60% reduction in *Clostridium difficile* infection (CDI) associated with the introduction of hydrogen peroxide vapor (HPV) automated room disinfection.

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### Introduction:
- *Clostridium difficile* is shed into the hospital environment, and contaminated surfaces are considered to be important in the transmission of *C. difficile* spores and the acquisition of *C. difficile* infection (CDI).\(^1\)\(^-\)\(^2\)
- A number of studies have shown that hydrogen peroxide vapor (HPV), an automated room disinfection system, may prevent the transmission of CDI in hospitals.\(^3\)\(^-\)\(^4\)
- We implemented HPV for the terminal disinfection of CDI patient’s rooms in 2012 and performed a retrospective study to evaluate whether HPV was associated with a reduction in CDI.

### Methods:
- Real-time polymerase chain reaction (PCR) was used for testing for *Clostridium difficile* toxin.
- All cases of CDI are reported to the infection control department, who attribute them as healthcare-associated or non-healthcare-associated using CDC/NHSN criteria for national reporting purposes.
- HPV was implemented in early 2012 for the terminal disinfection of rooms vacated by patients with CDI.
- Rooms vacated by patients with CDI were disinfected using HPV immediately, or held for HPV disinfection prior to the admission of the next patient when HPV equipment was not available immediately.
- We evaluated the rate of healthcare-associated CDI in the 2010 and 2011 (pre HPV) vs. the 2012 and 2013 (during HPV usage).
- A database recording the details of HPV usage in the hospital was collected prospectively.

### Results:
- The rate of CDI fell from 1.0 to 0.4 cases per 1000 patient days in the 24 months before HPV was implemented vs. the first 24 months of HPV usage (see Figure; 258 vs. 123 cases, 60% reduction, \(p<0.001\) using Fisher’s exact test).
- A total of 3060 rooms were disinfected using HPV in 2012 and 2013; the average HPV cycle time was 1 hr 48 minutes.

### Discussion:
- Our study suggests that improved disinfection at the time of patient discharge reduces transmission of CDI in hospitals.
- Our findings are in line with other studies, which have reported a similar magnitude of reduction in CDI associated with the implementation of HPV (30\%-50%).\(^3\)\(^-\)\(^4\)
- Our study was before-after in design, so we cannot rule out the possibility that other factors explain, at least in part, the difference in rate of CDI that we observed.
- No formal infection control initiatives were implemented during this period.
- HPV should be considered for the terminal disinfection of rooms vacated by patients with CDI.

### References: