

Norovirus: Preventing the spread of infection.

In the media we hear about Norovirus outbreaks in hotels, restaurants, cruise ships, schools and hospitals. It is commonly called the “Winter vomiting virus” or the “Cruise ship bug”, but we may not appreciate that Norovirus is thought to account for up to 50% of worldwide food borne gastroenteritis, making this a global public health concern.

Why does the virus cause such widespread problems and how can outbreaks be prevented or controlled?

Symptoms of Norovirus infection

The symptoms of Norovirus illness normally start 24 - 48 hours after the initial infection. The commonest symptoms are:

- Vomiting
- Watery diarrhoea

Some people may also have:

- mild fever
- headaches
- stomach cramps
- aching limbs

There is no specific treatment for a Norovirus infection, but the symptoms can lead to dehydration which is a particular concern for the vulnerable groups – children, the elderly, and those with other illnesses. Those who have a Norovirus infection should drink plenty of fluids, which can include re-hydration products, and eat a light diet.

Most people are free of symptoms after two to three days, although they may still be carriers of the virus for several days longer. Norovirus is thought to contribute to the deaths of about 80 people in the UK each year, most being elderly with other serious health problems.

Where does Norovirus come from and how does it spread?

“Norovirus” actually consists of a large number of different strains of the virus and new strains continue to evolve. The name “Norovirus” is derived from their identification following an investigation of an outbreak of viral gastroenteritis in a school in Norwalk, Ohio during 1968. The virus used to be known as ‘Norwalk virus’.

Norovirus, like all viruses, needs a living host in order to reproduce. However, it can survive outside the body for several days and be carried in food or water. It only takes a very small number of viral particles (~20) to make you ill. There are tens of thousands of viral particles in the vomit and faeces of an infected person, and individuals can also be a carrier of the

virus after their symptoms have disappeared, making it easier for the infection to spread. The following are the commonest sources and infection routes:

- Norovirus does not reproduce in food, but it can be carried on it - for example, if shellfish have been collected from water contaminated by sewage or if vegetables have been grown or washed with sewage contaminated water. During food preparation, contamination from these foods might also be transferred to other foods.
- The virus can survive on frozen foods and there have been a number of examples of Norovirus outbreaks originating from consumption of thawed, contaminated foods such as soft fruits.
- An infected person can easily contaminate any foods they prepare, especially if they handle ready-to-eat foods with hands which are contaminated with viral particles.
- Sewage contaminated drinking and bathing water can be a problem in countries without access to clean water supplies.
- Unfortunately, an infected person can have a sudden and uncontrollable urge to projectile vomit, and vomiting in public places produces an infectious aerosol containing thousands of viral particles which can then infect those nearby. Infections may also spread if the vomit material is not cleaned away effectively and contaminates other people. Small particles of the vomit might also land on surfaces and be picked-up on people's hands or even land on food some distance from the sick person and get eaten inadvertently.
- The infected person may spread viral particles if they do not wash and dry their hands thoroughly after using the toilet. Adults can become infected if they are helping in the toileting of young children.
- If viral particles have landed or been transferred onto a surface, touching the surface with the hands then touching the mouth can result in infection.
- Direct person to person contact is another method of spreading the virus, even the simple act of shaking hands could transfer it. In the family home, the infected person can also easily pass Norovirus to the rest of the family.

We can see how easily Norovirus outbreaks can occur in cruise ships, hospitals, schools and care homes. The start of the outbreak may originate from contaminated food or from a single infected person. Norovirus can then rapidly spread as people are in close proximity to each other. Any contaminated food could be eaten by many people. It can also be challenging to quickly and effectively clean a contaminated public place if somebody has vomited.

People in countries without access to clean water have additional risks of becoming infected by Norovirus and, once infected, they are more at risk of dehydration. Travel to countries with poor hygiene standards and lack of clean water is also a risk.

What can be done to help prevent the spread of Norovirus?

Prevention of a Norovirus outbreak is notoriously difficult, but good hygiene practices can help reduce the spread of the infection:

- Good hand hygiene is a very important infection control measure. The thorough washing and drying of the hands allows for the removal of dirt and debris containing the viral particles and is a good way of cleaning the harder to reach places, such as under the fingernails. It is particularly important to wash and dry the hands after using the toilet and before preparing food as this will limit the spread of the infection. Other important times are after cleaning surfaces, after clearing up vomited material, after toileting of young children and after handling baby's nappies. During a Norovirus outbreak, or when helping an infected person at home, it makes sense to wash and dry the hands more frequently throughout the day - touching a contaminated surface then placing the hands in the mouth can lead to infection.
- Hand gels should not be used to entirely replace the washing and drying of the hands, but can be used as an additional precaution when the hands are not visibly dirty or when soap and water are not available. However, care must be taken to use products which are proven to be effective against Norovirus. There is some evidence that because of the structure of the virus, it is not very susceptible to some alcohol-based sanitisers.
- Disinfect any surfaces which might be contaminated with Norovirus – use bleach where possible or another disinfectant with proven efficacy against Norovirus. This applies in particular to areas where a person has vomited as well as the toilet and bathroom. Soft materials such as curtains should be thoroughly washed and laundered. Carpets may need professional disinfection treatments. Food preparation surfaces and hand contact surfaces should also be disinfected as part of normal cleaning and disinfection routines.
- Those who have been ill with suspected Norovirus are normally advised not to return to their normal places of work or study until at least two days after the symptoms have stopped. During this time they should not prepare food for others and should avoid contact with others. Those working in the healthcare or food industry should follow their employer's rules on recommended times before returning to work.
- Those who are ill with Norovirus or who have recently recovered from it must not visit hospitals or care homes – a hospital ward may stop taking new admissions and allowing visitors in, if there is a Norovirus outbreak.
- Those ill on holiday should be isolated from others – on cruise ships they are advised to stay in their cabins and use their own toilet facilities, but staff must help them by providing food, cleaning and support. If staff do not help in this way then passengers will be much more likely to go back into public areas while still infectious.
- Adherence to the principles of food safety will go a long way in helping to prevent the spread of infections. These include good personal hygiene, cleaning, thorough cooking, minimising any handling of food, avoiding cross-contamination and discarding food which is suspected of any contamination. Food on open buffets or shared snacks in a bar area are a particular concern as there is potential for contamination, especially if guests help themselves to food and transfer the virus from their contaminated hands.
- Avoid eating raw, unwashed salad and vegetables.
- Purchase shellfish from reputable sources.
- Organisations such as the hospitals, care homes, schools and leisure facilities should have documented procedures for preventing the spread of infection and responding to a Norovirus outbreak. Staff training is particularly important, especially for those who prepare and handle food. These people need to understand the principles of hygiene

and food safety through their training, supervision and mentoring. Organisations should adhere to the latest food handler “Fitness to work” guidelines, which recommend that suspected Norovirus sufferers are excluded from the workplace. Often organisations will also have a dedicated team of ‘rapid-response’ cleaners who clean up after a vomiting incident. These cleaners should have been trained to protect themselves from becoming ill by using personal protective equipment (such as disposable aprons and gloves), they know how to carry out the cleaning and understand their role in helping to prevent the spread of infection. Those working in kitchens and handling food should not act as cleaners in circumstances such as this, as it creates an extra risk of spreading the virus onto food.

Norovirus is highly contagious and infection leads to unpleasant symptoms, especially for the vulnerable groups in the community. Those in countries with poor hygiene standards and without access to clean drinking water are at risk of serious dehydration. Although good hygiene practices are recognised as reducing the spread of the infection, we are still learning from the experiences of those who have to deal with Norovirus outbreaks and we continue to be surprised by the resilience of the virus when it is outside the body.

Further information about Norovirus and preventing its spread can be found in the following sources:-

NHS

<http://www.nhs.uk/conditions/norovirus/Pages/Introduction.aspx>

Health Protection Agency

<http://www.hpa.org.uk/HPA/Topics/InfectiousDiseases/InfectionsAZ/1191942172966/>

Guidance for the Management of Norovirus Infection in Cruise Ships 2007:-

http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1206003541373?p=1158945066455

International Scientific Forum on Home Hygiene: “Norovirus: infection and infection prevention through hygiene in the home”. www.ifh-homehygiene.org

Food Standards Agency:- “Food Handlers: Fitness to Work – A Practical Guide for Food Business Operators”

<http://www.food.gov.uk/foodindustry/guidancenotes/hygguid/foodhandlersguide>

Centre for Disease Control and Prevention, USA

<http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus.htm>