

Norovirus in the Community



Presented by George Koutsoulis
Senior Public Health Inspector
Regina Qu'Appelle Health Region



Norovirus is also referred to as

- Stomach flu
- Winter vomiting disease
- Not to be confused with Influenza virus that causes flu like symptoms
 - respiratory virus
 - can be prevented with seasonal flu shots



Calgary hospital ward falls to Norwalk siege

CALGARY (CP) - Patients and staff in the cardiac ward of Calgary's largest hospital have been felled by an outbreak of the stomach-churning Norwalk virus.

Officials at a Hospital in Calgary quarantined the area after nine patients and nine staff members contracted the virus.

Norwalk causes nausea, projectile vomiting, explosive diarrhea, abdominal-cramps

Foothills officials said they believe visitor came in and threw up.

...people recover from an infection within days, but consequences can be more serious for heart patients and others with weakened immune systems.

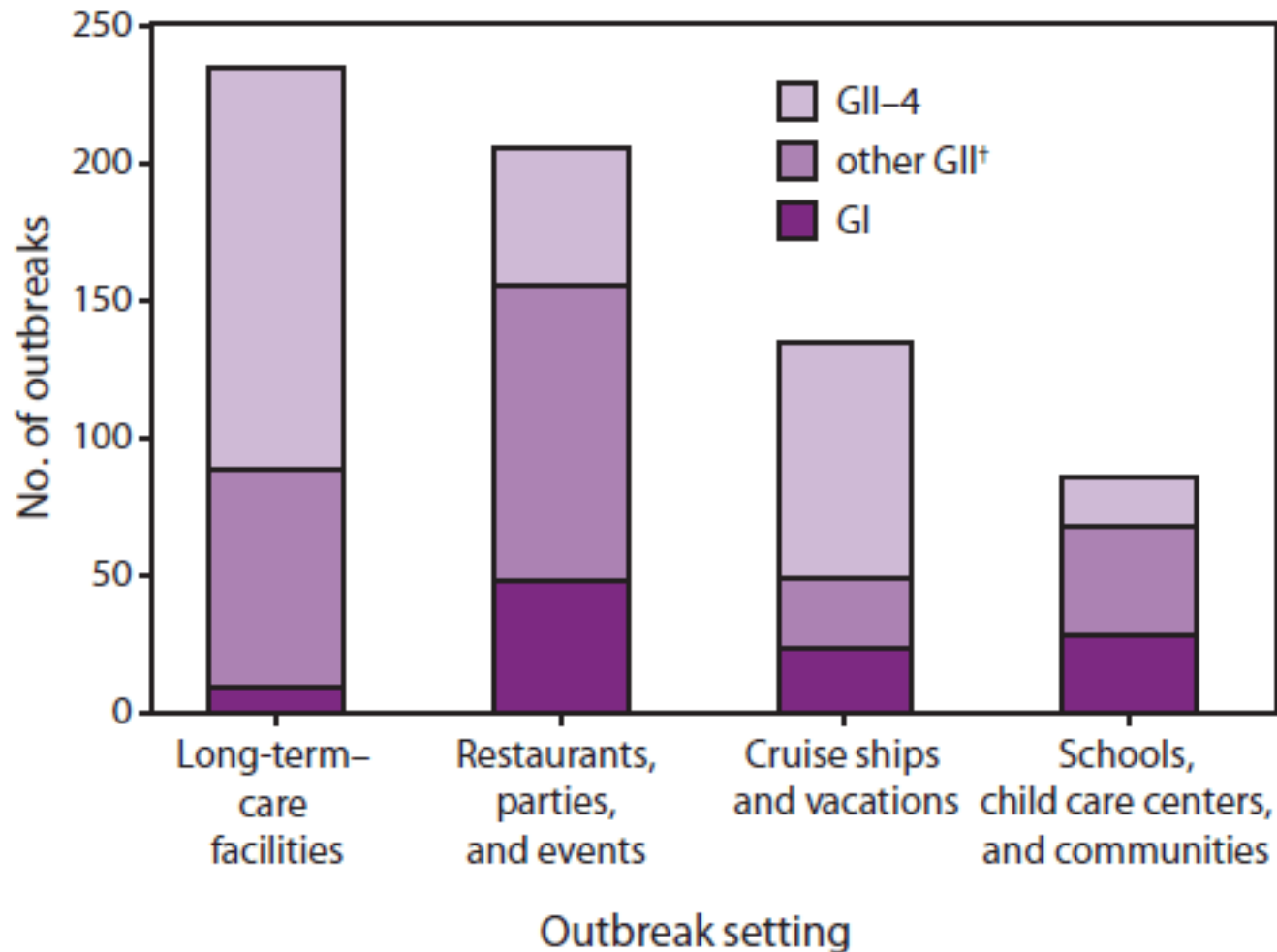
The virus has been persistent this winter, turning up in nursing homes.



Community Outbreaks

- Health care facilities especially Long Term Care
- Restaurants and catered events
- Schools and daycares
- Cruise ships and hotels

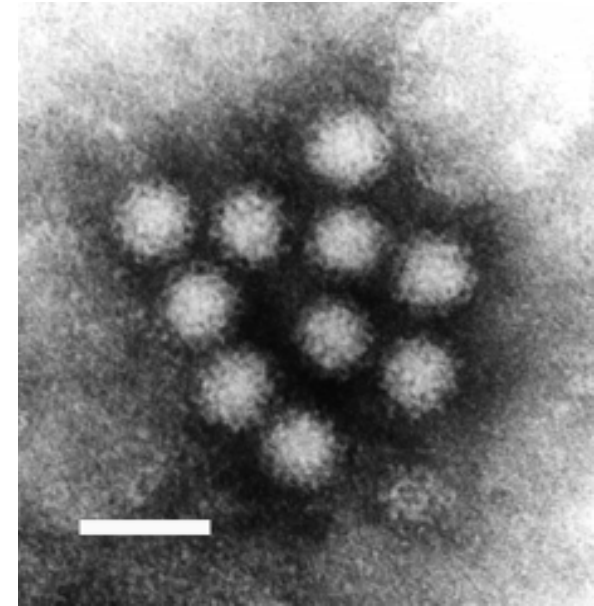
Number* of norovirus outbreaks laboratory-confirmed by CDC, by setting and genotype --- United States, 1994--2006



Norovirus Basics

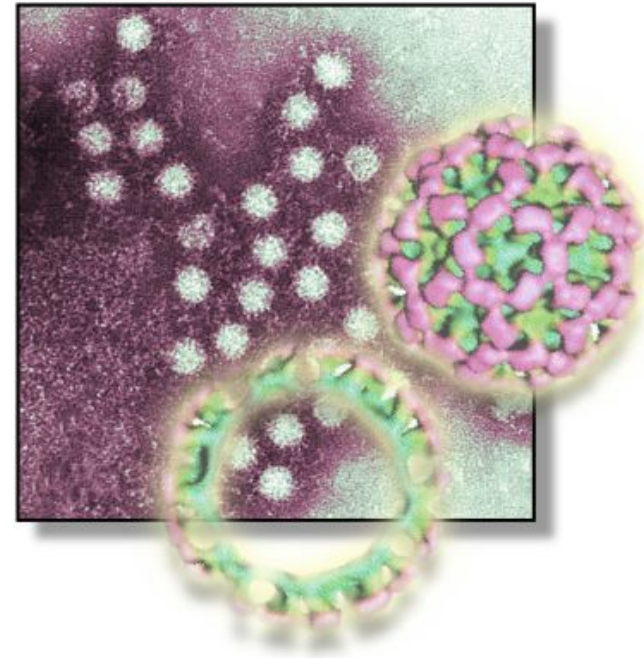
The virus

- Characteristics
- Illness
- Transmission



The Norovirus Family

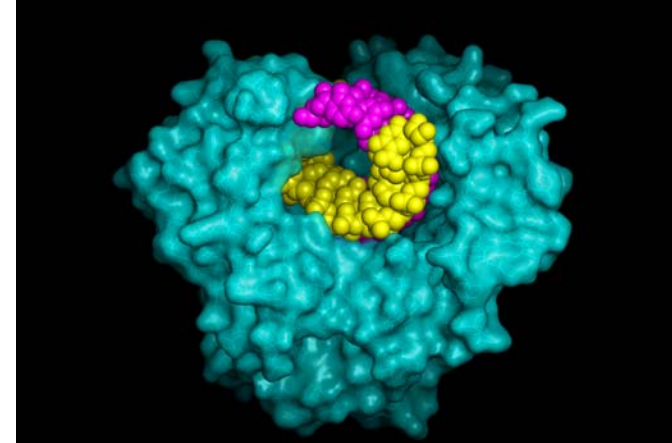
- Members of the Calciviridae family (cup-like)



- Norwalk first identified in 1968
 - elementary school outbreak
- Many other Noroviruses have been described since

Caliciviridae Family

- Non-enveloped viruses
 - Lack a lipid membrane
- Small Round structured viruses
- Five large genogroups
 - 90-95% genetic similarity within groups,
 - 60-65% similarity between groups
- Groups 1, 2 , and 4 Human Noroviruses
- Group 2 infects swine and humans
- Group 3 infect cows





Clinical features

- Symptoms begin 12-48 hours after infection
- Illness usually last 1 to 3 days
 - and 4 to 6 days in high risk groups
- Viral shedding peaks 2 - 5 days after symptoms onset
- Virus can be detected in stool up to 4 weeks after infection



Diagnosis

- Sudden onset of symptoms:
 - Nausea/vomiting (projectile)
 - Abdominal cramps
 - Watery diarrhea (explosive)
 - **Severe dehydration**



Detection based on:

Stool sample analysis using:

RT-PCR

– Reverse Transcriptase - Polimerase Chain Reaction

■ EIA

- Enzyme Immunoassay

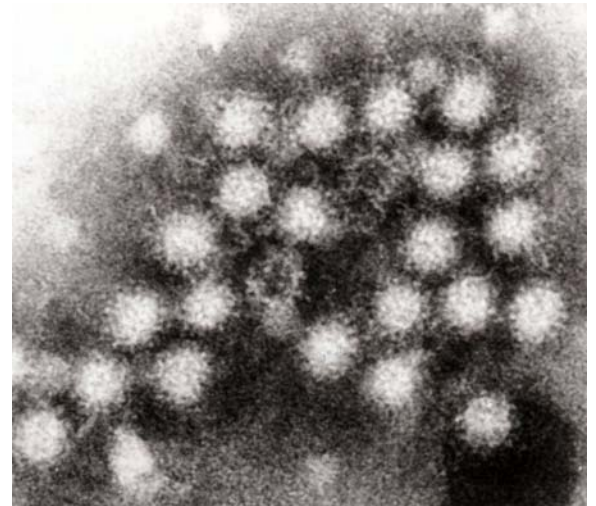


Immunity

- Human challenge studies have shown that infected volunteers are susceptible to reinfection with the same strain as well as similar strains.
- Protection may last from 6 to 8 months to the same strain of Norovirus

Infectious Dose

- As few as 18 viral particles!!!
- There are potentially 5 billion infectious doses in each gram of feces during peak shedding!





Methods of transmission

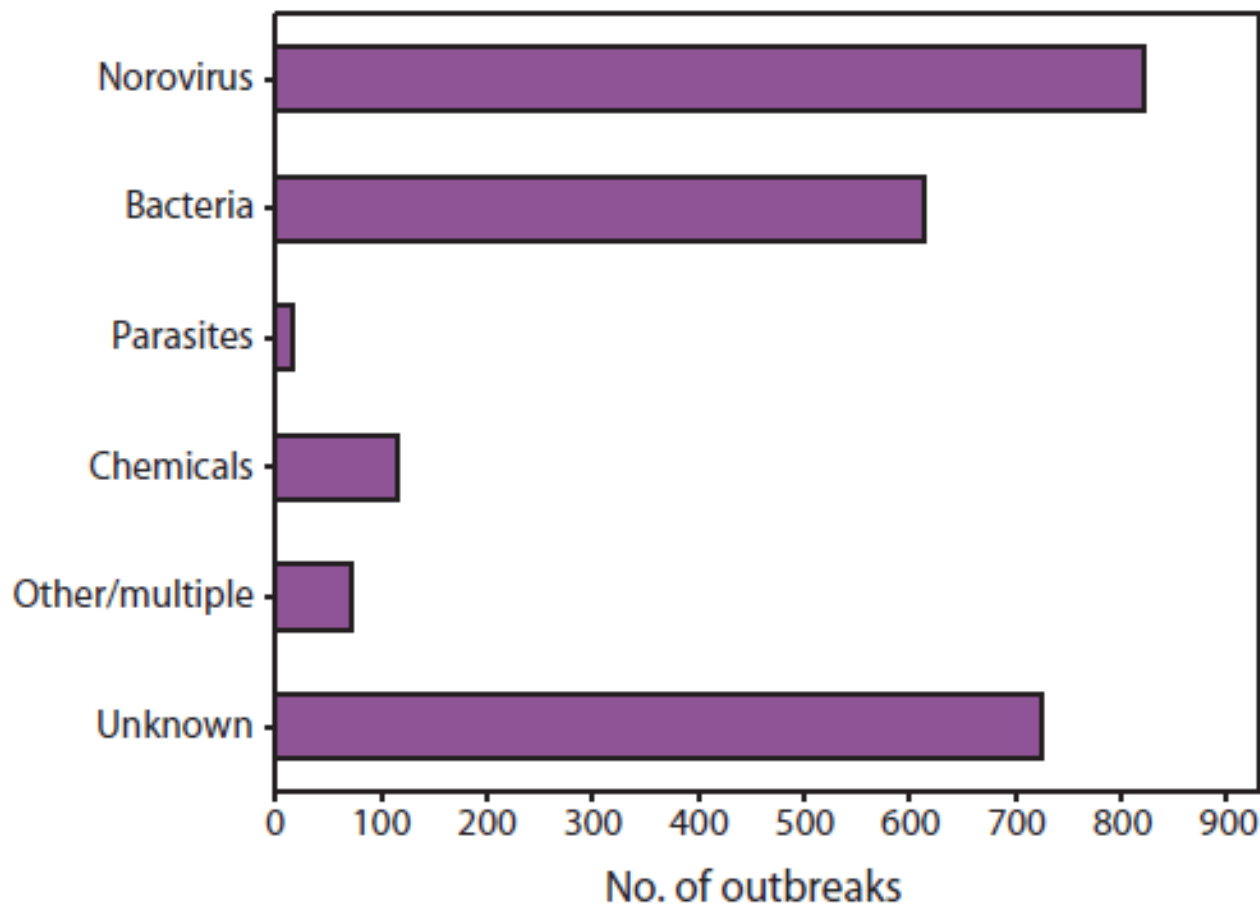
- Remember Humans are the only reservoir known for human norovirus infections!
- Direct Contact (person to person)
 - fecal-oral with stool, aerosolized vomitus, and unwashed hands
- Indirect Contact
 - fomites, environmental contamination
 - creates a great concern for secondary transmission to close contacts and family members



Foodborne transmission

- Uncooked, ready-to-eat foods pose the greatest risk
 - e.g. sandwiches, salads, bakery products, fruit
- Contamination by infected food handlers
- Oysters and clams (norovirus not killed by steaming)

Number* of foodborne disease outbreaks reported to CDC, by etiology --- United States, 2006--2007





Norovirus Outbreak Decontamination Procedure

- Infectious nature and stability of Norovirus in the environment, requires special consideration be given to the cleaning of contaminated areas.

Mystery illness strikes 140

CanWest News Service

CALGARY — Calgary Health officials are baffled about the cause of an outbreak that resulted in the complete lockdown of a downtown homeless shelter Sunday.

Residents at the Calgary Drop In Centre began experiencing gastro-intestinal symptoms — vomiting and diarrhea — overnight Saturday.

By Sunday, the number of people complaining of these symptoms hit 140.

Calgary police, fire and EMS locked down the building at lunchtime and no one was allowed to leave or enter until the building was given the all clear around 5 p.m.

"We're just beginning our investigation of this outbreak," said Judy MacDonald, deputy medical officer of health for the Calgary Health Region. "It looks like it is a gastro-intestinal outbreak. But it's very preliminary. We're not able to say what may have caused it. But we're certainly looking at all possibilities.

"Certainly we're looking at (the Norwalk virus). We do know that in the community right now there are some (norwalk virus) outbreaks. So it's a possibility, for sure.

"It's a reminder to people out there in the community that norwalk virus is around at any time of the year.

"We are aware of some outbreaks at continuing-care facilities, just one or two at this point.

"And this is not unusual because whenever you have a population of individuals that's living in a fixed setting, this can happen. It's not unusual.

"As part of the investigation we will be taking samples and we expect that we'll have some results to report, whether they'll be positive or negative, by mid week.



Canadian Press

Calgary emergency personnel arrive at a drop-in centre to investigate a mysterious illness.

Calgary Herald



Environmental Concerns

Relative resistance to disinfectants

- Phenols such as Lysol or Pinesol
- Quaternary ammoniums
- Ethanol or anionic compounds
- NOT reliable



Effective Disinfection

- Chlorine sensitive (1000 to 5000 mg/L)
- 2% glutaraldehyde sensitive
- Accelerated hydrogen peroxide
- Heat Pasteurization is effective
- Boiling is effective



Contaminated environment with vomit or feces

■ Personal protective equipment

- disposable gloves, gowns and mask should be used when cleaning the area
- eye protection or faceshield may be considered if there is risk of creating aerosols
- heavy duty glove should be used if concentrated disinfectant is used



Two Step Spill Clean Up Process

■ Absorbent material

- paper towels to soak up visible/ organic debris
- all collected waste material disposed of into plastic garbage bags minimize aerosols

■ Spill clean up requires 1:10 (5000mg/L) 5% sodium hypochlorite (bleach) dilution

- this is corrosive and may pit stainless steel.



Environmental Cleaning (non-contaminated surfaces)

- High-touch surfaces including:
 - counter tops, table tops,
 - door handles,
 - telephones,
 - light switches,
 - window ledges, and
 - chrome fixtures, railings etc.
- All require disinfection using the two step cleaning procedure.



Environmental Cleaning (non-contaminated surfaces)

■ First:

- All equipment and surfaces must be washed with a general purpose cleaner

■ Second:

- Disinfect with a hypochlorite solution. Single-use cloths shall be used. A fresh 1000-mg/L bleach solution (1 part chlorine bleach to 50 parts water) is effective in disinfecting non-contaminated surfaces.

■ (Don't use spray bottles!)



Carpet / Upholstered Furniture

- Visible debris cleaned with absorbent material and discard into plastic bag
- Steam clean (heat inactivation)
 - 70°C for 5 minutes
 - 100°C for 1 minute
- bleach may discolour



Cleaning vomit in food preparation areas:

- All equipment,
- vertical surfaces,
- and food contact surfaces must be disinfected 10-20 minute contact time
- rinse with clean water
- Rewash all exposed dishes, utensils and trays following recommended dishwashing procedures.



Food precautions

- Food exposed to the virus by someone vomiting in the area must be discarded.
- Food that has been handled by an infected person must also be discarded.



Cleaning vomit in food preparation areas

- When cleaning is complete gloves, cloths, and aprons shall be disposed of into laundry bag or garbage bag.
- Ensure hands are washed thoroughly, for at least 20 seconds, using soap and warm running water.



Relative resistance to antiseptics (Hand Cleansers)

- As non-enveloped viruses, Noroviruses, are more resistant to antiseptics
- 60% ethanol agents not always effective against non-enveloped viruses, may require prolonged contact times
- NOT effective against spores
 - should not be used as the primary means of hand hygiene when dealing with organisms such as *Clostridium difficile*.



Hand washing

- Hand washing with soap and water for 20 seconds may be more effective than alcohol-based hand rinses
 - Physical removal of viral particles
- Hand sanitizers remain widely used and likely to increase compliance



Hand Sanitizers

- Efficacy of hand sanitizers vs. hand washing is still controversial.
- Ethanol has been found to be more effective than other alcohol formulations.



Hand Sanitizers

- Hand sanitizers serve as an effective stopgap in between proper handwashing
- Hand sanitizers should not be considered a substitute for soap and water handwashing.



High Risk Occupation Staff Infection/ Illness

- Staff experiencing norovirus symptoms should
 - report symptoms to supervisor
 - see family physician
 - submit stool sample
 - stay away from work until symptoms are absent for 48 -72 hours!



Summary

- Low infectious dose
- Infectious during and after symptoms
- Multiple modes of transmission
- Very Stable in the environment
- Resistant to disinfection
- Multiple types
- Poor immunity



Questions ?



The End