

Management of Norovirus Infection Outbreaks in Hospitals and Nursing Homes

Noroviruses are a group of viruses that cause acute gastroenteritis in humans. Norovirus was recently approved as the official genus name for the viruses previously known as the "Norwalk-like viruses".

Every year thousands of cases of norovirus infections occur in the community, particularly during the winter months. The CDC estimates that 23 million cases of norovirus infection occur in the U.S annually. Every year thousands of cases occur in schools, on cruise ships, and in group homes or residential living facilities and nursing homes. Since noroviruses circulate widely in the community, attempts to circumvent their introduction into hospitals and nursing homes are unrealistic. Because the infection is often mild and only lasts a few days, affected individuals rarely seek medical attention. However, when outbreaks occur in hospitals or nursing homes among patients and/or staff, inconvenience can be great and costs can be substantial. Norovirus outbreaks can result in ward and/or hospital closures and temporary staff absenteeism that can adversely affect medical treatments.

Noroviruses are virulent and illness can occur following a very low infectious dose. Illness is characterized by nausea, sudden onset of projectile vomiting (particularly in children), watery, non-bloody diarrhea, abdominal cramping, chills, body aches and fatigue. Dehydration is a common complication, especially in children and the elderly. The duration of illness is usually two to three days, but body aches and fatigue may persist for several more days.

The virus is typically transmitted to individuals by the fecal-oral route from fecally contaminated food or water, person-to-person contact or contact with contaminated fomites. In recent institutional outbreaks, airborne transmission via vomiting has been proposed as facilitating rapid spread of infection. Once noroviruses are introduced onto a ward or floor, the infection may spread rapidly throughout the facility despite cohorting and measures to limit the spread of the infections.

To assist in the decision-making process for hospitals and nursing homes when these infections occur, the Bureau of Communicable Diseases, Division of Public Health has compiled a list of "recommended, but not required" control measures developed from experience with management of previous hospital outbreaks. The actions taken by different hospitals or nursing homes may vary with the number of cases and extent of spread within the facility.

Early (or Initial) control measures

- Once an index case presents within a ward, immediate isolation of the patient and the immediate area is essential.
- Patients entering the hospital with symptoms suggestive of norovirus infections should be admitted directly to a private room until an alternative cause of illness is established.
- The infection control staff should be immediately notified about the onset of the first case.
- Infection control staff should meet daily to monitor the outbreak and evaluate control measures.
- Reinforce enteric precautions and guidelines to all staff members.
- Staff should be reminded that **proper** hand washing after all patient contact (washing with warm running water and soap for at least 10 seconds) is the most effective way of reducing person-to-person spread of infection. In the absence of running water, alcohol gel may be used unless hands are grossly soiled.
- The local health officer should be immediately notified once an outbreak is suspected.
- Potential cases should be confirmed as soon as possible. Arrangements should be made with the local health officer to have stool specimens (collected in Enteric Kit #10) sent to the Wisconsin State Laboratory of Hygiene for norovirus PCR analysis.
- Symptomatic patients or residents should be cohorted.
- If an outbreak continues consider closing the facility to new admissions.
- Affected staff must be restricted from patient contact for 48 hours after cessation of symptoms.

Control of transmission at the ward level

- Unfortunately, by the time the outbreak has been recognized on a ward, it is likely the majority of susceptible patients and staff on duty may have been exposed to the infected agent, particularly if vomiting is a widespread symptom.
- Gloves, masks and gowns should be worn whenever contact with an infected patient or contaminated environment is anticipated.
- Affected wards or floors should be closed to new admissions and visitors to prevent the introduction of other susceptible individuals.
- "Airborne" transmission may be a significant contributor to the number of cases since projectile vomiting could potentially create infectious aerosols. Air currents generated by open windows or air conditioning could disperse aerosols widely. Air currents should be minimized.
- Affected wards should remain closed until a 48-hour period has passed with no new cases among patients or staff.
- Non-essential staff should be excluded from affected clinical areas.

- Minimizing the risk of transmission from vomiting may be difficult. The following measures may be useful and are recommended:
 - removal of exposed foods such as bowls of fruit
 - rapid cleaning and disinfection of areas where vomiting has occurred with a 0.1% hypochlorite solution (made fresh daily)
 - administration of anti-emetics
 - thorough cleaning regimen on all affected wards

Prevention of spread to other areas

- Transfers of patients from affected wards to other institutions or departments should be prohibited unless medically necessary.
- Allow for a 5 day clearance period in the patient if the affected patient is being discharged to a nursing home or long term care facility and 48 hours if returning to their own home.
- Restrict staff movement between wards, especially into infected areas.
- Staff working in affected areas should not work in unaffected areas for 48 hours after the end of a shift. This does not apply to staff who recently recovered.
- Whenever possible, essential staff should be dedicated to the infected areas only.
- If movement between infected areas and uninfected areas is unavoidable, the uninfected should be visited before the infected areas.
- Patient movement between wards and communal gatherings should be restricted.
- If it is necessary on clinical grounds to transfer patients to another ward, appropriate isolation precautions should be undertaken on the receiving ward.
- Expect staff shortages and plan ahead (infection control team).

Cleaning and disinfection

- Immediate cleaning and disinfection of contaminated areas are vital in controlling the spread of noroviruses. It is essential that those responsible for cleaning and disinfecting contaminated surfaces have adequate protective clothing and equipment to minimize the possibility of spread of infection among staff.
- Contaminated and potentially contaminated linen (adjacent beds) and removable fabrics should be immediately and carefully collected in plastic garbage bags and laundered. Exposed consumables, such as fruit, should be discarded.
- Contaminated bedding should be placed carefully into laundry bags without generating further aerosols. Minimize the number of staff handling this material.
- Contaminated pillows should also be laundered as infected linen unless they are covered with an impermeable cover, in which case they should be disinfected with a 0.1% hypochlorite solution.

- Contaminated hard surfaces should be washed with soap and water (using a disposable cloth), then disinfected with a 0.1% hypochlorite solution. Non-disposable mop heads should be discarded.
- Noroviruses may remain viable for up to 12 days in carpeting or other environmental surfaces. Therefore, a thorough cleaning of carpets, curtains, walls and all equipment is essential. Steam cleaning should be used for carpets and soft furnishings. Vacuum cleaning of carpets and buffing floors during an outbreak have the potential to re-circulate the viruses.
- Particular attention should be given to cleaning objects that are frequently handled such as taps, door handles, and toilet and bath rails. These areas should be cleaned and disinfected at least twice daily with a 0.1% hypochlorite solution.
- Toys in pediatric wards should be disinfected daily.
- Enhanced cleaning and disinfection should continue for at least 72 hours after the last documented case.

Communications

- Information regarding the outbreak status and control measures should be disseminated to all staff members on a daily basis.
- Other areas (radiology, physiotherapy, etc.) or wards should be alerted of problems early to alert staff on those wards.
- Notify visitors by signs or other visible communications about the existence of an outbreak and what precautionary measures should be followed.
- Early in the investigation notify other hospitals or health care facilities in the area about the outbreak.
- When an outbreak is or is likely to be significant, designate a media contact person. Once the media becomes involved it might be helpful to update press statements as needed.

Visitors

- Visitors, particularly the young or elderly, should be discouraged during an outbreak.

After the outbreak

- Two-week enhanced surveillance for new cases following the last known case.
- Meeting among the infection control committee to evaluate and enhance the initial control measures if future norovirus outbreaks occur.

References

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This overview of the management of norovirus outbreaks in hospitals and nursing homes was compiled by the Wisconsin Division of Public Health, Bureau of Communicable Diseases, Communicable Disease Epidemiology Section, February 2004.