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Epidemiology and Public Health Practice in WA

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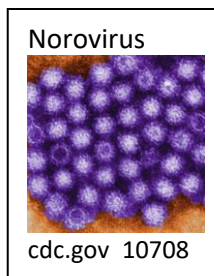
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Norovirus Infection

Norovirus infection is the most common cause of acute gastroenteritis (vomiting and/or diarrhea) in the United States. The Centers for Disease Control and Prevention (CDC) estimate is that 19-21 million illnesses occur each year in this country.

Background

Norovirus (and related viruses) are strictly human pathogens. After an incubation period that ranges from 12-48 hours, the illness is characterized by an abrupt onset of vomiting and/or diarrhea which may be accompanied by abdominal cramps, muscle aches, headache and low-grade fever. Some people who become infected with norovirus remain asymptomatic. Although generally a mild illness, norovirus infection can result in severe dehydration which can be severe or even fatal to the very young, the elderly, and persons with underlying illnesses such as those affecting the immune system. Immunity after a norovirus infection is likely short-term, so an individual can be infected more than once.



Both symptomatic and asymptomatic persons infected with norovirus can transmit norovirus to others, and both feces and vomitus of an infected person contain virus. Contagiousness peaks during acute illness but can last for four or more weeks. The virus can spread from one person to another directly (e.g., by a handshake), through contaminated food or water, or environmentally (e.g., through aerosolization of vomit). Persistence of the virus in the environment can be extensive, lasting over a week in water or on surfaces. If a person touches a surface with viral contamination and then eats without hand washing, through self-inoculation they can become infected.



Scott Lindquist, MD, MPH
 State Epidemiologist,
 Communicable Disease

Marcia J. Goldoft, MD
 Scientific Editor

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Surveillance for Norovirus

Norovirus infections are quite common. Because health care providers are not required to report patients diagnosed with norovirus in Washington State to public health agencies, there are no statistics on how many individual cases are occurring at any given time.

Nationally, multiple sources of data are used to estimate the number of norovirus infections, with an emphasis on reporting outbreaks:

System:	NORS	CaliciNet	NoroSTAT	NREVSS
Type of system	State, local, and territorial health departments	Federal, state and local public health laboratories	14 state health departments (not Washington)	Participating clinical and state laboratories
Type of reports	Outbreaks	Outbreaks and individual cases	Outbreaks	Individual cases
Data collected	Clinical and epidemiologic data	Genotypes and basic epidemiologic data	Minimum set of laboratory and epidemiologic data	Total number of tests and number of positive tests

<https://www.cdc.gov/norovirus/php/reporting/cdc-systems.html>

These outbreak reports, laboratory results, and case data from certain public health departments are used to assess current and past norovirus activity. As with any surveillance system, multiple factors can affect the completeness of reporting and the estimates derived from the reports.

Norovirus Outbreaks

Approximately 2,500 norovirus outbreaks are reported to CDC every year. Norovirus outbreaks occur year-round, but the majority occur between November and April when norovirus infections peak in the United States.

While single norovirus infections are not notifiable in Washington, suspected or confirmed norovirus outbreaks should be reported to the local health jurisdictions, which will determine any additional actions. Local health jurisdictions report these outbreaks to the Washington State Department of Health Office of Communicable Disease Epidemiology.

Investigating norovirus outbreaks can protect the public by:

- Preventing transmission from the case (e.g., certain work exclusions)
- Identifying and controlling the source of exposure
- Recommending remediation for affected food prep areas

Norovirus has multiple potential routes of transmission. Most norovirus outbreaks can be categorized by the following transmission types:

- Person-to-person: Norovirus outbreaks are common in congregate settings including long-term care or healthcare facilities, schools, childcare centers, camps, shelters or cruise ships. An initial case vomiting in a common area can result in multiple additional cases. In the United States over half of all norovirus outbreaks reported occur in long-term care facilities where outbreaks can be difficult to control and sometimes last months through continued episodes of transmission.

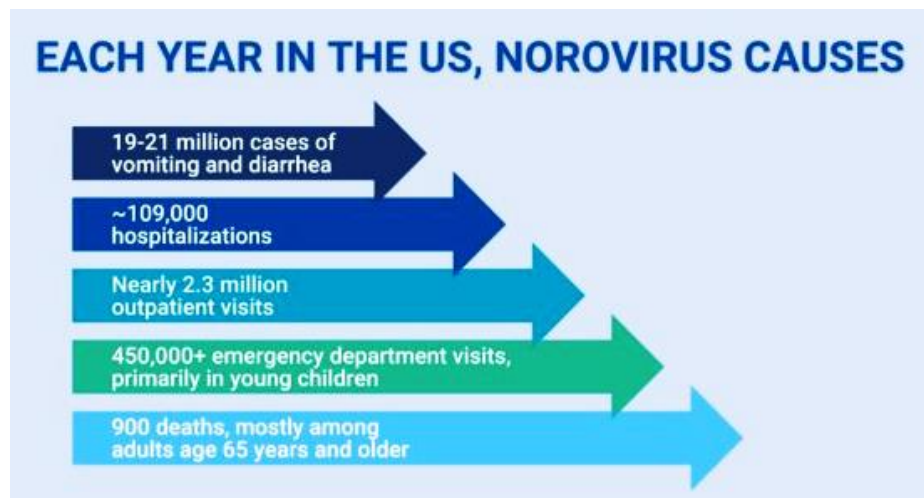
- **Foodborne:** Food service workers who work while ill or shortly after recovering from norovirus infection are a common cause of foodborne norovirus outbreaks because they can easily contaminate ready-to-eat food with un-washed, un-gloved hands during the period they are shedding huge amounts of virus. Consumption of raw bivalves (especially oysters) is another common source of foodborne norovirus outbreaks. These outbreaks occur when bivalve harvest areas are contaminated with human waste from shore sources such as leaking septic and wastewater systems or from ill boaters and beach-goers. Finally, raw produce (especially leafy greens and fresh fruit) can be a source of foodborne norovirus outbreaks when irrigation water is contaminated or the produce is handled by ill farm workers or food processors.
- **Waterborne:** In Washington, there have been several suspected and confirmed norovirus outbreaks associated with treated and untreated recreational water, some involving over a hundred known cases. Someone swimming while contagious for norovirus can contaminate recreational water with feces or vomitus, which is then swallowed by other swimmers. Drinking water from surface water or shallow wells can also become contaminated and be the source of norovirus outbreaks.
- **Mixed transmission:** These are outbreaks where there is more than one transmission mechanism. For example, norovirus may be introduced into a congregate living setting by an ill food worker who contaminates food and causes a foodborne outbreak. The virus can then spread person-to-person within the facility.

The Washington Integrated Food Safety Center of Excellence has developed a norovirus outbreak management toolkit for use by local health jurisdictions or facilities. There are tools available including checklists for investigation of outbreaks in long-term care or healthcare facilities and in schools or childcare centers, as well as forms and guidance documents (see Resources). The Washington State Department of Health Office of Communicable Disease Epidemiology is available to provide additional assistance.

Resources

CDC norovirus data: <https://www.cdc.gov/norovirus/data-research/index.html>

Norovirus Outbreak Management Toolkit: <https://foodsafetycoe.org/product/1531/>



<https://www.nfid.org/infectious-disease/norovirus/>