, well in excess of levels routinely present in public water systems. Despite these features, it is likely that relatively simple measures, such as correct handling of cold foods, frequent handwashing, and paid sick leave, may substantially reduce foodborne transmission of noroviruses.

Surveillance of Norovirus Infection in the United States

CDC currently does not conduct active surveillance to monitor outbreaks of gastroenteritis caused by noroviruses. Outbreaks are reported to CDC's Viral Gastroenteritis Section, Respiratory and Enteric Viruses Branch, Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases (NCID) when states send

specimens for testing or sequencing, or outbreaks are reported directly by states to the database maintained by the Foodborne Diarrheal Diseases Branch, Division of Bacterial and Mycotic Diseases, NCID.

Recently, a system called CaliciNet has been developed on the basis of the PulseNet model. CaliciNet is a database of norovirus sequences identified from outbreaks of norovirus that can then help to determine links between outbreaks. For further details please email calicinet@cdc.gov



Fact Sheet

Norovirus in Healthcare Facilities Fact Sheet

Released February 2007

General Information

Virology

Noroviruses (genus *Norovirus*, family *Caliciviridae*) are a group of related, single-stranded RNA, non-enveloped viruses that cause acute gastroenteritis in humans. *Norovirus* was recently approved as the official genus name for the group of viruses provisionally described as "Norwalk-like viruses" (NLV). Currently, human noroviruses belong to one of three norovirus genogroups (GI, GII, or GIV), each of which is further divided into >25 genetic clusters.

Clinical manifestations

The average incubation period for norovirus-associated gastroenteritis is 12 to 48 hours, with a median of approximately 33 hours. Illness is characterized by acute-onset vomiting; watery, non-bloody diarrhea with abdominal cramps, and nausea. In addition, myalgia, malaise, and headache are commonly reported. Low-grade fever is present in about half of cases. Dehydration is the most common complication and may require intravenous replacement fluids. Symptoms usually last 24 to 60 hours. Volunteer studies suggest that up to 30% of infections may be asymptomatic.

Epidemiology of transmission

Noroviruses are highly contagious, with as few as 100 virus particles thought to be sufficient to cause infection. Noroviruses are transmitted primarily through the fecal-oral route, either by direct person-to-person spread or fecally contaminated food or water. Noroviruses can also spread via a droplet route from vomitus. These viruses are relatively stable in the environment and can survive freezing and heating to 60°C (140°F). In healthcare facilities, transmission can additionally occur through hand transfer of the virus to the oral mucosa via contact with materials, fomites, and environmental surfaces that have been contaminated with either feces or vomitus.

Diagnosis of norovirus infection

Diagnosis of norovirus infection relies on the detection of viral RNA in the stools of affected persons, by use of reverse transcription-polymerase chain reaction (RT-PCR) assays. This technology is available at CDC and most state public health laboratories and should be considered in the event of outbreaks of gastroenteritis in healthcare facilities. Identification of the virus can be best made from stool specimens taken within 48 to 72 hours after onset of symptoms, although good results can be obtained by using RT-PCR on samples taken as long as 7 days after symptom onset. Other methods of diagnosis, usually only available in research settings, include electron microscopy and serologic assays for a rise in titer in paired sera collected at least three weeks apart. Commercial enzyme-linked immunoassays are available but are of relatively low sensitivity, so their use is limited to diagnosis of the etiology of outbreaks. Because of the limited availability of timely and routine laboratory diagnostic methods, a clinical diagnosis of norovirus infection is often used, especially when other agents of gastroenteritis have been ruled out.

Measures to Limit Transmission

Isolation precautions

Patients with suspected norovirus infection should be managed with [Standard Precautions](#) with careful attention to hand hygiene practices. However, [Contact Precautions](#) should be used when caring for diapered or incontinent persons, during outbreaks in a facility, and when there is the possibility of splashes that might lead to contamination of clothing. Persons cleaning areas heavily contaminated with vomitus or feces should wear surgical masks as well. In an outbreak setting, it may be prudent to place patients with suspected norovirus in private rooms or to cohort such patients.

Environmental disinfection

CDC recommends either chlorine bleach or U.S. Environmental Protection Agency (EPA) approved disinfectants for use in controlling norovirus outbreaks. All disinfectants should be used on clean surfaces for maximum performance. Please see the U.S. Environmental Protection Agency (EPA) website for a list of hospital disinfectants registered by the EPA with specific claims for activity against noroviruses. It should be noted that evidence for efficacy of disinfectants against norovirus are usually based on data of efficacy against feline calicivirus (FCV) as a surrogate for norovirus. However, feline calicivirus (a virus of the respiratory system in cats) has different physio-chemical properties to norovirus and there is debate on how well data on inactivation of FCV reflects efficacy against norovirus.

Chlorine bleach should be applied to hard, non-porous, environmental surfaces at a minimum concentration of 1000 ppm (generally a dilution 1 part household bleach solution to 50 parts water) This concentration has been demonstrated in the laboratory to be effective against surrogate viruses with properties similar to those of norovirus. Healthcare facility staff should use appropriate PPE (e.g. gloves and goggles) when working with bleach. In areas with high levels of soiling and resistant surfaces, up to 5000 ppm chlorine bleach may be used.

EPA-approved disinfectants should be used according to manufacturers' instructions.

Quaternary ammonium compounds are often used for sanitizing food preparation surfaces or disinfecting large surfaces (e.g., countertops and floors). However, because noroviruses are non-enveloped virus particles, most quaternary ammonium compounds (which act by disrupting viral envelopes) do not have significant activity against them.

Phenolic-based disinfectants have been shown to be active against noroviruses in the laboratory. However, this activity may require concentrations 2- to 4-fold higher than manufacturer recommendations for routine use.

Heat disinfection (i.e., pasteurization to 60°C (140°F)) has been suggested, and used successfully under laboratory conditions, for items that cannot be subjected to chemical disinfectants such as chlorine bleach.

***Note: The use of trade names and commercial sources is for information purposes only and does not constitute endorsement by CDC, the U.S. Public Health Service (PHS), or the Department of Health and Human Services (DHHS).**



Guidelines for the Control of Suspected or Confirmed Outbreaks of Viral Gastroenteritis (Norovirus) in Long Term Care Facilities

The following guidelines and recommendations have been developed to help stop the spread of viral gastroenteritis (norovirus) in long term care facilities. Facilities should be made aware that these viruses are highly contagious and can cause large outbreaks that are difficult to contain. Strict adherence to these preventive measures is necessary. These measures should be continued until the outbreak is over, i.e., when no signs or symptoms exist for five days within facility.

1. Isolate ill residents from others by confining them to their rooms until three days after their last symptoms. Group ill persons together if possible. Suspend activities where ill and well residents would be together. Group activities should be kept to a minimum, or postponed.
2. Exclude from work ALL staff that are ill with nausea, vomiting or diarrhea. Ill staff should remain away from work for a minimum of three days following the disappearance of symptoms.
3. Conduct staff meetings to educate staff on enteric precautions, isolation measures, personal hygiene, disinfection, handwashing, glove use, linen handling, proper laundering, droplet precautions for vomitus, and avoiding aerosolization of virus.
4. Ill residents should be served meals in their room. Discontinue self-service in the cafeteria/dining room to minimize food handling by residents.
5. Minimize the flow of staff between sick and well residents. Staff should be assigned to work with either well or sick residents, but should not care for both groups. (Staff who go between ill and well residents, or who work on multiple units or wings, play an important role in transmitting the virus from resident to resident.)
6. Staff should wear gloves when caring for ill residents or when touching potentially contaminated surfaces. Gloves should be discarded and hands washed **immediately** after completing patient care.
7. Staff should wash their hands when entering and leaving **every** resident room.
8. Masks should be worn when caring for residents who are vomiting
9. Designate cleaning teams to clean all surfaces (e.g., handrails, doorknobs, faucets, bath rails, PT/OT equipment etc.) with an appropriate germicidal product. Continue with twice daily cleaning of surfaces and objects by housekeeping.
10. It may be prudent to restrict visitations and to suspend new admissions (particularly compromised individuals) until the outbreak is over.

Nursing units should immediately report any residents or staff members with symptoms of viral gastroenteritis to the appropriate administrator, and notify their local health department. Facilities should instruct staff to document in the chart any reports of nausea, vomiting or diarrhea. New cases should be recorded daily using a case log to help with the outbreak investigation (name, age, room #, onset date, symptoms, duration of illness, etc.) Health Department staff can provide consultation or assistance, and also arrange for laboratory testing of residents and staff.