

Norovirus Incident Response Plans

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Foodservice Prevalence Study

- In total, 61 of 4,163 (1.5%) swabs presumptively positive for human norovirus, 9 confirmed by sequencing (Leone et al, 2018).
- Noroviruses in food establishments under **non-outbreak** conditions are rare events.
- Characteristics of food establishments vary **widely**.
- Tailor interventions cleaning routine to establishment/surface characteristics.
- Routine environmental monitoring for noroviruses is **not** practical.



Vomit/Diarrhea Clean Up

- 2017 FDA Food Code 2-501.11 requires *“procedures for employees to follow when responding to vomiting or diarrheal events that involve the discharge of vomitus or fecal matter onto surfaces in the food establishment.”*
- Annex 3 of the Food Code outlines **11** considerations to include in program.
- Compliance could be low, particularly among the 70% of independently owned and operated establishments.

U.S. Foodservice Industry -- 2021

- **Employment statistics**

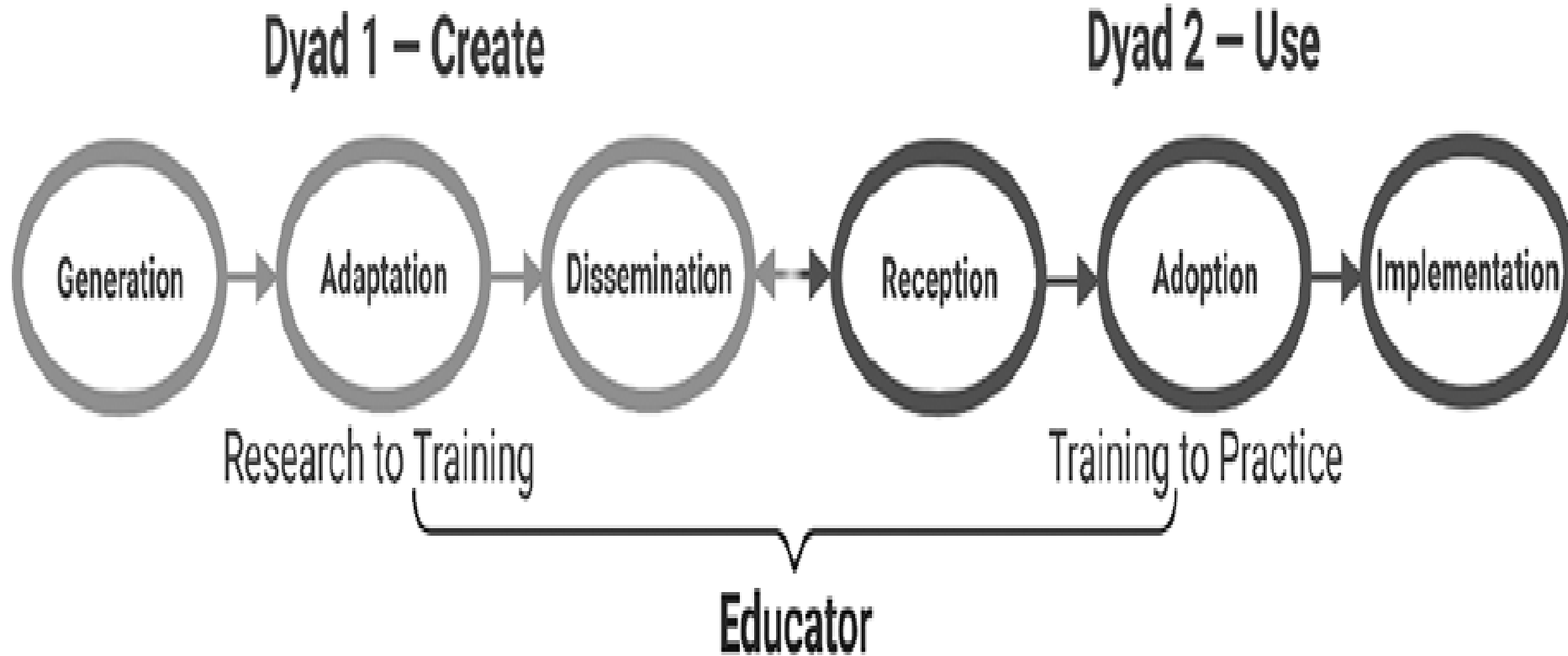
- US\$659 billion -- restaurant industry sales in 2020, down US\$240 billion
- 12.5 million units -- down 3.1 million from expected levels
- 110,000 -- restaurant locations temporarily or permanently closed

- **Other statistics**

- Approximately half (47%) of food dollar spent eating away from home (U.S. Economic Research Service)
- 9 in 10 restaurants have fewer than 50 employees
- 7 in 10 restaurants are single-unit operations
- Long-term care is the fastest growing institutional market followed by correctional foodservice.

SOURCE: National Restaurant Association, 2022

Knowledge Sharing Process



SOURCE: Yeargin et al., 2021

Food Safety Educators

- Success of knowledge sharing is highly dependent on a credible educator.
- Published literature suggests a highly credible source more likely to lead to behavioral change than a source with low credibility.
- Participants who received a positively framed communication from a credible source reported more positive intentions and behaviors than participants who received negatively framed information from a noncredible source.

Confusion?

- COVID-19 pandemic highlighted importance of environmental cleaning in retail/foodservice settings.
- Environmental cleaning = cleaning followed by antimicrobial treatment (e.g., sanitizing **or** disinfecting)
- Sanitizers and disinfectants **not** interchangeable antimicrobial products.
- Viruses eliminated using disinfectants **not** sanitizers.

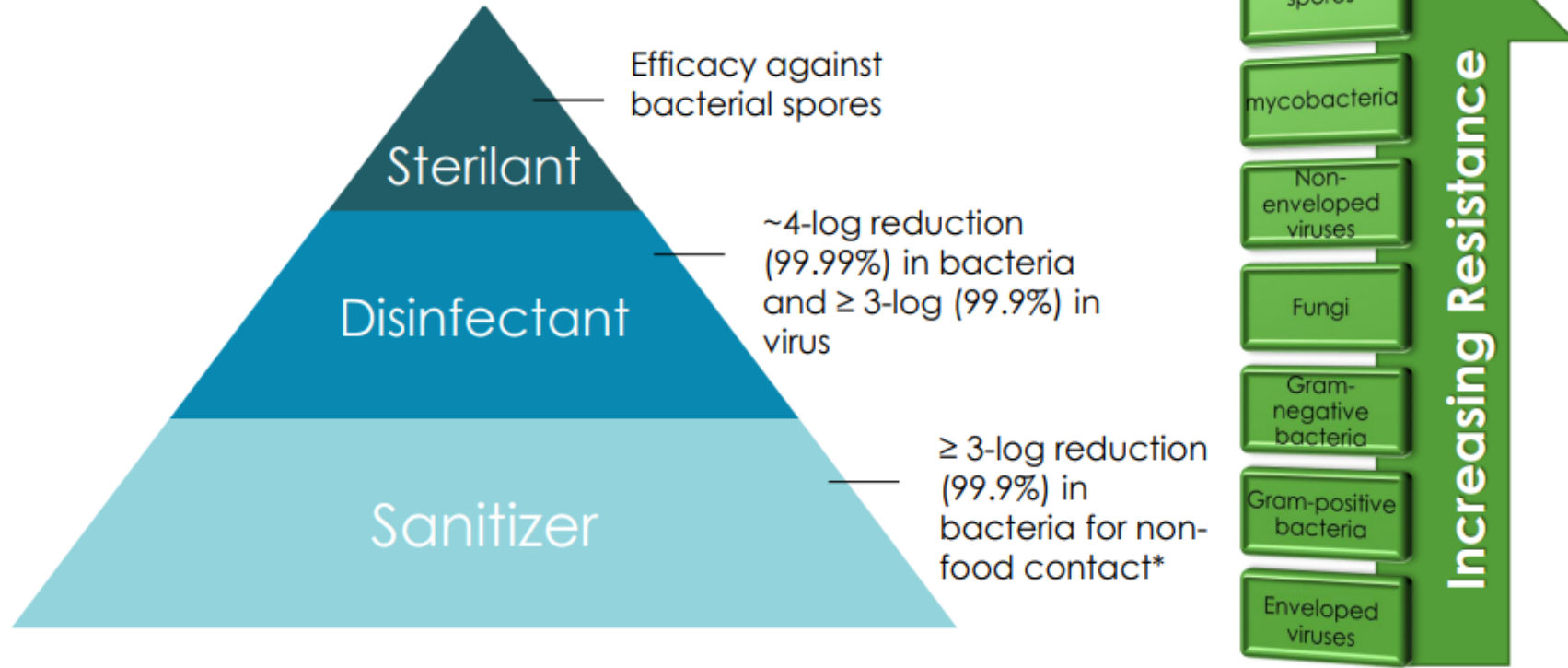


Environmental Cleaning

Action	What does it do?	Does EPA regulate?
Cleaning	Cleaning removes dirt and organic matter from surfaces using soap or detergents.	EPA regulates cleaning products <u>only</u> if claim to sanitize or disinfect.
Sanitizing	Sanitizing kills bacteria on surfaces using chemicals. Sanitizers <u>not</u> tested against viruses.	EPA regulates products that sanitize.
Disinfecting	Disinfecting a broad range of microorganisms (e.g., bacteria, fungi, viruses) on surfaces.	EPA regulates products that disinfect.



Levels of Efficacy and Hierarchy of Susceptibility



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SOURCE: Dr. Kristen Willis, U.S. EPA

What's the Problem?

- **Norovirus very contagious.**
 - Dose estimated to be 10-1000 particles.
 - Most contagious when sick with vomiting and diarrhea.
 - Infected person who vomits in a public place may expose many people.
- **Foodservice workers often go to work when sick.**
 - 1 in 5 foodservice workers have reported working while sick with vomiting or diarrhea.
 - Of outbreaks caused by infected food workers, 54% involve food workers touching ready-to-eat-foods with their bare hands.
 - Foodservice workers wash hands only 1 of 4 times that they should.
- **Norovirus hard to kill.**
 - Stay on surfaces and serving utensils for up to 2 weeks.
 - Resist many common disinfectants and hand sanitizers.

Vomiting and Diarrhea

- **Projectile Vomiting**
 - Hallmark symptom of a norovirus infection -- can release ≥ 30 million virus particles/vomiting episode.
- **Diarrhea**
 - Sick individuals produce 100-500g feces/day, while healthy individuals only produce 100-200g.
 - Stool from sick individuals can contain from 10^4 - 10^{11} bacterial cells or virus particles/gram.



FDA Food Code

- FDA Food Code sets standards for food establishments to prevent transmission of etiologic agents that cause foodborne disease (enteric agents) **not** respiratory viruses.
- Code mainly focuses on control measures for:
 - back-of-the-house (e.g., kitchen, storerooms)
 - broadly mentions the front-of-the-house (e.g., dining rooms and bathrooms).
- Front-of-the-house includes **both** food-contact and nonfood-contact surfaces.

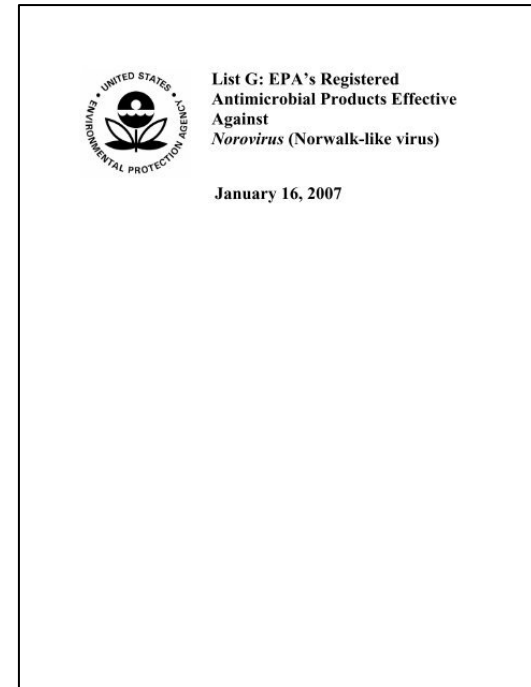


15 EPA Lists

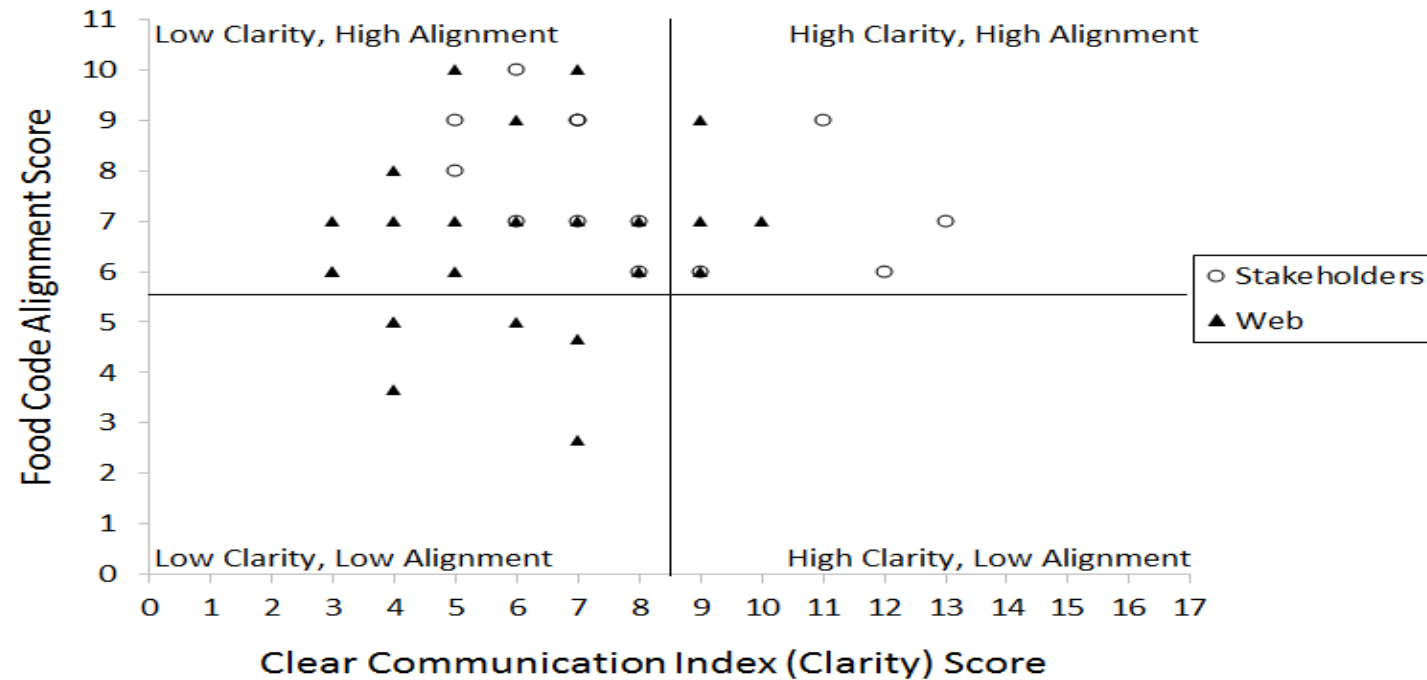
- A:** Antimicrobial Products as Sterilizers
- B:** Tuberculocide Products Effective Against *Mycobacterium tuberculosis*
- C:** Antimicrobial Products Effective Against Human HIV-1 Virus
- D:** Antimicrobial Products Effective Against Human HIV-1 and Hepatitis B Virus
- E:** Antimicrobial Products Effective Against *Mycobacterium tuberculosis* Human HIV-1 and Hepatitis B Virus
- F:** Antimicrobial Products Effective Against Hepatitis C Virus
- G:** ***Antimicrobial Products Effective Against Norovirus***
- H:** Antimicrobial Products Effective Against Methicillin Resistant *Staphylococcus aureus* (MRSA) and/or Vancomycin Resistant *Enterococcus faecalis* or *faecium*
- K:** Antimicrobial Products Effective Against *Clostridium Difficile* Spores
- L:** Antimicrobial Products That Meet the CDC Criteria for Use Against the Ebola Virus
- M:** Antimicrobial Products with Label Claims for Avian (Bird) Flu Disinfectants
- N:** ***Disinfectants for Use Against SARS-CoV-2***
- O:** Disinfectants for Use Against Rabbit Hemorrhagic Disease Virus (RHDV2)
- P:** Antimicrobial Products Registered with EPA for Claims Against *Candida Auris*

List G Limitations

- Disinfectants should appear on the Environmental Protection Agency's List G: EPA's Registered Antimicrobial products Effective Against Norovirus.
- While List G is helpful, it is infrequently updated by EPA.
- The EPA-registered label is **the** most up-to-date information on what can be used.



Clarity (X) and Alignment (Y) – 38 Artifacts



Clear Communication (clarity) score versus Food Code alignment score (n=38)—the following coordinates have two overlapping data points: (3,6), (4,5), (6,7), (7,7), (7,9), (8,6), (8,7), (9,6), and (9,9).

SOURCE: Chao et al., 2016

Content Analysis Conclusion

- Vomit cleanup procedures available, but evidence base to inform some procedural steps is limited.
- Some steps lack detail resulting in multiple interpretations of clean-up procedures (Getty et al., 2017).
- Detailed procedural steps needed to prevent infectious disease transmission from improper environmental sanitation practices.

Vomit and Diarrhea Clean Up

Vomit and diarrhea have millions of microorganisms that can cause foodborne disease. To prevent the spread of these microorganisms, all foodservice establishments must have a clean-up procedure in place.

Food workers should not clean up vomit or diarrhea.

ASSEMBLE A CLEAN-UP KIT

You can buy a kit from a supplier or assemble your own. Clean-up kits should contain personal protective equipment and cleaning supplies.

Personal Protective Equipment^a

- 2 pairs of single-use gloves
- 1 face mask
- 1 pair of goggles
- 1 single-use gown with sleeves
- 1 single-use hair cover
- 1 pair of shoe covers

Cleaning Supplies

- 1 sealable, plastic bag with twist tie
- 1 scoop/scrapper
- 1 roll of paper towels
- Absorbent powder/solidifier (such as kitty litter)
- 1-quart bottle of disinfectant^b

^a*Personal Protective Equipment.* At a minimum, your kit should have single-use gloves and a pair of goggles.

^b*Making Your Own Disinfectants.*

- If you use concentrated bleach (shown as 8.25% on the label) to make your own disinfectant, add 3/4 cups of bleach to 1 gallon of water.
 - If you use regular bleach, (shown as 5.25% on the label), add 1 cup of bleach to 1 gallon of water.
 - You can also use commercially prepared disinfectants. The U.S. Environmental Protection Agency has a list of other commercial disinfectants that you can use.
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BEFORE CLEAN UP BEGINS

- Ask everyone to leave the area where the event occurred. This includes customers and workers.
 - Block off this area to keep out anyone who is not cleaning up the area.
 - Put on personal protective equipment. At the very least, anyone cleaning up vomit or diarrhea must wear single-use gloves and goggles.
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Prepared: July 6, 2016

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CLEANING UP SURFACES

Many types of surfaces can become contaminated when someone throws up or experiences diarrhea in your establishment. It is important that you use the correct clean up procedure for the surface(s) that are contaminated. Three types of surfaces are common in foodservice establishments:

- Hard surfaces (floors, tables, utensils)
 - Soft surfaces that cannot be laundered (carpet and upholstered furniture)
 - Soft surfaces that can be laundered (linens, towels, and clothing)
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HARD SURFACES

STEP 1: Cover

- Cover the vomit or diarrhea with paper towels or an absorbent powder (such as kitty litter) to soak up liquids.

STEP 2: Remove

- Remove the paper towels or hardened powder with a scoop/scrapper and immediately place them in a plastic bag.

STEP 3: Wash

- Prepare a solution of soapy water.
- Wash all surfaces contaminated with vomit or diarrhea with this solution. This includes all nearby surfaces possibly splashed by vomit or diarrhea, such as chair legs, tables, walls, shelves, or counters. Wash as wide of an area surrounding the vomit or diarrhea as is possible.
- Rinse the soapy water from all surfaces with clean water.

STEP 4: Disinfect

- Using paper towels or a mop with a washable mop head, saturate all washed surfaces with a disinfectant. The disinfectant can be commercially prepared or one prepared in-house (see "Assemble a Clean-Up Kit").
 - If using a disinfectant that is prepared in house, let it sit for 10 minutes. If using a commercially prepared disinfectant, follow the manufacturer instructions.
 - Rinse all food-contact surfaces with clean water after they have been disinfected. Nonfood-contact surfaces do not need to be rinsed.
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CARPET AND UPHOLSTERED FURNITURE

STEP 1: Cover

- Cover the vomit or diarrhea with paper towels or an absorbent powder (such as kitty litter) to soak up liquids.

STEP 2: Remove

- Scoop up the paper towels or hardened powder with the scoop/scrapper and place in a sealable plastic bag.
- Never vacuum after this step.

STEP 3: Wash

- Prepare a solution of soapy water.
- Using soapy water, wash all carpet and upholstered surfaces contaminated with vomit or diarrhea. Wash as wide of an area as is possible.
- Rinse the soapy water from all surfaces.

STEP 4: Disinfect

- Steam clean the area for 5 minutes at a temperature of 170°F (76.7°C). (Not all steam cleaners can reach a temperature for 170°F (76.7°C), so check the manufacturing specifications.)
- Upholstered furniture that is soiled with vomit or diarrhea can also be disinfected with a bleach solution (described in "Assemble a Clean-Up Kit"), however, the bleach will discolor the material.

LINENS, TOWELS, AND CLOTHING

STEP 1: Contain

- Carefully place all contaminated items that can be washed in a washing machine in a plastic bag then seal the plastic bag.

STEP 2: Wash

- Machine wash soiled items in a washing machine using hot water and laundry detergent.
- For loads of all white items, add 5-25 tablespoons of bleach per gallon of water.

STEP 3: Dry

- Dry the just-washed items in a dryer on the high-heat setting.
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AFTER CLEAN UP

STEP 1: Remove

- Remove all personal protective equipment and place in the plastic bag. Do not touch any of the surfaces that were just cleaned as they can be re-contaminated. All personal protective equipment must be taken off before leaving the area that has just been cleaned.
- Place all used cleaning supplies, such as paper towels and disposable mop heads, in the plastic bag. Seal the bag with a twist tie.
- Throw away all uncovered food near the vomit or diarrhea event as well as any food handled by the person who was sick.
- Remove all waste from the facility immediately following local, state, or federal rules.

STEP 2: Clean mops and scoops

- Wash and disinfect mop handles and other reusable cleaning supplies, such as scoops/scrapers, using the same steps as used for hard surfaces.

STEP 3: Wash hands

- Wash hands thoroughly before performing any other duties.
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TRAINING WORKERS ON CLEAN-UP PROCEDURES

- Identify who will be in charge of cleaning up after vomit and diarrhea events.
 - Train selected workers in how to use personal protective equipment; wash and disinfect surfaces; and dispose of vomit and diarrhea.
 - Training should take place when:
 - the vomit and diarrhea clean-up procedures are first written and put in place;
 - new workers are hired; and
 - vomit and diarrhea procedures are changed.
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Provided by: *[Instructor name]*

Discovery -- Gaps in the Evidence

- **Soft Surface Clean Up**

- Recommend chlorine bleach solution (1000-5000 ppm) or an EPA-registered chemical disinfectant.
- All tested on hard surfaces using surrogates thus efficacy against norovirus and on non-launderable porous surfaces not known.

- **Clean-Up Radius**

- In some procedures, a cleaning radius of 25 feet is stated, which is based on epidemiological (not laboratory-controlled) evidence.

- **Surface compatibility**

- Effect of sanitizers/disinfectants on surfaces over time.

Conference for Food Protection

- Recommended Solution – committee be formed to address the term DISINFECTANTS in the Food Code.
- Committee charge:
 - Review current regulations
 - Develop guidance – focus on why to use, when to use, what to use, how to use, clean-up protocols, existing resources.

Thank you!

Questions?