

# Norovirus: An Infectious Cause of Montezuma's Revenge

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Cruise ship passengers may have believed they were the latest victims of the Aztec emperor's curse when multiple outbreaks of gastroenteritis hit the industry especially hard last year. Modern medicine has determined an infection with Norovirus, previously known as Norwalk virus, was the true cause of the travelers' malady. The NPHL has developed molecular tests capable of detecting this virus. Why would a public health laboratory in a land locked state hundreds of miles from an ocean need to offer this test? This article details more specific facts about Norovirus.

## What are Noroviruses?

Noroviruses are a family of viruses that cause gastroenteritis (*i.e.* stomach flu) but are not related to influenza viruses which cause respiratory illness. Noroviruses are found all over the world, infecting all age groups. Current data suggest the viruses are the most common cause of diarrheal-type illness in humans. Interestingly, less than 10% of Norovirus outbreaks are associated with vacations, while most are associated with restaurants or catered events, health care facilities such as nursing homes, and schools or day cares.

Noroviruses were originally named "Norwalk viruses," after an outbreak of gastroenteritis in a school in Norwalk, Ohio, in 1968. The virus has also been referred to as a Calicivirus. Caliciviruses are a large group of viruses that are small and round in structure. Subsequent work by molecular virologists has confirmed that the virus belongs to the Calicivirus Family but is distinct and thus the International Committee on Taxonomy of Viruses has renamed the organism Norovirus. There are four distinct genotypes of Noroviruses that differ slightly in their genetic makeup but are all capable of causing disease.

## What are the symptoms?

Infections with Norovirus generally present suddenly with nausea, vomiting, diarrhea, and stomach cramping. Some people experience a low-grade fever, chills headache, muscle aches, and fatigue. Symptoms usually begin 24 to 48 hours after ingestion of the virus and subside within 1 to 4 days. Generally, there are no long term health effects, although dehydration may require medical attention.

## How do people become infected?

Noroviruses are present in the stool or vomit of infected people. One can become infected in several ways, including: eating food or drinking liquids that are contaminated with the virus, touching contaminated surfaces or objects and then placing one's fingers in the mouth, or direct contact with an infected person (sharing food or utensils with someone who is ill). It is important to remember that this illness is very contagious and good hand washing and proper hygiene prevents the virus from spreading. In addition, it is recommended that people not prepare food for others until three days after symptoms have passed.

## Can you get Norovirus again?

Yes. Little is known about immunity to Norovirus infections; however, people can be infected repeatedly, most likely due to a combination of a lack of lasting immunity and the large diversity of circulating Norovirus strains.

## How is Norovirus detected?

Norovirus cannot be cultured, thus, other methods must be used to detect this pathogen. For years, electron microscopy was the only method available, however, laboratories now use Polymerase Chain Reaction (PCR) amplification specific for the virus's genetic material. For this type of testing, a portion of stool or vomitus (1 mL minimum) should be collected during the acute phase and sent frozen in appropriate packaging. Testing can also be performed on food suspected of being contaminated.

## Why test for Norovirus?

While no vaccine can prevent infection and no drug can cure Norovirus, the value of testing lies in identifying the cause of illness and taking measures to prevent its spread.

If physicians or laboratorians suspect that an outbreak of Norovirus is occurring they should contact their County Health Officials or Dr. Tom Safranek the State Epidemiologist. Researchers at the Centers for Disease Control and Prevention in Atlanta have developed a molecular test to characterize an outbreak strain and determine its extent. Therefore, a specimen that is positive at the NPHL may be submitted to the CDC at the request of epidemiology. Through comparison of the nucleotide sequences of PCR products, a genetic "fingerprint" of sorts, it is possible to confirm whether the strain detected in a food sample or food handler is identical to that of ill patients. Using this approach, a link can be established between ill patients from different geographical locations and a specific distributed food. For more information about Norovirus, please visit the CDC website (<http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus.htm>).