Norovirus  ‘the vomiting bug’

Norovirus
Norovirus is the major cause of epidemics of non-bacterial gastroenteritis. It is extremely infectious. The infective dose is small, between 3-20 virus particles only and faeces contain up to 100 billion viral particles per gram in both symptomatic and asymptomatic individuals. The virus is acid stable and retains its infectivity after passage through the stomach. Viral replication occurs in the mucosal epithelium of the small intestine. Norovirus may remain viable in the environment for approximately 12 days.

Transmission
Transmission is primarily via the faecal-oral route and is either direct or indirect via contaminated hands, food, environment or equipment. Norovirus may also be spread via aerosolisation of vomit containing the virus.

Disease Progression
The onset is acute and viral shedding can commence several hours before the onset of illness and can continue in faeces for at least 7 to 10 days. Maximum shedding occurs 24 to 72 hours after exposure. Norovirus has high attack rates with as many as 30-50% of those exposed becoming infected. This virus is usually a ‘mild’ self-limiting illness lasting 24 to 48-hours and mortality is rare.

Outbreaks
Outbreaks have been reported in diverse settings such as long term care facilities (LTCF), hospitals, cruise ships, accommodation settings and food premises. Food specific outbreaks often involve a symptomatic or recently symptomatic food handler who contaminates the food. Staff or visitors to LTCF’s who may have an ill contact at home are also a risk for introducing infection to a facility e.g. LTCF.

Case Definition
A case is defined by sudden onset of vomiting, which may or may not be accompanied by diarrhoea. Other symptoms may include nausea, abdominal cramps, muscle aches, headache, chills and fever. The duration of illness is usually 12 to 60 hours, and the incubation period is usually 15 to 48 hours. The person who presents with signs and symptoms of illness must have been in contact with cases or the environment/geographic area in which the outbreak is occurring. Relapse or re-infection may occur. It is also important to remember that an outbreak of diarrhoea or vomiting may be due to other causes e.g. rotavirus, salmonella, campylobacter and post antibiotic diarrhoea caused by Clostridium difficile.

Staffing Guideline
- Only permanent staff should work in an affected area - this includes isolated rooms and preferably also isolate the associated wing as virus spread precedes known infections
- Any staff whose symptoms meet the case definition must be symptom free for 48-hours before recommencing work. Scrupulous hand hygiene remains critical on return to work because viral shedding will still be occurring in lower numbers
- Staff working in the affected area should not work in any other area until 48-hours after finishing work in the affected area
- If casual staff are required to fill vacancies in affected areas, they should be allocated there on a continuous basis
- If the outbreak continues and further casual or bureau staff are required, who have not worked in the affected area during the outbreak, they should be allocated asymptomatic patients in non-infectious rooms or areas
- Exclude all non-essential staff and visitors where possible

Outbreak Precautions
- Standard + Contact Precautions Essential
- Extreme Hand Hygiene is Critical
- All staff, visitors and patients should wash their hands thoroughly on entry and exit from the affected area
- Extremely good hand hygiene with liquid soap and water is critical. Alcohol hand gel takes longer to be effective than in routine use
(keep hands closed after application to increase contact time) and there is some doubt of its efficacy for this virus. The ideal is to wash hands with liquid soap and water **plus** then use alcohol hand gel after leaving the affected area or patient

### Contact Precautions
- Gloves and apron when working in rooms with symptomatic patients/residents
- Mask usage is unnecessary except if patient has uncontrolled vomiting or diarrhoea (aerosols). Staff should carry a mask in their pocket during the acute outbreak phase for emergencies

### Patient Movement or Transfers
- Do not move patients from room to room
- If a patient does have to be moved to another room, leave the vacated room empty until it has been terminally cleaned
- Rehabilitation therapy is suspended in the affected area while any patient meets the case definition
- Receiving facilities such as hospitals, should be notified of any recent outbreak prior to any transfer from your facility

### Linen
- Take the linen carrier to the bedside
- Labelled infectious bags should be used for soiled linen
- Laundry powder (containing bleach) plus minimum 60°C but ideally 70°C hot water wash should inactivate norovirus

### Cleaning Guidelines
- Wear protective gear while cleaning
- Prompt [regular cleaning and disinfection](#) with diluted bleach (see dilution table below) of all **contaminated or touched surfaces**, equipment, bedrails, handrails, door and trolley handles, bell ringers, switches, phones, mop handles, etc is essential
- All shared patient equipment should be wiped down with bleach between usage
- Use labelled person specific commodes
- All toilets, basins and taps should be cleaned after use with bleach
- Carpets should be steam cleaned post D&V accidents and also terminal clean recommended
- Launder curtains when a patient has had vomiting or diarrhoea that causes contamination
- No vacuuming during an outbreak unless vacuum has a HEPA filter (high-efficiency particulate air filter)

### Bleach Disinfection Dilution – see table below
- Bleach comes in different strengths – check label
- 20mls of **5%** bleach solution made up to one litre with water makes **0.1% usable disinfectant**. (0.1% = 1000ppm = 1.0g/L of chlorine)
- Remake fresh bleach solution 24-hourly

### Other Prevention Measures
- Avoid ice and icemaker use during outbreaks – ice is easily contaminated
- Remove any fruit from bowls
- Avoid finger foods
- Do not touch your face or mouth
- Use paper towel to turn off taps if no elbow levers

### Visitors/Communication
- Inform visitors by email, phone, etc and via facility **door signs** of the outbreak. Visitors are not welcome unless there are special circumstances
- Wash hands on arrival and departure
- Do not visit anywhere else in the LTCF
- If visitors or their family have suffered from vomiting or diarrhoea they should **stay away for at least two days after their symptoms resolve**

### Reopening an Area
- After appropriate cleaning, the affected area(s) may be reopened at least 72-hours after the last case of diarrhoea and or vomiting (this accounts for main infectivity time of 48-hours post symptom resolution plus the usual incubation period)

#### How to Make One Litre of 0.1% Bleach Disinfectant

<table>
<thead>
<tr>
<th>Original Bleach Strength (% sodium hypochlorite)</th>
<th>Volume of Bleach Needed (ml)</th>
<th>Volume of Water Needed (ml)</th>
<th>Total Volume Made (ml)</th>
<th>Final Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>100</td>
<td>900</td>
<td>1000</td>
<td>0.1%</td>
</tr>
<tr>
<td>2%</td>
<td>50</td>
<td>950</td>
<td>1000</td>
<td>0.1%</td>
</tr>
<tr>
<td>3%</td>
<td>35</td>
<td>965</td>
<td>1000</td>
<td>0.1%</td>
</tr>
<tr>
<td>4%</td>
<td>25</td>
<td>975</td>
<td>1000</td>
<td>0.1%</td>
</tr>
<tr>
<td>5%</td>
<td>20</td>
<td>980</td>
<td>1000</td>
<td>0.1%</td>
</tr>
</tbody>
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