On November 9, 2007, the Oregon Public Health Division (OPHD) was notified of an outbreak of acute gastroenteritis in a long-term residential treatment facility. Two previous outbreaks caused by norovirus had occurred at the facility in March and July 2007. OPHD initiated an in-depth epidemiologic investigation, which included submitting archived and recent specimens from the three outbreaks to CDC for genotyping. The overall attack rate for the most recent outbreak was approximately 14% among patients and 7% among employees. The outbreak was unusual in that it lasted 63 days, versus 24-27 days for the two previous outbreaks in 2007. Person-to-person transmission was suggested by a prolonged and dispersed epidemic curve and lack of illness in some wards, although all wards were served by one central kitchen. Barriers to conducting adequate hygiene (e.g., lack of handwashing stations) and multiple lapses in infection control (e.g., noncompliance with staff wellness policies) were identified. Timely and sustained implementation of comprehensive and effective infection control measures are needed to prevent and contain norovirus outbreaks in large institutional settings.

Although norovirus outbreaks are common in health-care settings, recurrences within a short period in a single facility are rare. This facility experienced a substantial increase in norovirus activities in 2007 compared with previous years, with three norovirus outbreaks reported in 2007, one reported in 2006, and none reported during 2003-2005. Statewide in Oregon, no increase in norovirus outbreaks in similar settings was observed during 2006-2007. Each of the three outbreaks at the facility in 2007 was caused by different norovirus variants, indicating that the recurrences of outbreaks likely resulted from repeated introduction of different norovirus variants.

Although all wards were served by a common food supply, prolonged transmission occurred only within certain wards, suggesting that this third outbreak, similar to the two previous outbreaks, likely resulted from person-to-person transmission rather than a foodborne source. Because of the patients' long-term residency and lack of mobility outside and within the facility, employees or visitors were more likely to have contributed to the introduction of new infection and dissemination across wards. In fact, the six unaffected wards were administratively separate from the other 16 wards; neither patients nor employees transferred from the 16 affected wards to the six unaffected wards. In this facility, employees are required to use their limited sick leave
days (approximately 12 days/year) when furloughed. This administrative policy and the concurrent shortage of staff might account for the number of infected employees reporting to work while sick. Barriers to conducting adequate hygiene (e.g., lack of handwashing stations), multiple lapses in infection control (e.g., noncompliance with staff wellness policies), and permitting employee mobility between affected and unaffected wards likely contributed to the recurrent and sustained outbreaks.

Facility employees who cleaned up vomitus were at higher risk for illness. This is consistent with previous reports of norovirus transmission through aerosolized vomitus. Gloves were worn by 97% of surveyed employees who cleaned vomitus, but they rarely wore gowns or aprons and masks while cleaning vomitus. Masks have been shown to reduce the risk for norovirus infection among nursing home employees. To reduce the risk for norovirus transmission through aerosolized vomitus, OPHD recommends the following steps: 1) remove vomitus and fecal material carefully to limit aerosolization (e.g., soaking up vomitus or diarrhea with paper towels or other disposable cloths with minimal agitation and removing those in impervious bags), 2) thoroughly clean surfaces and disinfect with freshly made 5,000 ppm hypochlorite solution or other EPA-registered norovirus disinfectants, and 3) wear appropriate personal protective equipment (PPE) (e.g., gloves, masks, and gowns) when cleaning vomitus or feces.

Norovirus is infectious at low doses (as few as 10 viral particles), and long-term or cross-strain immunity is limited. Norovirus is transmitted readily in health-care settings with close contacts between ill and well persons, which makes rapid implementation of effective control measures important. The findings of this report highlight the importance of timely implementation of standard infection control practices and targeted norovirus control measures as recommended by CDC for the use of masks, and by OPHD to prevent and control norovirus outbreaks in large residential treatment facilities. In addition, when inconsistent use of PPE is identified, CDC recommends thorough evaluation of workplace programs, such as a review of workplace policies and practices, training, selection of PPE, and disposal of used PPE. In response to this outbreak, OPHD officials worked with facility administrators to increase staff capacity and emphasize the importance of employees staying home while ill. In addition, patient rooms are now cleaned by housekeeping staff using EPA-registered products.

If you have any questions please feel free to contact Dr. Sandy Snow at 501-661-2169 or fax to 501-661-2300 or e-mail to Sandra.snow@arkansas.gov.