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Norovirus Outbreaks in a Pediatric Hospital: Lessons Learned

Idaresit Umoh, MPH, CIC; Bethany Phillips, MPH, CIC, MLS; Michael Sebert, MD; Zachary M. Most, MD

BACKGROUND

Norovirus outbreaks in healthcare facilities are notoriously difficult to contain, and timely notification and isolation of suspected cases are key for preventing spread.

In February 2021 (Outbreak 1), Infection Prevention and Control (IP&C) was notified of a cluster of patients with gastrointestinal (GI) illness, which evolved into an extensive norovirus outbreak involving patients and employees. To better manage future outbreaks, a norovirus guideline was created. The outcomes of Outbreak 1 were reviewed in comparison to subsequent outbreaks in November 2021 (Outbreak 2) and March 2023 (Outbreak 3), to evaluate the impact of the guideline.

METHODS

Cases were identified by direct notification from unit staff, and active surveillance conducted by IP&C.

Confirmed healthcare-acquired infections (HAIs) were defined as patients with acute GI symptoms >48 hours after admission, and possible HAIs were patients with symptom onset >12 hours after admission and ≤48 hours after admission OR symptom onset ≤ 48 hours after discharge. Confirmatory GI PCR panels were collected for symptomatic patients.

Intervention measures applied (listed in the guideline) were determined by outbreak category.

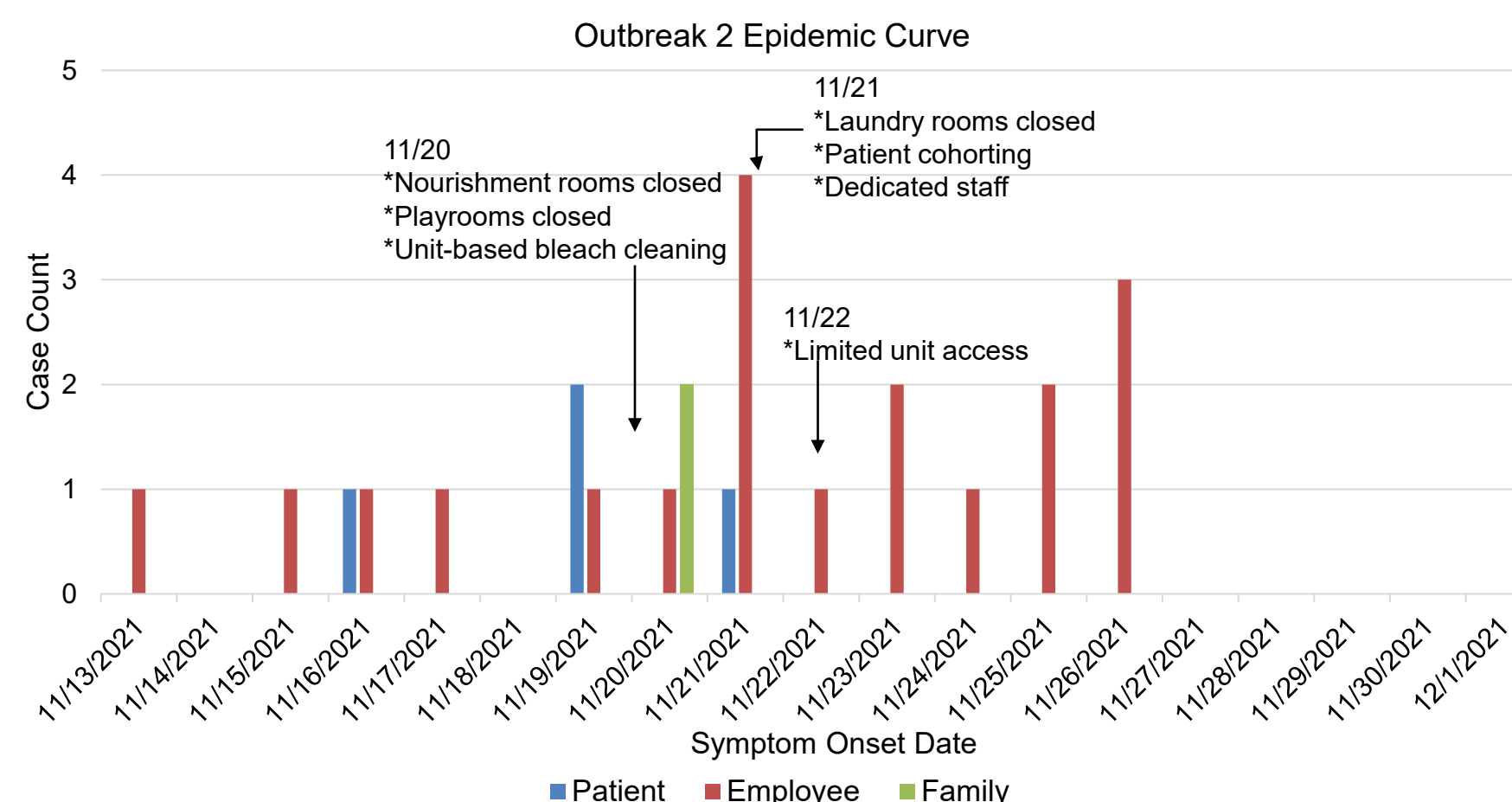
Categories of Norovirus Outbreak(s)			
	# of Unit(s)/area(s) affected	Case type	
		Patient	Staff/Visitor
Category 1	One ¹	X	
Category 2	One	X	X
Category 3	Multiple	X	X

1. IP&C will determine whether overlapping small outbreaks on two separate units without involvement of staff or visitors should be managed as independent category 1 outbreaks or a larger category 3 outbreak based on the epidemiology of the cases.

RESULTS

	PRE-GUIDELINE	POST-GUIDELINE	
	OUTBREAK 1	OUTBREAK 2	OUTBREAK 3
Symptomatic Patient Status	20	4	20
Confirmed HAI, N (%)	19 (95%)	4 (100%)	19 (95%)
Possible HAI, N (%)	1 (5%)	-	1 (5%)
Age, Mean (Range), years	4.5 (2-20)	2.5 (0-5)	2.0 (0-14)
Female, N (%)	10 (50%)	2 (50%)	15 (75%)
Symptomatic Family/Visitors	4	2	4
Number of units affected	7	1	8
Outbreak Duration (days)	32	15	47
Days from symptom onset to isolation of index case	5	1	1
Days from symptom onset to IP&C notification of index case	5	4	8
Work restricted employees*	157	19	58

*Work restrictions were managed by Occupation Health



ISOLATE

- Suspected and confirmed norovirus patients should be placed on Contact Enteric (CE) precautions
- Use soap and water for hand hygiene. Norovirus is not killed by alcohol hand gel.

CLEAN

- Cleaning and disinfection with bleach should be done by EVS and unit staff.
- Cleaning measures are guided by outbreak categories.

COHORT

- Single patient rooms should be maintained, but affected units can cohort patients according to status (i.e., CE vs. non-CE patients).
- Staff may also be designated to care for CE patients only.

WORK RESTRICTIONS

- Staff with GI symptoms should be restricted from work.
- Occupational Health should be notified and will determine clearance.

CONCLUSION

Successful management of a norovirus outbreak requires quick and efficient collaboration between multiple teams and departments. The experience of Outbreak 1 in combination with the novel norovirus outbreak guideline was associated with a much smaller/shorter Outbreak 2, and fewer staff cases in Outbreak 3. This may have been due index patients being isolated more quickly (five days compared to one day).

The guideline standardized the management of norovirus outbreaks, however there are limitations. Variations such as affected units and patient population makes all outbreaks unique and challenging to compare. In addition, results from only 3 outbreaks limit our ability to make a stronger assessment of the guideline's impact. Application of the guideline to future outbreaks and analyzing outcomes will provide more supporting data.

FUTURE STEPS

- ❖ Development of EHR Norovirus dashboard to monitor incidence levels
- ❖ GI Panel order requires notifying IP&C when a hospitalized patient is suspected of norovirus

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Norovirus Outbreak Guideline



Norovirus Guidance for Staff

We would like to acknowledge EVS, Occupational Health, and affected unit staff and leaders for their collaboration and efforts towards managing each outbreak.