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**PUBLIC HEALTH
EPIDEMIOLOGY & ASSESSMENT**

Norovirus Infections

Questions and Answers about Cleaning and Disinfection

Modified from the California Department of Public Health (CDPH) "Norovirus Question and Answer" dated 1/23/07 (Supplement to Prevention and Control of Viral Gastroenteritis Outbreaks in California Long-term Care Facilities 2006), the Centers for Disease Control and Prevention (CDC) "Guidelines for Disinfection and Sterilization in Healthcare Facilities, 2008" (http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Disinfection_Nov_2008.pdf), and Michigan Guidelines for Environmental Cleaning and Disinfection of Norovirus (http://www.michigan.gov/documents/Guidelines_for_Environmental_Cleaning_126234_7.pdf).

What should I use to clean and disinfect contaminated surfaces?

Contaminated surfaces should be cleaned of any debris then disinfected promptly with household chlorine bleach-based cleaners, diluted chlorine bleach (see below), or U.S. Environmental Protection Agency (EPA) approved disinfectants, following manufacturer's recommendations. There are specific EPA-registered disinfectants with claims of activity against norovirus (see http://www.epa.gov/oppad001/list_g_norovirus.pdf); however, these disinfectants were tested against a different virus similar to norovirus and may not be as effective against noroviruses.

Diluted household chlorine bleach can be applied to hard, non-porous, environmental surfaces; a minimum concentration of 1000 ppm and up to 5000 ppm is recommended to be effective against noroviruses. See table on the next page for instructions for making bleach solutions.

What is the best way to clean contaminated fiber sofas, rugs, etc?

The best method to clean contaminated furniture and rugs is not clear. Steam cleaning fabric-covered furniture alone may not achieve the necessary temperature required to get rid of the virus. Any particulate matter should be removed as thoroughly as possible prior to disinfection. Chemical disinfection of soiled areas prior to steam cleaning should be considered. Cleaning with detergent and water followed by liberal use of a disinfectant is another alternative. Test the chemical on a non-obvious area for colorfastness prior to use. If the object does not tolerate the disinfectant, suggested temperatures for steam cleaning are 158° F for five minutes or 212° F for one minute. Dry vacuuming is NOT recommended.

Are there special recommendations for cleaning contaminated laundry?

Contaminated clothing, linens or other items should be bagged as soon as possible at the point of use. Soiled laundry should be handled with minimal agitation to avoid contamination of air, surfaces, and persons. Detergents and cycle times should be suitable for the water temperature chosen, following manufacturer's recommendations. Disinfection of washing and drying machines is not needed as long as gross soil is removed from items before washing, and proper washing and drying procedures are used. There are no recommendations for specific dryer temperatures or times; however, laundered items should be thoroughly dried.

How to Make Bleach Solutions for Disinfection* Use Standard Household Bleach (5.25%-6.15%) and Cool Water Do Not Use "Ultra" or Scented Bleach Products			
Approximate Chlorine Concentration (ppm)	Use this Amount of Bleach in 1 Gallon Water	Approximate Dilution	Application
50-60	1 teaspoon	1:1000	Use for home food contact surfaces
100	½ tablespoon (about 1 capful)	1:500	Use in food facilities routinely (not during norovirus outbreak)
200	1 tablespoon	1:250	Use for food/mouth contact items during norovirus outbreaks
500-600	¼ cup (0.25 cup)	1:100	Use for routine home disinfection of surfaces
1000	1/3 cup	1:50	Use for norovirus outbreaks; use in patient care facilities
5000-6000	1 and ½ cups (1.5 cups) to 1 and 2/3 cups	1:10	Use for norovirus or <i>Clostridium difficile</i> outbreaks; use in patient care facilities; body fluid and blood spills

*When working with bleach, all recommended safety precautions listed on the manufacturer's label should be followed. Diluted bleach solutions are best when made fresh daily; if not made daily, they can be stored in an opaque container for up to 30 days, but the chlorine concentration will decrease by half in 30 days. All containers should be clearly labeled and dated.