

Norovirus Outbreak Prevention and Response Guide at Accession



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Published By

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June 2020

Navy and Marine Corps Public Health Center
Technical Manual NMCPHC-TM 6221

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1. Introduction

a. Background. Norovirus is a highly infectious pathogen and one of the leading causes of gastrointestinal outbreaks around the world (CDC, 2013). It is one of the most costly pathogens that contribute to food-borne illnesses in the United States (U.S.) Furthermore, it is likely to be the single most common cause of disease-outbreak related illnesses aboard ships in the U.S. Navy (Delacour et al. 2010). Recruit training commands are an ideal setting for severe Norovirus (NoV) outbreaks given the close living quarters and the nature of certain training evolutions. Unlike shipboard outbreaks, the regular influx of new recruits to a training center on a weekly basis creates an environment conducive to continuous and frequent disease spread. This was evident during a 2017 NoV outbreak in a recruit training center which lasted for nearly four months and affected approximately 1600 recruits.

NoV illness is characterized by a sudden onset of diarrhea or vomiting, usually without fever. Symptoms generally last 24-72 hours. In the training setting, NoV outbreaks often present with a sudden and rapid increase of cases over a short period of time, during which some cases require intravenous (IV) hydration.

NoV outbreaks cost the Navy more than one thousand workdays and millions of dollars each year. Lost days from work can severely degrade operational readiness. This technical manual provides guidance to Navy and Marine Corps recruit training centers on the prevention and control of NoV illnesses and outbreaks.

b. Transmission. Norovirus is transmitted in multiple ways. It can be spread through direct contact with an infected person or aerosolization of the virus through a vomiting event (emesis). Large outbreaks of NoV are often associated with consumption of contaminated food or water. Foodborne outbreaks of NoV have been associated with infected food handlers who prepared ready-to-eat food immediately before serving. NoV can also be spread through contact with contaminated surfaces or objects. This virus is very persistent in the environment and can remain viable for weeks on hard surfaces, as well as on contaminated fabrics for days or weeks (CDC, 2015). In appropriate aqueous conditions, the virus can survive for months. It has been found to persist in seawater and is associated with consumption of shellfish (Campos and Lee, 2014). Therefore, direct hand contact with contaminated surfaces, such as in the latrine area, followed by touching others who live in close quarters propagates viral transmission. Note that infected people whose symptoms are resolved may continue to shed and transmit the virus.

It takes 24-72 hours for one to develop symptoms from the time they become infected (incubation period). Since NoV is extremely contagious, attack rates of up to 25% have been seen in close living environments. A key mitigation measure to prevent further disease transmission is to consistently conduct disease surveillance in order to ensure immediate recognition of a potential outbreak.

2. Prevention and Control Strategy.

There are a variety of control methods that can be implemented to contain a potential viral outbreak at Navy and Marine training sites. Typically, once the spark has ignited, usually by way of one infected individual, it becomes a race against time to contain the outbreak.

The fire safety acronym, RACE, can be applied to address a Norovirus outbreak.

- R Rapid rescue, testing, and treatment of an infected individual or the contaminated area.
 - Drill Instructors (DIs) should send anyone with multiple vomiting or diarrheal episodes to sick call immediately for medical evaluation.
 - Medical staff should work with laboratory staff to ensure proper studies are ordered for suspected NoV cases.

- A Sound the alarm and notify the appropriate authorities once an outbreak is suspected.
 - Drill Instructors should notify medical and preventive medicine of any sudden and large increases of recruits with vomiting and/or diarrheal episodes.
 - Preventive Medicine should contact their regional Navy Environmental and Preventive Medicine Unit (NEPMU) if an outbreak is suspected and assistance is needed.

- C Contain and take control of the outbreak.
 - For outbreaks affecting a large number of recruits in a short period of time, immediately investigate potential routes of exposure (food, water, sanitation practices).
 - Isolating ill recruits to a separate floor or a unit, away from well recruits, may be recommended.

- E Encourage sanitation and hygiene measures to extinguish any ongoing disease spread.
 - Regularly inspect cleaning practices and increase frequency of cleaning.
 - Promote good handwashing practices through slogans, posters, and/or a mandatory brief.
 - Establish a process to report all episodes of vomiting and diarrheal episodes that may have contaminated the environment to ensure proper cleaning and disinfection of affected areas.
 - Recruits with Sick in Quarters (SIQ) chit for acute gastroenteritis (AGE) or NoV should not enter the galley. Bagged meals should be provided to them in their berthing compartments to ensure isolation of ill and infectious recruits.

a. Hand Hygiene. One of the two most important tools to prevent NoV transmission is the implementation of a good handwashing technique. Regular handwashing removes NoV, which protects the individual and prevents the spread of NoV to others. Proper handwashing should be practiced before and after meal times, after visiting heads, after handling trash, and before and after meal preparation.

Handwashing stations should be placed in the front of the galley. Regular monitoring of handwashing should be conducted by disease investigators (DIs), and the frequency of monitoring should increase during an outbreak.

During an outbreak, strict hand hygiene should be enforced and inspected by DIs with spot checks conducted by preventive medicine staff. Recruits should roll up their sleeves (two folds). Hands should be washed with soap and water for at least 20 seconds. The five simple and effective steps to a thorough handwashing are:

1. Wet hands with clean water
2. Lather with soap.
3. Rub hands together and apply friction for at least 20 seconds.
4. Rinse hands under running water.
5. Dry completely with paper towels. Recruits should refrain from drying clean hands on their dirty uniforms to avoid recontamination.

In previous outbreaks, reminders in the form of posters have been proven to successfully market key messages. To learn more, see the CDC norovirus page:

<https://www.cdc.gov/norovirus/images/stop-norovirus-lg.jpg> or state department of health posters http://www.floridahealth.gov/environmental-health/food-safety-and-sanitation/_documents/CleanupofNorovirusPoster.pdf. Proper handwashing reminders should be posted in latrines, in the kitchen area and outside the galley. Slogans may also be used as long as the message is clear, easily understood, and properly implemented.

Use of alcohol-based hand sanitizers should not be a replacement for soap and water handwashing. The efficacy of ABHSs against NoV, in particular, remains controversial with mixed evidence depending on the product formulation and evaluation methodology.

b. Environmental Contamination. The second most important tool for NoV control and prevention is the use of chemical disinfectants. NoV has been shown to survive disinfection using non-chlorine-based solutions. Training commands should ensure the use of disinfectants that are effective against NoV. A list of Environmental Protection Association (EPA) registered disinfectants capable of neutralizing NoV can be found at: <https://www.epa.gov/pesticide-registration/list-g-epas-registered-antimicrobial-products-effective-against-norovirus>. EPA registered products with a manufacturer's label indicating effectiveness against noroviruses, non-enveloped viruses, or other surrogates (i.e. feline calicivirus) are also acceptable. Be aware that some products may falsely claim they are effective against NoV. Alternatively, liquid household bleach (5.25% sodium hypochlorite) may be used to produce a 1000 parts per million (ppm) bleach disinfection solution, which can be prepared by mixing one-third cup of bleach with one gallon of water. The prepared 1000ppm disinfection solution should be made daily to ensure effectiveness. Disinfectant solutions should be utilized to clean training environments (including sand pits and pools), training equipment, galley surfaces, heads, berthing, gas masks, canteens, and laundry facilities.

- Depending on the geographic area, noroviruses can circulate seasonally or year-round. To prevent a NoV outbreak, training commands should, at a minimum, utilize NoV killing disinfectants during the NoV season based on their local surveillance data. Year-round use of such disinfectants is a strong deterrent to outbreak spread and is recommended especially in settings with less than optimal environmental controls (e.g. use of field portable toilets, high throughput in galleys preventing disinfection between platoons/ships/companies, etc.). During an outbreak, NoV killing disinfectants must be used to ensure effective control. NoV killing disinfectant use should be implemented immediately and should proceed until two weeks after the onset date of the last case or until deemed appropriate by the Preventive Medicine Department. Supplies: Spill kits should include gloves, absorbent towels, double plastic bags of appropriate thickness, and appropriate disinfectants. Do not overload bags. Do not transport bags in chutes or dumbwaiters.
- Personal Protective Equipment (PPE): PPE should be donned by cleaners. Put on disposable gloves, gown or coveralls, boots, and face mask (in case of an aerosolized virus) prior to cleaning up contaminated areas, as needed.
- Routine cleaning and disinfection: During non-outbreak times, this should be conducted on any areas or surfaces that recruits come into contact with, to include, but not limited to: shared equipment in all the heads, in the galley, and in the gym, as well as furniture, doorknobs, faucets, and any other frequently touched areas or surfaces with which recruits come into contact. As a general rule, the cleaning and disinfection of high traffic areas should be conducted more frequently than that of low traffic areas.
- Cleaning and disinfection during an outbreak: During a NoV outbreak, frequency of cleaning and disinfection should increase. All surfaces should be cleaned and disinfected regularly. Specific measures should be taken in areas in which a vomiting or diarrheal incident has occurred, as described below:
 - o When a vomiting or diarrheal incident occurs, encourage the ill personnel to perform their own cleanup, or report the incident to the appropriate cleaning staff when appropriate. Identify dedicated cleaning and disinfecting equipment to use, and ensure complete disinfection of shower facility used by ill recruit in order to minimize exposure to well recruits. The cleaning crew will then take the below steps:
 - Remove visible debris from vomiting or diarrheal incidents using an absorbent (double layer) material and discard these in a plastic bag to minimize aerosols.
 - Clean and disinfect the original site of contamination and a radius of six feet surrounding it.
 - For hard surfaces: Pour the NoV killing disinfectant or 1000 (ppm) bleach disinfection solution onto the contaminated surface, wait 10 minutes, wipe with an absorbent towel, respray with 1000 ppm bleach disinfection solution, and allow the area to air dry. This includes shared equipment (e.g. chairs, mats, and masks), toilets, handles, chairs (wooden, plastic, and steel parts), faucets, light switches, phones, tables, elevator buttons, sinks, countertops, bathroom stall doors, door handles, paper towel dispensers, soap dispensers, handrails, floors, and bunk frames.
 - For carpeting/ upholstered furniture: The area should be cleaned with hot water and detergent, and then steam cleaned at 158°F for five minutes or 212°F for one minute to completely inactivate the virus. *Dry vacuuming is not recommended.* Avoid disinfecting with bleach since discoloration may occur.

- For sand pit disinfection: If a recruit vomits in a sand pit during training, the sand within a six foot radius of the incident must be removed and disposed of in case of contamination from splatter.
- For pool disinfection: If a recruit vomits or has a fecal incident in a pool, the pool must be shocked or superchlorinated. Normal levels of chlorine in the pool are inadequate to kill NoV (Fecal incident response recommendations for Aquatic Staff CDC, 2018).
- For shared hard equipment with difficult areas to reach for cleaning: The item may be submerged into a disinfectant for at least two minutes and then air dried.
- For surfaces that are permeable or difficult to dry quickly, such as ropes or equipment that can be potentially damaged by frequent bleach cleaning: recruits should be encouraged to wash their hands frequently with soap and water before and immediately after any tasks or training evolutions.
- Upon disinfection completion, remove PPE and place in plastic bag to discard. Discard other soiled items in plastic bags appropriately. Wash hands with soap and water immediately after handling the trash.

Training sites should ensure appropriate agreements and plans are in place in regard to supporting contracts for food handling, latrine cleansing, laundry, etc. to ensure rapid adoption of proper environmental sanitation practices and disinfectant use in the event of an outbreak.

Selection of the chemical sanitizer to be used to meet this requirement shall be in accordance with 7-204.11 and the EPA's list of registered antimicrobial products effective against Norovirus and replaces the use of quaternary disinfectant.

i. Gas Mask

Gas masks should be cleaned and sanitized prior to reissue and use by a different recruit as well as when the mask is turned in as serviceable excess. Prior to conducting sanitization of the equipment, don personal protective equipment (PPE) and prepare a 200 ppm sanitizing solution, from 5.25% sodium hypochlorite (5.25% liquid household bleach). Ensure that PPE is donned and doffed properly before and after solution preparation.

IAW TM-3-4240-542-13&P follow the steps below:

1. Ensure those who are assigned cleaning and sanitizing duties don appropriate PPE (gloves, masks, disposable coveralls, eye protection).
2. Prepare 200 ppm sanitizing solution by mixing one tablespoon of 5.25% sodium hypochlorite (liquid household bleach) to every one gallon of potable water. (Prepare enough solution to cover face piece, use one gallon of prepared sanitizing solution for every 10 masks) (Figure 1). If the steps of the TM 3-4240-542-13&P cannot be followed, follow the directions on the manufacturer's label.
3. Use chlorine test strips to ensure proper concentration (200 ppm) is achieved and maintained. Testing strips can be ordered through normal supply channels.

4. Prepare rinsing station allowing for ability to submerge face piece and agitate potable water.
5. Remove the air filter from the mask.
6. Pull the strap over the front of the mask.
7. Clean the masks in a soapy potable water solution. 8. Rinse with potable water.
9. Immerse face piece, outlets, air deflectors, head harness and outlet valve cover in sanitizing solution for five minutes. Use your finger to agitate the solution into all corners of the mask.
10. Rinse in clear, warm potable water, gently agitating for 2 minutes.
11. Air dry or use a lint-free cloth to gently wipe the mask and all associated parts. If air drying, invert face piece to allow water to drain.

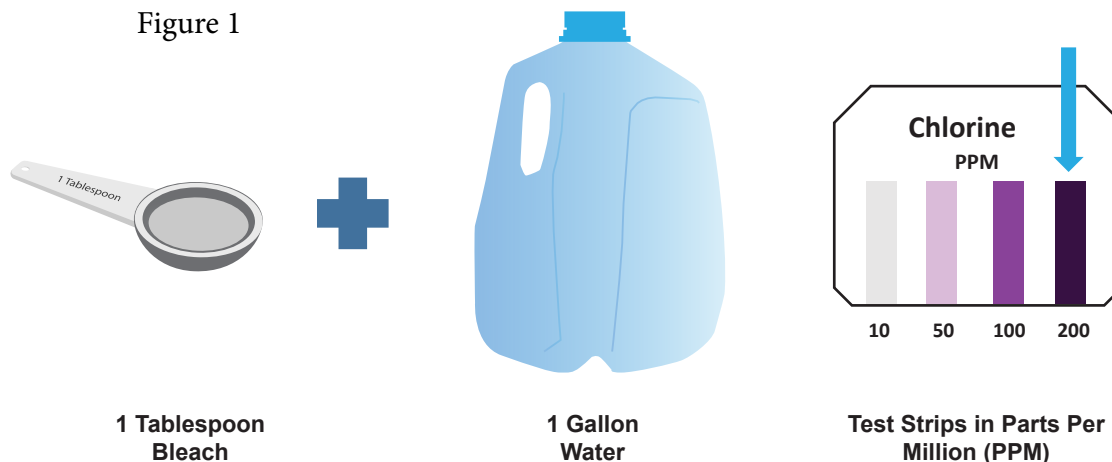
ii. Canteen/Drinking Tubes

Canteen usage is another critical component of possible reinfection. Measures need to be taken to ensure canteens are cleaned and sanitized before reissue to help prevent potential transmission of disease causing microorganisms; a routine weekly sanitization process needs to be implemented and logged. Prior to conducting environmental sanitizing of the equipment ensure personal protective equipment (PPE) is donned and doffed properly during preparation of the 200 ppm sodium hypochlorite (liquid household bleach) sanitizing solution. . If using HHT (calcium hypochlorite) ensure granules are properly dissolved to ensure that the integrity of the drinking system is not compromised, in order to prevent potential hazards to personnel.

IAW TM-3-4240-542-13&P follow the steps below:

1. Ensure those who are assigned cleaning and sanitizing duties don appropriate PPE (gloves, masks, disposable coveralls, eye protection).
2. Prepare sanitizing solution by mixing one tablespoon of sodium hypochlorite (5.25% liquid household bleach) into each one gallon of potable water (Figure 1). If the steps of the TM 3-4240-542-13&P cannot be followed, follow the directions on the manufacturer's label.
3. Use chlorine test strips to ensure proper sanitizing solution concentration (200 ppm) is reached and maintained. Testing strips can be ordered through normal supply channels.
4. Remove the water canteen cap, fill canteen with sanitizing solution and replace water canteen cap.
5. Use the sanitizer (prepared 200 ppm bleach solution) and a scrub brush to clean the interior of the cap to include gasket and external threads on the top of the canteen.
6. Remove drink coupler from its housing and unwrap external drink tube from the front module main body.
7. Open water canteen cap retaining strap on water canteen cap.
8. Connect the drink coupler to the water canteen cap and turn the drink tube lever on the front module main body upward until it stops and is fully opened, to open the drink tube shutoff valve.
9. Invert water canteen above mask, squeeze canteen to force the solution through the drink coupler.
10. Lower water canteen to upright position or squeeze sides to vent canteen. Use entire contents.

11. Rinse twice with potable water using the same process.
12. Remove the water canteen cap (while still attached to the drink coupler) from the canteen to drain excess water.
13. Turn the drink tube lever on the front module main body, downward, until it stops and fully closed, to close the drink tube shutoff valve.
14. Remove drink coupler from water canteen cap, close water canteen cap retaining strap and replace cap on canteen.
15. Remove outlet valve cover assembly and new outlet disk valve.
16. Dry all parts with clean, dry outsert pouch or allow to air dry. Invert canteen on a clean surface to allow water to drain.
17. Remove drink coupler from external drink tube. Sanitize the microphone, microphone adapter, communications lead, drink coupler and if issued the audio frequency amplifier adapter using applicator and isopropyl alcohol.
18. Do not reinstall components until pieces are thoroughly dried.



If a suspected or identified respiratory, bacterial or viral outbreak has occurred the disinfection process would need to be executed, using a minimum concentration of 1000 ppm bleach disinfecting solution. This increased concentration of the solution could potentially damage the integrity of the equipment. Protocols for increased handwashing should be in place for recruits following handling and use of gas masks and canteens to reduce the transmission of disease and risk of a potential outbreak.

c. Galley

Food handlers have been found to be a major source of foodborne contamination in large NoV outbreaks (Hardstaff et al., 2018). To prevent food-related outbreaks of NoV, personnel who work with, prepare, or distribute food must be excluded from working if they develop symptoms of acute gastroenteritis. Personnel should not return to these activities for a minimum of 72 hours after symptom resolution or longer, as required by military health regulations

<https://www.med.navy.mil/directives/Pub/5010-1.pdf>. Additionally, food handlers must perform proper hand hygiene prior to contacting or prepping food items and beverages

<https://www.med.navy.mil/directives/Pub/5010-1.pdf>. Finally, food handlers should be certified and trained on safe food handling practices in order to prevent cross-contamination.

Each galley should keep “dead man’s trays” daily. A “dead-man’s tray” also known as a dummy or sample tray, is a plate of prepared food from the meal. Ideally, these should be preserved for a minimum of seven days. When an outbreak is suspected, the food manager should be immediately notified to hold all dead man’s trays until informed to discard them during the outbreak investigation.

Food managers maintain detailed records on products purchased and specific lot numbers prepared each day in dining facilities in order to allow comprehensive trace back in the event of suspected foodborne illness.

Anytime a recruit or other individual vomits in a mess hall, it should be treated as if it were caused by a potential NoV infection:

1. Immediately contact the Food Service Manager.
2. For clean-up, follow the instructions above in section 3.b. Close and block off a radius of at least a 28 fee around the area with cones and/or signage.
3. Inform all personnel in the facility of the incident, and implement more frequent and vigorous hand washing.
4. Unserved and served food within the blocked off area should be discarded immediately. Food utensils within the radius of the affected area should be turned in to the scullery. All equipment and surfaces must be disinfected before the area is re-opened. Ensure disinfectants capable of neutralizing NoV are used.
5. Affected recruit service lines should cease operations until the following have been executed:
 - a. Convert the salad bar from self-service to a single-sided bar with the food service team serving the recruits. Under no circumstances should the recruits serve themselves. Alternatively, shut down the salad bar until the outbreak is over.
 - b. If utensils have been determined to be affected, replace them with disposable/paper plates, plastic utensils, and foam cups until Preventive Medicine staff lifts the restriction.
6. Once the Food Service Manager or Preventive Medicine staff verifies terminal cleaning and disinfection procedures are complete, the area may be reopened.
7. During an outbreak, ill recruits, AD personnel, and food service workers (FSW) should be excluded from the facility.
8. Actively promote adherence to hand hygiene among FSWs and the recruits entering the facility.

Where necessary the Contractor shall disinfect all recruit and staff decks, encompassing tables, seats, cold bar counters, hot line counters, beverage counters, reach-in storage areas, utensil storage areas, tray storage areas, bread container covers, and soup/oatmeal container covers, at the end of every meal period.

d. Cleaning Soiled Laundry

Once a Norovirus outbreak is suspected, enforce specific laundry cleaning procedures:

1. Have a designated laundry team to remove soiled laundry from barracks and to clean the soiled laundry. All recruits handling soiled laundry should wear the appropriate PPE (gloves and gowns).
2. Normal (non-contaminated) and contaminated laundry should not be mixed. Designate a separate washer and dryer for the cleaning of contaminated laundry only. Clean and soiled laundry areas should be clearly marked.
3. Clothes and linen contaminated with stool or vomit need to be immediately and cautiously bagged to minimize airborne particles that may pose a risk for transmission. DO NOT SHAKE soiled laundry.
4. Double bag the soiled laundry. Clearly label these bags so that launderers are aware of the contamination and know to follow Norovirus laundering procedures.
5. Wash soiled items with detergent and the maximum heat and cycle available.
6. Dry contaminated clothes and linens separately from normal (non-contaminated) items at a temperature greater than 170°F.
7. After each use, clean the washer using a rinse cycle with household bleach.

Note: *It may be better to discard certain soiled items than to risk exposure during cleaning.*

3. ADMINISTRATIVE CONTROL MEASURES

a. Commander and Drill Instructors

Leadership role: Leaders play an essential role in protecting the health of the people in their care. Drill Instructors have a vital role in disease prevention and control, discovery of health problems, implementation of changes for better health, and education of recruits on how they can reduce the risk factors for NoV. Diarrheal disease can be contracted from contaminated water or food, the environment, and person-to-person transmission, but in all cases, it generally has a catastrophic impact on the fighting force and regular operations.

- Leadership delegates broad oversight responsibility for NoV prevention and control programs.
- Serves as a liaison with medical consultants in infection prevention and control, and related specialties to keep abreast of changes in the field.
- Provides resources such as equipment, supplies, and staffing to perform infection prevention and control.
- Monitors personnel within their area of responsibility to ensure they understand and comply with all infection prevention and control policies and practices.
- Comply with work practice and engineering controls, such as the practice of good hand hygiene.

Leaders must ensure that recruits only consume food and water from approved sources; that waste disposal and handwashing devices are adequate, and that unit dining facilities and living conditions are operated under sanitary conditions. Given the close nature of the recruit training environment, recruits are highly susceptible to infectious diseases, especially viral and bacterial gastroenteritis. Leaders can use administrative control measures to prevent and control NoV while still allowing for the high levels of activity.

b. Bleach Field Days

The spread of pathogens is a major threat to military operations. Humans can transmit diseases from one place and from one organism to another in a short amount of time. It is imperative that leadership employs basic disinfecting procedures to prevent the spread of pathogens. At the end of each training session and before returning from the field, all equipment should be cleaned and thoroughly disinfected.

C. Risk Communication

Formulating a Risk Communication plan will help ensure information and recommendations are disseminated throughout the entire training population.

Before an outbreak occurs, education of staff and recruits regarding prevention of disease spread should be part of the routine training curriculum, including the importance of handwashing, proper handwashing technique, and key aspects of disinfection and sanitation.

During an outbreak, an all-hands town hall may be necessary to pass information quickly and thoroughly. Topics to be covered may include: outbreak statistics and updates, NoV prevention measures, how to immediately notify medical, and procedures for reporting environmental/head/linen contamination during a vomiting and/or diarrheal incident. It would also be a great opportunity to distribute educational fact sheets, printed guidance on infection prevention and control guidance/instructions. Posters can also easily provide quick education and reminders to leadership, DIs, and recruits, on the recognition of NoV symptoms, prevention methods, and modes of transmission. Handwashing posters, specifically, should be posted near handwashing stations, heads, and galleys.

d. Separating Ill Recruits from Well Recruits (Cohorting)

Considering the highly infectious nature of NoV, keeping ill people separate from well people is an effective means of interrupting transmission of the virus and limiting environmental contamination. Exclude ill recruits from training until 48 hours after his or her most recent diarrheal or vomiting incident. Ideally, ill recruits should all be restricted to a separately designated barrack or berthing compartment, and should be served by recruits who properly observe contact isolation precautions.

Recommendations the following:

1. Have a supply of emesis bags and gloves for vomit.
2. Increase space allocation between patients to over 10 ft. if space permits, by skipping a rack or two.

3. Wipe down spaces frequently and daily.
4. Have appropriate spill kits and other products on hand, including an EPA-registered disinfectant capable of neutralizing Norovirus.
5. Have personal PPE on hand, such as disposable masks, gloves, and gowns.
6. Post handwashing signs and procedures to encourage good hand hygiene among Sailors and Marines. Provide access to hand sanitizer.
7. Exclude ill recruits from the galley and have meals delivered directly to them.
8. No church service or any social gathering. As needed, arrange services in house with the chaplain.
9. When separating recruits, ensure respiratory illness patients are not placed in same sick barrack as gastrointestinal disease patients.

e. Bunk Visitors

Establish visitor policies for acute gastroenteritis (e.g., NoV) outbreaks. Restrict non-essential visitors from affected areas of the facility during outbreaks of NoV. For affected areas in which it is necessary to have continued visitor privileges during outbreaks, screen and exclude visitors with symptoms consistent with NoV infection, and ensure that they comply with hand hygiene and contact precautions.

f. Bunk Spacing and Per-Person Space Requirements

It is necessary to maintain bunk spacing of at least three feet and for alternating head to toe positioning to reduce the potential for viral transmission.

4. Surveillance and Outbreak Detection

a. Surveillance and Outbreak Detection

Monitoring the occurrence of gastrointestinal diseases is key to identifying an outbreak at its earliest, implementing mitigation measures quickly, and ensuring established mitigation measures are working. Multiple tools should be employed to maintain vigilance during peak seasons and staff should be prepared to ramp up activities when an outbreak is suspected.

Three key elements for the foundation of a strong surveillance program:

- (a) local instruction and standard operating procedures (SOPs),
- (b) activities to monitor gastrointestinal diseases on a daily basis and
- (c) a plan to implement enhanced surveillance activities during an outbreak.

Ensure a local instruction (implementing BUMED INST 6220.12C) is in place describing the roles and responsibilities involved in carrying out an effective command reportable medical events program. A well written instruction will include the laboratory, providers, as well as the preventive medicine department. A well implemented instruction will be coordinated between the Military Treatment Facility MTF and the recruit training center/command in order to further delineate the roles, responsibilities, and expectations of drill instructors, company/ship commanders, and recruit center leadership. The instruction should discuss disease surveillance and outbreak response and the duties of each department to support that program. Along with the local instruction, the preventive medicine department should have SOPs describing in detail how the preventive medicine department carries out its role as described in the instruction. More than one SOP is likely needed and a well written SOP is one in which a new staff member can use as a step-by-step guide in carrying out surveillance and response duties.

Implement activities to monitor counts and rates of gastrointestinal disease symptoms (i.e. nausea, vomiting, and diarrhea) of patients entering the clinic or battalion aid station. This may be done in a number of different ways as long as timely identification of a potential increase can be achieved. Ideally, information should be monitored and updated on a daily basis as NoV outbreaks often spread rapidly and violently and can overcome a recruit center clinic's ability to hydrate patients. Several tools may prove to be helpful to a preventive medicine department in this area.

- ← First, medical staff play an important role in alerting Preventive Medicine to perceived increases in outpatient visits. Strong communication should be maintained between providers and Preventive Medicine staff. Furthermore, medical staff should be trained on ways to remain alert of increases in disease occurrence and should know to whom to report such perceived increases.
- ← Second, tools such as Electronic Surveillance System for the Early Notification of Community-based Epidemics ESSENCE or Composite Health Care System CHCS ad hocs/spool reports (or AHLTA/MHS GENESIS data pulls of ICD-10 codes) can provide a means for monitoring acute gastroenteritis trends to either identify a potential outbreak OR corroborate and describe a suspect outbreak. These are especially useful if training centers are supported by more than one outpatient medical office (i.e. clinic, Basic Aid Station before BAS, ER, etc.). Some medical clinics maintain binacle lists or sick call logs which can prove to be in valuable for surveillance purposes also to identify an outbreak early, pinpoint effected companies/ships, and narrow down potential causes of the outbreak. Whichever tool(s) is(are) implemented, make sure staff understand the strengths and limitations of the data and information being monitored (i.e. ESSENCE data lags 1-2 days behind, CHCS ad hocs can be very timely but may miss events if the report isn't coded to capture all events of interest, etc.).

Knowledge of what to expect should form the basis for surveillance activities. Providers and preventive medicine staff should know the baseline rate of disease in their supported population as well as thresholds for triggering additional response. Baseline rates and thresholds will depend on the tools employed for surveillance. Preventive medicine staff should become knowledgeable of outbreak experiences in the past both locally and at other training sites. After action reports may have been drafted which could provide essential lessons learned. If these cannot be acquired locally, area NEPMUs have archives. Disease Reporting System internet (DRSi) may be search for outbreak reports as well to provide a general idea of local outbreak occurrence. Additionally, the Defense Occupational and Environmental

Health Readiness System (DOEHRS) may provide insight into breakdowns in environmental controls which could lead to outbreaks. Having advanced knowledge of these inspection reports can lead to quick risk assessment at the onset of an outbreak.

When an outbreak is suspected, plans should be in place to implement enhanced surveillance activities. Suspect outbreaks should be reported via the DRSi. To obtain more information on acquiring a DRSi account and reporting, see <http://www.med.navy.mil/sites/nmcphc/program-and-policy-support/drasi/Pages/default.aspx>. Preventive medicine staff should also be aware of how to consult the Navy's expert disease outbreak investigators from their supporting NEPMU.

In the training setting, NoV outbreaks are characterized by relatively equal numbers of vomiting cases and diarrhea cases with symptoms lasting about 12-60 hours. Many times, IV fluids are needed as well given the strenuous nature of training. Outbreaks often also present as a sudden and large increase in GI illness. In the event of an outbreak, implement the following enhanced surveillance activities:

- (1) Begin active case-finding when a cluster of acute gastroenteritis cases is detected in the center. Use a specified defined case. Track this by keeping a line list of information about the ill with a tool similar to [Appendix C](#). Collect relevant epidemiological, clinical, and demographic data as well as information on patient location and outcomes. This will aid your efforts to characterize the affected groups and each case. It may aid your efforts to find a single source of the illnesses. Ensure you have a process to avoid counting cases more than once on this list, and ensure that you have a way to trace cases back to the identity of the patient while also protecting their personal information.
- (2) If the outbreak is continuing OR if it is large and involves clinic visits to multiple providers, develop a case questionnaire or intake form to be given to medical providers to fill out on anyone with GI symptoms. This will ensure standard collection of information for additional cases to find unreported cases, describe the outbreak, and identify potential areas of disease transmission.
- (3) Prepare and submit an urgent medical event report as is required by BUMEDINST 6220.12C.
- (4) Contact your supporting NEPMU, listed in [Appendix D](#), for assistance. NEPMUs can assist with investigation steps, risk communication, laboratory testing and medical event reporting.
- (5) Assess the modes of transmission by plotting the distribution of patient symptom onset times on an epidemiologic curve. Contact your supporting NEPMU listed in [Appendix D](#) for assistance.
- (6) When appropriate, work with medical to collect an adequate number of laboratory specimens. Ensure medical is instructed in the proper way to collect samples and ordering lab tests. Ensure lab is instructed on proper lab testing or mail out directions. Contact your supporting NEPMU listed in [Appendix D](#) for assistance with lab testing or guidance on the use of commercial rapid detection tests.

- (7) Begin putting personal and environmental hygiene protocols in to place. Assess current sanitation capabilities of affected battalion and encourage vigilance. Plan to conduct periodic inspections to ensure procedures are being followed (handwashing, disinfection, laundering).
- (8) Raise recruit unit awareness of signs, symptoms and advise cohort ill persons to limit their movement.

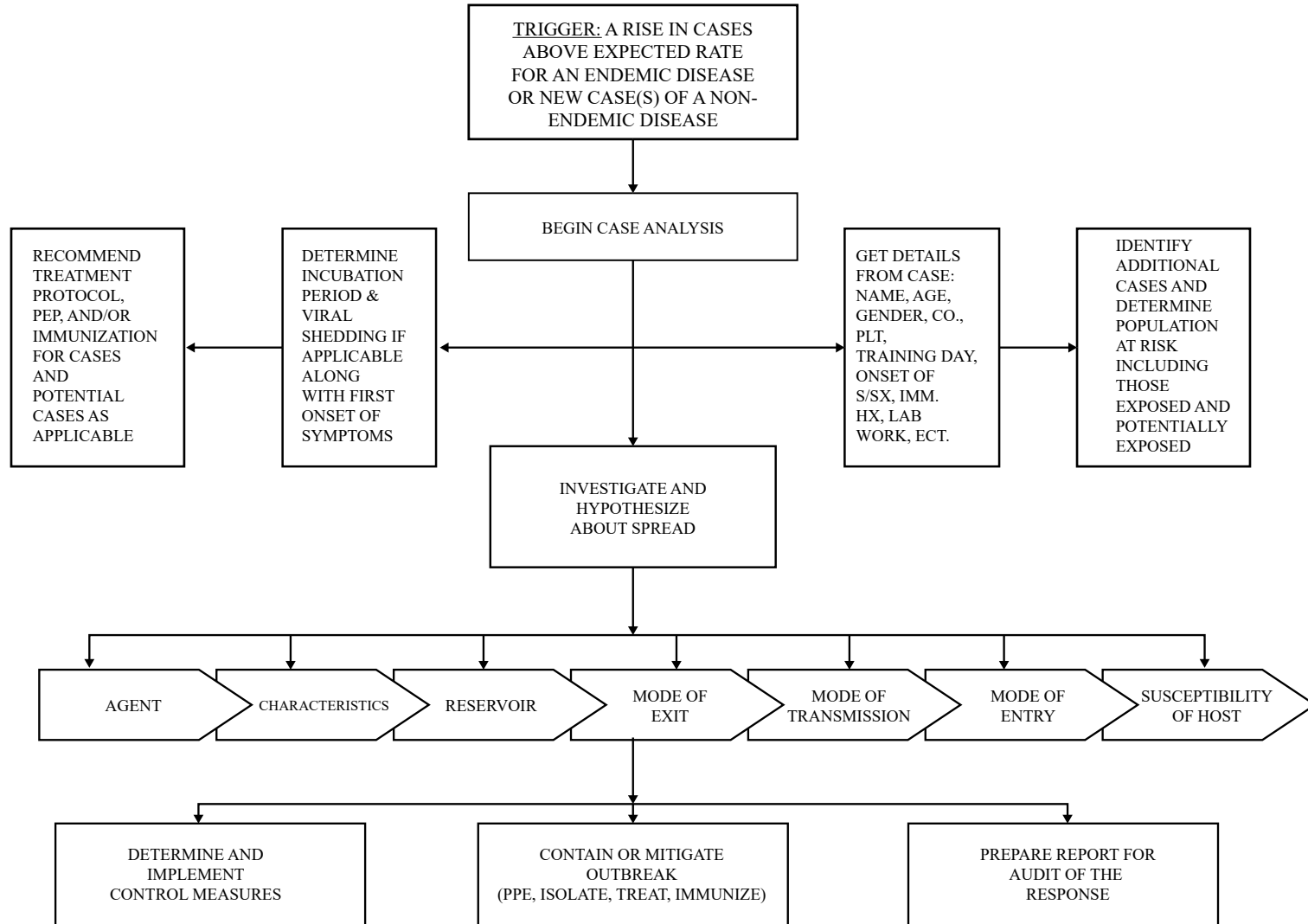
b. Laboratory Sample Collection and Transportation

Laboratory sample collection significantly contributes to rapid outbreak confirmation and control. Not all ill persons need be tested. In fact, in most circumstances, only a small representative sample of patients need to be tested in order to identify the etiologic agent and inform mitigation efforts. In persisting outbreaks, additional testing may be necessary.

Stool is the most optimal sample for NoV testing, although vomitus can also be collected and tested. Specimens should be collected as early as possible during a suspected NoV gastroenteritis outbreak and ideally from individuals experiencing the acute phase of illness, within 2-3 days of onset. Specific collection procedures depend on the lab providing the testing. Preventive Medicine should work with the MTF lab to determine NoV testing capability prior to an outbreak. Medical providers as well as Preventive Medicine staff should be aware of how to order the appropriate lab test, the lab's specific specimen collection procedures, and should have testing kits readily available during an outbreak. Contact the closest MTF or supporting NEPMU (listed in Appendix D) for additional assistance.

Routine collection and processing of environmental samples during a NoV outbreak is not recommended. When supported by epidemiologic evidence, environmental sampling can be considered useful to confirm specific sources of contamination during investigations. NEPMUs can assist with this

Appendix A OUTBREAK FLOWCHART



Appendix B

Outbreak Tool Kits

Develop a Questionnaire

This model questionnaire is limited to collecting information about the patients. Know that you may need to add more specific questions to identify and assess environmental exposures. Preventive Medicine support for questionnaire development may be obtained from your nearest NEPMU.

AGE Cluster Investigation Questionnaire

(To be completed by the investigating technician, NOT the patient)

I. DEMOGRAPHIC INFORMATION

Last Name:	First Name:	SSN/EDIPI:
Platoon:	Training Day:	DOB:
Age:	Gender:	Today's Date:

II: CLINICAL INFORMATION

Y N UNK **Did you submit any lab specimens for testing?**

If YES: Date: _____ Provider / facility ordering test: _____

If NO: Are you willing to submit a stool specimen for testing?

Did you have:

Y N UNK **Nausea**

Y N UNK **Vomiting**

If yes, what was the location of the first episode? _____

Did you vomit in any location other than the head? _____

Who cleaned up the vomit? _____

How was the vomit cleaned? _____

Y N UNK **Diarrhea (3 or more loose stools in a 24 hour period)**

If yes, specify: Blood in stool Mucus in stool Watery stool Other _____

If yes, date of onset of diarrhea: ____ / ____ / ____ Time of onset: AM or PM

Maximum # stools in a 24 hour period _____

Duration of diarrhea (days): _____

Y N UNK **Fever**

If yes, what was the highest recorded temperature: _____

Was the fever diagnosed by a provider or self-reported by recruit? _____

Y N UNK **Other symptoms**

If yes, describe them: _____

Y N UNK **Are you still experiencing vomiting or diarrhea?**

If no, what when was the last episode? Date: _____ Time: _____

Y N UNK **Were you seen at sick call?**

If yes, when and where? _____

Y N UNK **Were you hospitalized overnight?**

Y N UNK **Are you taking any medications?**

If yes, what medication? _____

Y N UNK **Did anyone you know have a similar illness?**

If yes, who?

Name: _____ Platoon: _____

Name: _____ Platoon: _____

Name: _____ Platoon: _____

Y N UNK **Did you attend a large gathering/training evolution in the 7 days before your illness?**

If yes, which gathering? Church Receiving Gas Chamber Swimming Pool

Range Crucible Marine week Other: _____

III. ENVIRONMENTAL EXPOSURE INFORMATION

Y N UNK **At any time during the last 7 days, did you ingest water that is not for drinking?**

If yes, at what event and when? _____

Did you wash your hands after this event? _____

Y N UNK **At any time during the last 7 days, did you touch reptiles, wild life, or domestic animals?**

If yes, at what event and when? _____

What is your primary source of drinking water (select all that apply??)?

Spigots/sinks Bottles Canteens Waterbulls Unknown

When was the last time you cleaned your canteen with bleach and water?

1 week or less 1-2 weeks ago 2-3 weeks ago 3-4 weeks ago 4 or more weeks

Y N UNK **Do you wash your hands immediately before entering the galley?**

If no, do you use hand sanitizer? Y N

(During the 3 days before having diarrhea and/or vomiting.)

Y N UNK **Was there toilet paper in the heads?**

If no, please specify which heads you used here: _____

Y N UNK **Did you wash your hands after using the bathroom?**

If no, please specify which heads you used here: _____

Y N UNK **Was there soap in the heads?**

If no, please specify which heads you used here: _____

Y N UNK Were there paper towels in the heads?

If no, please specify which heads you used here

IV. FOOD HISTORY

Y N UNK Did you eat at the self-serve salad bar?

If yes , please specify. every meal some meals no meals

Y N UNK Did you eaten a boxed lunch within the past 3 days? yes no

Y N UNK Have you eaten a brown bag lunch?

Y N UNK Have you eaten any seafood?

Date of onset of illness

Meal	Location	Foods Eaten
Breakfast		
Lunch		
Dinner		

1 day before onset of illness

Meal	Location	Foods Eaten
Breakfast		
Lunch		
Dinner		

2 days before onset of illness

Meal	Location	Foods Eaten
Breakfast		
Lunch		
Dinner		

3 days before onset of illness

Meal	Location	Foods Eaten
Breakfast		
Lunch		
Dinner		

--	--	--

--	--	--

4 days before onset of illness

Meal	Location	Foods Eaten
Breakfast		
Lunch		
Dinner		

5 days before onset of illness

Meal	Location	Foods Eaten
Breakfast		
Lunch		
Dinner		

6 days before onset of illness

Meal	Location	Foods Eaten
Breakfast		
Lunch		
Dinner		

7 days before onset of illness

Meal	Location	Foods Eaten
Breakfast		
Lunch		
Dinner		

Appendix C

Disease Outbreak Line List Example

Case #	Last name	First Name	Date of Illness Onset	Time of Illness Onset	First Symptom-Free Date	Symptom-free Time	Vomiting	Diarrhea	Fever	Bloody stools	Abdominal cramps	Rate	Rank	Age	Sex	Recruit Training Group	Residence (1. Ship's berthing; 2. Barracks; 3. Base Housing; 4. Off-base)	Roommates or Household Members (barracks roommate(s), partner, spouse,	Monitored By (name of Leadership POC, Medical Provider, or Dept. responsible for daily monitoring, if applicable)	Other Notes/Comments

Appendix D

Contact Information

NEPMUs

Navy Environmental and Preventive Medicine Unit Two

(Atlantic and European regions)

COMM: 757-953-6600; DSN: 312-377-6600

PLAD: NAVENPVNTMEDU TWO NORFOLK VA

Web site: <http://www.med.navy.mil/sites/nmcphc/nepmu-2/Pages/default.aspx>

E-mail: usn.hampton-roads.navhospporsva.list.nepmu2norfolk-threatassess@mail.mil

Navy Environmental and Preventive Medicine Unit Five

(Pacific region)

COMM: 619-556-7070; DSN: 312-526-7070

PLAD: NAVENPVNTMEDU FIVE SAN DIEGO CA

Web site: <http://www.med.navy.mil/sites/nmcphc/nepmu-5/Pages/default.aspx>

E-mail: usn.san-diego.navenpvntmedufive.list.nepmu5-health-surveillance@mail.mil

Navy Environmental and Preventive Medicine Unit Six

(Pacific theater)

COMM: 808-471-0237; DSN: 315-471-0237

PLAD: NAVENPVTMEDU SIX PEARL HARBOR HI

Web site: <http://www.med.navy.mil/sites/nmcphc/nepmu-6/Pages/default.aspx>

E-mail: usn.jbphh.navenpvntmedusixhi.list.nepmu6@mail.mil

Navy Environmental and Preventive Medicine Unit Seven

(European and African theaters)

COMM (international): 011-34-956-82-2230 (local: 727-2230); DSN: 94-314-727-2230

PLAD: NAVENPVNTMEDU SEVEN ROTA SP

Web site: <http://www.med.navy.mil/sites/nmcphc/nepmu-7/Pages/default.aspx>

E-mail: nepmu7@eu.navy.mil

NMCPHC

COMM: (757) 953-0700; DSN: (312) 377-0700

PLAD: NAVMCPUBHLHCEN PORTSMOUTH VA

Web site: <https://www.med.navy.mil/sites/nmcphc/program-and-policy-support/Pages/Tuberculosis-Prevention-and-Control.aspx>

E-mail: usn.hampton-roads.navmcpubhlhcnhors.list.nmcphc-threatassess@mail.mil

Appendix E

Action Check List for Outbreak of acute Viral GI illness

1. Inform the command leadership of the problem and advise them of necessary command actions
2. Inform and advise the crew of the problem and actions you expect of them.
3. Submit an “Urgent” Navy Medical Event Report following requirements in the BUMEDINST 6220.12
4. Submit patient specimens as previously planned following guidance of your nearest NEPMU.
5. Distribute questionnaires to Department leaders to identify unreported cases.
6. Prepare a line list of patients meeting your case definition.
7. Construct and evaluate an epidemiologic curve for clues to the source of illnesses
8. Exclude all ill Food Service Workers (FSWs) from working in the galley until they have been symptom free for 48 to 72 hours.
9. Ensure all FSWs use gloves and proper hand hygiene before handling any Ready-to-eat foods.
10. Eliminate all self-service practices from the galleys/food service lines until the illness rates return to baseline levels.
11. If operationally feasible cohort ill persons together in specific berthing spaces or parts of them until 48 to 72 hours after the illness of these groups subside.
12. Execute a plan for handling contaminated clothing and linens contaminated with vomit or feces.
13. Limit unnecessary group activities or group gatherings, and consider closing access to spaces where this occurs such as workout spaces, etc.
14. Ensure the contaminated environment is properly disinfected after any episodes of vomiting/diarrhea.
15. Routinely clean/disinfect frequently touched environmental surfaces (door handles plus latching devices, and door knobs/watertight door levers, light switches, hand railings, phones, etc.) and equipment in areas where ill are grouped together, clinical areas, and high traffic areas.
16. Save, refrigerate and place on medical hold samples of suspicious food items in sterile urine specimen cups stored in plastic bags and away from all other food items. Seek guidance on food sample testing from your nearest NEPMU.

Clean-up and Disinfection for Norovirus ("Stomach Bug")

THESE DIRECTIONS SHOULD BE USED TO RESPOND TO ANY VOMITING OR DIARRHEA ACCIDENT

Note: Anything that has been in contact with vomit and diarrhea should be discarded or disinfected.

1 Clean up

- Remove vomit or diarrhea right away!**
 - Wearing protective clothing, such as disposable gloves, apron and/or mask, wipe up vomit or diarrhea with paper towels
 - Use kitty litter, baking soda or other absorbent material on carpets and upholstery to absorb liquid; do not vacuum material; pick up using paper towels
 - Dispose of paper towel/waste in a plastic trash bag or biohazard bag
- Use soapy water to wash surfaces that contacted vomit or diarrhea and all nearby high-touch surfaces, such as door knobs and toilet handles**
- Rinse thoroughly with plain water**
- Wipe dry with paper towels**

DON'T STOP HERE: GERMS CAN REMAIN ON SURFACES EVEN AFTER CLEANING!

2 Disinfect surfaces by applying a chlorine bleach solution

Steam cleaning may be preferable for carpets and upholstery. Chlorine bleach could permanently stain these.

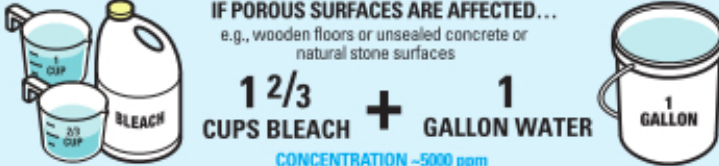
a. Prepare a chlorine bleach solution

Make bleach solutions fresh daily; keep out of reach of children; never mix bleach solution with other cleaners

IF HARD SURFACES ARE AFFECTED...
e.g., non-porous surfaces, vinyl, ceramic tile, sealed counter-tops, sinks, toilets

 **1/3 CUP BLEACH + 1 GALLON WATER**
CONCENTRATION ~1000 ppm

IF POROUS SURFACES ARE AFFECTED...
e.g., wooden floors or unsealed concrete or natural stone surfaces

 **1 2/3 CUPS BLEACH + 1 GALLON WATER**
CONCENTRATION ~5000 ppm

- Air dry surfaces unlikely to have food or mouth contact of...**
- Rinse all surfaces intended for food or mouth contact with plain water before use**

3 Wash your hands thoroughly with soap and water

Hand sanitizers may not be effective against norovirus

Facts about Norovirus



Norovirus is the leading cause of outbreaks of diarrhea and vomiting in the US, and it spreads quickly.

Norovirus spreads by contact with an infected person or by touching a contaminated surface or eating contaminated food or drinking contaminated water. Norovirus particles can even float through the air and then settle on surfaces, spreading contamination

Norovirus particles are extremely small and billions of them are in the stool and vomit of infected people.

Any vomit or diarrhea may contain norovirus and should be treated as though it does.

People can transfer norovirus to others for at least three days after being sick.

IF CLOTHING OR OTHER FABRICS ARE AFFECTED...

- Remove and wash all clothing or fabric that may have touched vomit or diarrhea
- Machine wash these items with detergent, hot water and **bleach** if recommended, choosing the longest wash cycle
- Machine dry



disinfect-for-health.org

Scientific experts from the U.S. Centers for Disease Control and Prevention (CDC) helped to develop this poster. For more information on norovirus prevention, please see <http://www.cdc.gov/norovirus/preventing-infection.html>.



co.somers.nj.us/health



neha.org



waterandhealth.org



americanchemistry.com

Stop Norovirus!

Norovirus causes diarrhea and vomiting. It spreads easily from an infected person to others, especially in long-term care facilities. Elderly residents are more likely to become very sick or die from norovirus.

Protect yourself and elderly residents from norovirus.

WASH YOUR HANDS



Wash your hands often with soap and water for at least 20 seconds each time and avoid touching your mouth.

CLEAN SURFACES



Use a bleach-based cleaner or other approved product* to disinfect surfaces and objects that are frequently touched.

WASH LAUNDRY



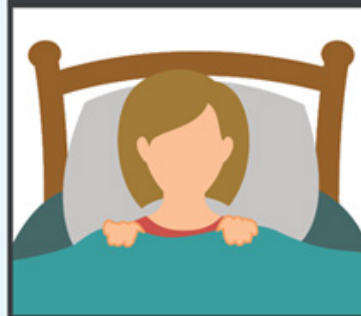
Remove and wash soiled clothes and linens immediately, then tumble dry.

USE GOWN AND GLOVES



Use gown and gloves when touching or caring for patients to reduce exposure to vomit or fecal matter.

STAY HOME WHEN SICK



If you're sick, stay home and don't take care of or visit people in long-term care facilities for at least 2 days after your symptoms stop.

For more information, visit www.cdc.gov/norovirus



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

*Use a chlorine bleach solution with a concentration of 1000-5000 ppm (5-25 tablespoons of household bleach [5.25%] per gallon of water) or other disinfectant registered as effective against norovirus by the Environmental Protection Agency (EPA) at http://www.epa.gov/oppad001/list_g_norovirus.pdf

CS258219-A

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Published By

NAVY AND MARINE CORPS PUBLIC HEALTH CENTER (NMCPHC)

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Portsmouth, VA 23708-2103