# Norovirus – The Cruise Ship Revenge Bug?

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By now it has become clear that Norovirus is back and in full force on cruise ships. Based on the latest CDC data by the VSP (Centers for Disease Control and Prevention, 2023), as of June 2023 there were already 13 outbreaks and that is just with those cruise ships under the US authority. Since you have probably heard about “Montezuma’s Revenge,” do we now have a “Cruise Ship Revenge” disease? Before we answer that question, let us look at why Norovirus is so transmissible and what we can do about it.

First, the norovirus is a gastrointestinal illness affecting your stomach or intestines. These organs will get inflamed, resulting in pain, throwing up, diarrhea and nausea. Those that had it will tell you that it is not pleasant. So, why do we have Norovirus outbreaks so often on cruise ships? Cruise ships are big, confined, and contained spaces, with many people living closely together. In such a situation, when you have a highly transmissible disease, it has many potential victims. However, we must also realize that officials track illnesses on cruise ships, so reporting happens quickly, and the news picks up on that because it is “news.”

## *Headline: Cruise Ship Outbreak*

But make no mistake, Norovirus illness is all around us because it is a leading cause of foodborne diseases and often happens without us knowing about it. Most often, individual cases are not reported, the person does not seek medical help, and the “news” does not take notice. Nevertheless, about 1 in every 15 people (USA) will get sick every year with Norovirus. (National Foundation for Infectious Diseases, 2023).

On cruise ships, as on land, you have essentially two sources for the disease: one is a sick person; the other one is contaminated food. As mentioned above, the virus is released by a person in a rather dramatic form, diarrhea and throwing up. Both are sometimes very “explosive” ways of release and will create infectious particles (aerosols) that settle on surfaces and, if touched by others, can be transferred to the mouth. Consequently, we have a classical way of surface transmission. The other way is food contamination in for example shellfish, fruits, or vegetables. We know that shellfish like oysters are filter feeders, and the virus will accumulate if the water is contaminated with sewage (e.g., diarrhea + virus). If eaten raw, you have a shellfish outbreak opportunity (Centers for Disease Control and Prevention, 2023). The primary source for Norovirus is fecal material that contaminates surfaces and other fomites or is a direct transmission from an infected person.

Noroviruses are environmentally persistent and can stick around for a while. That ability and the fact that these are non-enveloped viruses makes them more difficult to deactivate with disinfectants is also not helping. In addition, the virus has high infectivity (Teunis, 2020) since it only takes very few viral particles to make you sick potentially. We also call that a very low infectious dose. In addition, there are no approved vaccines available. It is not surprising that an editorial commentary written by Aron J. Hall in the *Journal of Infectious Diseases (Hall, 2012)* was titled, ***“****Noroviruses: The Perfect Human Pathogens?****”***

## Norovirus Is A Significant Cause Of Worldwide Morbidity And Mortality

We must realize that Norovirus is a significant cause of worldwide morbidity and mortality. CDC estimates include 685 million cases annually and 200 million cases in children under five years of age, with an estimated 50,000 child deaths (Centers for Disease Control and Prevention, 2023). It is also estimated that Norovirus illness costs $60 billion yearly due to healthcare costs and lost productivity.

That brings us back to the original question: Is Norovirus the Cruise ship revenge bug? Looking at the statistics, the chance of getting the disease in the US for an adult is approximately 1 in 15 (6.6%) during a year. It is estimated that catching the disease is lower on a cruise. However, the latest cruise ship cases (2023) show an upward trend and resulted in over 6% cases within passengers per cruise with an outbreak. So yes, if you have contaminated food on a cruise ship or sick people coming on board, the disease can spread quickly, and your risk of getting infected will rise. It might not be “revenge,” but indeed very unpleasant and potentially dangerous.

## We Do Not “Kill” Viruses

Good hand hygiene is one of the most profound and effective measures against Norovirus. Haven’t we heard that before? It never gets old. Washing your hands if you handle food, after touching potentially contaminated surfaces and objects, and avoiding touching your mouth with dirty hands can all help. Remember, washing your hands with soap and warm water has the primary purpose of removing the virus. Soap and water do not deactivate Norovirus, and to be clear, the virus cannot be killed! Not because it is so hardy, but you do not kill something that is not alive. Since the virus is not a living thing, we destroy it or deactivate it, or dissemble it, or make it non-infectious, and so on. We do not “kill” viruses.

The key is to use strong disinfectants to deactivate the virus on surfaces. Use products that have documentation to show they were tested and approved. In the US, the EPA has an approved Norovirus disinfectant list (US EPA, 2023).

What about sanitizers with alcohol? On the one hand, alcohol-based sanitizers have a better effect on removing viruses if used on surfaces as part of wiping (Faircloth, 2022), while alcohol-based hand sanitizers might be of limited effectiveness; however, if that is the only thing you have, use it copiously and wipe it off to aid in the removal of the virus. As the CDC says: “*Hand sanitizer does not work well against norovirus”,* with the **emphasis being on not working well.**

So, keep a watch out for these nasty enteric diseases, stay home when you are sick and keep your hands clean. As for the cruise ship, I hope you have a pleasant and enjoyable trip.

### References:

Centers For Disease Control and Prevention. (2023, July 25). Outbreak Updates for International Cruise Ships. (https://www.cdc.gov/nceh/vsp/surv/gilist.htm

National Foundation for Infectious Diseases. (2023). Norovirus. https://www.nfid.org/infectious-disease/norovirus/

Centers for Disease Control and Prevention. (2023, May 10). Norovirus Outbreaks. https://www.cdc.gov/norovirus/outbreaks/index.html

Teunis PFM, Le Guyader FS, Liu P, Ollivier J, Moe CL. (2020) Noroviruses are highly infectious but there is strong variation in host susceptibility and virus pathogenicity. Epidemics, 32. https://www.sciencedirect.com/science/article/pii/S1755436520300281/pdf

Tan M. (2021). Norovirus Vaccines: Current Clinical Development and Challenges. *Pathogens (Basel, Switzerland)*, *10*(12), 1641. https://doi.org/10.3390/pathogens10121641

Hall A. (2012) Noroviruses: The Perfect Human Pathogens? *The Journal of Infectious Diseases*, 205 (11 1622–1624. https://doi.org/10.1093/infdis/jis251

US Environmental Protection Agency. (2023, June 6). List G: Antimicrobial Products Registered with EPA for Claims Against Norovirus (Feline calicivirus). https://www.epa.gov/pesticide-registration/list-g-antimicrobial-products-registered-epa-claims-against-norovirus-feline

Faircloth J., et al (2022), The Efficacy of Commercial Surface Sanitizers against Norovirus on Formica Surfaces with and without Inclusion of a Wiping Step. Applied and Environmental Microbiology, 88 (17). https://journals.asm.org/doi/epub/10.1128/aem.00807-22

Centers for Disease Control and Prevention. (2023, May 10). Prevent Norovirus. https://www.cdc.gov/norovirus/about/prevention.html