



NOROVIRUS OUTBREAK DETECTION AND MANAGEMENT

GUIDANCE FOR LONG-TERM CARE FACILITIES IN Williamson County, Texas

Williamson County & Cities Health District
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Table of Contents

1. Norovirus basics	3
2. Norovirus outbreak prevention, detection, and management	
▪ Outbreak prevention and detection	5
▪ Outbreak response	6
Appendix A: Forms and Tools	
▪ Log of Outbreak Cases	
▪ Facility check-list	
▪ Gastroenteritis Outbreak Initial Report Form	
▪ Norovirus Summary Final Report Form	
Appendix B: Laboratory Testing Guidelines	
Appendix C: Sign Templates, Example Notices, Links to Informational Handouts	
Appendix D: Environmental Cleaning and Disinfection Guidelines	

Acknowledgements and References

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Norovirus Basics

Outbreaks of gastroenteritis in long term care facilities (LTCF) are not uncommon in Texas or the United States. Noroviruses are most often the culprit and, due to the highly contagious nature of the virus, require immediate attention to prevent prolonged spread of the virus in residents and staff. Norovirus-associated gastroenteritis outbreaks can be detected early by recognizing the typical symptoms of illness, and can be controlled by taking specific infection control steps to prevent the virus from being transmitted from person-to-person.

The Virus

Noroviruses (formerly known as Norwalk-like viruses) are members of the virus family Caliciviridae. Noroviruses are single-stranded ribonucleic acid (RNA) viruses that are non-enveloped, making them difficult to eliminate (most disinfectants target an envelope which is missing in these viruses). Currently human Noroviruses belong to one of three genogroups (GI, GII, or GIV), each of which is further divided into greater than 25 genetic clusters. GII viruses are the most common type associated with outbreaks. Because there are many different circulating Noroviruses and immunity is not protective between circulating strains, *Norovirus* outbreaks may occur multiple times in the same facility. *Norovirus* characteristics are shown in the following table:

Characteristic	Observation	Consequences
Low infectious dose	<10 ² viral particles	Permits droplet or person-to-person spread, secondary spread, or spread by foodhandlers
Prolonged asymptomatic shedding	≤2 weeks	Increased risk for secondary spread or problems with control regarding foodhandlers
Environmental stability	Survives ≤10 ppm chlorine, freezing, and heating to 60 C	Difficult to eliminate from contaminated water; virus maintained in ice and steamed oysters
Substantial strain diversity	Multiple genetic and antigenic types	Requires composite diagnostics; repeat infections by multiple antigenic types; easy to underestimate prevalence
Lack of lasting immunity	Disease can occur with reinfection	Childhood infection does not protect from disease in adulthood; difficult to develop vaccine with lifelong protection

Characteristics of “Norwalk-like viruses” that facilitate their spread during epidemics. From MMWR RR Vol 50 /No. RR-9, Table 1.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5009a1.htm>

Incubation Period and Duration of Illness

Illness begins between one to two days following exposure to a resident or employee who is ill or incubating the infection. Unless complicated by underlying illness, age, or dehydration, the illness is generally mild and of short duration (1-2 days). Some individuals may continue to feel weak. Short-lived immunity occurs only for that particular type of *Norovirus* following infection. Re-infections are possible. Cross-protection against other *Norovirus* types is not thought to occur.

Signs and Symptoms of Norovirus-associated Gastroenteritis

The main symptoms are:

- **Vomiting.** Vomiting, often projectile, is usually a prominent symptom and may be present in at least half of those ill.
- **Diarrhea.** Diarrhea tends to be watery, short-lived and less severe than diarrhea caused by bacteria. Bloody diarrhea is not a hallmark of *Norovirus* infection; therefore, a bacterial etiology should be explored if diarrhea is bloody.

Symptoms also may include:

- nausea,
- headache,
- fever (usually low-grade),
- chills, and
- abdominal cramps.

Norovirus Transmission/Communicability

Noroviruses are spread when material contaminated by stool or vomitus from an infected person is ingested. Noroviruses are **extremely infectious**. Excretion of virus in stool begins a few hours before the onset of symptoms and reaches a maximum 24-72 hours after exposure. The viruses can continue to be present in the stool of infected persons for a week or more, even after they recover or even if they have never been sick.

Noroviruses can remain infectious on environmental surfaces for many days and are relatively resistant to disinfection, heat, and cold. The virus can spread a number of ways:

- Person-to-person (fecal/oral, vomit/oral-vomiting will also suspend viral particles in the air resulting in contamination of the environment).
- Fomites (contaminated surfaces)
- Foodborne
- Waterborne

Outbreak Prevention & Detection

Inform employees of the importance of immediately reporting acute gastroenteritis and not coming to work if they are sick. Strictly enforce hand washing and glove policies. Unfortunately, in some cases there may be little that can be done to prevent the initial introduction of the virus, since an infected staff member or visitor may be shedding the virus even before they are ill, or they may never become symptomatic.

Discuss routine infection control measures (hand washing, use of hand sanitizer, asking friends and family not visit if they are ill) with residents and family members.

Establish and maintain a program of surveillance for viral gastrointestinal disease to detect an outbreak early.

- Conduct systematic surveillance for illness throughout the facility (not just for gastrointestinal illness). Extract data from patient charts to monitor for trends that may reveal an outbreak (i.e. people with similar symptoms over time).
- Immediately report staff or patients with diarrhea or vomiting to the Infection Control Practitioner, Director of Nurses or facility manager.
 - An outbreak of viral gastroenteritis should be suspected when two or more residents and/or staff have vomiting and diarrhea with onset within one to two days.
- If you suspect a reportable disease (e.g. *E. coli*, *Salmonella*, *Shigella*, *Campylobacter*) report to the Williamson County and Cities Health District (WCCHD). For a list of conditions reportable in Texas go to:
<http://www.dshs.state.tx.us/idcu/investigation/conditions/default.asp>

Outbreak Response

Rapidly implementing control measures at the first sign of a gastroenteritis outbreak can prevent additional cases. Interrupting person-to-person transmission controls the outbreak of viral gastroenteritis.

1. Notify the Williamson County and Cities Health District (WCCHD) Communicable Disease Management Team (CDMT) at 512-943-3660. You may also notify WCCHD by faxing in an Initial Report (Appendix A).
2. Record and track cases using Log of Outbreak Cases (Appendix A).
3. Submit samples for laboratory testing (Appendix B). **NOTE: Decisions to institute control of a possible outbreak should not be delayed while waiting for laboratory test results.**
4. Implement control measures:
 - Limit or temporarily suspend new admissions or transfers;
 - Limit transfers out to only medically necessary transfers (NOTE: EMS/patient transport, hospitals and other receiving facilities should be notified of the possibility of norovirus when transferring/transporting patients from a facility experiencing cases of acute gastroenteritis);
 - Cancel group activities;
 - Require ill employees to remain at home until they have been without symptoms for 48 hours. Upon their return to work, limit their contact with persons who are medically fragile or could be put at risk of severe complications if they were to contract a norovirus infection;
 - Limit mingling of ill and non-ill residents. If possible, limit ill residents to their rooms for the duration of their illness;
 - Perform deep cleaning of the facility, including common areas and resident rooms (Appendix D);
 - Enforce strict hand washing and glove policies;
 - Ensure universal precautions are followed by staff cleaning up emesis/feces. Gowns and masks should be worn along with gloves (Appendix D);
 - Inform family members and healthcare providers in writing (see example notice in Appendix C) of ongoing transmission of gastrointestinal illness possibly attributable to norovirus;
 - Limit visitors. Provide all visitors with information sheets on how they can limit their own risks of contracting norovirus (Appendix C);
 - Post precautionary notifications on entrances and exits (Appendix C);
 - Deploy hand sanitizer dispensers and reminders and instructions to use them throughout your facility.
5. Consult as needed with WCCHD during outbreak response. Consultation may include different individuals and programs within WCCHD including CDMT, Epidemiology, and the Health Authority. Facilities should be prepared to provide the following preferably in electronic format:
 - Census of current residents, with names, room and bed numbers, dates of birth;
 - List of current employees, with job assignment (RN, LVN, CAN, housekeeping), dates of birth, and home or cell phone number;
 - List of cases, with names, room and bed numbers, dates of onset of symptoms, symptoms, hospitalization status

Appendix A: Forms and Tools

Log of Outbreak Cases

Facility Check-list

Initial Report Form

Norovirus Outbreak Summary Form

Log of Outbreak Cases

Location/Facility Name: _____ Earliest Date for Onset of Symptoms: _____

Facility Contact Name and Phone Number: _____

Name of Ill Person	Resident: Room #/Bed # Staff: Position & Shift	Date of Birth	Sex	Date of Initial Onset of Symptoms (indicate am or pm)	Abdominal Cramps	Fever	Diarrhea	Vomiting	Nausea	Duration of Illness (days)	Date Hospitalized	Date Specimen Submitted	Lab Result



Gastroenteritis Outbreak Response Checklist Long Term Care Facilities

√	Action
	Notify Williamson County and Cities Health District (WCCHD) of outbreak
	Send in Initial Report Form for outbreak to WCCHD
	Initiate tracking of outbreak cases using Log of Outbreak cases
	Limit or temporarily suspend new admissions or transfers
	Limit transfers out to only medically necessary transfers (NOTE: EMS/patient transport, hospitals and other receiving facilities should be notified of the possibility of norovirus when transferring/transporting patients from a facility experiencing cases of acute gastroenteritis).
	Cancel group activities.
	Require ill employees to remain at home until they have been without symptoms for 48 hours. Upon their return to work, limit their contact with persons who are medically fragile or could be put at risk of severe complications if they were to contract a norovirus infection.
	Limit mingling of ill and non-ill residents. If possible, limit ill residents to their rooms for the duration of their illness.
	Perform deep cleaning of the facility, including common areas and resident rooms.
	Enforce strict hand washing and glove policies.
	Ensure universal precautions are followed by staff cleaning up emesis/feces. Gowns and masks should be worn along with gloves.
	Inform family members and healthcare providers in writing of ongoing transmission of gastrointestinal illness possibly attributable to norovirus.
	Limit visitors. Provide all visitors with information sheets on how they can limit their own risks of contracting norovirus.
	Post precautionary notifications on entrances and exits
	Deploy hand sanitizer dispensers and reminders and instructions to use them throughout your facility.
	After outbreak subsides, meet with staff to review response to outbreak. Identify any necessary updates to policies and procedures.
	Implement any necessary updates to policies and procedures.
	Submit Norovirus Outbreak Summary Form to WCCHD.



INITIAL REPORT FORM LONG TERM CARE FACILITY GASTROENTERITIS OUTBREAK

Gastrointestinal outbreaks should be reported to the Williamson County and Cities Health District (WCCHD) within 24 hours of when the outbreak is identified. Enteric infections will be investigated to determine the cause and reduce disease transmission. Gastroenteritis due to *Norovirus* may be confused with other infections prior to laboratory detection. Initially it is important to obtain some basic information and clinical samples from each suspected case to rule out other serious food-borne pathogens such as *E. coli*, *Salmonella*, *Shigella*, *Campylobacter*, or Hepatitis A.

Fax completed form to WCCHD at the beginning of an outbreak (fax 512-930-4017)

Please attach additional comments and an epidemiologic curve (list or graph of number of cases by date of illness onset) if available.

Reporter: _____ **Date of Report:** ___/___/___

Facility name: _____

Address: _____

Phone: _____ **Fax:** _____

Facility contact person: _____

Title: _____ **Phone:** _____

Type of facility:

Skilled nursing facility Assisted living Rehabilitation facility

Other: _____

Date of first illness onset: _____

Specimens submitted to a lab: Yes No **If yes** Date submitted: ___/___/___

DSHS lab Commercial lab _____

of persons tested: _____

Norovirus positive: _____ # positive for other pathogens: _____

List other pathogen(s): _____

Total number of residents in facility at time of outbreak (ill and well): _____

Total number of staff in facility at time of outbreak (ill and well): _____

Total # of ill residents: _____ **Total # of ill staff:** _____

PLEASE FAX BACK TO: Williamson County & Cities Health
Communicable Disease Management Team
100 West 3rd St., Georgetown, Texas
FAX #: 512-930-4017



NOROVIRUS OUTBREAK SUMMARY FORM LONG TERM CARE FACILITIES

Please complete and fax this form to your local health district at the end of the outbreak.

Please attach additional comments and an epidemiologic curve (list or graph of cases by date of illness onset) if available.

Reporter: _____
Facility name: _____

Address: _____
City: _____ **State:** _____ **Zip code:** _____
County: _____
Phone: _____ **Fax:** _____

Facility contact person: _____
Title: _____ **Phone:** _____

Type of facility: Skilled nursing facility Assisted living Rehabilitation facility
 Other: _____

Date of first illness onset: _____ **Date of last onset:** _____

Specimens submitted to a lab: Yes No *If yes* Date submitted: __/__/____
 DSHS lab Commercial lab _____ # of persons tested: _____
 # Norovirus positive: _____

Total number of residents in facility at time of outbreak: _____
Total number of staff in facility at time of outbreak: _____
Total # of ill residents: _____ **Total # of ill staff:** _____
Number of hospitalizations: _____ **Number of deaths:** _____

Please provide a ratio in the table below: Total with symptoms/Total people for whom this information was collected. Example: 5/12 residents with fever.

Symptoms	Residents	Staff
Abdominal Cramps		
Fever		
Diarrhea		
Vomiting		
Nausea		
Other		

PLEASE FAX BACK TO: Williamson County & Cities Health
 Communicable Disease Management Team
 100 West 3rd St., Georgetown, Texas
 FAX #: 512-930-4017

Appendix B: Laboratory Testing Guidelines



LABORATORY TESTING GUIDELINES FOR NOROVIRUS

Testing for norovirus may not be useful for outbreaks that are clinically and epidemiologically consistent with norovirus and occur in areas where norovirus is known to be circulating. Consult with the Williamson County and Cities Health District (WCCHD) Communicable Disease Management Team (CDMT) at 512-943-3660 to determine the need for laboratory testing. Control measures should never be delayed while awaiting laboratory confirmation.

- Specimens should be collected as soon as possible after the onset of illness, within 48 hours. Viral shed is greatest during this phase.
- Collect one specimen from a minimum of four to a maximum of ten ill individuals in support of an outbreak investigation.

Long term care facilities should submit samples to a private laboratory for testing. Check with the laboratory for specimen submission requirements. Call WCCHD CDMT at 512-943-3660 if your facility is unable to submit specimens to a private laboratory.

General Stool Specimen Collection Guidelines

1. **IMPORTANT:** Complete the specimen label with name, date of birth, and date of collection.
2. Wash hands and follow CDC recommendations for using personal protective equipment in healthcare settings for preventing the transmission of infectious agents.
3. Lift the toilet seat and place newspaper or plastic wrap over the bowl, leaving a space in front for the urine to pass freely into the toilet.
4. Lower the toilet seat so that the newspaper or plastic wrap is held in place with a slight depression in middle for collecting the sample.
5. Use a tongue blade or plastic spoon to collect a sample of the stool and place the sample into the sterile labeled container. Collect 2 – 3 teaspoons of stool.
6. Do not place anything else in the container. Replace the lid and close tightly.
7. Refrigerate the sample until it is transported.
8. Follow laboratory guidelines for transporting the sample.

NOTE: If the sample is left at room temperature, bacteria can grow and interfere with testing. Freezing the sample will limit what testing can be performed.

Appendix C: Sign Templates, Example Notices, Links to Informational Handouts

Recommend adapting sign templates for specific facility and copy on bright highly visible color paper. Post signs at all entrances and exits.

Sign Template #1

Sign Template #2

Letter/Notice to Family Members and Visitors

Links to Centers for Disease Control & Prevention Facts Sheets

Notice to the Public

Gastroenteritis or “stomach flu” in this facility!

Multiple cases of illness in residents and staff have been reported to the Williamson County & Cities Health District. Symptoms reported include nausea, vomiting, diarrhea, fever, headache, stomach cramps, chills, muscle aches and tiredness. This facility is working with public health to prevent further illness.

The following control measures have been implemented:

- All residents, staff and visitors need to wash hands frequently, especially before meals and after using the restroom.
- All well visitors are requested to stay away until this situation is controlled (except for emergencies)
- All ill visitors, volunteers and employees are requested to stay away until 72 hours after vomiting and/or diarrhea ends
- All ill residents are confined to their rooms until diarrhea and/or vomiting ends
- Meals to ill residents will be served in their rooms
- Additional housekeeping practices are now in place to clean and sanitize all surfaces in this facility

If you have questions or concerns please contact:

NOTICE!

This facility is currently experiencing an outbreak of gastrointestinal illness.

We are working with the Williamson County & Cities Health District to contain and control the outbreak.

For the safety of our residents, family members, and guests, we are requesting that visitors be limited as much as possible.

If you must visit during this time, please check in at the front desk, sign in, and take an information sheet for your reference.

(Date)

Dear Family Member and Visitors:

The comfort, health, and safety of our residents are our highest priority. As you may be aware, a stomach illness known as “norovirus” has been identified in some of our residents this week. We are working diligently with public health authorities to prevent the spread of the virus. Information on norovirus has been attached for your review.

Please be assured that control measures are currently in place and that our staff members are closely monitoring all residents for signs of illness.

If you or a family member should experience nausea, vomiting, or diarrhea please follow-up with your medical provider and notify the Williamson County and Cities Health District at 512-943-3660. Should you have any additional questions, please feel free to call us at <facility phone number>.

Kindest regards,

(facility representative)

Links to CDC Norovirus Fact Sheets:

Norovirus in Healthcare Facilities Fact Sheet:

http://www.cdc.gov/ncidod/dhqp/id_norovirusfs.html

Norovirus Questions & Answers (in English and Spanish):

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

Appendix D: Environmental Cleaning and Disinfection Guidelines



GUIDELINES FOR ENVIRONMENTAL CLEANING AND DISINFECTION OF NOROVIRUS

Materials Needed

Disposable gloves, masks, eye protection or face shields, and gown or protective clothing. For additional information about personal protective equipment: http://www.cdc.gov/ncidod/dhqp/gl_isolation.html (Part II.E). Note that using a more concentrated disinfectant requires a heavier duty glove than a simple non-sterile latex/vinyl glove.

Disinfection (for non-visibly soiled areas)

Examples of items to disinfect: doorknobs, faucets, sinks, toilets, commodes, bath rails, phones, counters, chairs (including backs), tables, hand rails, elevator buttons, light switches, mattress covers, aprons, uniforms, linens, bedding, and ice machines.

Use of Chlorine Bleach (sodium hypochlorite) is preferred

- USE ONLY IN WELL-VENTILATED AREAS
- Chlorine bleach is corrosive and irritating to all mucosal tissue, skin, eyes, and respiratory tract. AVOID SPRAY BOTTLE APPLICATION.
- Chlorine bleach may damage fabrics and other surfaces. Spot test area before using for disinfection.

Concentrations of chlorine bleach used for disinfection:

- a) Minimum concentration of 1000ppm
 - i. Use for non-porous surfaces, tile floors, counters, sinks, toilets
 - ii. 1:50 dilution
 - iii. 1/3 cup standard (5.25%) bleach per gallon of water
- b. Maximum concentration of 5000ppm
 - i. Use for porous surfaces, wooden floors
 - ii. 1:10 dilution
 - iii. 1 2/3 cup standard (5.25%) bleach per gallon of water
- c. Solutions should be made daily, or can be stored in a dark (light-proof) container and discarded after 30 days

Leave bleach on surface for 10 – 20 minutes, and then rinse with clean water.

EPA Approved Disinfectants

If bleach cannot be used, U.S. Environmental Protection Agency (EPA) has also approved disinfectants for cleaning surfaces. A list of approved disinfectants is maintained on the EPA website: http://www.epa.gov/oppad001/list_g_norovirus.pdf.

Not all disinfectants shown on the EPA list are approved for use in food establishments. NOTE: Most quaternary ammonium compounds may not be effective against norovirus.

Disinfection (for Large Spills of Vomitus or Stool)

1. Pre-clean visible/organic debris with absorbent material (double layer and placed in a plastic bag to minimize exposure to aerosols).
2. Liberally disinfect area and objects surrounding the contamination (multiple applications may be required).
 - a. Hard surfaces-disinfect with bleach (see previous section)
 - b. Carpet/Upholstered Furniture
After pre-clean: Clean with hot water and detergent and then steam clean (158° F for 5 min or 212 ° F for 1 min) for complete inactivation. A professional carpet cleaning company is recommended to reduce the risk of aerosolizing virus. Dry vacuuming is not recommended.

Linens/Clothing

If soiled, vomit or stool should be carefully removed to minimize aerosols. Keep contaminated and uncontaminated clothes separated. Do not shake soiled laundry and linens. Soiled linens and laundry should be placed directly into a bag at the point of removal. Wash items in a pre-wash cycle, then use a regular wash cycle using detergent and dry separately from uncontaminated clothing at high temperature greater than 170° F. Ensure segregation of clean and soiled linens and clothing.

Medical Equipment Cleaning Precautions

Medical equipment used for care of norovirus infected patients should either be dedicated to that room for the duration of isolation or be thoroughly disinfected upon removal from the room. Consult terminal cleaning recommendations for your facility. Select a cleaning agent that is consistent with the equipment manufacturer's recommendations.

Ice Machines

Contaminated ice machines must be disinfected.

References for Additional Information

Guideline for Environmental Infection Control in Health-Care Facilities, 2003:
http://www.cdc.gov/ncidod/dhqp/gl_environinfection.html

Guidelines for Infection Control in Health Care Personnel, 1998:
http://www.cdc.gov/ncidod/dhqp/gl_hcpersonnel.html

Guideline for Isolation Precautions:
Preventing Transmission of Infectious Agents in Healthcare Settings 2007
http://www.cdc.gov/ncidod/dhqp/gl_isolation.html

EPA's Registered Antimicrobial Products Effective Against Norovirus:
http://www.epa.gov/oppad001/list_g_norovirus.pdf