

OREGON PUBLIC HEALTH DIVISION • DEPARTMENT OF HUMAN SERVICES

NOROVIRUS OUTBREAKS IN NURSING HOMES

A long, long time ago, in 1972, a 27-nm particle was found to be the etiologic agent of a 1968 gastroenteritis outbreak at a school in Norwalk, Ohio, and Norwalk virus was born.^{1,2} Acute gastroenteritis of presumably viral origin with nausea, vomiting, diarrhea, abdominal cramps and malaise has been called intestinal grippé, winter vomiting disease, hyperemesis hiemis, and recently, as a result of diagnostic advances, norovirus infection.^{3,4} In Oregon we call it a nuisance, and one exquisitely difficult to control.

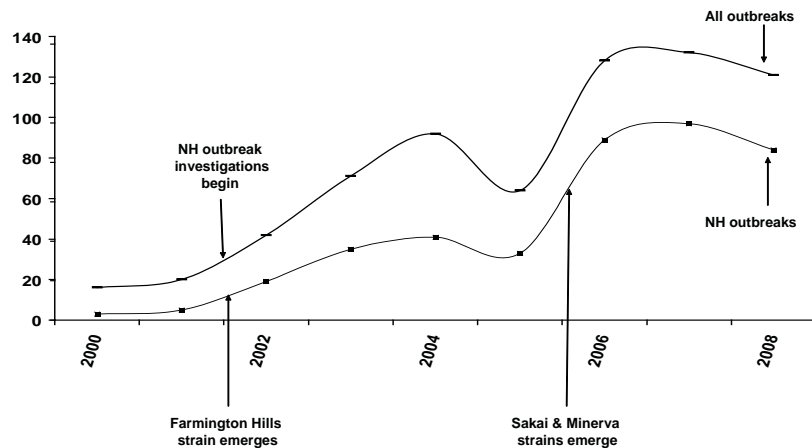
In early 2003, both the popular and the scholarly press reported what appeared to be a dramatic increase in gastroenteritis outbreaks caused by Norwalk-like virus, newly renamed “norovirus” to include related viruses, such as Mexico, Desert Shield and Snow Mountain, in one genus of the family *Caliciviridae*.^{5,6}

Noroviruses are a diverse genus made up of three distinct human genogroups with 26 genotypes. Norovirus genogroup II genotype 4 (GII.4) is the most common strain and plagues health care settings more than other strains. Our 2000–2008 epidemic curve of norovirus outbreaks (Figure) reflects the epidemic cycles that have developed as new strains of GI.4 emerged, starting with the Farmington Hills strain in 2002–03 through the Sakai and Minerva strains in 2006–07.^{5,7}

OREGON OUTBREAKS

From 2003–2006, local health departments in Oregon investigated 165 norovirus outbreaks in residential care facilities, assisted living facilities and facilities providing 24-hour nursing care (henceforth simply called nursing homes). This translates to an annual norovirus outbreak rate of at least 8% of nursing homes and represents only an approximation of the true rate of these outbreaks. Not all nursing home outbreaks are reported, and at

Norovirus outbreaks in Oregon, 2000–08



least 10% lack norovirus confirmation because stool specimens are not collected.

During 2003–06 more than 6,000 cases of noroviral gastroenteritis were logged among residents and staff. Annually, 4% of nursing home residents were afflicted with norovirus, 1.8% of those afflicted were hospitalized, and 0.5% died during the outbreaks. In individual facilities, however, attack rates can be extraordinary, ranging from 6%–78% (median 32%) among residents, and 3%–44% (median 16%) among employees. The outbreaks lasted 3–51 days (median 11), affected 5–154 residents and staff (median 33), and most often occurred from December through March (“winter vomiting disease”). Facilities providing 24-hour nursing care and facilities with ≥90 beds had more than their fair share of outbreaks. The pattern of illness onsets was most consistent with person-to-person transmission; 94% appeared to be predominantly or exclusively spread this way. Employee infection risk is, logically, directly related to cleaning up vomitus and other unpleasant tasks. How norovirus entered the facilities is unknown.

Using a 3,300-case subset of data collected during 2003–05, we constructed a profile of signs (from

both resident and staff cases) and symptoms (just from staff cases for reasons of reliability) demonstrating lots of diarrhea and vomiting in these outbreaks, but not much fever (Table). The presence of constitutional symptoms sets noroviral infection apart from other viral gastroenteritides like rotavirus, enterovirus, and enteric adenovirus. The median duration of noroviral vomiting or diarrhea was 36 hours.

Norovirus signs and symptom profile, Oregon nursing homes and similar settings, 2003–05

	Resident	Staff
Diarrhea	86%	85%
Vomiting	69%	79%
Fever (subjective)	20%	30%
Nausea	—	76%
Cramps	—	61%
Fatigue	—	50%
Headache	—	43%
Myalgia	—	38%

CONTROLLING NOROVIRUS OUTBREAKS

Norovirus is extremely contagious, and outbreaks are maddeningly diffi-



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cult to contain. Briefly, norovirus quits the infected host in stool and vomitus (which can aerosolize) and is swallowed by a susceptible host after being carried to said host on things, such as food and fingers, that people put in their mouths.

During norovirus outbreaks, residents are advised to keep to their rooms while ill (though this is difficult in certain settings), group activities should be cancelled, and admissions should be discontinued until seven days after the onset date of the last case (a considerable period given that the median outbreak duration is 11 days). Anti-emetics may reduce vomiting and the risk of dehydration.

The most important control measure for staff, especially kitchen staff, is absence from work whilst vomiting or having diarrhea, then for 72 hours after symptoms resolve. Using personal protective equipment (gowns, gloves, and possibly masks) when caring for a patient after a vomiting or diarrhea accident, or when cleaning up after such an accident, is recommended. Scrupulous hand washing at such times is a no-brainer.

Preventing norovirus infection in staff cannot be overemphasized. Patient care can be profoundly compromised by inadequate staffing, and staff may be the link in the chain of norovirus transmission from the facility to the community and visa versa. The above, along with other control measures (found on our web site at www.oregon.gov/DHS/ph/acd/outbreak/control.pdf), must be implemented as soon as anything that even looks like a norovirus outbreak occurs (that is, when

≥ 3 residents or employees develop acute-onset vomiting, diarrhea or both within 96 hours of each other).

PHYSICIAN RESPONSIBILITIES

Outbreaks of acute gastroenteritis in nursing homes are reportable immediately to the local health department in which the facility is located.

With respect to individual patients, consider that gastroenteritis may be noroviral in origin when someone has both vomiting and diarrhea with systemic symptoms but no fever. Plus, patients feel really terrible. Viral diagnostic tests are commercially available but of little clinical value.

Treatment is symptomatic; anti-norovirals have yet to be developed. Instruction in preventing norovirus transmission is indicated, especially if the patient or a family member—ill or not—is a food handler. Clinicians can advise patients (or their parents) to remain home from work, school or child care for at least the duration of symptoms, if not longer, and to sanitize bathrooms with bleach-based cleansers.

With your help, to quote the sixteenth President of the United States on this the Inauguration Day of the forty-fourth, “fondly do we hope, fervently do we pray, that this scourge... may speedily pass away.”

REFERENCES

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RSV Surveillance

Respiratory syncytial virus (RSV) is the most common cause of severe lower respiratory infection among infants and children. Premature infants and persons with compromised respiratory, cardiac or immune function are at increased risk for severe disease or death. Infants and children at risk for severe RSV disease can be protected with monthly doses of a humanized murine anti-RSV monoclonal antibody during the RSV season.

The Oregon Public Health Division began surveillance for RSV in October, 2008. Sixteen labs in Oregon voluntarily report for this active surveillance system. RSV season officially began the week of December 7–13, 2008, after two consecutive weeks where the mean percentage of specimens tested for RSV was greater than 10%. RSV specimen positivity in Oregon is currently greater than 30%.

Check out the latest in surveillance: www.oregon.gov/DHS/ph/acd/diseases/rsv/rsv_page.shtml.