

# **INVESTIGATION AND MANAGEMENT OF OUTBREAKS OF KNOWN OR SUSPECTED NOROVIRUS IN LONG TERM CARE FACILITIES**

Colorado Department of Public Health and Environment  
Communicable Disease Epidemiology Program

## **What is Norovirus?**

• **AGENT:** Noroviruses (also known as Norwalk-like virus, calicivirus, and small round structured viruses) are a group of viruses that cause acute viral gastroenteritis. Gastroenteritis is inflammation of the lining of the stomach and intestines, and usually causes nausea, vomiting, and/or diarrhea. Illness caused by norovirus is often referred to as the “stomach flu”. Noroviruses may account for more than 90% of gastroenteritis outbreaks not caused by bacteria or toxins. They can survive relatively high levels of chlorine (up to 10 ppm) and varying temperatures (from freezing to 140°F). Humans are the only known reservoirs. Outbreaks of norovirus infection have involved many different settings, including restaurants, catered events, schools, child care centers, camps, cruise ships, swimming pools, hospitals and long term care facilities (LTCFs). Other viruses also cause acute gastroenteritis, including rotavirus (which occurs primarily in children), adenovirus, sapovirus, and astrovirus. These viruses are transmitted the same way as noroviruses, and control measures for outbreaks of these viruses would be the same as for norovirus outbreaks.

• **INCUBATION PERIOD:** 12 - 48 hours

• **DURATION:** 12 - 60 hours

• **SYMPTOMS:**

▪ vomiting	▪ abdominal cramps	▪ chills
▪ diarrhea (not bloody)	▪ headache	▪ muscle aches
▪ low-grade fever	▪ nausea	▪ malaise

Onset of symptoms is sudden. Vomiting is more prevalent among children, whereas, adults usually experience diarrhea. Severe dehydration, although rare, can be fatal, especially among older persons with debilitating health conditions. The illness is self-limiting. Long-term sequelae have not been reported, and there is no long-term immunity.

• **TRANSMISSION/COMMUNICABILITY:** Noroviruses are highly concentrated in the stool and vomitus of infected people. The viruses have a low infectious dose (< 100 viral particles), which allows for easy person-to-person transmission via the fecal-oral route. Airborne (through aerosolized vomitus) and fomite transmission may occur. Noroviruses can cause large, protracted outbreaks in LTCFs due to the low infectious dose, close living quarters, and potential for decreased personal hygiene among residents due to various health conditions. Attack rates during these outbreaks can be 50-70% or higher among residents as well as staff. People are most contagious from the moment they begin feeling ill until diarrhea subsides; however they can remain contagious for at least two days after recovery. Norovirus has been detected in stool as long as three weeks after onset. Some people may have asymptomatic norovirus infection yet still shed the virus. This reinforces the need for good hygiene and handwashing.

- **TREATMENT:** There is no antiviral medication for treatment nor is there a vaccine for prevention of norovirus infection. Supportive therapy consists of replacing fluids and electrolytes to prevent dehydration.
- **DISINFECTION:** Noroviruses are resistant to many commonly used disinfectants, including quaternary ammonium compounds that are often used in health care facilities. During an outbreak it is important to use a 10% bleach solution (one cup of bleach in nine cups of water) or a disinfectant approved by EPA with specific claims for activity against noroviruses. A list of EPA-registered disinfectants effective against norovirus is available at: [www.epa.gov/oppad001/chemregindex.htm](http://www.epa.gov/oppad001/chemregindex.htm). All disinfectants should be used on clean surfaces for maximum performance.

### **What Types of Facilities do these Guidelines Cover?**

These guidelines were written primarily to provide guidance for norovirus outbreaks in long term care facilities (LTCFs), however they can be adapted and used for investigation and control of norovirus outbreaks in other health care or residential settings, such as assisted living facilities, residential care facilities for the developmentally disabled, and acute and transitional care units. As the arrangement of these other types of facilities can vary tremendously, it is recommended that public health agencies contact CDPHE for guidance in these situations.

### **LTCF Regulation in Colorado and Outbreak Response:**

The CDPHE Health Facilities and Emergency Medical Services Division (HFEMS) maintains licensing and regulatory authority over LTCFs and similar facilities, and conducts routine inspections and complaint investigations. In addition, some local public health agencies conduct routine environmental health inspections of LTCF food service operations.

In contrast, **outbreaks** of illness at such facilities are investigated by the Communicable Disease Epidemiology Program (CDEP) at CDPHE or by the appropriate local public health agency. By statute (CRS 25-1-506), state and local public health agencies have the duty and authority to investigate and control the causes of epidemic or communicable diseases. Further, Colorado Board of Health Regulations detail which conditions are reportable and the specific powers state and local public health authorities have to investigate and control disease (“Rules and Regulations Pertaining to Epidemic and Communicable Disease Control” 6 CCR1009-1). **Group outbreaks from any source are reportable conditions.** As such, these should be reported promptly so that appropriate control measures can be implemented as quickly as possible.

While outbreaks of gastrointestinal illness are not always preventable, a LTCF’s response to an outbreak, and to requests from public health, should be fast and thorough. CDEP does not typically report details of outbreaks to HFEMS. However, CDEP or a local public health agency can place a complaint with HFEMS if serious infection control lapses are identified or if a facility does not cooperate with investigation or implementation of control measures during an outbreak.

## What Constitutes an Outbreak?

As the presence of diarrhea in one or two residents in a LTCF is not unusual, determining when there is an outbreak can be somewhat subjective. **In general, an outbreak of gastroenteritis in a LTCF is defined as the presence of more diarrhea or vomiting than would usually be expected in the facility, or in a particular unit, for that time of year.**

An outbreak of norovirus infection may be classified as “suspect” or “confirmed”:

- *Suspected norovirus outbreak:* The signs and symptoms of the illness closely resemble those of norovirus, however stool samples were not collected, stool was tested only for bacterial pathogens, or results from norovirus testing were inconclusive.
- *Confirmed norovirus outbreak:* The signs and symptoms of the illness are consistent with those of norovirus, and laboratory testing yielded results that were positive for norovirus in specimens **from at least two different ill individuals.**

In general, outbreaks fall into one of two categories: common (or point) source outbreaks, or person-to-person (or propagated) outbreaks.

- *Common (or point) source outbreak:* This type of outbreak occurs when a group of persons is exposed to an infectious agent from the same source. An example would be eating a food item contaminated by an ill food handler or consuming water from the same contaminated source. When the exposure is brief (such as a single meal), the resultant cases of illness develop within one incubation period of the disease. Epidemic curves for this type of outbreak generally begin with a sharp spike in cases (examples of epidemic curves are on page 7).
- *Person-to-person (or propagated) outbreak:* This type of outbreak does not have a common source and spreads more gradually from person-to-person, usually growing as it spreads. Outbreaks of this type are common in LTCFs due to introduction of the virus by an ill visitor, staff member or new resident.

Note: Norovirus outbreaks in LTCFs that begin as common source outbreaks may continue as person-to-person outbreaks due to the contagious nature of the virus. Staff members can become infected and further spread the virus within the affected facility or to other facilities where staff members may work.

## Case Definition:

During an outbreak, it is important to use specific criteria to determine which persons will be counted as “cases,” or ill people. The following case definition is recommended for a suspected norovirus outbreak in a LTCF:

Vomiting and/or diarrhea (two or more loose stools in a 24-hour period) in a resident or staff member with onset of symptoms since (specified date) and whose symptoms have no other apparent cause.\*

\* The use of a new medication or laxative, or other pre-existing health conditions, can often cause gastrointestinal symptoms.

### **Reporting Requirements:**

An isolated, individual case of norovirus infection is not a reportable condition in Colorado.

As with all group outbreaks, **facilities should report suspected norovirus outbreaks to the local public health agency or state health department within 24 hours.** Local public health agencies (LPHAs) are asked to report outbreaks to the CDPHE Communicable Disease Epidemiology Program (303-692-2700) as soon as possible. When making an initial report to CDPHE, local health departments should report the following: facility name, location, number ill to date, estimated size of facility, date of first onset, and suspected route of transmission. E-mail notification from LPHAs to CDPHE is acceptable.

### **Individual Case Investigation:**

If a LTCF resident develops acute gastroenteritis, the facility should investigate to determine if others are ill (i.e. if the ill person might be part of an outbreak). The facility should be vigilant in looking for other cases of illness in both residents and staff. The facility should consider placing an ill resident on contact precautions until his or her symptoms subside and should follow facility policies for infection control in residents with gastroenteritis.

Contact precautions involve instituting practices to reduce the risk of transmission by direct (touching of the patient) or indirect (touching of surfaces or objects that have been in contact with the patient) contact with an infectious person. Contact precautions usually require health care providers to wear a gown and gloves when caring for the ill patient, and placing the ill patient in a single-patient room (if feasible). Gowns and gloves should be donned upon room entry and removed upon exiting the ill patient's room, and proper handwashing should occur. Medical equipment (such as blood pressure cuffs) used on a patient on contact precautions should not be used on other patients unless the equipment is cleaned and disinfected before reuse.

### **Diagnosis and Laboratory Confirmation:**

**Outbreak control measures should not be delayed while waiting for test results as testing may take several days to complete.**

**Norovirus outbreaks can be difficult to distinguish from outbreaks of other etiologies, such as Salmonella. When an outbreak of gastrointestinal illness is detected, CDPHE strongly encourages facilities to submit stool for bacterial culture and norovirus testing simultaneously so outbreaks of other pathogens are rapidly identified, as control measures may differ from those used for norovirus.**

The state laboratory and commercial diagnostic laboratories can perform norovirus testing (polymerase chain reaction [PCR]) and bacterial culture on a fee for service basis. LTCF's may submit specimens to their laboratory of choice for norovirus testing and stool culture.

To confirm the etiology of an outbreak, **submitting two to six stool specimens** from different individuals is recommended, as two positive specimens are necessary to consider the etiology “confirmed.” Since there is no specific treatment for norovirus infection, testing every ill person is not necessary. While stool is preferred, vomitus specimens can also be tested for the presence of norovirus, if more readily available. If possible, specimens should be collected during the first 48 hours of illness while stool is still liquid. Otherwise, specimens collected within 7-10 days of illness onset are usually acceptable.

If using the state laboratory, guidance on specimen collection and transport can be found at: [www.cdphe.state.co.us/dc/Epidemiology/outbreak\\_forms.html](http://www.cdphe.state.co.us/dc/Epidemiology/outbreak_forms.html). At the state laboratory, norovirus results are usually ready within 1 full business day after specimen receipt and bacterial culture results in 2-3 days. The current fee for norovirus PCR is \$110 per specimen. The fee for bacterial stool culture (Campylobacter, Salmonella, Shigella, E. coli O157) is \$90 per specimen. The state laboratory will invoice the submitting agency, not individual medical insurance providers.

LTCF’s using another lab for stool testing should consult with that lab for instructions on specimen collection and transport instructions.

In rare circumstances, such as when a common source outbreak is suspected, or when there are other concerns that warrant an in-depth public health investigation, CDPHE may waive fees for stool testing at the state laboratory. **Local public health agencies investigating the outbreak should make arrangements with the CDPHE Communicable Disease Epidemiology Program prior to submitting these specimens to the state laboratory.** Depending on the symptoms and duration of illness, additional tests, such as ova and parasite tests can be performed by the CDPHE laboratory.

### **Investigating a Norovirus Outbreak in a Long Term Care Facility:**

(See flow chart on page 10)

#### **{A} Is it an outbreak?**

Norovirus outbreaks can occur at any time of the year, but are more common in the winter and early spring. It is not uncommon for outbreaks of norovirus to occur in LTCFs at the same time “stomach flu” is occurring in the community.

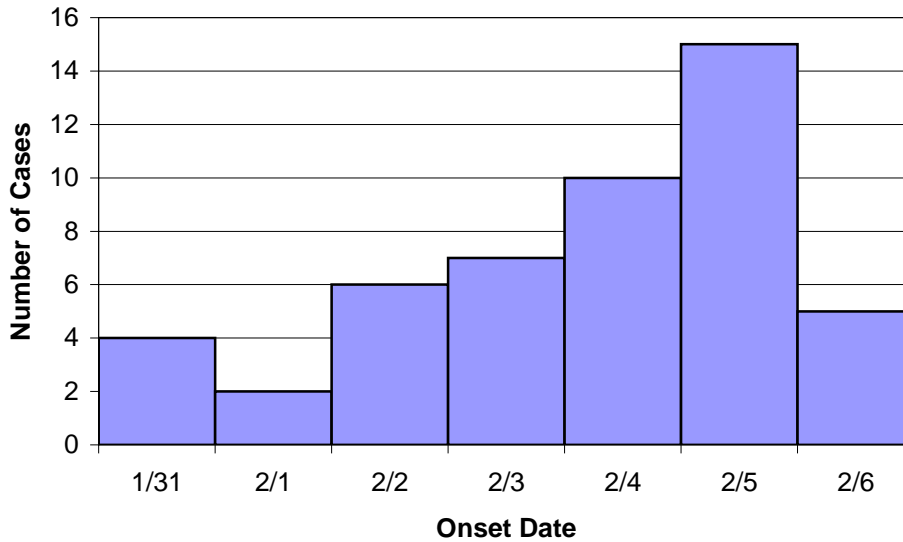
When a LTCF contacts a public health agency to report an outbreak, the first step is to confirm that an outbreak is occurring. This is not always straightforward because LTCFs do not always perform systematic surveillance for gastrointestinal illness. Often, the best approach is to speak with the infection control practitioner or director of nursing and inquire about the usual number of residents who have diarrhea and/or vomiting at any given time. If the number of reported cases exceeds what is expected, then an outbreak may be occurring. If it is unclear whether an outbreak is occurring, monitor the facility for additional cases of illness for at least one week.

#### **{B} Preliminary Investigation:**

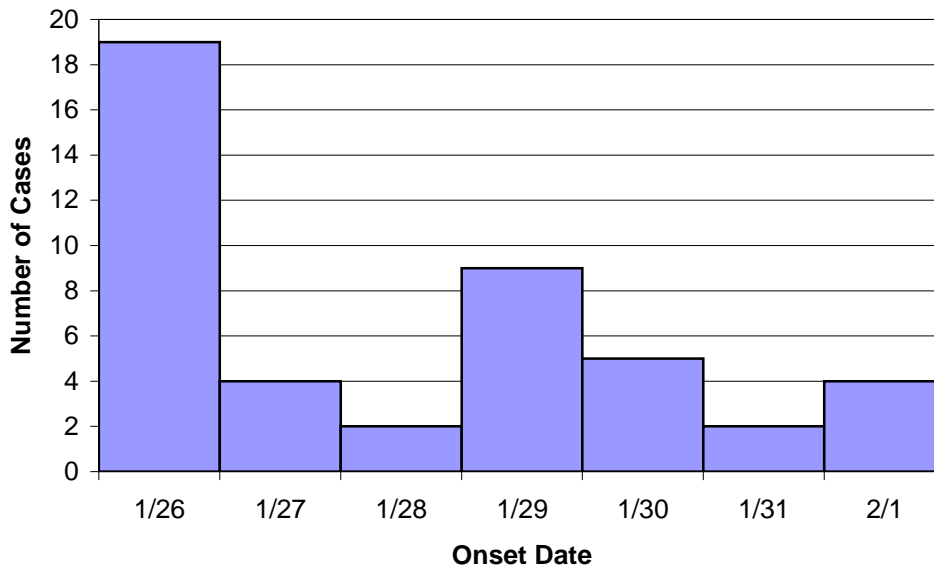
- **Local public health agencies are encouraged to perform a preliminary investigation of outbreaks of suspected norovirus that occur in LTCFs in their jurisdictions.** CDPHE is available to assist local public health agencies investigate these outbreaks.

- The goals of conducting a preliminary investigation are:
  - Determine if the outbreak is likely to be from a common source
  - Determine if norovirus is the likely cause of the outbreak
  - Determine how the outbreak is progressing through the facility
  - Implement control measures in the facility to halt progression of the outbreak
- It is appropriate and important to work closely with the facility's infection control practitioner, director of nursing, and/or administration during the preliminary investigation.
- Ask the infection control practitioner or director of nursing to collect the following information. The recommended way to gather this information is through creating a line list of all residents and staff who are ill. Sample line lists are available on pages 13-14.
  - The number ill residents
  - The number of ill staff
  - Illness onset dates and times
  - Symptoms
  - Average duration of illness
  - Distribution of illness in the facility (affected units/wings)
  - Hospitalizations/deaths
- Norovirus outbreaks are usually characterized by a higher frequency of vomiting, headache, and muscle aches than is common for gastroenteritis outbreaks from other causes, such as Salmonella. It is important to ask about these symptoms when collecting data. However outbreaks caused by other pathogens (e.g. Salmonella) can be clinically indistinguishable from norovirus.
- Develop and use a case definition, such as the one on page 3, for the purpose of counting the number of people who are ill (cases).
- Assist the LTCF to implement appropriate control measures as outlined on pages 11-12.
- If residents and staff are still experiencing symptoms, or symptoms have occurred in the past 7 days, recommend the facility collect 2-6 stool specimens for norovirus testing and bacterial culture. Information on testing and specimens is on page 4. Stool specimens may be sent to a commercial laboratory or to CDPHE for testing.
- In the absence of lab testing for norovirus, Kaplan's criteria can be used to determine whether the cause is likely to be norovirus:
  - Stools negative for bacterial pathogens
  - Mean or median duration of illness 12-60 hours
  - Vomiting in at least 50% of cases
  - Mean or median incubation period 24-48 hours
- Provide the LTCF with information about norovirus outbreaks. Print pages 11–16 and distribute them to the LTCF, or refer them to: [www.cdphe.state.co.us/hf/Protocols.htm](http://www.cdphe.state.co.us/hf/Protocols.htm)
- Plot an epidemic curve (epi-curve). The vertical axis (y-axis) marks the number of ill people, and the horizontal axis (x-axis) marks the illness onset date. Plot the new cases of illness that occur on each date. Two examples are shown on the following page.

### Person-to-person transmission (propagated) outbreak:



### Common source outbreak



- When examining epidemic curves for suspected norovirus outbreaks in LTCFs, it is important to remember that noroviruses spread very rapidly from person to person. An outbreak that begins as a common-source outbreak can rapidly turn into a propagated outbreak involving many secondary cases. This means that cases may occur over more than one incubation period (i.e. over more than 2 days). This can make interpretation of an epidemic curve somewhat challenging. In order to determine whether the outbreak began with a common exposure (and thus requires a more thorough investigation), the first few days of the outbreak should be examined. **If during the first three days of the outbreak there is a steep rise in the number of cases, a common source outbreak is**

likely. If, however, during the first three days of the outbreak there were only a few cases each day followed by a large increase in cases, the outbreak is more likely not to have a common source.

**{C} If the epi-curve suggests that the outbreak is NOT from a common source AND the symptoms are consistent with norovirus infection:**

- If the symptoms are consistent with norovirus infection (i.e. vomiting, non-bloody diarrhea, low-grade fever, headache, muscle aches, nausea, abdominal cramps, chills, malaise), and the *average* duration of symptoms is one to two days, the following steps should be taken:
  - Continue to complete the line list started in section B, adding new cases as they occur. The facility should take primary responsibility for this task.
  - In order to examine the progression of illness throughout the facility, it is helpful to obtain a diagram of the facility layout and denote ill resident's rooms their onset date. The same can be done with ill staff and the area of the facility they typically work.
  - Continue to monitor the LTCF for adherence to control measures and to follow the progression of the outbreak. Depending on the progression of the outbreak, this phase may last for several days or several weeks.
  - The facility and the local public health agency should each designate a primary contact for the outbreak investigation. The facility should provide updates to the local public health agency daily, or as agreed upon by both parties.
  - In general, an outbreak can be considered "over" if at least 4 days (2 incubation periods) have passed since the onset date of the last new case (be it in a resident or staff member). However, most control measures should remain in place for at least 2 weeks after the last case's onset, because infected persons can shed norovirus for up to 2 weeks after recovery and norovirus can persist on environmental surfaces.
  - When the outbreak is over, complete the "Norovirus Outbreak Report Form for Long Term Care Facilities" on page 16 and return it to CDPHE.

**{D} If the epi-curve suggests that the outbreak is from a common source OR the symptoms are NOT consistent with norovirus infection:**

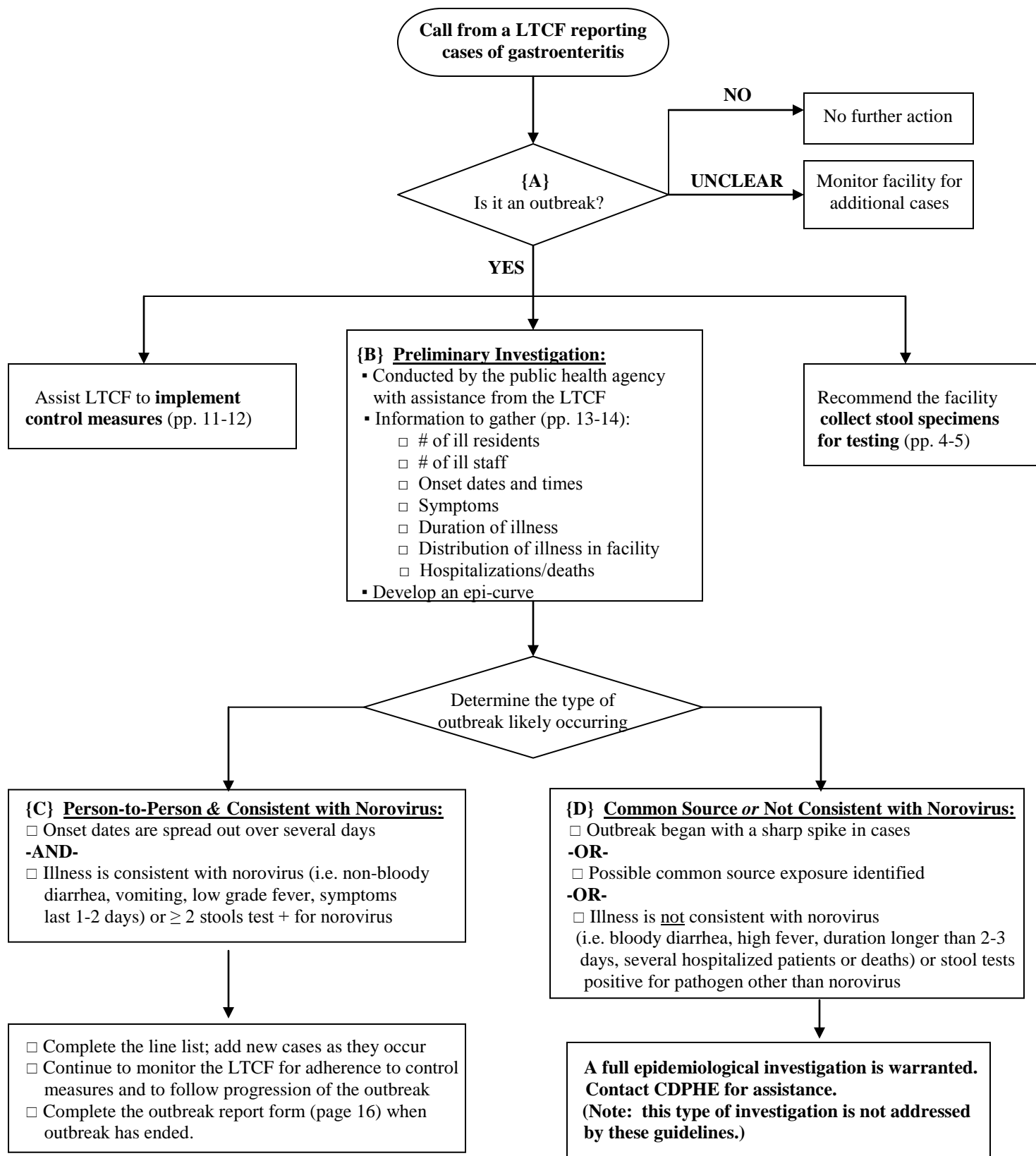
- If the outbreak began with a large number of cases, or a common exposure is identified, a common source outbreak may be occurring. **In this case, a full epidemiological and environmental investigation is warranted, which is not addressed by these guidelines.** The purpose of the full investigation is to try to identify and eliminate the source of the outbreak and implement control measures to prevent additional spread and future outbreaks of this type. **Please contact CDPHE for assistance and to arrange for stool testing at the CDPHE laboratory.**
- If the illness is not consistent with norovirus infection, a full epidemiological investigation is warranted, which is not addressed by these guidelines. The purpose of the full investigation is to determine the causative agent (e.g. *Salmonella*); identify the source; and implement control measures to prevent additional spread and future outbreaks of this type. In particular, **if any of the following circumstances apply, please contact CDPHE for assistance:**

- Symptoms include bloody diarrhea or high fever, or any other symptom not consistent with norovirus infection.
- The *average* duration of symptoms is longer than two days.
- Several patients are hospitalized or die.
- Stool testing results are positive for a pathogen other than norovirus.

For additional information on norovirus, please visit the following CDC websites:

- “Norwalk-Like Viruses” Public Health Consequences and Outbreak Management:  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5009a1.htm>
- Information on norovirus, including frequently asked questions:  
<http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus.htm>

**Flow chart for public health investigation of suspected outbreaks of gastroenteritis in a LTCF:**  
 (see pages 5-9 in this section for more detailed information)



## Norovirus Outbreak Control Measures:

**Implement control measures as soon as the potential outbreak is recognized.** Do not wait for laboratory results. Since noroviruses may be shed in the stool for weeks after symptoms subside, enhanced precautions need to be in place for at least two weeks following the last case of illness. Some can be discontinued when the outbreak is ‘over’ (at least 2 incubation periods have elapsed since the onset of the last case). The following control measures should be implemented:

### Handwashing:

- Staff, residents, volunteers and visitors must be more conscientious about handwashing and infection control. In general, handwashing should occur more frequently among all people in the facility.
- Hand sanitizing gels and lotions (also known as waterless hand sanitizers) can be used if handwashing facilities are not easily or immediately accessible. They can also be used in addition to proper handwashing. These products are not a substitute for proper handwashing.

### Staff:

- Symptomatic staff members should be reported to the person in charge of infection control or employee health. The following data should be systematically recorded (i.e. on a line list – see page 13): name, sex, age, illness onset date and time, symptoms, job title and location, illness duration, and if a stool specimen was collected.
- **Exclude ill staff, especially food handlers, from work until at least 48 hours after diarrhea and vomiting have ceased, even if they are feeling well sooner.**
- **Instruct ill staff employed at other healthcare facilities or LTCFs not to work at those other sites until at least 48 hours after diarrhea and vomiting have ceased.**
- Nursing staff should not “float” between affected areas and non-affected areas.
- Non-essential staff should be excluded from the affected areas.
- Staff should use disposable single-use gloves and gowns when caring for ill residents. **Change gloves and gowns and wash hands before caring for each resident.**
- Schedule a meeting with staff to review infection control procedures.
- Staff should wear appropriate PPE (gowns, gloves, and surgical masks) when cleaning areas contaminated with feces or vomit, or when caring for residents who are vomiting.
- Staff such as physical and occupational therapists who are essential and may visit several facilities in one day should be counseled about the outbreak and infection control. Within the affected facility, these staff should visit unaffected units before affected ones and should maintain excellent hand hygiene, especially when moving between facilities.

### Residents:

- Symptomatic residents should be reported to the person in charge of infection control, and the following data should be systematically recorded (i.e. on a line list – see page 14): name, sex, age, illness onset date and time, symptoms, room number, unit/wing, hospitalization status, illness duration, and if a stool specimen was collected.
- Ill residents should be placed on contact precautions and should be restricted to their rooms as much as possible until at least 48 hours after cessation of vomiting and diarrhea.
- Group activities should not occur among affected residents/units until the outbreak is over.

- Staff should make an effort to decrease feelings of isolation among ill residents. Consider encouraging family members to make more frequent telephone calls to ill residents.
- Residents should not be moved from an affected area to an unaffected area.
- Maintain the same staff-to-resident assignments.
- Consider the use of antiemetics (anti-vomiting medication) for residents with vomiting.
- If a resident is transferred to the hospital, notify the hospital that the resident is coming from a facility at which an outbreak of viral gastroenteritis is occurring.

#### Facility

- The facility, in conjunction with the state or local public health agency, should consider halting new admissions until the outbreak is over.
- Use a 10% solution of household chlorine bleach (a cup of bleach per nine cups of water) or an EPA-approved disinfectant with specific activity against norovirus. **Quaternary ammonium compounds are not effective against noroviruses.** A list of EPA-registered disinfectants is available at: [www.epa.gov/oppad001/chemregindex.htm](http://www.epa.gov/oppad001/chemregindex.htm).
- Clean and disinfect more frequently than usual, especially bathrooms, bathtubs, toilets, and areas of the facility commonly touched, such as handrails and doorknobs.
- Clean and disinfect any area that becomes soiled with feces or vomit promptly with a bleach solution or EPA-approved disinfectant.
- Common medical equipment (such as blood pressure cuffs) should be adequately cleaned and disinfected between residents. Consider dedicating pieces of commonly used equipment (blood pressure cuffs, glucometers, etc.) for use in affected areas.
- Flush any vomit or feces in toilets immediately.
- For carpets and upholstered furniture, remove visible debris with absorbent material and steam clean (158F for 5 minutes or 212F for 1 minute)
- Handle soiled linens and clothing as little as possible. They should be laundered with detergent in hot water at the maximum available cycle length and then machine dried.
- Any food handled by an ill person should be properly discarded.
- Discontinue self-service or family-style dining in dining rooms until outbreak is over.
- Disposable dishes and utensils are not necessary as regular dishwashing practices effectively removes any pathogens.
- Post signs that the facility is experiencing an increase in gastrointestinal illness.

#### Visitors/Volunteers:

- Encourage all visitors and volunteers to wash their hands while in the facility.
- Postpone visits from elderly persons, young children and persons with underlying medical conditions until the outbreak is over.
- Ill family members and friends should be asked to avoid visitation until symptoms subside.
- Monitor facility volunteers for illness. If ill, exclude them from volunteer work until at least 48 hours after recovery.

#### **Additional Information:**

To report an outbreak or for further guidance, please contact your local public health agency or CDPHE:

<b>Communicable Disease Epidemiology</b>	<b>(303) 692-2700</b>
<b>After-Hours Number</b>	<b>(303) 370-9395</b>
<b>Laboratory Services Division (state laboratory)</b>	<b>(303) 692-3090</b>

## OUTBREAK SURVEILLANCE FORM – STAFF

Facility: \_\_\_\_\_

NAME	SEX	AGE	ONSET		SYMPTOMS (SEE BELOW)	JOB TITLE	JOB LOCATION	ILLNESS DURATION	STOOL COLLECTED
			DATE	TIME					
				AM					
				PM					
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**Symptoms:** **V** = Vomiting   **D** = Diarrhea   **F** = Fever (provide temperature)   **A** = Abdominal Cramps   **H** = Headache   **N** = Nausea  
**M** = Muscle Aches   **C** = Chills   **O** = Other (please list)

## OUTBREAK SURVEILLANCE FORM – RESIDENTS

Facility: \_\_\_\_\_

NAME	SEX	AGE	ONSET		SYMPTOMS (SEE BELOW)	ROOM #	UNIT/ WING	HOSPITAL- IZED	ILLNESS DURATION	STOOL COLLECTED
			DATE	TIME						
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**SUMMARY OF GUIDELINES FOR INVESTIGATION AND MANAGEMENT OF NOROVIRUS  
OUTBREAKS IN LONG TERM CARE FACILITIES**

Colorado Department of Public Health and Environment  
Communicable Disease Epidemiology Program

**Agent:** Noroviruses cause acute viral gastroenteritis. In long-term care facilities (LTCFs), outbreaks of gastroenteritis caused by noroviruses are fairly common (especially in the winter), but require immediate attention to prevent prolonged spread of the virus in residents and staff.

**Incubation period:** 12 - 48 hours

**Duration of symptoms:** 12 - 60 hours

**Symptoms:** Onset of symptoms is sudden, consisting of nausea, vomiting, diarrhea (not bloody), abdominal cramps, low-grade fever, headache, chills, muscle aches and malaise. Severe dehydration can be fatal, especially among older persons with debilitating health conditions.

**Transmission/Communicability:** Noroviruses are extremely infectious, and are highly concentrated in the stool and/or vomit of infected people. Transmission is primarily person-to-person via the fecal-oral route, although airborne and fomite transmission may occur during outbreaks. Noroviruses can also cause foodborne and waterborne outbreaks. People are most contagious from the moment they begin feeling ill until diarrhea subsides, however they can remain contagious until at least 48 hours after recovery.

**Treatment:** There is no antiviral medication for treatment nor is there a vaccine for prevention. Supportive therapy consists of replacing fluids and electrolytes to prevent dehydration.

**Investigation:** In the event of an outbreak, the following steps should be taken:

- **Notify CDPHE or the local public health agency within 24 hours (phone numbers below).** CDPHE is available to assist LTCFs and local public health agencies investigate these outbreaks and review appropriate control measures.
- Collect 2-6 stool specimens from different ill individuals and submit them to a commercial laboratory or to CDPHE for norovirus testing and bacterial culture (on a fee for service basis). Try to collect specimens during the first 48 hours of illness while stool is still liquid.
- **Outbreak control measures should not be delayed while waiting for test results.**
- At the minimum, the facility should collect and document the following information for each ill resident and staff member:
  - Illness onset date and time
  - Symptoms
  - Duration of illness
  - Hospitalizations/deaths
  - Wing/room number (residents)
  - Job duties, work location, dates worked (staff)
- Based on the data collected above, the local public health agency and/or CDPHE will determine if the outbreak is likely from a common source or due to person-to-person spread. Additional information will be collected as needed to determine the source of the outbreak.

**Additional Information:**

<b>Communicable Disease Epidemiology</b>	<b>(303) 692-2700</b>
<b>After-Hours Number</b>	<b>(303) 370-9395</b>
<b>Laboratory Services Division (state laboratory)</b>	<b>(303) 692-3090</b>

For additional information on norovirus, please visit these CDC websites:

- “Norwalk-Like Viruses” Public Health Consequences and Outbreak Management:  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5009a1.htm>
- Information on norovirus, including frequently asked questions:  
<http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus.htm>

**GASTROENTERITIS (NOROVIRUS) OUTBREAK REPORT FORM FOR LONG TERM CARE  
AND HEALTHCARE FACILITIES**

Outbreaks should be reported to the local or state health department within 24 hours of being identified. When the outbreak has ended, please complete and fax this form to CDPHE or your local health department; attach additional comments, epi-curve, and/or outbreak report if available.

Reported by: \_\_\_\_\_  
Agency: \_\_\_\_\_ Title: \_\_\_\_\_

Facility name: \_\_\_\_\_  
Address: \_\_\_\_\_ City: \_\_\_\_\_ Zip code: \_\_\_\_\_  
County: \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Facility contact person/title: \_\_\_\_\_

Facility type (check all that apply):  Skilled nursing  Assisted living  Rehabilitation  
 Independent living  Acute care hospital  Other: \_\_\_\_\_

Facility census at start of outbreak: # Residents \_\_\_\_\_ # Employees \_\_\_\_\_

Date of first illness onset: \_\_\_\_\_ Date of last illness onset: \_\_\_\_\_

Total number of ill residents: \_\_\_\_\_

Total number of ill staff: \_\_\_\_\_

Number of persons hospitalized: \_\_\_\_\_ Number of deaths: \_\_\_\_\_

Shortest duration of illness: \_\_\_\_\_ Longest duration of illness: \_\_\_\_\_ Median duration: \_\_\_\_\_

Primary route of transmission:  Person-to-person  Food/water\*  Other: \_\_\_\_\_

\*If foodborne/waterborne is suspected, contact CDPHE immediately. More complete investigation is needed.

<b>Symptoms</b>	<b># Residents</b>	<b># Employees</b>
Abdominal cramps		
Fever		
Diarrhea		
Bloody diarrhea		
Vomiting		
Headache		
Other:		
<b>Total people for whom this information was collected</b>		

Were stool specimens submitted to a laboratory for testing?  Yes  No

If yes, where:  CDPHE (state) lab  Other lab: \_\_\_\_\_

Date submitted (earliest date, if submitted on multiple days): \_\_\_\_\_

<b>Stool Test Summary</b>			
<b>Type of Test</b>	<b>Total # tested</b>	<b>Total # positive</b>	<b>Organism found</b>
Norovirus PCR			
Bacterial culture			
Other:			

**Fax completed form to:** Colorado Department of Public Health and Environment (CDPHE)  
(303) 782-0338  
(Or to your local public health department)

Questions? Call CDPHE at (303) 692-2700

Complete guidance can be found at: [http://www.cdphe.state.co.us/dc/Epidemiology/dc\\_group.html](http://www.cdphe.state.co.us/dc/Epidemiology/dc_group.html)