Norovirus and *Clostridium Difficile* Outbreak Associated with Fredonia Regional Hospital — Wilson County, July 2016

Kansas Department of Health and Environment

Background

On Wednesday, July 27, 2016, at 9:00 a.m. Fredonia Regional Hospital (FRH) reported an increase in gastrointestinal illnesses among patients and staff members to the Kansas Department of Health and Environment's (KDHE) Epidemiology Hotline. The Wilson County Health Department was notified and an outbreak investigation was started at 9:15 a.m. on Wednesday, July 27, 2016 to determine the source of illness and implement appropriate control measures. A line list template was sent to the FRH infection preventionist for completion.

FRH consists of a critical access facility (medical floor) and a geriatric-psychiatric unit. These units are separate entities and do not share medical or administrative staff members. The only commonalities between the two units are the cafeteria, smoking patio, and cleaning staff.

Key Investigation Findings

- Eighteen individuals (nine staff members and nine patients) reported gastrointestinal illness. Of those, all 18 met the illness case definition. A case was defined as vomiting or diarrhea in a patient or staff member of FRH between June 16, 2016 and July 29, 2016.
- Of the nine case-patients identified, six were patients on the medical floor and three were seeking care at the geriatric-psychiatric unit. Seven out of 9 affected staff worked on the medical floor while the other two had specialized duties.
- Onset of illness among cases ranged from June 16 to July 29, 2016 (Figure 1).
- Sex and age were provided for all 18 cases. There were 14 females and 4 males, and ages ranged from 28 – 93 years (median = 57.5 years).
- Stool specimens were obtained from all 9 patient cases and one staff member. Five case-patients cases tested positive for norovirus and four tested positive for norovirus and *Clostridium difficile* (*C. diff*). One staff case tested positive for norovirus (Table 1).
- The first case-patient identified on the medical floor tested positive for *C. diff* on June 18, 2016 and continued to have positive *C. diff* results through July 14, 2016 (Table 2). This case also tested positive for norovirus on July 14, 2016.
- The first case-patient identified on the geriatric-psychiatric unit tested positive for *C. diff* on June 24, 2016. This case also tested positive for norovirus on July 7, 2016.

Table 1. Number of Positive Laboratory Results by Type of Case (n=18)

	Norovirus	Norovirus and *C. diff*	Unknown
Medical Floor Patient	3	3	0
Geriatric Psychiatric Patient	2	1	0
Staff	1	0	8

Figure 1. Number of Norovirus Cases Among Patients and Staff by Onset Date or Specimen Collection Date (n=18)

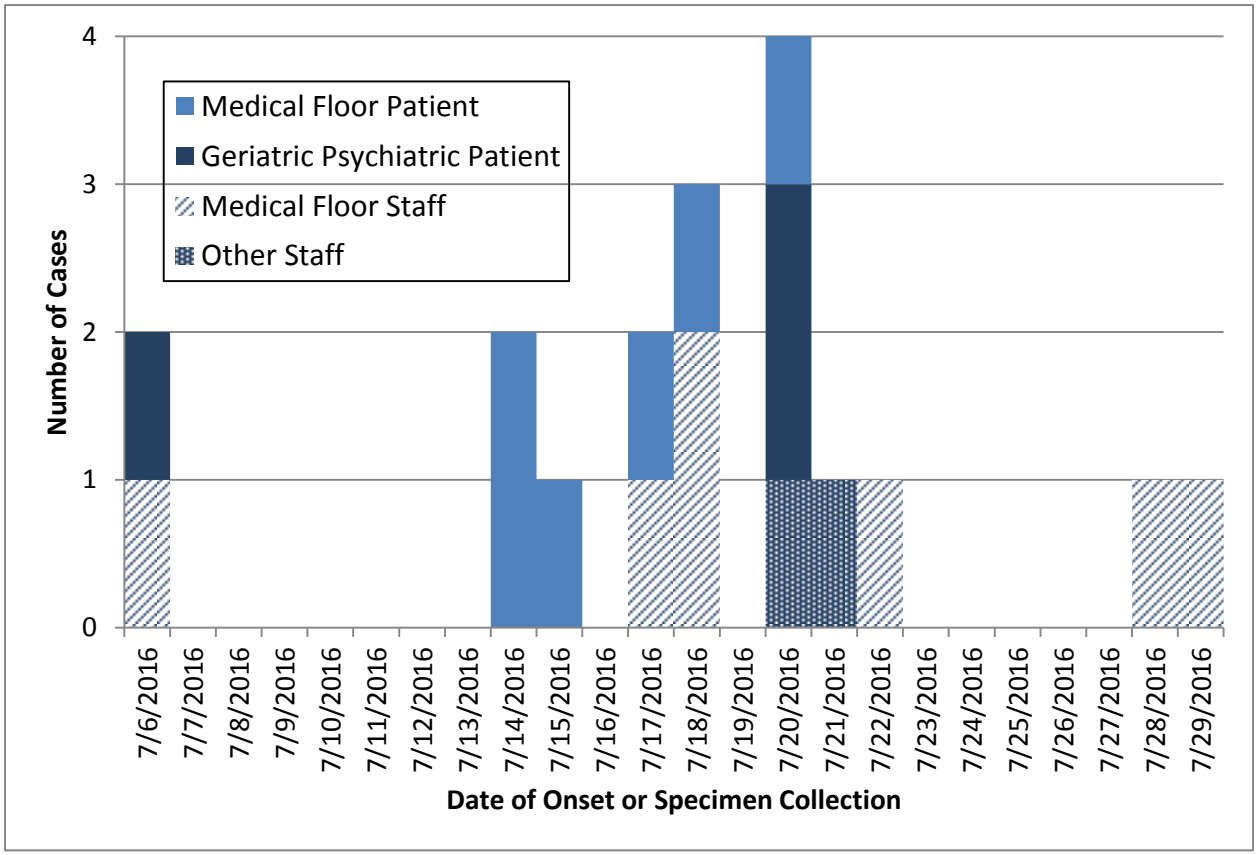

Table 2. Laboratory Test Dates of Positive Clostridium Difficile Results for Patients with *C. diff* (n=4)

	Lab Test #1	Lab Test #2	Lab Test #3
Patient 1 (Medical)	6/18/16	6/24/16	7/14/16
Patient 2 (Psychiatric)	6/24/16	7/6/16	
Patient 3 (Medical)	7/18/16		
Patient 4 (Medical)	7/20/16	7/29/16	

Conclusion and Recommendations

Eighteen individuals met the case definition for this investigation. Norovirus and *C. diff* were confirmed as the causative agents of this outbreak. The index case who was identified on June 16, 2016 tested positive for *C. diff* on June 16, June 24, and July 14, 2016. Additionally, this case-patient was positive for norovirus on July 14, 2016. Since there was limited shared staff, it was undetermined how this outbreak spread from the medical floor to the geriatric-psychiatric unit. The long infectious period of this case may have contributed to the spread of *C. diff* in this facility. In addition, transmission was likely increased due to this elderly population returning to long-term care facilities between multiple admissions to the facility.

Five case-patients tested positive for norovirus and four case-patients tested positive for both norovirus and *C. diff*. Eight of the nine ill staff members were not tested and one was confirmed to have norovirus.

C. diff is a spore-forming, gram-positive anaerobic bacillus. It accounts for 15-25% of all episodes of antibiotic-associated diarrhea.[1] *C. diff* is shed in feces and the spores are transferred to patients mainly via the hand of healthcare personnel who have touched a contaminated surface or item. Over the past several years many states have reported increased rates of *C. diff* infection, noting more severe disease.[1] Patients most at risk remain the elderly, especially those using antibiotics.[1]

Norovirus is a highly contagious pathogen and the most common cause of gastroenteritis in the United States with an estimated 19-21 million illnesses each year.[2] Transmission is commonly via fecal-oral route, through direct contact with an ill person or fecally-contaminated food, water or surfaces. Norovirus incubation is typically 12-48 hours and with symptoms lasting one to three days.[3] Clinical presentation of norovirus includes nausea, vomiting and diarrhea. Infected persons can transmit the virus through feces or vomit from prior to the onset of symptoms up to two weeks after recovery.[4]

Recommendations were focused toward the cleaning staff because they were one of the only commonalities between the units. These included increasing cleaning in the facility and keeping personal protective equipment (PPE) on the cleaning carts. Signs were posted on rooms with patients experiencing vomiting and/or diarrhea that read “Stop! Contact Precautions”. PPE was available at the entrance of these rooms for all staff and visitors. Contact precautions were recommended for 48 hours after symptoms resolved. Hand washing was stressed to all patients and staff members; ill staff members were excluded until symptom free for 24 hours.

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[1] "Frequently Asked Questions about Clostridium Difficile for Healthcare Providers." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 2012. Web. 17 Nov. 2016.
[2] Norovirus. (2013, July 26). Retrieved November 17, 2016, from http://www.cdc.gov/norovirus/about/overview.htm
[3] FoodSafety.gov. (n.d.). Norovirus (Norwalk virus). Retrieved November 17, 2016, from http://www.foodsafety.gov/poisoning/causes/bacteriaviruses/norovirus/
[4] South Australia Health. (2015, November 30). Norovirus infection – including symptoms, treatment and prevention. Retreived November 17, 2016, from Norovirus infection – including symptoms, treatment and prevention