



Reusable Grocery Bags and Norovirus Transmission

Aurora A. Saulo

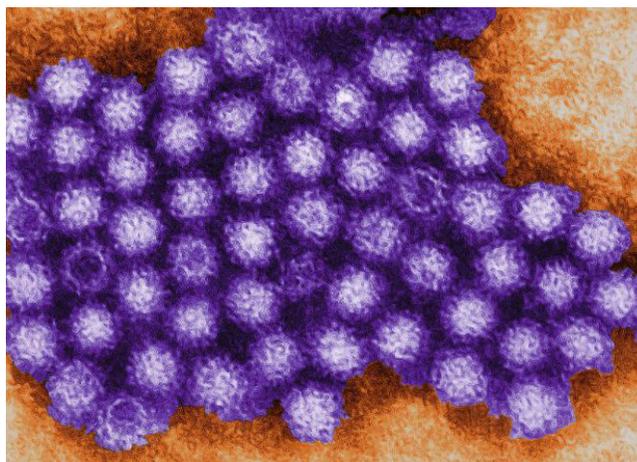
Department of Tropical Plant and Soil Sciences

Norovirus Transmission Via an Inanimate Object

Reusable shopping bags have now been officially implicated in the transmission of norovirus. In October 2010, seventeen girls aged 13–14 years old belonging to an Oregon soccer group and four adult parent-chaperones traveled to King County, Washington, for a weekend soccer tournament. They traveled on Friday afternoon in private automobiles, stayed in a local hotel, shared rooms and bathrooms, and ate at local restaurants. They also bought some packaged cookies, chips, and fresh grapes, which they kept in a reusable fabric grocery bag. The cookies and chips were in resealable open-top packages but remained unopened until Sunday lunch. The reusable grocery bag was kept in a bathroom.

Shortly after midnight on Saturday, one delegate started vomiting and having diarrhea, symptoms of a norovirus illness. When her symptoms continued, she decided to move in with her chaperone for the rest of the night. She used the chaperone's bathroom, where the reusable grocery bag containing fresh grapes and unopened bags of cookies and chips was kept. She did not touch the grocery bag or its contents. The soccer player and the chaperone traveled back to Oregon on Sunday morning and did not return to participate in the tournament. The chaperone later experienced the same symptoms of food-borne illness.

The reusable grocery bag with the food remained with the rest of the Oregon team and was passed among the members as part of their Sunday lunch. The remaining members of the group returned to Oregon on Sunday afternoon, and within 72 hours of their return,



Transmission electron micrograph of norovirus, provided by Charles D. Humphrey for the Centers for Disease Control.

seven other members of the group reported vomiting and diarrhea that continued for 1–7 days. No one was hospitalized. There were no similar reports of food-borne illness from the other groups who participated in the tournament or from other patrons of the restaurants. The Oregon Public Health Division connected all the variables of this case only upon learning of the reusable grocery bag kept in the bathroom where the delegate vomited and had diarrhea. They concluded that touching the reusable grocery bag had been sufficient to contaminate the other group members' hands. The noroviruses were then transmitted to the foods (cookies or chips or grapes) upon retrieving them from the bag, and the microorganisms were ingested when the foods were eaten.

Noroviruses are the world's leading cause of gastroenteritis and the United States' most common cause of food-borne illness. They are highly contagious and require only a small number of cells to infect. Routes of transmission are fecal-oral (via contaminated hands), airborne (aerosolization of vomit and feces), and environmental via fomites (inanimate objects, such as grocery bags). Contaminated hands can transfer the viruses to up to 7 clean surfaces. Aerosolized viruses in vomit and from flushing the toilet likewise contaminate surfaces and fomites that, when touched by hands, are easily transmitted.

This case introduces an interesting question: how should stores protect their staff, customers, and goods from contaminated reusable bags? If handled properly, single-use items such as disposable plastic bags do reduce the risk of cross-contamination; today, however, there are various other factors to consider, including social, economic, environmental, and public concerns, as well as physical effects.

Important Tips

- Do not store food in a bathroom.
- Aerosolized viruses occur and land on surfaces and objects. The entire area where aerosolization occurs must be disinfected, including objects.
- If possible, confine the ill person to the use of one bathroom. There must be a standard procedure used for cleaning and disinfecting bathrooms, surfaces, and objects.
- Reusable grocery bags must be washed before using. When juices from raw meat and seafood spill or when eggs crack in the bag, the bag becomes contaminated with harmful microorganisms. When the customer then places in the bag fresh produce to be served without cooking, or other foods (packaged or otherwise), those foods and the hands touching those foods may also become contaminated. When the customer places the contaminated bag with groceries and produce on the check-out counter, the surfaces, food, objects, and other shoppers may be contaminated, and the cross-contamination may continue from the grocery store to the home.

Reference

Repp, K.K. and Keene, W. E. (May 9, 2012). A point-source norovirus outbreak caused by exposure to fomites. *Journal of Infectious Diseases*, 1–3. http://www.oxfordjournals.org/our_journals/jid/prpaper.pdf