

Gastroenteritis Outbreaks – Including Norovirus

Module 7



Learner Outcomes

By the end of this module you will be able to:

- Outline the case definition for a gastroenteritis outbreak.
- Explain the difference between a suspect and confirmed outbreak.
- Describe the indicators of norovirus.
- Describe the ways norovirus is spread.
- Explain the role of the public health inspector in the outbreak investigation.



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Background



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Gastroenteritis Outbreaks

- Gastroenteritis outbreaks = enteric outbreaks.
- These outbreaks continue to represent a significant burden of illness in long-term care homes (LTCH).
- Each year in Ontario, approximately 1000 gastroenteritis outbreaks are reported to public health.
- The number of cases associated with a single outbreak may range from 10 to 200.



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Infectious Agents

- The agents responsible for these outbreaks may be viral, bacterial or parasitic in nature.



**Viral –
Norovirus**



**Bacterial –
Salmonella**

Viral



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Viral Gastroenteritis

- Viral gastroenteritis is the leading cause of gastroenteritis outbreaks in institutions.
- In LTCHs, norovirus is the most common cause.
- Norovirus affects both residents and staff, especially during the winter months when community incidence is also high.
- Norovirus can spread in various ways.



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Norovirus – Indirect Transmission

- Norovirus can spread through indirect transmission by touching contaminated surfaces.



Norovirus Person-to-Person Contact

- Norovirus can spread through person-to-person contact.



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Norovirus – Aerosolization

- Norovirus can be aerosolized with forceful vomiting.
 - This means it can be carried in the air



Norovirus – Contaminated Food/Beverage

- Eating or drinking contaminated food or beverages.
 - Contamination of food most often occurs by an infected food handler.



Norovirus Indicators

- Indicators of a norovirus outbreak include sudden onset of symptoms with a significant proportion of affected persons experiencing nausea, vomiting and diarrhea.



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Norovirus – Secondary Transmission

- Although there may be a common source such as a food item that is responsible for an outbreak, secondary transmission from person-to-person can readily occur.
- Infected individuals typically shed millions of viral particles in their feces or vomitus but only a few are needed to cause infection.



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Norovirus Transmission – Hand Hygiene

- Norovirus particles are able to survive for days on a variety of surfaces, making hand hygiene vital to infection prevention and control efforts.
- Please see Module 4 for more information on hand hygiene.



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Other Causes



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Bacteria and Parasites

- Bacteria and parasites are less often the cause and often are the result of a point source such as bacteria-contaminated food or water.
- The initial attack rate can be high, but the disease usually does not spread beyond those initially infected.



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Bacteria and Parasites

- Person-to-person transmission of bacteria and parasites is less common so there is greater success in controlling outbreaks caused by bacteria and parasites.
- Some bacterial pathogens such as Shigella, Verotoxin-producing Escherichia coli and Salmonella typhi require special considerations.
- The TBDHU will consult for guidance.

Case Definitions



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Case Definition

- At least one of the following must be met:
 - 2 or more episodes of diarrhea or watery stool (takes the form of its container) within a 24-hour period, **OR**
 - 2 or more episodes of vomiting within a 24-hour period, **OR**
 - 1 episode of diarrhea or watery stool (takes form of container) and one episode of vomiting within a 24-hour period **OR**
 - Laboratory confirmation of a known gastrointestinal pathogen and at least 1 compatible symptom (e.g., nausea, vomiting, diarrhea, or abdominal pain or tenderness)



Ruling out Non-Infectious Causes

- Consider ruling out non-infectious causes of these symptoms (medications, laxatives other non-infectious diseases).
 - Bowel movements should be unusual/ different.
- Some residents may not be able to report nausea or abdominal pain. In these cases, careful observation may be needed to determine if these symptoms are occurring.
 - For example, behavioural changes may be a clue that residents are experiencing nausea or pain.



Ruling out Non-Infectious Causes

- Frail residents with small appetites may have only one episode of either vomiting or diarrhea and may or may not exhibit other signs and symptoms associated with gastrointestinal illness.
 - These residents may be considered suspect cases and infection-control measures are implemented to prevent potential transmission.



Declaring an Outbreak



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Suspect Outbreak

- A suspect outbreak is:
 - two suspected cases of infectious gastroenteritis in a specific area within 48 hours



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Confirmed Outbreak

- A confirmed outbreak is:
 - three or more cases of infectious gastroenteritis in a specific area within a four-day period

OR

- three or more units/floors having a case of infectious gastroenteritis within 48 hours



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Calling an Outbreak Over



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Calling an Outbreak Over

- The end of an outbreak is determined on a case-by-case basis.
- The specific period will be decided by the TBDHU in consultation with the LTCH and is based on the transmission risk.

Calling an Outbreak Over

- The specific period varies by micro-organism, but often is set at:
 - No new cases after one infectious period plus one incubation period.
 - For example, the most common type of enteric illness in LTCH is Norovirus. This outbreak can be declared over after 5 days.
 - 48 hours after the symptoms of the last case have resolved and
 - all appropriate precautions were taken
 - there was no confirmed infectious agent
 - norovirus was not suspected
 - Kaplan's Criteria were used



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Kaplan Criteria

- When laboratory confirmation of a suspected norovirus outbreak is not possible, the Kaplan Criteria may be applied to determine the likelihood that the outbreak is viral.



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Kaplan Criteria

- These criteria are as follows:
 - a mean (or median) illness duration of 12 to 60 hours
 - a mean (or median) incubation period of 24 to 48 hours
 - more than 50% of people with vomiting **AND**
 - no bacterial agent found



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Kaplan Criteria

- The criteria are very specific.
 - When all four criteria are present, there is a high likelihood that the outbreak can be attributed to norovirus.
- But, the criteria lack sensitivity.
 - About 30% of norovirus outbreaks do not meet these criteria.
- So, the possibility of a viral cause should not be discarded if these criteria are not met.



Investigation



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Investigation

- The TBDHU public health inspectors will investigate the possible sources of the gastroenteritis
 - contaminated food
 - contaminated water
 - other agent(s)
- Outbreaks that spread from person-to-person may have started with a point source such as ill kitchen staff or contaminated food or utensils.



Investigation

- In addition to inspecting all food preparation areas, the investigation could also include the collection of:
 - information from residents, staff and others who may have been exposed to contaminated food or water
 - clinical samples from staff; this includes both symptomatic and non-symptomatic staff



Before ending the module...



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Check your learning

Now that you have reached the end of the module, can you:

- Outline the case definition for a gastroenteritis outbreak?
- Explain the difference between a suspect and confirmed outbreak?
- Describe the indicators of norovirus?
- Describe the ways norovirus is spread?
- Explain the role of the public health inspector in the outbreak investigation?



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Back at work

When you return to work, what will you do differently as a result of this module?



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References

- Control of Gastroenteritis Outbreaks in Long-Term Care Homes; A Guide for Long-Term Care Homes and Public Health Unit Staff; Public Health Division Ministry of Health and Long-Term Care; October 2013



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