



Focus on LTC/behavioral health outbreaks— Identify the pathogen: Norovirus

BY STEVEN J. SCHWEON, RN, MPH, MSN, CIC, HEM, FSHEA

“Norovirus is the most common cause of acute gastroenteritis in the United States. Annually, it’s responsible for 19–21 million illnesses and contributes to 56,000–71,000 hospitalizations and 570–800 deaths.”²

Hospital outbreaks are reported more often in the medical literature than outbreaks in the long-term care (LTC)/behavioral health setting. By studying and learning from outbreaks in the LTC/behavioral health setting, infection preventionists (IPs) will glean additional knowledge and apply this information to hopefully prevent future infections, and infection clusters in their facilities. This column will assist the IP with heightening awareness of appropriate interventions for preventing an outbreak.

Weber et al.¹ described an outbreak of loose/watery stools, nausea, abdominal pain, vomiting, and fever among patients and staff on a hospital-based, locked inpatient pediatric behavioral health unit that admits patients 6 to 12 years of age. Ultimately, three of the four patients, 10 of the 38 permanently assigned staff, three staff members who were temporarily assigned, and five family members developed gastroenteritis. The index (first) case was incontinent and wore diapers; he also frequently smeared feces on environmental surfaces.

Stool samples are negative for rotavirus, *Salmonella*, *Shigella*, *E. coli* 0157:H7, *Campylobacter*, *Yersinia*, *Giardia*, and *Cryptosporidium*. Based on your education and training, you strongly suspect:

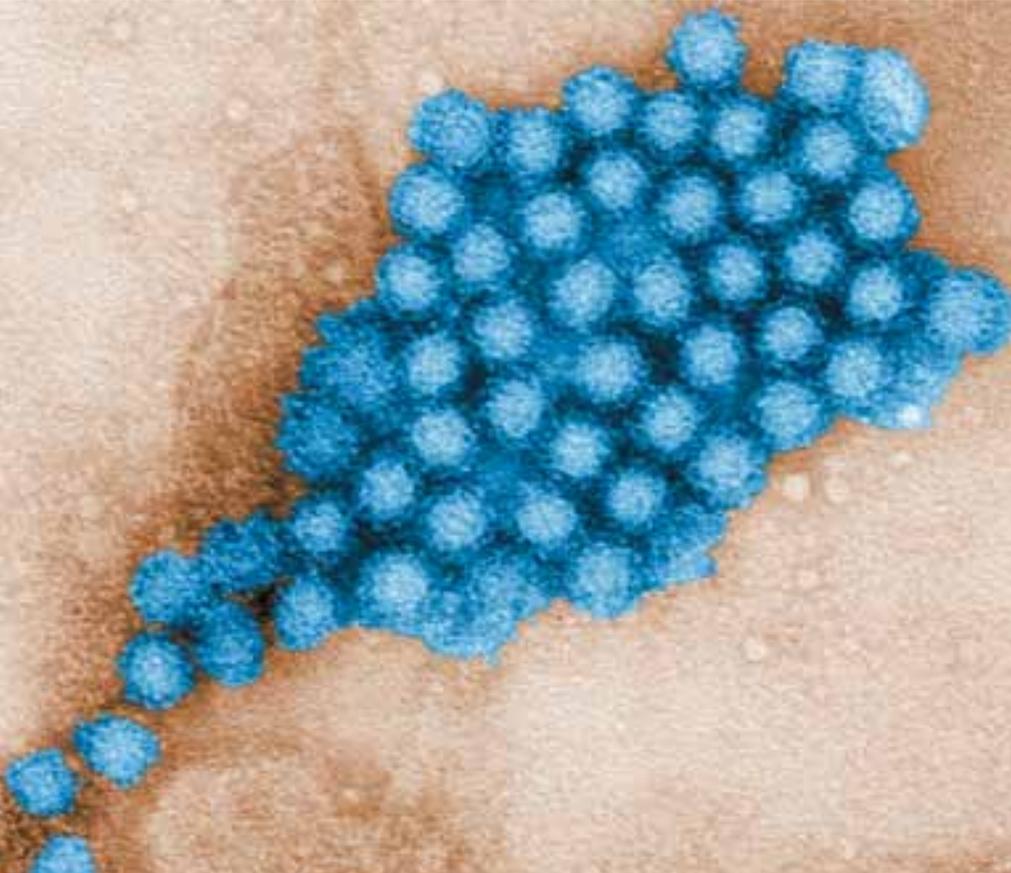
- ① *Vibrio cholerae* (cholera)
- ② Hepatitis A
- ③ Amebiasis
- ④ Norovirus

Stool samples from the index patient and two staff members were positive for norovirus by reverse transcription polymerase chain reaction (RT-PCR).

Due to the index case’s psychiatric disorder, it was difficult to confine the patient to his room.¹ The unit was closed to all admissions. All ill staff members were given sick leave. Hand hygiene was performed with soap and water, rather than with alcohol-based hand rub. Employees were not allowed to eat or drink on the unit. All staff, upon entering the unit, performed hand hygiene and wore gloves and a disposable gown. The unit was extensively cleaned and disinfected with a bleach solution. Because of these actions, resolution of the outbreak was swift.

Norovirus is the most common cause of acute gastroenteritis in the United States. Annually, it’s responsible for 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.²

Norovirus was named after the original Norwalk strain, where a gastrointestinal outbreak occurred in a school in Norwalk, Ohio, during 1968. More than 25 different norovirus genotypes have been identified that affect humans.³



LEFT: This transmission electron micrograph (TEM) revealed some of the ultrastructural morphology displayed by Norovirus virions, or virus particles.

Transmission occurs through close personal contact with an infected individual, or the fecal-oral route, when contaminated food or water is ingested. Touching contaminated surfaces, objects, and substances can also spread the virus. Norovirus can also be transmitted through aerosolized vomit, where the virus can enter a susceptible person's mouth and be swallowed. It's possible for an infected person to shed norovirus before having symptoms. The shedding continues while ill, and may continue for two or more weeks after recovery.

The virus is highly contagious, where as few as 18 particles can infect an individual; once infected, an individual can shed billions of viral particles.³ The norovirus incubation period ranges between 24 to 48 hours.

Symptoms include nausea, vomiting, diarrhea, abdominal pain, fever, cephalgia, and myalgia. The clinical course generally persists for one to three days. There is no specific, antiviral medication available. Treatment includes replacing fluid loss from vomiting and diarrhea, and correcting electrolyte imbalances. Antimotility medications may be helpful in older children and adults, especially when used with rehydration therapy.⁴

The real-time reverse transcriptase-polymerase chain reaction (RT-qPCR) is the most widely used diagnostic assay for detecting norovirus genetic material in the stool, vomitus, and environmental specimens.⁴ The optimal approach to detect the virus is within 48–72 hours after symptom onset.⁴

The Centers for Disease Control and Prevention (CDC) recommends that during outbreaks, staff should perform hand hygiene with soap and water after removing personal protective equipment.⁵ CDC also recommends initiating contact precautions in a single room for patients with suspected norovirus gastroenteritis and cleaning and disinfecting surfaces with a chlorine bleach solution or other disinfectants registered as effective against norovirus by the Environmental Protection Agency (EPA).⁶

Employees may come to work despite being ill (presenteeism); thus, enforce your sick leave policy to prevent additional transmission to patients and staff. Restrict ill employees from returning to work for a minimum of 48 hours after resolution of symptoms.⁵

TAKE-HOME MESSAGES FOR THE BEHAVIORAL HEALTH INFECTION PREVENTIONIST

1. Managing a gastroenteritis outbreak on a behavioral health unit can be very challenging. Additional human capital and infection prevention supplies may be needed to prevent further transmission.
2. Report all gastroenteritis outbreaks to your local health department.
3. Separate ill patients from asymptomatic patients on the milieu.
4. Consider suspending group therapy, new admissions, and visitors during an outbreak.
5. Increase the frequency of environmental cleaning and disinfection.
6. Cautiously handle and wear personal protective equipment when handling soiled clothing or linens that may be contaminated with vomitus or feces.
7. Refer to CDC's norovirus guidelines for managing an outbreak.⁶
8. Ensure your facility has signage that promotes hand hygiene, respiratory etiquette, and asking visitors not to visit when ill. 



Steven J. Schweon, RN, MPH, MSN, CIC, HEM, FSHEA, is an infection prevention consultant with a specialized interest in acute care/long-term care/behavioral health/ambulatory care infection challenges, including outbreaks.

References

1. Weber DU, Sickbert-Bennett EE, Vinje J, Brown VM, MacFarquhar JK, EngelJP, and Rutala WA. Lessons learned from a norovirus outbreak in a locked pediatric inpatient psychiatric unit. *Infect Control Hosp Epidemiol* 2005 (26):841-843.
2. Centers for Disease Control and Prevention. Norovirus. Overview. Available at: www.cdc.gov/norovirus/about/overview.html. Accessed December 12, 2014.
3. Centers for Disease Control and Prevention. Norovirus. Clinical Overview. Available at: www.cdc.gov/norovirus/hcp/clinical-overview.html. Accessed December 12, 2014.
4. Centers for Disease Control and Prevention. Norovirus. Laboratory diagnosis and treatment. Available at: www.cdc.gov/norovirus/hcp/diagnosis-treatment.html. Accessed December 13, 2014.
5. Centers for Disease Control and Prevention. Guideline for the prevention and control of norovirus gastroenteritis outbreaks in healthcare settings. Available at: www.cdc.gov/hicpac/pdf/norovirus/Norovirus-Guideline-2011.pdf. Accessed December 13, 2014.
6. Centers for Disease Control and Prevention. Norovirus. Preventing Norovirus infection. Available at: www.cdc.gov/norovirus/preventing-infection.html. Accessed December 13, 2014.