

**WHITE PAPER:
Guidelines for Response to Vomiting and Diarrheal
Incidents in Foodservice Establishments**

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INTRODUCTION

In September 2011, the United States Food and Drug Administration (FDA) issued a supplement for the *2009 Food Code* that included a new Section: 2-501.11 *Clean Up of Vomiting and Diarrheal Events*. This *Food Code* addition has two parts:

- the first requires that food establishments have *written* procedures for their employees to follow when they are cleaning up vomit or diarrhea;
- the second part requires that the procedures include how the food establishment is going to protect their employees, customers, foods, and surfaces from contaminants that might be spread from the vomit and/or diarrhea.

The Conference for Food Protection committee originally proposed this new section due to a lack of awareness on the part of foodservice establishments on how to effectively respond to a vomiting or diarrheal event that would protect employees, customers and food. The goal is for an establishment to respond properly and as quickly as possible after an event to reduce the risk of the transmission of pathogens throughout the facility. The key to meeting this goal is having a response procedure in place that avoids the further spread of pathogens through the facility, one that includes identifying appropriate personnel, instructions for isolating the affected area, protecting food, moving customers, and clean up.

If a state has adopted the FDA's *2009 Food Code*, the foodservice establishments in that state would be subject to compliance with this new section and should have written procedures and protocol for cleaning up such spills.

The *Food Code* does not give specific protocols or procedures on how this clean up should be carried out to prevent contamination of food, employees, customers, and surfaces; therefore, this paper gives general guidelines on what should be included in an establishment's written procedures. In addition, this paper reviews the potential for contamination and spread of illness from vomit and diarrhea, and provides information on the proper cleaning procedures and materials necessary to prepare a foodservice establishment for such events.

IMPORTANT NOTE: The practices and products discussed in this paper give general, widely accepted guidelines for vomiting and diarrheal events in foodservice establishments. Each state and jurisdiction may be subject to its own regulations, specifically around the use of disinfecting agents. Your local public health authority can provide you with further guidance specific to your area and facility.

PUBLIC HEALTH SIGNIFICANCE OF VOMIT AND DIARRHEA CONTAMINATION

Why are vomiting and diarrhea incidents high-risk for the spread of contamination? Often times, when a person with gastroenteritis vomits or has diarrhea, projectile or explosive vomiting or diarrhea can occur and propel small airborne virus particles within a 25-foot radius. Gastroenteritis viruses have been known to survive for 12 -60 days on environmental and hard surfaces such as toilets, faucets, door handles, handrails, carpets, upholstery, telephones, computers, touch screens, equipment, and kitchen preparation surfaces. These viruses, known scientifically as enteric viruses and more commonly as intestinal viruses, can cause gastroenteritis and include rotaviruses, hepatitis A, and norovirus.

Norovirus is one of the best known and the most frequent cause of foodborne gastroenteritis. The U.S. Centers for Disease Control and Prevention (CDC) reported that about 21 million cases of norovirus occur each year in the U.S. and that it is responsible for 58% of the foodborne illnesses and 50% of the foodborne outbreaks in which a known microorganism is identified. While the duration of norovirus symptoms – nausea, vomiting, diarrhea, cramping and fever – lasts only one to five days in most people, it can develop into a serious illness for the very young and the elderly. Ill persons may shed the virus in their feces for up to two weeks following their illness; improper hand washing could allow the virus to continue to spread. Illnesses from norovirus result in healthcare and lost productivity costs of approximately \$2 billion each year in the United States.

It only takes a few enteric virus particles to infect an individual. When an infected person vomits, the small airborne virus particles settle on surfaces, food, and persons in the area. It has been estimated that a minimum of 1 million norovirus particles are in a milliliter, or about 1/5th of a teaspoon, of vomit and up to 100 billion in a milliliter of diarrhea. The infectious dose or number of these pathogenic viruses that it takes to make someone sick are usually very small – only 10-100 in the case of norovirus. Individuals become infected is through the “fecal-oral” route: when a person’s hands touch surfaces that are contaminated with a few virus particles on them and then touches his or her mouth, or if the person is in close proximity when someone vomits or has diarrhea and inhales some of the airborne virus particles, infection can occur in the next twenty-four hours.

Quaternary ammonium compounds that are typically used in daily foodservice environment cleaning will not eliminate viruses expelled during a vomiting or diarrheal event. If an appropriate disinfectant is not used to clean up potentially contaminated areas, it is likely that viruses will still be present. Because the viruses can survive for a number of days on hard surfaces, there is a potential for people to become infected days after the initial vomiting or diarrheal event.

DISINFECTING AGENTS

One of the biggest challenges with norovirus is that it is not inactivated with the quaternary ammonium sanitizers at the concentrations typically used in daily cleaning, so when cleaning up vomit or diarrhea, an effective disinfectant that will inactivate the virus particles must be used. Every vomiting or diarrheal incident should be treated as if norovirus is present. Although it is not the only cause of gastroenteritis

or vomiting, it is responsible for over 50% of gastroenteritis illnesses and is very resistant to the sanitizers commonly used in foodservice operations.

Both CDC and the U.S. Occupational Safety and Health Administration (OSHA) recommend chlorine as the disinfectant of choice against norovirus; that also makes it an effective choice against other viruses and pathogens that commonly cause gastroenteritis. CDC has recommended various concentrations to be used dependent upon the type of contamination – directly on a spill or type of surface.

A chlorine bleach solution can be made from regular, unscented household bleach, which is about 5.25% chlorine, or from the chlorine sanitizer used for low-temperature dish machines, which may be about 6% chlorine. Some concentrated household bleaches are now available at 8.25% chlorine. Table 1 has examples of how to prepare appropriate dilutions of bleach at the recommended concentration. Note: The concentrations are approximate for ease of preparation. Use chlorine test strips to monitor lower concentrations of solutions.

TABLE 1. Dilution of household bleach for appropriate chlorine concentration for use in clean up of vomiting or diarrhea spill.

DILUTION 5.25% household bleach, 6% dish machine sanitizer	DILUTION 8.25% concentrated bleach (use 1/3 less)	APPROXIMATE CONCENTRATION	USE
1 part bleach to 10 parts water; 1- ² / ₃ cup bleach/gallon water	1 part bleach to 16 parts water; 1 cup bleach/gallon water	5,000	Directly on spills of vomit or feces; porous surfaces, wooden floors
1 part bleach to 50 parts water; ¹ / ₃ cup bleach/gallon water	1 part bleach to 80 parts water; ¹ / ₃ cup bleach/gallon water	1,000	Non-porous surfaces; hard surfaces
1 part bleach to 250 parts water; 1 tablespoon/gallon of water	1 part bleach to 400 parts water; 2 teaspoons/gallon of water	200	Food contact surfaces; stainless steel subject to fallout from virus particles in the area. Use 1,000 ppm chlorine if directly contaminated with vomit or feces.

When using chlorine as the disinfectant of choice, there are a few things to keep in mind:

- A fresh solution must be used, no older than 30 days, when preparing from household bleach.
- Chlorine can be dangerous to use. It must not be mixed with any other chemicals, especially the quaternary ammonium compounds due to the hazardous gas that can form.
- When using chlorine, try to use pump bottles or pour bottles rather than spraying bottles so the chlorine does not become aerosolized and inhaled by employees. Spray bottles can also disturb or “stir up” virus particles back into the air.

When chlorine is not a possible choice for a disinfectant due to the type of surfaces being treated or because chlorine is not kept on the premises for safety reasons, there are alternatives to chlorine. It is important to ensure that any alternatives you choose are U.S. Environmental Protection Agency (EPA) or OSHA approved. The EPA has a list of disinfectants approved for use against norovirus. This list, known as List G, may be found on the internet at: www.epa.gov/oppad001/list_g_norovirus.pdf. Verify that the disinfectant selected:

- has efficacy against Feline calicivirus or mouse murine virus, both of which mimic the norovirus in laboratory testing; and
- is approved for use in foodservice operations.

Every disinfectant on the EPA list is not approved for foodservice operations, so ensure that the disinfectant chosen is one that is appropriate for foodservice use. Remember, a disinfectant must be rinsed off of food contact surfaces after use. Most importantly, a disinfectant must be used according to label instructions or it might not be effective to inactivate an enteric virus.

Some chemicals often relied upon are known to be ineffective disinfectants against norovirus – ethanol, quats and anionic detergents. There are some disinfectants on the EPA list that are quaternary ammonium and alcohol combinations that are specially formulated with efficacy against norovirus as well as accelerated hydrogen peroxide-based disinfectants that might be used in place of chlorine. One alternative suggested by CDC for use on porous surfaces that may become damaged by chlorine bleach is concentrated phenolic solutions, such as those found in some Lysol or Pinesol products. These would be mixed at two to four times the manufacturer’s recommendations. Hydrogen peroxide-based disinfectants are becoming more commonly used in place of chlorine. These products should be used with caution, just as when using a chlorine solution.

PROCEDURES, RESOURCES, AND TRAINING FOR CLEANUP

The new Food Code supplement section 2-501.11 *Clean Up of Vomitus and Diarrheal events* requires that procedures be written for employees of an establishment to follow when cleaning up a spill. Employees who are designated to clean up vomit or any diarrheal incidents should be given procedures, be properly trained, and be provided resources to protect themselves from exposure to any pathogens. The employees responsible for cleanup of these spills are at a significantly higher risk of becoming ill. It

is important that they understand safe practices for cleanup of the contaminated area. This includes using an effective process, materials, and personal protective equipment.

A written plan for cleanup of these events needs to include:

- directions for using personal protective equipment to protect employees who clean up a spill; and
- procedures for how to contain, disinfect, and remove contaminants from the area to prevent further contamination of food and surfaces, customers and employees.

Whether it is a guest or food handler that is ill, evaluation of any exposed food or potentially exposed food is critical to protect customers and employees. Remember that the airborne particles from vomiting may reach up to 25 feet away, and if the ill person is an infected food handler, they may have contaminated food with which they had contact if they didn't properly wash their hands.

Some suggested actions immediately after a vomiting incident are as follows:

- Position signage and/or an employee to block entry into a contaminated area, whether in the food prep area or in a dining area.
- If the incident occurs in food prep area, stop all food prep and serving operations.
- Discard any food that has any possibility of being contaminated, whether it was in the process of preparation, cold holding, hot holding, or being served. Consider everything in the 25-foot radius of the incident as being contaminated.
- Because single-service items and portion packages are not practical to disinfect, discard these items.
- Begin spill clean up and disinfection as soon as possible. (See next section)
- Have employees focus on frequent, proper hand washing and glove use.
- Monitor dish machine rinse water temperature or sanitizer concentration.
- Encourage hand washing for customers as well.
- If incident occurs in dining area, it is appropriate to remove/discard potentially contaminated self-service items such as mints, salt/pepper, creamers, etc. and having employees serve these items to prevent cross-contamination and carry over to other customers.
- Disinfect or discard menus that may have been contaminated.
- Remove customers within a 25-foot area of the incident and offer to reseal, when possible. Explain that these measures are being taken so that clean up and disinfection can be done immediately and carried out safely. Each establishment should develop its own protocol for compensating guests inconvenienced or affected by an illness incident.
- In a buffet situation, food items must be replaced if they are within the 25-foot radius. To avoid the use of any potentially contaminated plates, cuts and cutlery, have employees hand out these items and serve customers. If the food buffet is outside the contaminated area, consider replacing food items, where feasible.

While having to remove and relocate customers is challenging, it is important that the food establishment take all the appropriate steps to protect customers from exposure and perform due diligence. Most customers will understand and welcome these precautions.

Employees charged with the responsibility for cleanup of these spills need to be provided the resources for protecting themselves as well as properly cleaning up and disinfecting the area. The next section details what these resources include and how to use them.

CLEANUP PROCEDURES AND SPILL KITS

One of the important tools or resources for cleaning up vomit or feces is a cleanup kit. This resource needs to be available and properly supplied for effective disinfection of areas contaminated during a vomit or diarrhea event. Similar to a bloodborne pathogen spill kit, it should be OSHA-compliant for use in foodservice operations. Keep the kit in a readily available area and properly train employees that could potentially use the cleanup kit on its use.

What should the spill cleanup kit include? The following is a list of items that should be included:

- Personal Protective Equipment (PPE)
 - Disposable nitrile or non-latex gloves
 - Face and eye shields
 - Disposable apron
 - Shoe covers
 - Hair covers
- Absorbent powder to solidify or gel debris (baking soda or Red Z powder)
- Scoop and/or scraper to remove the absorbent material – preferably disposable
- Large volume of disinfectant effective against norovirus to apply to the entire spill area (Chlorine, hydrogen peroxide, specially formulated quaternary ammonium compounds, etc.)
- Disinfectant wipes or paper towels
- Large plastic bag and twist tie closure for disposal of materials

The following sequence should be used for spill cleanup:

1. If they haven't been removed already, request that people clear the area that is to be disinfected and ensure they do not enter food preparation, service, or storage areas to prevent further contamination and so that the cleanup can be done immediately and safely.
2. PPE should be put on in the following order: apron, shoe covers, hair cover, face mask/shield or goggles for eye, and lastly, gloves. This order is important to prevent the gloves from being damaged while donning the equipment. It is easier to put this protective gear on without gloves. Some may wish to consider the use of double gloves to further protect themselves (see #8).
3. Spread the absorbent over the vomit or diarrhea spill.
4. Allow the absorbent to soak up any liquid and become solidified.

5. Scrape and/or scoop up the absorbent and place without agitation or movement into the disposable bag. Keep in mind that if the incident occurs on a carpeted surface, it presents special circumstances as the carpet may absorb some of the spill. Scooping/scraping up the debris may create spatter if the nap is scraped.
6. Apply disinfectant to the entire area and allow it to stand for the manufacturer's recommended time – 10-20 minutes for chlorine bleach.
7. Use paper towels or disinfectant wipes to clean up the disinfectant and place into disposable bag. You may also use additional wipes with disinfectant to further clean the spill area.
8. Remove PPE and place it into disposable bag, being careful to remove gloves last so that hands are not contaminated. Using double gloves is also an option so that the initial pair of gloves used in cleanup can be discarded and second gloves can be worn when contacting the disposal bag.
9. Close the bag with the twist tie and immediately transfer to outside dumpster. In most locations this material can be placed into the dumpster and is not considered a biohazard, but check with you local regulations to be sure.
10. The employee should then wash hands and any exposed part of arms using soap and water.

While the immediate spill is being disinfected, other surfaces in the area may also be disinfected as well. In a dining room, this may include tables and chairs, service counters, condiment stations, walls, etc., while in the food preparation area, those surfaces closest to the spill such as equipment surfaces, doors to reach-in coolers could be disinfected. Focus first on areas that are closest to the spill.

Because the ill person or other customers may have also had incidents in the restroom, cleaning and disinfecting the restrooms should be part of any cleanup procedure. Typically, the industrial chemicals sold to disinfect bathrooms will be effective against pathogens that cause gastroenteritis. But just to be sure, check the label to verify it has effectiveness against norovirus (Feline calicivirus may be referenced) and use as directed.

As hand washing is the best way to prevent foodborne illnesses, increase awareness and handwashing for all employees, especially following a vomit or diarrhea event in an establishment. Not all hand sanitizers are effective against norovirus. A 70% alcohol solution in a liquid form is optimal compared to gels or foams.

In some instances, it may be appropriate to close a location to facilitate a complete cleaning and disinfection, especially if there was a large amount of food contaminated. Complete and total disinfection of an establishment is one way to “break the cycle” so that lingering virus particles on hard surfaces do not continue to cause illnesses days later.

TYPES OF SURFACES AND APPROPRIATE DISINFECTION

Various types of surfaces will be found in foodservice establishments – hard, non-porous surfaces, porous surfaces, and items that can be machine-washed. Depending upon the surface or materials, the disinfectant choice and concentration will vary (refer to Table 1 for suggestions). It is important to note that before an area can be disinfected, visible debris must first be removed with disposable towels to

which disinfectant has been applied. These should also be placed in a disposable bag. Employees cleaning should wear PPE to prevent exposure to pathogens.

What are the hard, non-porous surfaces to include in the disinfection?

- Countertops, stainless steel surfaces
- Tables, chairs – remember to include tops and bottoms of these areas
- Handles, doorknobs, hand rails
- Sinks, faucets, and toilets – all surfaces
- Items touched by everyone – light switches, elevator buttons and public telephones
- Walls, bare floors, and even ceilings may be considered for disinfection

Apply disinfectant and allow it to stand for the minimum contact time or to air dry so that any pathogens are killed. Remember, if a food contact surface was directly contacted by the spill, it must be rinsed with water after disinfection. All food contact surfaces or equipment suspected of being contaminated with virus fallout may be first washed and then disinfected with 200 ppm chlorine solution. Equipment and utensils can then be run through a dish machine. It is best to use disposable towels or equipment when removing debris, disinfecting or rinsing surfaces so that there are not items that must be disinfected after use, for example mops or cloth towels.

Some surfaces are porous and are more difficult to clean and disinfect:

- Carpets
- Upholstered chairs/sofas
- Draperies
- Wooden floors and surfaces

A caution: It is important to refrain from vacuuming a contaminated area prior to disinfectant as this will just allow any pathogens to become airborne and spread contamination.

On porous surfaces, chlorine bleach is obviously not an appropriate disinfectant due to the fabric bleaching/discoloration that would most likely occur. A disinfectant may be used, but may need to be tested first for color fastness. If a disinfectant is used, the area should be saturated and allowed to stand for the minimum contact time recommended on the label or to air dry.

Steam cleaning may be a better option for carpets and upholstered surfaces. To inactivate norovirus, steam cleaning must be done at 158 -170°F for at least five minutes or if possible, 212°F for one minute. This means that hot water from the faucet would not be adequate and that the steamer used must be able to heat the water up to temperature.

Machine washing is an option for items such as:

- Tablecloths, aprons, cloth napkins, and towels
- Employee uniforms and clothing
- Window coverings

It is important that any contaminated items are not shaken but folded and placed in an isolated laundry bag so they can be removed to a laundry area without causing further airborne particles that might contaminate other surfaces. Do not launder contaminated articles with other items; wash these separately with a pre-wash and then a regular wash with detergent. Most importantly, dry at a temperature on a high heat cycle that reaches 170°F.

SUMMARY

It is impossible to predict or prevent vomit or diarrheal events in any establishment. Therefore, the best way to be prepared is to have an established plan in place for what to do following such an incident. This is the goal of the *2009 Food Code* Section: 2-501.11 Clean Up of Vomiting and Diarrheal Events. Under this section, foodservice establishments must have written procedures for how they are going to clean up vomiting or diarrheal spills, and employees need to be trained on the procedures to protect themselves, customers, surfaces and the food.

To stay prepared for such events, have an appropriately stocked available, Investigate and know your disinfectant options, and be sure employees know what to do. Conduct regular training if turnover is frequent.

If a spill should occur, be very diligent and thorough when cleaning up the area and all potentially contaminated surfaces, keeping in mind that the area to disinfect is large – a 25-foot radius from spill site. Consider that some locations end up voluntarily closing to be able to completely disinfect the restaurant. It is important to break the re-contamination cycle with proper disinfection the first time.

Most importantly, remember that protecting customers and employees is your duty as a responsible foodservice operator. Having a documented plan of action in place not only helps comply with the law and keep those in your establishment safe, it also helps you protect your brand.

REFERENCES/RESOURCES

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