Kentucky Public Health
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NOROVIRUS OUTBREAK RESPONSE GUIDE

PURPOSE

This guide is written to provide guidance for responding to norovirus outbreaks in various settings within the community, including jails, schools, long-term care facilities (LTCF), assisted living facilities, and other healthcare or residential facilities, such as independent living facilities, residential care facilities for the developmentally disabled, acute care, transitional care, and rehabilitation units.

AUTHORITIES

902 KAR 2:020 Disease Surveillance – http://www.lrc.ky.gov/kar/902/002/020.htm

Section 5. *Outbreaks or Unusual Public Health Occurrences. (1) If, in the judgment of a health professional licensed under KRS Chapters 311 through 314, or a health facility licensed under KRS Chapter 216B, an unexpected pattern of cases, suspected cases, or deaths which may indicate a newly-recognized infectious agent, an outbreak, epidemic, related public health hazard or an act of bioterrorism, such as smallpox, appears, a report shall be made immediately by telephone to the:*
(a) Local health department where the professional is practicing or where the facility is located; or
(b) [Kentucky] Department for Public Health.

(2) An instance of suspected staphylococcal or other foodborne intoxication or an instance of salmonellosis or other foodborne or waterborne infection shall be reported within one (1) business day, and shall include all known information about the persons affected.

(3) The local health department:
(a) Shall investigate the outbreak or occurrence;
(b) Shall carry out public health measures appropriate to the disease or condition involved;
(c) Shall make medical and environmental recommendations appropriate to prevent future similar outbreaks or occurrences; and
(d) May seek assistance from the Department for Public Health.

For facilities under regulation of the Office of the Inspector General (OIG), although not written into state nursing facility licensure and federal certification laws, OIG encourages adherence to these standards as part of each facility's infection control program, under 42 C.F.R. 483.65, and to promote a sanitary environment, under 42 C.F.R. 483.15(h) and 483.70.

NOROVIRUS

IDENTIFICATION

CLINICAL DESCRIPTION: Noroviruses (previously referred to as Norwalk-like virus) are a very contagious group of viruses which can cause acute gastroenteritis, an inflammation of the stomach and small and large intestines.

INCUBATION PERIOD: It usually takes 12 to 48 hours from the time a person is exposed until symptoms develop.

SYMPTOMS: Acute onset, nonbloody diarrhea, vomiting, nausea, and abdominal cramps. Some persons might experience only vomiting or diarrhea. Low-grade fever and body aches also might be associated with infection.

DURATION OF ILLNESS: Typically symptoms resolve without treatment after 1--3 days in otherwise healthy persons. However, more prolonged courses of illness lasting 4-6 days can occur, particularly among young children, elderly persons, and hospitalized patients.

SPREAD: Norovirus is spread from person-to-person via the fecal-oral route or through contaminated food or water. The infectious dose for Norovirus is very low, i.e., as few as 18 viral particles. The virus leaves the body through the stool of an infected person and usually enters another person when hands, foods, or objects contaminated with stool are placed in the mouth. Spread of norovirus can occur when people do not wash their hands after using the toilet or changing diapers. People can also get sick by eating food items contaminated during preparation or serving. Aerosolized spread from vomiting is possible. Person-to-person spread often occurs within families, schools, nursing homes, cruise ships, in childcare settings, and communities. Most norovirus outbreaks occur from November to April in the United States, but outbreaks may occur at any time of year.

CONTAGIOUS PERIOD: While the symptoms are present and up to 72 hours after vomiting and/or diarrhea has stopped. Viral excretion peaks 2-5 days after infection and may persist in the stool for as long as 4 weeks following infection, although it is unclear if detection of virus alone indicates a risk for transmission.

TREATMENT: There is no specific drug treatment for those with norovirus. Norovirus illness cannot be treated with antibiotics because it is caused by a virus. Supportive therapy may be necessary to prevent dehydration and to maintain fluid and electrolyte balance. Vomiting and diarrhea may lead to dehydration, which may become a medical emergency. Symptoms of dehydration include: decrease in urination, dry mouth and

throat, and/or feeling dizzy when standing up. Ask a healthcare provider how to prevent dehydration.

EXCLUSION: Ill individuals should be excluded from work, childcare, and school until diarrhea and vomiting have stopped. More strict criteria apply to daycare workers, caregivers, food handlers, and LTCF staff who are ill with norovirus. These individuals should be excluded for 72 hours after recovery. Anyone with vomiting and/or diarrhea should NOT use pools, swimming beaches, recreational water parks, spas or hot tubs for at least 72 hours (3 days) after diarrhea and/or vomiting symptoms have stopped. Please call your local health department to see if further restrictions apply.

REPORTING TIMELINE:

Outbreaks of acute gastrointestinal illnesses that could be caused by norovirus should be reported to the Local Health Department within the jurisdiction in which the outbreak is occurring or to the Kentucky Department for Public Health immediately upon recognition of the outbreak. (902 KAR 2:020 Disease Surveillance – Section 5). Two or more cases of acute gastrointestinal illness epidemiologically linked (e.g., by place and time) should trigger Infection Preventionists to investigate whether an outbreak is occurring.

LOCAL HEALTH DEPARTMENT QUICK REFERENCE GUIDE FOR POSSIBLE NOROVIRUS OUTBREAKS

- Notify the Kentucky Department for Public Health (KY DPH), Reportable Diseases Section (RDS) of a Potential Outbreak – Complete the Initial Reporting Form for Outbreaks of Suspected or Confirmed Gastroenteritis (can be obtained from the KDPH Reportable Disease Section). This form provides a summary of the current situation, including: name of the facility/establishment/institution involved; contact information for facility/establishment/institution; number of ill individuals (aggregated by staff/residents/employees/customers/etc.); total number of individuals exposed (aggregated by staff/residents/employees/customers/etc.); a working case definition (see next bullet); and any actions being taken by the facility/establishment/institution to control the outbreak. Initiate a line list and prepare an epidemic curve.

- Working case definition – All case definitions should include the elements of Person, Place, Time and Clinical/Laboratory characteristics. Initial case definition should be broad and then made more specific, as new information comes in. An example of a case definition for suspect norovirus infection would be: "Any Resident/staff member/customer (Person) at xxx LTCF/institution/establishment (Place) with at least two or more episodes of vomiting and/or diarrhea (Clinical characteristics), within the past 24 hours with an onset date on or after Month/Day/Year (Time)." Case definitions may include methods to categorize cases as suspect, probable, or confirmed when these categories are necessary or useful. Case definitions for probable and confirmed cases should also include criteria for cases that were epi-linked to confirmed cases. Symptomology and laboratory criteria are the basis for the establishment of case categories. For example: a confirmed case meets all the characteristics established in the case definition; a probable case usually has all the crucial characteristics but is missing a final component of confirmation, such as a final lab test, or an epidemiologic link to a confirmed case; a suspect case usually has some similar symptoms to known cases but may be missing a crucial symptom or may not link clearly to known cases and is not lab-confirmed.

- **Remember the Three Threes**- (KDPH specific recommendations for norovirus): **3 days** per incubation period; up to **3 days** of exclusion for employees after symptoms have resolved; and have at least **3 norovirus-positive** specimens to confirm an outbreak.

- Conduct a site visit along with an environmentalist or obtain the layout as necessary and obtain an inspection report of the facility from the Local Health Department (LHD) environmentalist.

- Encourage and Review: Proper Hand Washing - Appropriate hand hygiene is likely the single most important method to prevent norovirus infection and control transmission. Reducing any norovirus present on hands is best accomplished by

thorough hand washing with running water and plain or antiseptic soap. Alcohol-based hand sanitizers (> 62% ethanol content) may be used to complement hand washing but should not be considered as a substitute to soap and water hand washing.

- Cleaning and Disinfecting Surfaces - Particular attention during cleaning should be given to the likely areas of greatest environmental contamination such as bathrooms and high-touch surfaces (e.g., door knobs and hand rails). Clean, then disinfect contaminated surfaces with either of the following methods: Use a chlorine bleach solution with a concentration of 1,000-5,000 ppm (see Table 1 for dilution instructions based upon the concentration of bleach solution) for hard, nonporous surfaces. Prepare a fresh dilution of bleach every day and discard unused portions. If using a bleach solution for disinfection on nonporous surfaces, allow to air dry after application. OR, use disinfectants registered as effective against norovirus by the EPA (http://www.epa.gov/oppad001/list_g_norovirus.pdf).

- Cleaning and Sanitizing Surfaces – Particular attention should also be given during cleaning of eating utensils, food use contact surfaces, mixed use tables, high chair trays, feeding trays, plastic mouthed items (toys, pacifiers, etc.) Clean, then sanitize potentially contaminated items with a soap solution, rinse and dry with a paper towel, use a sanitizing bleach solution and allow to air dry before wiping with a towel. Use a chlorine bleach solution with a concentration of 200 ppm (see Table 1 for dilution instructions based upon the concentration of bleach solution)

- Safety Precautions for Mixing Bleach Solutions – avoid mixing solution with other cleaning agents; use solution in well-ventilated areas; use personal protective equipment while disinfecting by wearing disposable gloves, masks, and eye protection noting that environmental cleaning with heavy bleach concentrations will require a heavier duty glove; and properly label all working bottles/containers of sanitizing solutions to identify the contents (Note: It is a critical violation of the Kentucky food code to store chemicals improperly in unlabeled containers).

- Recommend that ill staff members in health-care facilities and food handlers be excluded during their acute illness and for 48-72 hours following resolution of symptoms.

- Recommend use of contact precautions for preventing the spread of gastroenteritis (PPE- gown, gloves, & surgical mask for vomiting). Vomitus could aerosolize and infect others, who are in close proximity (Norovirus is highly infectious, as the infectious dose is very low, i.e., as few as 18 viral particles).

- Avoid cross-coverage staffing. Avoid allowing staff to move between units or facilities with affected patients and units or facilities that are not affected whenever possible.

- Cohort symptomatic patients when possible and provide separate toilets facilities for ill and well persons.

- Contacts of symptomatic individuals (contacts may be individuals such as: family members, roommates, staff, etc.) should be monitored for symptom development.

- Recommend the facility have signs on all entrances about the outbreak. The signs should alert visitors, supply staff, and vendors about the ongoing outbreak and encourage soap and water hand washing before and after visiting.

- Cancel or postpone group activities, including dining. Residents should eat in their rooms. Ill residents should be restricted to their rooms during the acute phase of their illness and for a period of 24-72 hours following recovery.

- Recommend that the facility close to new admissions for two norovirus incubation periods, i.e., six days, after the last onset of a case in a staff member or resident. Readmissions may be allowed to an unaffected unit.

- When transferring symptomatic patients, notify the EMS and the hospital or the receiving facility in advance about the ongoing outbreak, so appropriate precautions could be put in place to prevent the spread into the community or other facilities.

- Collect stool specimens on 7 to 10 ill residents, patients, or staff and coordinate with KDPH RDS staff to send to the Division of Laboratory Services (DLS) for norovirus testing. Separate specimens for diagnostic testing for bacterial pathogens and for *C. difficile* should be collected for concurrent testing. The bacterial pathogens and C. *difficile* specimens must be sent to a facility's usual lab or a national reference lab. Specimens collected for Norovirus testing may be submitted to DLS; coordinate this process through the KDPH RDS. *NOTE: Norovirus specimens must be raw (not in medium)* – Please see pages 22-23 for instructions on collecting and submitting stool specimens. KDPH recommends having at least 3 norovirus-positive specimens to confirm an outbreak. Please make sure to collect at least 7 specimens for testing. In the event that <7 but >3 specimens are collected and sent to the state lab and if 3 or more of those test positive for norovirus, KDPH does not recommend collecting any more specimens.

  Write a Final Outbreak Report and complete the Final Reporting Form for Outbreaks of Suspected or Confirmed Gastroenteritis. . For norovirus or

gastroenteritis outbreaks of unidentified etiology occurring in long term care facilities, the LHD is only required to complete the Final Reporting Form for Outbreaks of Suspected or Confirmed Gastroenteritis, an outbreak report is not required.See the Kentucky Foodborne and Waterborne Outbreak Investigation Manual for further instructions

- Enter data into NORS (National Outbreak Reporting System). Please see the Kentucky Foodborne and Waterborne Outbreak Investigation Manual for more specific instructions on how to enter data.

Criteria for Outbreak Determination if No Lab Specimens are Available:

Kaplan Criteria may be used to determine if the likely cause of an outbreak is norovirus, in the absence of laboratory confirmation.

The Kaplan Criteria are:

1. A mean (or median) illness duration of 12 to 60 hours,
2. A mean (or median) incubation period of 24 to 48 hours,
3. More than 50% of people with vomiting, and
4. No bacterial agent found.

When all four criteria are present, it is very likely that the outbreak was caused by norovirus. However, about 30% of norovirus outbreaks do not meet these criteria. If the criteria are not met, it does not mean that outbreak was not caused by norovirus

SUMMARY OF GUIDELINES: LIMITING THE TRANSMISSION OF THE NOROVIRUS IN HEALTHCARE FACILITIES, DAYCARES, AND THE COMMUNITY

General Control Measures

- Use contact precautions (Personal Protective Equipment (PPE) – gowns, gloves, and surgical mask for vomiting).
- Practice proper hand hygiene: Wash your hands with soap and water, especially after using the toilet, changing diapers and before handling food.
- Wash fruits and vegetables and cook meat products thoroughly.
- Clean and disinfect contaminated surfaces and all high-touch areas.
- Wash laundry thoroughly.

Norovirus can be spread through fecal or vomitus contact

- Remove bulk vomitus or stool and dispose of in the toilet.
- Clean the soiled area with detergent and water.
- For non-porous surfaces follow with a disinfectant or sanitizer effective against norovirus (Bleach solution or EPA approve product).
- Disinfectants and Sanitizers should be used at its maximum strength following the manufacturer's instructions.
- The Center for Disease Control and Prevention recommends that chlorine bleach disinfectant and sanitizer be used at the appropriate strength for the surfaces to be disinfected or sanitized. Up to 5000 ppm for non-porous surfaces to 200 ppm for mouthed items or food contact surfaces. See Table 1 for dilution instructions based upon ppm and surfaces. Allow the disinfectant and/or sanitizer to sit on the area in accordance with labeling directions.
- Carpet or upholstered fabric visibly soiled with vomit or feces can be cleaned with hot water and detergent or steam cleaned.
- Do not dry vacuum.
- Clean frequently touched surfaces with the appropriate disinfectant or sanitizing solution. See Table 1 for bleach solution dilution instructions.
- Follow recommended safety precautions for mixing bleach solutions:
    - avoid mixing solution with other cleaning agents;
    - use solution in well-ventilated areas;
    - use personal protective equipment while disinfecting by wearing disposable gloves, masks, and eye protection noting that environmental cleaning with heavy bleach concentrations will require a heavier duty glove;

- properly label all working bottles/containers of sanitizing solutions to identify the contents (Note: It is a critical violation of the Kentucky food code to store chemicals improperly in unlabeled containers).

Limit the transfer of germs between sick and healthy individuals

- Dispose of vacuum cleaner bags between sick and non-sick living areas.
- Limit the flow of traffic in and out of ill resident's rooms.
- When possible, ill residents should be segregated from well residents during routine activities.
- Suspend group activities until the outbreak is over
- If possible Cohort ill individuals, if not possible, monitor close contacts for symptom development (close contacts may be individuals such as: family members, roommates, staff, etc.).
- When you are sick, do not prepare food or care for others.
- Avoid cross-coverage of staff between units with illness and without.

Sick employees should stay home

- Facilities should have a "Worker's Health Policy" in place and review it at least annually with employees.
- When an employee is ill, the supervisor should be notified.
- Employees with vomiting, diarrhea, or nausea should be excluded from work until 48-72 hours after symptoms resolve.
- Employees should use special care when other people in the home are sick, especially children or spouse.

Table 1: Bleach Dilutions

Bleach	Dilution (Ratio)	Water	Bleach	PPM (Approximate)	Application	Suggested Cleaning Method
5.25%	1:10	1 gallon	1 2/3 cup	~5000	Porous surfaces such as wood floors or surfaces visibly soiled with vomitus or feces (surfaces not likely to have food or mouth contact)	Clean surface using soap and water, rinse with clean water and dry towel, then spray with bleach solution and allow to air dry.
5.25%	1:50	1 gallon	1/3 cup	~1000	Non-porous surfaces such as handrails, tile floors, counter-tops, sinks, toilets, doorknobs and other commonly handled items that are visibly soiled with vomitus or feces (surfaces not likely to have food or mouth contact)	Clean surface using soap and water, rinse with clean water and dry towel, then spray with bleach solution and allow to air dry.
5.25%	1:250	1 gallon	1 Tbsp.	~200	Food/mouth contact items, stainless steel, and toys mouthed by children	Clean surface using soap and water, rinse with clean water and dry towel, then spray with bleach solution and allow to air dry.
6% to 6.25%	1:10	1 gallon	1 ½ cup	~5000	Porous surfaces such as wood floors or surfaces visibly soiled with vomitus or feces (surfaces not likely to have food or mouth contact)	Clean surface using soap and water, rinse with clean water and dry towel, then spray with bleach solution and allow to air dry.
6% to 6.25%	1:50	1 gallon	¼ cup	~800	Non-porous surfaces such as handrails, tile floors, counter-tops, sinks, toilets, doorknobs and other commonly handled items that are visibly soiled with vomitus or feces(surfaces not likely to have food or mouth contact)	Clean surface using soap and water, rinse with clean water and dry towel, then spray with bleach solution and allow to air dry.
6% to 6.25%	1:250	1 gallon	2 tsp.	~200	Food/mouth contact items, stainless steel, and toys mouthed by children	Clean surface using soap and water, rinse with clean water and dry towel, then spray with bleach solution and allow to air dry.

Table 1: Bleach Dilutions

Bleach	Dilution (Ratio)	Water	Bleach	PPM (Approximate)	Application	Suggested Cleaning Method
8.25%	1:10	1 gallon	1 cup	~5000	Porous surfaces such as wood floors or surfaces visibly soiled with vomitus or feces (surfaces not likely to have food or mouth contact)	Clean surface using soap and water, rinse with clean water and dry towel, then spray with bleach solution and allow to air dry.
8.25%	1:50	1 gallon	2 ½ Tbsp.	~800	Non-porous surfaces such as handrails, tile floors, counter-tops, sinks, toilets, doorknobs and other commonly handled items that are visibly soiled with vomitus or feces(surfaces not likely to have food or mouth contact)	Clean surface using soap and water, rinse with clean water and dry towel, then spray with bleach solution and allow to air dry.
8.25%	1:250	1 gallon	2 tsp.	200	Food/mouth contact items, stainless steel, and toys mouthed by children	Clean surface using soap and water, rinse with clean water and dry towel, then spray with bleach solution and allow to air dry.

All EPA-registered products have manufacturer instructions for diluting the product for sanitizing and disinfecting. To find the manufacturer's instructions for the specific product you are using, you may follow the process outlined on this website: http://cfoc.nrckids.org/Bleach/FindingEPARegInfo.cfm

Safety Precautions for mixing: avoid mixing solution with other cleaning agents; use cleaning solution in well-ventilated areas; use personal protective equipment while disinfecting by wearing disposable gloves, masks, and eye protection noting that environmental cleaning with heavy bleach concentrations will require a heavier duty glove; and properly label all working bottles/containers of sanitizing solutions to identify the contents (Note: It is a critical violation of the Kentucky food code to store chemicals improperly in unlabeled containers).

HOUSEKEEPING: HANDLING LINENS TO PREVENT AND CONTROL INFECTION TRANSMISSION OF NOROVIRUS

It is important that all potentially contaminated linen be handled with appropriate measures to prevent cross-transmission.

GENERAL HANDLING

- If the facility handles all used linen as potentially contaminated (i.e., using standard precautions), no additional separating or special labeling of the linen is recommended.
- No special precautions (i.e., double bagging) or categorizing is recommended for linen originating in isolation rooms.
- Double bagging of linen is only recommended if the outside of the bag is visibly contaminated or is observed to be wet through to the outside of the bag.
    - Alternatively, leak-resistant bags are recommended for linens contaminated with blood or body substances.
- If standard precautions for contaminated linens are not used, then some identification with labels, color coding or other alternatives means of communication is important.
- For the routine handling of contaminated laundry, minimum agitation is recommended, to avoid the contamination of air, surfaces, and persons.
- The risk of environmental contamination may be reduced by having personnel bag or contain contaminated linen at the point of use, and not sorting or pre-rinsing in resident care areas.
- It is important that laundry areas have hand washing facilities and products, as well as appropriate Personal Protective Equipment (PPE) (i.e., gloves and gowns) available for workers to wear while sorting linens.
- If laundry chutes are used, it is recommended that they are properly designed and maintained so as to minimize dispersion of aerosols from contaminated laundry (e.g., no loose items in the chute and bags are closed before tossing into the chute).

WASHING/PROCESSING OF LINENS

- Detergent and water physically remove many microorganisms from the linen through dilution during the wash cycle. Facilities should also follow manufacturer's instructions for clothing, linens, and other laundry items to determine the appropriate methods to use to produce a hygienically clean product. It is also important for facilities to consider a resident's individual needs (e.g., allergies) when selecting methods for processing laundry.
  *****AAMI (Association for the Advancement of Medical Instrumentation) defines the term "hygienically clean" as "free of pathogens in sufficient numbers to cause human illness."*

Detergent

- Advances in technology allow modern-day detergents to be much more effective in removing soil and reducing the presence of microbes than those used in the past when much of the research on laundry processing was first conducted.
- Facilities may use any detergent designated for laundry in laundry processing. Further, laundry detergents used within nursing facilities are not required to have stated anti-microbial claims. Facilities should closely follow manufacturer's instructions for laundry detergents used.

Bleaching

- Laundry processing conducted within facilities typically occurs in a low water temperature environment. Many laundry items are composed of materials that cannot withstand a chlorine bleach rinse and remain intact.
- A chlorine bleach rinse is not required for all laundry items processed in low temperature washing environments due to the availability of modern laundry detergents that are able to produce hygienically clean laundry without the presence of chlorine bleach.
- However, a chlorine bleach rinse may still be used for laundry items composed of materials such as cottons.

Water Temperature

- Hot water washing at temperatures greater than 160 degrees F (71ºC) for 25 minutes and low temperature washing at 71 to 77 degrees F (22-25 degrees C) with a 125-parts-per-million (ppm) chlorine bleach rinse remain effective ways to process laundry.
- If a facility chooses to process laundry using a hot water temperature environment, the temperature maintained for 25 minutes should be at or above 160 degrees F (71ºC).
- Facilities are not required to maintain a record of water temperatures during laundry processing cycles.

Drying Temperature

- Laundry should be dried at a high temperature (greater than 170°F)

Alternate Methods for Laundry

- Ozone Cleaning. The CMS, in collaboration with the CDC, has also determined that ozone cleaning systems are acceptable methods of processing laundry. Ozone cleaning systems also should be used per manufacturer's instructions.

Professional Laundry Services

- If linen is sent off to a professional laundry, the facility should obtain an initial agreement between the laundry service and facility that stipulates the laundry will be hygienically clean and handled to prevent recontamination from dust and dirt during loading and transport. *For example, an ozone laundry cleaning system is a method which may require a professional laundry service. The facility will need to obtain such an agreement in this instance. Whether laundry processing is*

completed within the facility or outside the facility, facilities should have written policies & procedures which should include training for staff who will handle linens and laundry.

MACHINE CARE AND MAINTENANCE

- Laundry equipment should be used and maintained according to the manufacturer's instructions to prevent microbial contamination of the system. It is recommended that damp linen is not left in machines overnight.
- The CDC recommends leaving washing machines open to air when not in use to allow the machine to dry completely and to prevent growth of microorganisms in wet, potentially warm environments.
- Facilities are required to follow manufacturer's instructions for all materials involved in laundry processing (e.g., washing machines; dryers; any laundry detergents, rinse aids, or other additives employed during the laundry process).

BEDDING

- Standard mattresses and pillows can become contaminated with body substances during resident care if the integrity of the covers of these items is compromised.
- A mattress cover is generally a fitted, protective material, the purpose of which is to prevent the mattress from becoming contaminated with body fluids and substances.
- A linen sheet placed on the mattress is not considered a mattress cover.
- Patches for tears and holes in mattress covers do not provide an impermeable surface over the mattress. Therefore it is recommended that mattress covers with tears or holes be replaced.
- It is recommended that moisture resistant mattress covers be cleansed and disinfected between residents with an EPA approved germicidal detergent to help prevent the spread of infections, and fabric mattress covers should be laundered between residents.
- Pillow covers and washable pillows should be laundered in a hot water laundry cycle between residents or when they become contaminated with body substances.
- Discarding mattresses if fluids have penetrated into the mattress fabric and washing pillows and pillow covers in a hot-water laundry cycle will also reduce the risk of indirect contact with infectious agents.

FOOD SERVICE STAFF

NOROVIRUS CAN BE TRANSMITTED AND SPREAD THROUGH POOR FOOD HANDLING PRACTICES AND CONTAMINATION OF FOOD AND/OR SURFACES.

Hand washing: The single most effective means of controlling the spread of viruses and bacteria in the food service environment is frequent, thorough and effective hand washing.

- Wash hands often, with soap and warm water and dry with a disposable or clean, dry towel.
- Wash hands after engaging in any activity that may contaminate them such as:
    - Wash hands after using the restroom.
    - Wash hands after handling soiled equipment or utensils.
    - Wash hands during preparation as often as necessary to prevent contamination and prevent cross contamination.
    - Wash hands between raw and ready-to-eat foods.
    - Wash before putting on plastic gloves.
    - Wash hands after removing gloves.

Manual sanitizing of food contact equipment:

- Some sanitizers are not effective against norovirus. Check to be sure you are using a sanitizer that is effective against norovirus. http://www.epa.gov/oppad001/list_g_norovirus.pdf
- Regular Unscented Liquid Bleach and many other sodium hypochlorite based compounds are effective against norovirus.
- Use all products in accordance with manufacturer's labeling directions and at the recommended strength and concentration. Remember some products listed on EPA's list may not be approved for use in a food service area and should be used only in approved areas.

Heat sanitization of equipment and utensils:

- Heat sanitizing dishwashers that meet the regulatory requirement of 180° F are effective against noroviruses.
- Low temperature dish machines that use a sanitizing additive in the final rinse can be used as an alternative.
- The additive should be a sanitizing product that is effective against norovirus.
- Use the correct concentration of sanitizer specified for the chemical agent used.

Sanitizing of non-food contact surfaces:

- Non-porous, frequently touched hard surfaces such as dining room chairs, tables, bus carts, etc. should be wiped clean with detergent and water and then sanitized with an approved sanitizing agent. See Table 1 for bleach solution dilution instructions.
- Use sanitizer at the highest concentration allowed for the intended surface and always in accordance with labeling directions. See Table 1 for bleach solution dilution instructions.
- Allow the sanitizer to stand on the surfaces in accordance with labeling directions (or allow to air dry) to completely kill the virus.
- Personal protective equipment (PPE), such as disposable gloves and face masks, should be worn when handling concentrated cleaners.
- Employees should follow all Occupational Safety and Health Administration (OSHA) guidelines for use as applicable to their facility.

Wash fruits and vegetables thoroughly:

- Raw fruits and vegetables have been known to be a source of norovirus transmission.
- Prior to cutting, all ll raw fruits and vegetables should be thoroughly washed before preparation and service. NOTE: Check the label for commercially packaged fruits and vegetables. Those labeled “Ready-to-Eat” generally do not require further washing.
- Cutting boards and utensils used for the preparation of fruits and vegetables should be cleaned and sanitized before and after preparation.

Ice Machines

- Ice machines should be cleaned and sanitized at the onset of an outbreak and access to the machine should then be limited to designated food service staff only.
- Ice machines and other common food containers have been implicated in some outbreaks.

Sick food workers

- Facility should have a “Workers Health Policy” in place and review it annually with staff and new employees.
- Staff diagnosed as having a confirmed case of norovirus or who have been exposed to a person living in the same household with a confirmed case of norovirus should be excluded from working in the food service area in accordance with the 2005 FDA Model Food Code.
- Food workers who are sick with vomiting, diarrhea, yellowing of the skin, sore throat with fever, or with open lesions or cuts should notify their supervisor and should be restricted from work in food service areas in accordance with the 2005 FDA Model Food Code.
- Return to the food service operation of a restricted or excluded employee shall follow the guidance established in the 2005 FDA Model Food Code.
- Staff may contact the local health department for guidance on worker restriction and exclusion.

Limit access to unauthorized personnel

- Unauthorized personnel should not be allowed in the kitchen and food prep areas.
- Unauthorized personnel should not have access to ice machines.

MEDICAL STAFF, ADMINISTRATIVE AND OTHER NON-MEDICAL PERSONNEL

Medical staff, administrative personnel, or other non-medical personnel in the facility can transfer viruses from one person to another if proper precautions are not taken.

Notify others immediately

- As soon as a resident or staff member becomes symptomatic, staff should actively begin infection control measures outlined in this guidance.
- Food service, housekeeping, other non-medical personnel, and visitors should be notified when there is a suspected case of norovirus or other communicable disease.
- Appropriate signage and/or notifications should be put into place.
- The Local Health Department should be notified and consulted for control measures.

Hand washing is key to prevention

- Hand washing should always be performed before and after direct patient care.
- Personnel should always wash their hands when entering a resident's room and before handling any resident equipment.
- Staff should wash their hands after coming into contact with the resident's skin, bedding or any equipment inside an ill resident's room.

Avoid unintentional transfer of germs

- Staff members who are ill should not return to work until they have been without symptoms for 48-72 hours.
- Group activities at the facility should be limited, at the administrator's discretion, until the outbreak is declared over.
- Equipment or surfaces that may come into contact with multiple residents such as physical therapy equipment, stethoscope, medical carts, etc. should be cleaned and sanitized routinely to prevent the unintentional transfer of germs. See Table 1 for bleach solution dilution instructions.
- Clean and sanitize all high-touch areas. See Table 1 for bleach solution dilution instructions.
- Medical and other support staff should use standard precautions, including appropriate Personal Protective Equipment (PPE) such as masks, disposable gowns or gloves as indicated by the resident's condition and the agency's infection control plan.
- Administrators and medical staff should work together to cohort sick residents by confining them in one area if the building, attended by a single set of staff, if possible.
- If possible, avoid allowing staff to move between units or facilities with affected patients and units or facilities that are not affected whenever possible.

LABORATORY SPECIMENS FOR DIAGNOSTIC TESTING

The early recognition of the causative agent of gastroenteritis may limit the impact among other residents and staff. **Submit laboratory specimens for diagnostic testing in a timely manner.** Laboratory confirmation plays a vital role in this determination. In outbreaks of unknown etiology, diagnostic specimens should be collected for: bacterial pathogens, norovirus, and C. *difficile*. Norovirus specimen collection and submission guidelines are detailed below.

Clinical Specimens:

***Stool*-preferred specimen for norovirus testing**

Timing:
Specimen collection for viral testing should begin on day 1 of the epidemiological investigation. Any delays to await testing results for bacterial or parasitic agents could preclude establishing a viral diagnosis. Ideally, specimens should be obtained during the acute phase of illness (i.e., within 48-72 hours after onset) while the stools are still liquid or semisolid because that is when the level of viral excretion is greatest. In specific cases, specimens might be collected later during the illness (i.e., 7-10 days after onset), if the testing is necessary for either determining the etiology of the outbreak or for epidemiologic purposes (e.g., a specimen obtained from an ill food handler who might be the source of infection). If specimens are collected late in the illness, the utility of viral diagnosis and interpretation of the results should be discussed with laboratory personnel before tests are conducted.

Number and Quantity:
Specimen collection should occur as early as possible. Ideally, specimens from 7 to 10 ill persons should be obtained during the acute phase of the illness (preferably within 48-72 hours after onset). Bulk samples (i.e., 10-50 ml of stool placed in a stool cup or urine container) are preferred, as are acute diarrhea specimens that are loose enough to assume the shape of their containers. Serial specimens from persons with acute, frequent, high-volume diarrhea are useful as reference material for the development of assays. The smaller the specimen and the more formed the stool, the lower the diagnostic yield. Rectal swabs are of limited or no value because they contain insufficient quantity of nucleic acid for amplification.

Storage and Transport:
Because freezing can destroy the characteristic viral morphology that permits a diagnosis by EM, specimens should be kept refrigerated at 4C° (39F°). At this temperature, specimens can be stored without compromising diagnostic yield for 2-3 weeks, during which time testing for other pathogens can be completed. If the specimens have to be transported to a laboratory for testing, they should be bagged and sealed and kept on ice or frozen refrigerant packs in an insulated, waterproof container. Specimens must be shipped overnight. If facilities for testing specimens

within 2-3 weeks are not available, specimens can be frozen at -20C°. (-4F°) for antigen or PCR testing.

Vomitus

Vomiting is the predominant symptom among children, and specimens of vomitus can be collected to supplement the diagnostic yield from stool specimens during an investigation.

Recommendations for collection, storage, and shipment of vomitus specimens are the same as those for stool specimens.

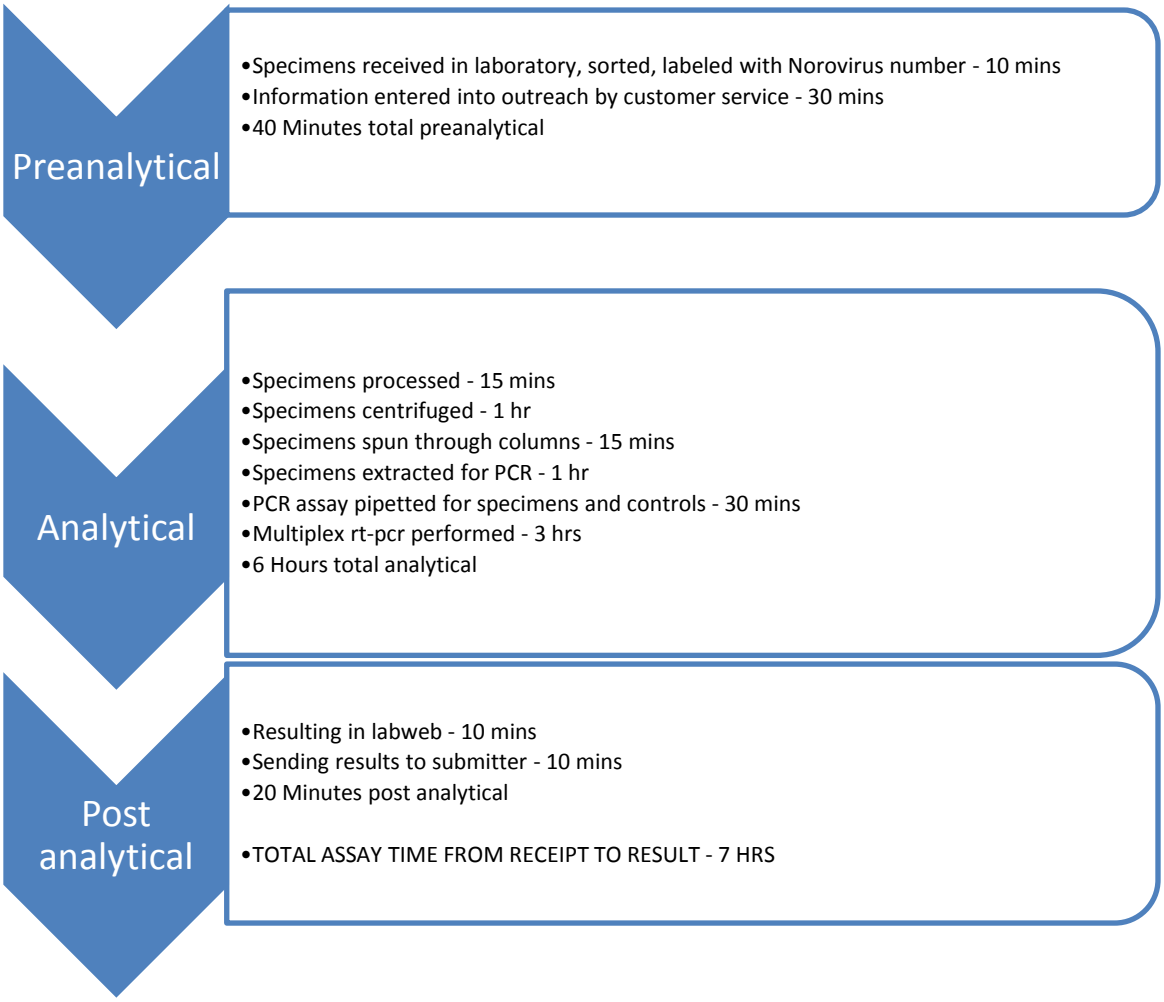
Note: Raw specimens for norovirus testing should be collected at the same time as collection of specimens for both bacterial cultures and if indicated, C. diffile testing. No more than 10 raw specimens for norovirus can be sent to DLS for storage and testing per outbreak. Please advise the Reportable Disease Section (502-564-3418) prior to sending specimens.

Environmental Specimens

If a water or food is suspected to be the source of infection, samples should be obtained as early as possible with respect to the time of exposure and preferably stored frozen at -4° F (-20° C). Samples may include food or water that is suspected as the source of infection. DLS will coordinate with CDC for testing of these samples, if deemed necessary. Contact DLS for collection, packaging, and shipping instructions.

Clinical specimen collection packaging and shipping guidance and appropriate lab submission form may be found on p.22-23 of this document or at the Division of Laboratory Services website: http://chfs.ky.gov/dph/info/lab/

Laboratory Processes and Timeline for Results for Norovirus Specimens



Collection and Packaging of Norovirus

Supplies Needed for Norovirus

Kit Components:

Cold Pack
95kPa Bag with absorbent
Vial in zip bag with Zorb Sheet
Lab Form 275

Collection of Specimen

1. Check expiration date of specimen vial.
2. Make sure two identifiers or lab label is on specimen vial.
3. Fill out lab or Outreach form completely.

Stool Specimens
1. Collect stool specimen into clean container. DO NOT mix urine or water with sample.
2. Open vial carefully. Using the collection spoon attached to the cap, fill vial with specimen until half full.
3. Replace cap tightly.

Swab Specimens
1. Remove cap and place into clean vial.
2. Break swab shaft evenly with the lip of the vial.
3. Replace cap and tightly.

If larger specimen collection containers are used, contact KY DLS for additional instructions.

Packaging and Shipping

Place sample vial into zip bag with Zorb sheet

Place sample/samples into 95kPa bag

Place sample bag on top of frozen freezer block and replace styrofoam lid

Place Outreach or Lab Form 275 on top of styrofoam lid

Close box and place appropriate label on top of box

KY Division of Laboratory Services (502)564-4446 10/2013

"This form, when filled in, contains patient information that must be protected in accordance with the Health Insurance Portability Accountability Act."

Lab 275 (Rev 9/2013)

Kentucky Public Health

Viral Isolation and Immunology

KY Division of Laboratory Services
100 Sower Blvd Suite 204
Frankfort KY 40601
(502) 564-4446 FAX (502) 564-7019
Paul Bachner, MD, FCAP, Director

Patient Information:

(Use label or fill in completely)

Name (Last, First, MI)

Social Security # Sex EO Age (dd-mmm-yyyy)

Home Address

City

State ZIP County

Send Reports to:

Submitter

Street Address / P O Box

City

State ZIP

Phone Fax

Physician (if other than Submitter)

Tests Requested

Viral Isolation:	Specimen Type / Date Collected
Influenza _____ ☐	Throat Swab_____
Hospitalization ☐	NP Swab _____
Institutionalized ☐	Nasal Swab_____
Pregnant (_____ weeks)	Genital Swab_____
Herpes ☐	CSF _____
Enterovirus ☐	Other_____
Other _____	

Agent Detection:	Date Collected
Herpes virus ☐	FA Slide _____

Serology:	Date Collected Serum
Toxoplasmosis ☐	_____
CMV ☐	_____
Herpes ☐	_____
Measles (Rubeola) ☐	_____
Varicella zoster ☐	_____
Mumps ☐	_____
ARBOVIRUSES: ☐	
West Nile ☐	Serum _____
Other	CSF _____

PCR	Date Collected
NOROVIRUS ☐	Stool _____
	Other _____
Other, Specify:_____	Serum _____

CLINICAL DATA

Purpose of request:

☐ diagnostic (give onset)
☐ immune status
☐ antibody status
Other _____

Date of Onset:

Symptoms:	YES	NO
Fever	☐	☐
Neurological	☐	☐
Headache	☐	☐
Respiratory	☐	☐
Gastrointestinal	☐	☐
Fatigue	☐	☐
Rash	☐	☐
Lesions	☐	☐

Other_____

Immunizations / Date
None ☐
MMR_____
Influenza_____
Varicella_____
Other_____

Contacts / Recent Travel
Tick bite _____
Mosquito bite _____
Community _____
Other_____
Travel _____

********** DLS Laboratory Findings **********

Date Received	Laboratory #	Tech	Date Reported

References

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