MedicalXpress

Norovirus disinfection: How much is enough?

November 9 2012

A variety of institutions and governments have developed "commonsense-based" disinfection guidelines to control norovirus contamination, but now, for the first time, a Dutch team has come up with science-based guidelines. The research is published in the November 2012 issue of the journal *Applied and Environmental Microbiology*.

Norovirus is the most common cause of gastroenteritis, according to the Centers for Disease Control and Prevention (CDC). This fecal-orally transmitted virus is notorious for spreading like wildfire in schools, on ocean cruises, and where-ever one infected person may be involved in the feeding of hundreds more, leaving victims tossing their cookies for as long as several days. Norovirus is especially problematic when it strikes hospitals, as both staff and patients are laid low.

In the study the researchers first determined how low the concentration of virions needed to go for transmission to become unlikely. They then tested different methods of cleaning hard surfaces, by using water, soap, or chlorine bleach solutions to determine the best method, or combination of methods for achieving a sufficiently low concentration to prevent virus transmission from hard surfaces, such as your kitchen counters.

The researchers prescribe a two-step process: wipe with a wet cloth, and then disinfect with chlorine. Their prescription is directed at hospitals, schools, restaurants, and other food-handling establishments. In most

cases, a 250 ppm solution of chlorine is sufficient, but for high levels of contamination, they recommend 1,000 ppm, says principal investigator Erwin Duizer, of the National Institute for Public Health and the Environment, Bilthoven, the Netherlands.

To achieve 1,000 ppm, one Suma Tab D4 tablet must be dissolved in 1.5 liters of water (about a quart and a half). Household bleach, says Duizer, is an average about 5 percent chlorine when new (concentration declines with age), or 50,000 PPM, and thus, can be diluted 50-fold to achieve the 1,000 ppm.

Norovirus is apparently no more resistant to cleaning and disinfection than other pathogens, says Duizer. The virus' efficiency in causing outbreaks "is more likely due to their extremely low infectious dose," resulting in the requirement of a very low level of residual contamination in order to prevent further transmission. "Fortunately, reducing the level of residual contamination to that low level is not that difficult and can be achieved without extreme measures," says Duizer.

"The current guideline for norovirus outbreaks in the Netherlands is quite stringent in some aspects," says Duizer. "During recent years I have heard many complaints from people in the field that 'it just can't be done.'" The new guidelines will be more practical, and thus more effective, he says.

More information: E. Tuladhar, W.C. Hazeleger, M. Koopmans, M.H. Zwietering, R.R. Beumer, and E. Deuzer, 2012. Residual viral and bacterial contamination of surfaces after cleaning and disinfection. Appl. Environ. Microbiol. 78:7769-7775.

Provided by American Society for Microbiology