Norovirus outbreaks: containment or closure?

In this article...

- A new approach to norovirus outbreak management
- How the research was conducted
- Key findings and recommendations

A study examined whether containing affected patients in single rooms and bays was more efficient at managing an outbreak of norovirus than closing entire wards.

Keywords:
Norovirus/Outbreak/
Infection prevention and control

Noroviruses are an important cause of viral gastroenteritis and their highly transmissible nature makes controlling their spread within healthcare environments particularly challenging (Glass et al, 2009; Estes et al, 2006).

The virus is widely disseminated following vomiting or explosive diarrhoea, potentially exposing other patients and staff in the same clinical area and extensive contamination of the environment (Chadwick and McCann, 2003; Caul, 1994). Outbreaks occur more frequently in the winter, adding to operational and financial burdens at a time when hospitals are already under significant pressure (Harris et al, 2010; Lopman et al, 2004; 2003).

National guidelines for managing hospital outbreaks of norovirus traditionally recommend containment through the closure of wards with cleaning before reopening starting 48–72 hours after the last symptomatic case. Norovirus Working Party, 2012; Chadwick et al, 2000). While this traditional approach may be effective, it can cause considerable operational disruption during extensive or prolonged outbreaks.

5 key points

1. Norovirus outbreaks can cause significant disruption to hospitals.
2. Traditional outbreak controls include closing wards, with cleaning before reopening 48-72 hours after the last symptomatic case.
3. Many outbreaks can be safely managed by grouping affected patients in single rooms and bays, rather than closing wards.
4. Single rooms and bays can also contain remaining affected patients on wards that have been closed, to allow for cleaning and reopening.
5. This strategy, combined with infection control, can reduce the disruption of outbreaks.

Norovirus is widely disseminated following vomiting or explosive diarrhoea.
Adopting a step-wise approach to closing and opening bays on a ward at the beginning and end of an outbreak might provide appropriate containment of symptomatic patients while allowing unaffected areas of a ward to function normally. A recent paper suggested that it is not always necessary to close an entire ward at the start of an outbreak, and that effective control may be achieved by closure of bays (Iltingworth et al, 2011).

In 2007, we decided to adopt a new strategy to limit the operational impact of norovirus outbreaks. We attempted to contain outbreaks early by grouping symptomatic patients in single rooms or bays without closing the entire ward.

Method
This intervention study was performed at Derriford Hospital, a 1,200-bed teaching hospital in south-west England with 42 wards containing between 14 and 34 beds. Each ward has between three and seven single rooms, with the remaining beds configured in five- or six-bed bays, at least two of which are fitted with doors.

We defined hospital outbreaks of norovirus as two or more cases of diarrhoea and/or vomiting affecting staff and/or patients in the same clinical area within 24 hours and where at least one stool sample tested positive for norovirus. Standard data collection was performed prospectively for each outbreak between 2005 and 2011 and included the number of symptomatic patients and staff, duration of the outbreak and number of bed-days closed. The last was defined as the total number of beds closed, rather than those that were just unoccupied.

Before June 2007, outbreak control measures included closing wards, with reopening after the last affected patient had been asymptomatic for 72 hours and terminal cleaning had been undertaken. After June 2007, once the number of cases on a ward exceeded available single rooms, bays with symptomatic patients were closed. If patients in more than two bays were affected, the entire ward was closed. As beds on closed wards became available through discharges, affected patients were moved into single rooms or empty bays with doors on the same ward to allow earlier cleaning and opening of other areas on the ward. Empty bays were then cleaned and either reopened or used so other bays could be cleaned when this was required.

Results
During the study period, there were 11-44 outbreaks per year, with most occurring in the winter months. Before June 2007, 90% of outbreaks were managed by closing an entire ward; after June 2007 when practice changed, this dropped to 54%.

As would be anticipated, beds were closed for significantly shorter periods when only bays rather than entire wards were closed. When considering all outbreaks, the change in management strategy to a step-wise opening and closing of wards resulted in a significant reduction in both the duration of closure and number of bed-days closed.

The number of relapses of infection did not increase significantly after the change in strategy.

Discussion
Controlling the nosocomial spread of norovirus has traditionally relied on closing wards, with cleaning and reopening 48-72 hours after the last symptomatic case (Norovirus Working Party, 2012; Chadwick et al, 2000).

The findings of this study provide further evidence that many norovirus outbreaks can be controlled by containment in bays rather than by entire ward closure, particularly when this is combined with adequate infection control support (Iltingworth et al, 2011). This approach is most effective when implemented promptly before extensive transmission has occurred within a clinical area.

The study also showed that, if an entire ward has been closed, single rooms and bays with doors can be used at the end of an outbreak to segregate symptomatic or recovering patients while other areas of the ward are cleaned before they are reopened. This allows earlier terminal cleaning and enables individual bays to open, while other areas of a ward remain closed to admissions and discharges. Adopting this strategy reduced the time entire wards were closed as well as the number of bed-days closed.

Conclusion
This study provides further evidence that many hospital outbreaks of norovirus can be safely managed by grouping affected patients in single rooms and bays rather than closing entire wards.

Using single rooms and bays to contain affected patients remaining on wards that have been closed allows early terminal cleaning and other areas of the ward to be opened for normal operational use. This strategy, combined with strict infection control procedures, can reduce the duration of and operational disruption caused by hospital norovirus outbreaks. Replication of these measures in other hospitals would be expected to lead to similar improvements.

References

“This Nurses must have the courage to do the right thing”
Caroline Shuldham p24