

Norovirus infections in health care settings

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Noroviruses (NoVs) are the leading cause of gastrointestinal (GI) illness worldwide. NoVs cause an acute illness characterized by vomiting, diarrhea, cramping, and fever. Symptoms most often appear between 24 and 48 hours after exposure, are self-limiting, and typically resolve within 24 to 72 hours. NoV, unlike other viral GI microorganisms, infects individuals across all

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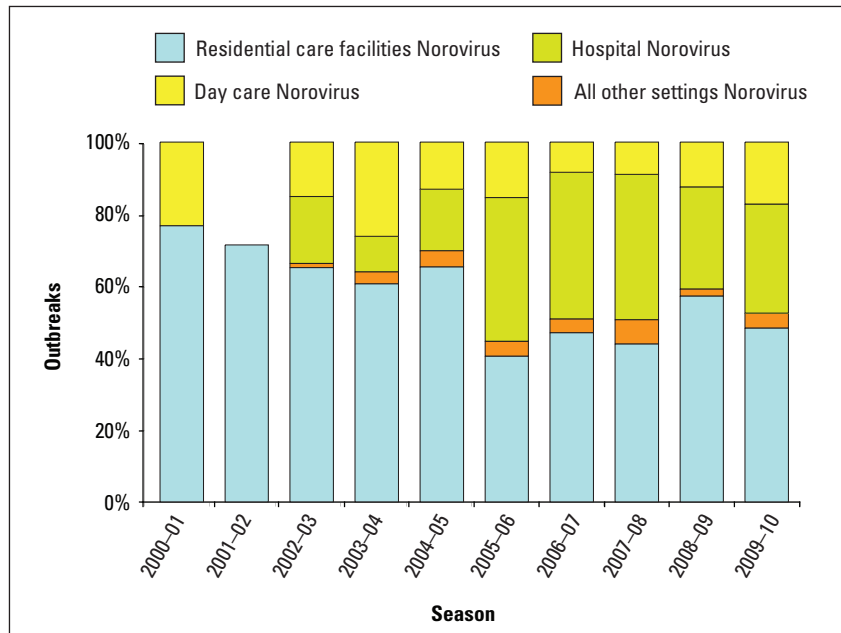


Figure. Confirmed Norovirus outbreaks (tested at BCPHML) in British Columbia by facility type, 2000–2010. Other settings include food establishments, correctional facilities, events, camps, cruise ships, and schools.

age ranges. As such, outbreaks of NoV occur in many settings, including hospitals, residential care facilities, day cares, schools, restaurants, and cruise ships. Spread of NoV is primarily through person-to-person transmission, after contamination of surfaces such as doorknobs, or through ingestion of contaminated food and water. Transmission may also occur due to aerosolization of vomitus. NoV is extremely contagious; infected persons shed high levels of virus and the infectious dose is as low as 10 virions. It is also persistent in the environment and on surfaces and resistant to some of the hospital-grade disinfectants routinely used. NoV outbreaks occur yearround but more frequently in colder months.

Laboratory confirmation of NoV infection generally serves three main purposes: identification of the out-

break etiological agent, surveillance, and for infection prevention and control. In general, samples (stool or vomitus) should only be tested for facility infection prevention and control purposes or as part of an outbreak investigation.¹⁻³ An outbreak is defined as three or more cases of GI illness, potentially related, occurring within a 4-day period and within a specific geographic area (i.e., unit, ward, restaurant, event, cruise ship).

In 2010 BCCDC Public Health Microbiology and Reference Laboratory (BCPHMRL) received nearly 1000 specimens from 242 outbreaks. Outbreaks most commonly occurred in residential care facilities (48%), hospitals (31%), and day cares (4%). Other settings such as food establishments and events accounted for 17% of outbreaks as noted in the **Figure**.

Continued on page 149

Continued from page 119

The majority of these outbreaks (73%) were caused by NoV, and DNA sequencing at the BCPHMRL showed that 80% of those were caused by GII.4 variants of NoV, the most common variant worldwide. This strain is known to predominate in health care and residential care facilities, likely

but should not replace hand washing with soap and water where readily available. Hands must be washed if visibly soiled. Contaminated surfaces may be cleaned then disinfected using bleach at a concentration of 1000 ppm (20 mL household bleach diluted in 1 L of water). Alternatively, accelerated hydrogen peroxide, a cleaner/

Exclude health care providers with NoV symptoms from work until 48 hours after resolution of symptoms to minimize the risk of transmission. The use of these precautions minimizes the transmission of NoV within health care settings.

Work was performed at BCCDC Public Health Microbiology and Reference Laboratory and BC Provincial Infection Control Network.

Alcohol-based sanitizers at high-alcohol concentrations are effective at inactivating NoV, but should not replace hand washing with soap and water where readily available.

due to a replicative advantage, low infectious dose, and high genetic variability. The high genetic variability of NoV, particularly in the antigenic region of the virus, means that immunity to reinfection with GII.4 in subsequent outbreaks and future prospects for a vaccine are unlikely.

The best prevention for NoV infection is practising frequent and diligent hand hygiene. Alcohol-based sanitizers at high-alcohol concentrations are effective at inactivating NoV,

disinfectant, may be used.² In health care settings (including physician offices), patients with suspected NoV infections should be placed away from other patients (i.e., in private rooms) or cohorted with other patients with NoV infection. Group activities should be curtailed, food sharing should be prohibited, gowns and gloves should be worn, and frequent hand hygiene must be practised when caring for affected patients. Wear facial protection if the patient is actively vomiting.

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