01.44 - Prevention and Control of Healthcare-Associated Norovirus Infections

Purpose: To prevent healthcare-associated norovirus infections in patients, employees, contract workers, volunteers, visitors and students and to control and eradicate norovirus infections should any occur.

Audience: All healthcare workers of the UTMB Health System and contract workers, volunteers and students.

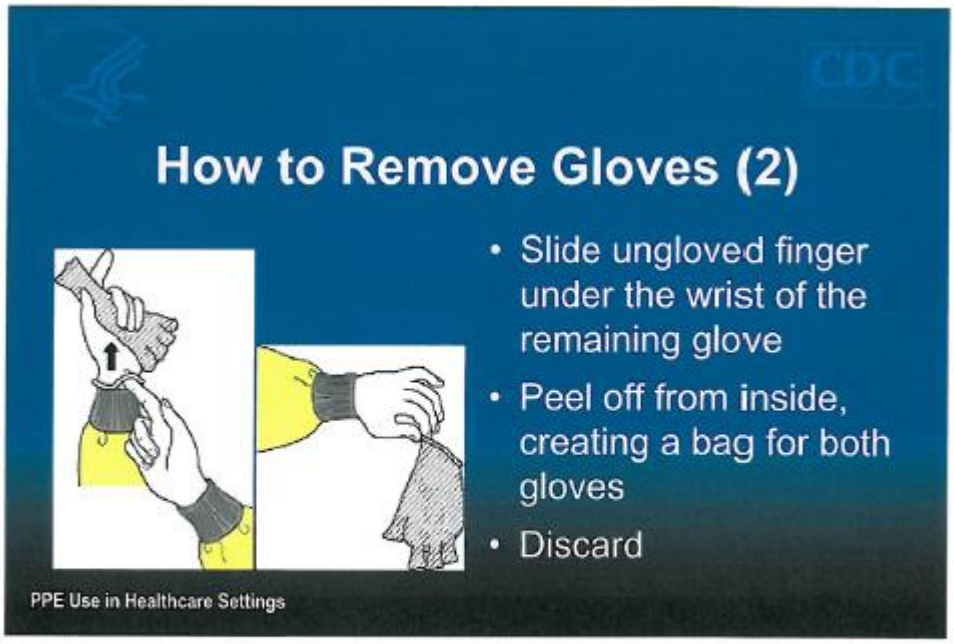
Policy: The key to prevention and control of healthcare-associated norovirus infections is early identification of cases followed by prompt isolation.

I. Detection of cases of norovirus infection
   A. Noroviruses are the most common cause of infectious gastroenteritis in the United States as well as the most common cause of food borne infections in the U.S.
   B. The most common symptoms of norovirus infection are vomiting, nausea, diarrhea and abdominal cramps. Vomiting is often sudden and projectile with no prodrome, i.e., no prior nausea, diarrhea or abdominal cramps.
   C. Patients who have sudden onset of projectile vomiting should be placed on both Extended Contact Precautions (ECP) and Droplet Precautions (DP).
      1. When persons with norovirus infections vomit, many droplets are produced which can travel up to 10 feet.
      2. Persons within 10 feet can inhale the droplets and then swallow them leading to norovirus infection.
      3. Projectile vomiting will also lead to contamination of environmental surfaces when the droplets of vomitus fall on surfaces within 10 feet of the person who vomited.
   D. Healthcare workers who suddenly have projectile vomiting should immediately leave the hospital and not return until 48 hours after symptoms have cleared. Healthcare Epidemiology should be contacted immediately 24/7. The environmental surfaces within a 10 foot radius covering 180º in front of the person with projectile vomiting must be cleaned and disinfected with sodium hypochlorite.
   E. Patients who are admitted with diarrhea of undetermined cause or develop diarrhea of undetermined cause while hospitalized should be placed on ECP and DP.
   F. Cases may also be identified by notification from another healthcare facility that a case of norovirus infection or suspected norovirus infection is being transferred to UTMB.

II. Isolation of patients with possible norovirus infection pending results of a stool test for norovirus.
   A. Patients with diagnosed or suspected norovirus infection should be placed on ECP and DP. When providing care for a patient who is vomiting frequently, in addition of the surgical mask, wear goggles or a full face shield. DP may be discontinued when the patient is no longer vomiting.
   B. No stethoscopes, phones or ipads may be brought into the isolation room. Disposable stethoscopes will be provided in each isolation room.
   C. Patients must remain on ECP until at least 72 hours after clearance of all symptoms.
   D. Isolation of infants and young children (e.g., under 2 years) with norovirus infection is the same as above except that they should be on ECP until 5 days after clearance of symptoms and signs.
   E. Patients with chronic diseases and immunosuppression may shed norovirus for prolonged periods and must remain on ECP for weeks or months. The Department of Healthcare Epidemiology should be consulted about length of ECP for these patients.
   F. Handle soiled linens carefully, without agitating them, to avoid dispersal of virus.
   G. Change privacy curtains if they become visibly soiled.
   H. Patients should not be transferred to another nursing unit within the hospital before they are taken off of isolation for norovirus infection.
   I. Restrict movement of patients to other areas of the hospital except for essential care or treatment.
   J. All equipment brought into patients' rooms who are on isolation for norovirus infection must be cleaned and disinfected with a 1:10 dilution of sodium hypochlorite after removal from the room.

III. Hand hygiene when providing care to patients isolated for norovirus infection
   A. The norovirus is a non-enveloped virus and cannot be killed with alcohol
   B. Hand hygiene must be performed by hand washing with the liquid antiseptic soap and water
      1. Hand washing must be performed after gloves are carefully removed, avoiding contamination of the hands as the gloves are removed. (Note: most of the viral load is on the gloves covering the hands. When gloves are carefully removed, the few viral particles on the hands will be much easier to wash off).

Using one gloved hand, grasp the outside of the opposite glove near the wrist. Pull and peel the glove away from the hand. The glove should now be turned inside-out, with the contaminated side now on the inside. Hold the removed glove in the opposite gloved hand.



Slide one or two fingers of the ungloved hand under the wrist of the remaining glove. Peel glove off from the inside, creating a bag for both gloves. Discard in waste container.

2. Hand washing needs to be thorough with all surfaces of hands and fingers being washed. After thorough rinsing, dry hands with paper towels. Use paper towels to turn off the faucet.

IV. Diagnosis of norovirus infections

A. Liquid stools should be sent to the Clinical Microbiology Laboratory
B. Formed stools will be rejected for norovirus testing by the Laboratory
C. Stool will be tested by RT-PCR. The norovirus cannot be cultured.

V. Prevention of an outbreak after a possible exposure

A. Norovirus may be introduced into a healthcare facility by a patient, healthcare worker (HCW), visitor, volunteer or a student.
B. Every HCW, volunteer or student exposed to a patient with norovirus infection prior to diagnosis and isolation of the patient or who is within 10 feet of a person who has sudden onset of projectile vomiting, will be furloughed for 72 hours.
C. A patient in a room with the door open who is within 10 feet of a person who has sudden onset of projectile vomiting will be placed on ECP and DP for 72 hours.
D. HCWs, volunteers and students who develop norovirus infection will be permitted to return to work 48 hours after clearance of symptoms.
E. HCWs, volunteers and students should not come to work if they have vomiting and/or diarrhea. They should not return to work until 48 hours after symptoms clear.
F. When HCWs, volunteers or students have onset of vomiting and/or diarrhea while working on a patient care unit, they will be sent home. They may return to work 48 hours after clearance of symptoms.

VI. Cleaning and disinfection of isolation rooms and other areas in the patient units.

A. Rooms must be cleaned and disinfected twice per day
B. Clean surfaces with detergent starting with the least contaminated areas such as door handles, bed rails, across the bed tables and work toward surfaces with greater contamination such as toilets, toilet seats, railing in bathrooms and sinks
C. Do not use Cavicide, because all of the surfaces cleaned will then be disinfected with a 1:10 dilution of sodium hypochlorite (bleach) using the bucket and cloth method. When Cavicide and sodium hypochlorite have contact, they interact forming chlorine gas.

1. All surfaces will be disinfected with the 1:10 dilution of sodium hypochlorite by applying the solution to surfaces so that they are very wet
2. The surfaces should be allowed to dry for 5 minutes followed with another heavy application of bleach so that the surfaces are very wet
3. Frequently touched surfaces will be cleaned and disinfected with bleach three times per day
   a. Door handles and rails
   b. Computer keypads
   c. Computer tables
   d. Telephones
   e. Arm rests on chairs
   f. Push plates on soap dispensers
   g. Chair armrests and tabletops in conference rooms
   h. Faucet handles
4. When patients are discharged, privacy curtains should be removed and sent to the laundry.
5. When patients are discharged, in addition to terminal cleaning and disinfection of the room, discard disposable patient-care items and send unused linens to the laundry.

D. Vomitus and stool should be cleaned up while wearing gown and gloves.
   1. When cleaning up vomitus and stool, care should be taken to avoid creating splashes or droplets
   2. After the surface has been cleaned, a 1:10 dilution of sodium hypochlorite (bleach) solution should be applied to the area with a bucket and cloth so that the surface is very wet
   3. When the surface is dry, bleach should be applied a second time and allowed to dry for 5 minutes
   4. The area may then be cleaned with water to remove residual bleach
   5. After gloves have been removed, hands must be washed with liquid antimicrobial soap and water. Alcohol will not kill the norovirus.

VII. Prevention and control of norovirus infections in the Emergency Department (ED)

A. All patients admitted to the ED with diarrhea of unknown cause should be placed on ECP.
   1. ECP will prevent transmission of all enteric pathogens

2. Patients with possible *C. difficile* or norovirus infections must always be on ECP, because alcohol will not kill *C. difficile* spores or the norovirus and the usual disinfectants like Cavicide will not kill *C. difficile* spores or the norovirus.
3. Because norovirus can also be transmitted by airborne droplets when patients vomit, patients must also be placed on DP.
4. Therefore, it is necessary to differentiate patients with likely norovirus infections from those with likely *C. difficile* infections.

B. Patients who present with diarrhea of unknown cause who are more likely to have *C. difficile* infection will present with the following symptoms, signs and recent history
   1. No vomiting
   2. Diarrhea for more than 72 hours
   3. Abdominal pain and ileus
   4. Fever
   5. Recent history of admission to a short-term or long-term healthcare facility
   6. No symptoms or signs of gastroenteritis in family members
   7. Recent history of treatment with antibiotics

C. Patients who present with diarrhea of unknown cause who are more likely to have norovirus infection will present with the following symptoms, signs and recent history.
   1. Vomiting, especially projectile vomiting with no prodrome, i.e., no prior nausea or abdominal cramps.
   2. Diarrhea
   3. Abdominal cramping
   4. No antibiotic use in the last month
   5. Cases of an illness with vomiting and diarrhea in family members or coworkers.

D. Patients whose illness meets the clinical definition of norovirus infection must also be placed on DP, because noroviruses may also be transmitted by large droplets which are produced when patients vomit.
   1. Norovirus infection can be diagnosed by sending a stool specimen to the Clinical Microbiology Laboratory for an RT-PCR test.
   2. If norovirus infection is diagnosed prior to the patient's departure from the ED or if norovirus infection has not been ruled out, then the room where the patient received care in the ED must be cleaned and then disinfected with two applications of a 1:10 dilution of sodium hypochlorite, separated by 5 minutes using the cloth and bucket method.

3. For patients being admitted, the receiving unit must be notified that the patient has norovirus infection or possible norovirus infection if norovirus infection has not yet been ruled out.

VIII. Prevention and control of norovirus infections in UTMB outpatient facilities

A. When patients present to an outpatient clinic or outpatient care center with vomiting and diarrhea, they should be placed in an examination room immediately and placed on ECP and DP
   1. The Healthcare workers who provide care for the patient should don surgical masks as soon as possible
   2. The patient should be admitted to the clinic by a clerk wearing mask, gown and gloves in the examination room

B. Vomitus and stool should be cleaned up while wearing gown and gloves.
   1. When cleaning up vomitus and stool, care should be taken to avoid creating splashes or droplets
   2. After the surface has been cleaned, a 1:10 dilution of sodium hypochlorite (bleach) solution should be applied to the area with a bucket and cloth so that the surface is very wet
   3. When the surface is dry, bleach should be applied a second time and allowed to dry for 5 minutes
   4. The area may then be cleaned with water to remove residual bleach
   5. After gloves have been removed, hands must be washed with liquid antimicrobial soap and water. Alcohol will not kill the norovirus.

IX. Food borne infections due to noroviruses

A. Food borne infections due to norovirus can result from contamination of food during production, processing, distribution and preparation.

B. Food borne outbreaks are commonly associated with food handlers symptomatically or asymptomatically infected with noroviruses.
   1. Food handlers who develop vomiting and/or diarrhea should not report to work until they are symptom free for 72 hours
   2. When a food handler vomits while at work, the vomiting episode must be reported immediately to the employee's supervisor
      a. If vomiting takes place in a restroom, the restroom must be closed immediately until it has been thoroughly cleaned and all surfaces disinfected with a 1:10 dilution of sodium hypochlorite.
      b. If vomiting takes place outside of a restroom, an area with a radius of 12 feet covering 180º in front of the person who vomited must be cleaned and disinfected with 1:10 dilution of

sodium hypochlorite including all surfaces. Any food preparation implements or equipment must be thoroughly cleaned with soap and water followed by disinfection with a 1:10 dilution of sodium hypochlorite. Any uncovered food in the area must be discarded.

c. The food handler who vomited must leave the area and may not return until 72 hours after symptoms have cleared.

d. All food handlers within a diameter of 12 feet of the person who vomited must be furloughed for 72 hours. If the furloughed food handlers develop no vomiting and/or diarrhea in 72 hours, they may return to work. If the furloughed food handlers develop vomiting and/or diarrhea, they may return to work 72 hours after clearance of symptoms.

C. Hand hygiene
   1. Hand hygiene is a very important practice for food handlers.
   2. Hand washing should be performed after contact with uncooked food and contaminated surfaces and before contact with cooked food and clean environmental surfaces.
   3. Clean gloves should be worn when preparing food
   4. Hand washing should be performed before gloving and after gloves are removed

D. Food handler staffing
   1. An adequate number of food handlers are necessary for safe preparation of food.
   2. When food handlers are pressed for time to meet schedules for delivery of food, there is evidence that safe practices are not maintained under time restraints.

E. Water should be from a clean source.

F. Because UTMB's health permit from the Galveston County Health District is for a High Risk Establishment, uncooked oysters, clams, scallops and mussels are strictly prohibited from service to patients and guests.

X. Norovirus outbreaks

A. Patient care units
   1. Case definition
      a. Hospitalized for ≥ 18 hours
      b. ≥ 3 diarrheal stools in 24 hours
      c. Stool sample positive for norovirus by RT-PCR
   2. Outbreak definition
      a. Two or more cases of norovirus infection on the same patient care unit within 5 days
      b. Both cases confirmed by RT-PCR on liquid stool

B. Initial response to the outbreak
   1. Non-essential staff, students and volunteers will be excluded from working in units where there are patients infected with norovirus.
   2. Patients who develop nausea and/or vomiting will be placed on ECP and DP immediately.
   3. All healthcare workers exposed to the patients with norovirus infection prior to the patients' isolation will be furloughed for 72 hours
   4. The norovirus cleaning and disinfection protocol will be activated for the unit or units where the patients are located.
   5. All shared or communal food items for patients or staff must be removed from clinical areas for the duration of the outbreak.
   6. Non-essential visitors will be restricted from affected areas of the facility during norovirus outbreaks.
   7. When it is necessary to have continued visitation in certain areas of the hospital, e.g., pediatrics and ICUs with critically ill patients, visitors will be screened and those without signs and symptoms will be permitted to visit. These visitors must comply with hand hygiene and ECP.
   8. An episode of projectile vomiting will be managed as in Section I above.

C. HCWs, other than physicians, will not be permitted to work on other nursing units until all of the cases on the outbreak unit(s) have cleared.
   1. Physicians cannot enter isolation rooms with stethoscopes, phones or ipads.
   2. Disposable stethoscopes will be available in each room
   3. Paramedical HCWs (e.g. PT/OT, Respiratory Therapists, etc.) must adhere strictly to ECP and DP.

D. If cases of norovirus infection spread on the outbreak unit(s) reaching ≥ 5 cases, cohorting of patients will be initiated.
   1. Cohorting requires that HCWs who provide care for patients with norovirus infection do not provide care for patients without norovirus infection.
   2. Patients without norovirus infection will be cared for by HCWs who do not care for patients with norovirus infections.
   3. Paramedical HCWs will work first with patients in the non-infected cohort and then with patients in the infected cohort.
   4. Physicians must first attend to patients in the non-infected cohort prior to making rounds on the infected cohort.