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The Use of Portable Pulsed Xenon Ultraviolet Light (PPX-UV) after Terminal Cleaning Associated with a Significant Decline in Hospital-Associated *Clostridium difficile* Infection (HA-CDI) in a Community Hospital

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Background:

There is mounting evidence that contamination of patient rooms from previous occupants is associated with HA-CDI. Recent studies have demonstrated the effectiveness of portable UV light on deactivating C difficile endospores. We sought to determine if using PPX-UV after routine terminal cleaning would decrease HA-CDI in our hospitalized population.

Methods:

Programs in place at baseline (prior and during implementation of PPX-UV):

- Chlorine-based agents for terminal cleaning C difficile rooms
- Contact precautions for the duration of hospital stay for patients with C difficile
- HCW use of soap and water for hand hygiene in C difficile rooms
- Enhanced education of environmental service (ES) workers
- Implementation of competency evaluations for ES workers
- Efficient communication system for notification of discharges to ES

In 2011 (PPX-UV Intervention year):

- 2 PPX-UV devices added to usual terminal cleaning procedures
- The PPX-UV device contains a flashlamp operating at 1.5 Hz emitting broad spectrum UV light. The flashlamp retracts into a heavy-duty case for wheeled transport by one person
- PPX-UV used for three, 7-minute exposures, (once in bathroom, twice in main room)
- Goal of using PPX-UV in every discharge room, but actual use 56%
- Also used in the operating suite, emergency department and other areas as available
- Surveillance for HA-CDI per routine
- No other new infection prevention interventions instituted during this time

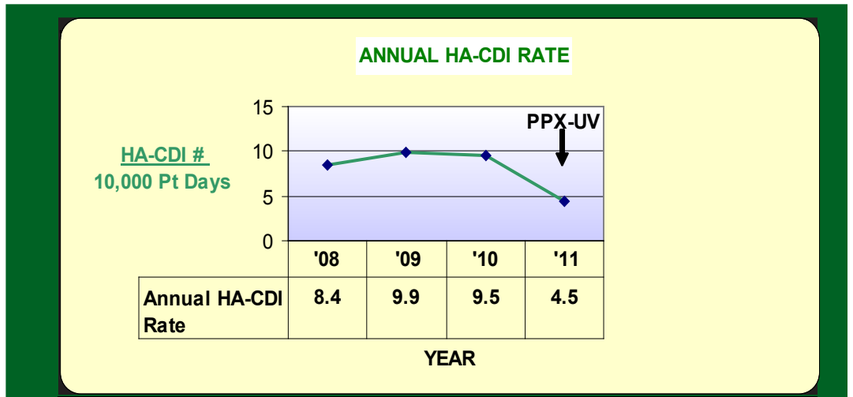
Results:

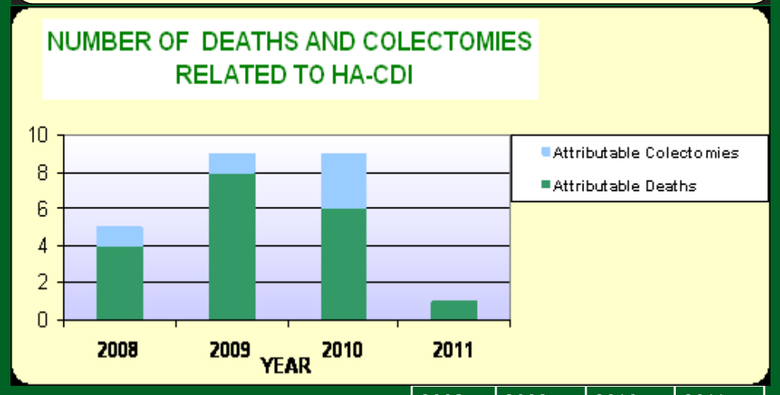
- HA-CDI rates per 10,000 patient days (pd) were reduced from 9.46/ 10,000 pd for 2010 to 4.45/10,000 pd in 2011. (53% decline, p=0.010).
- Of the 15 patients who were diagnosed with HA-CDI in 2011, 11 (73%) were placed in rooms that had not been treated with the PPX-UV device prior to occupation.
- The number of colectomies and deaths attributable to HA-CDI dropped from 6 colectomies and 3 deaths in 2010 to 0 colectomies and 1 death in 2011.
- Overall room turn-over time extended by about 15 minutes
- PPX-UV technology was easily incorporated into current ES staffing and workflow

Conclusion:

While this observational study does not take the place of a controlled trial, it does reflect the successful implementation of this new technology in a real-world setting. The dramatic apparent reduction in infection, death, and colectomy due to HA-CDI, when PPX-UV was added to standard prevention interventions, makes this technique well worth investigating further.

Disclaimer: There is no financial relationship between Cooley Dickinson hospital and Xenex, Inc. other than the rental of the devices.





	2008	2009	2010	2011
Number HA-CDI Patients	32	36	33	15
Number HA-CDI attributable deaths	4	8	6	1
Number HA-CDI attributable colectomies	1	1	3	0
Rate HA-CDI per 10,000 pt. days	8.36	9.85	9.46	4.45**
Rate of death for HA-CDI patients (# colectomies/total HA-CDI)	0.13	0.22	0.18	0.067
Rate of colectomy for HA-CDI patients (# colectomies/total HA-CDI)	0.03	0.03	0.09	0.0
% of discharge rooms treated with PPX-UV	0	0	0	56
Number (%) of HA-CDI patients whose rooms were not treated with PPX-UV prior to admission	32 (100)	36 (100)	33 (100)	11 (73)
Hospital Patient Days	38263	36540	34870	33687
Hospital Average Age	57.9	58.4	57.5	58.3
Hospital Acuity index (DRG case weight CMS)	0.0953	1.1265	1.1315	1.1386

** Comparison of 2010 to 2011: 53% reduction, p=0.010; Comparison of the average rate of years 2008-2010 to 2011: 52% reduction, p=0.002.

About Cooley Dickinson

Cooley Dickinson, a full-service community hospital, is ranked in the top 5 percent of all U.S. hospitals in patient safety by HealthGrades®, the country's leading independent health care ratings organization. It is the only hospital in the Springfield, Mass. area to achieve the HealthGrades Patient Safety Excellence Award™ for four consecutive years, 2009-2012. Learn more at www.cooley-dickinson.org. Visit http://tinyurl.com/crptw35 to watch the CNN Money Report about Cooley Dickinson and the Xenex© light machine.

At left, a staff member shows one of the hospital's Xenex© UV light machines. Below, representatives from Cooley Dickinson's Environmental Services and Infection Prevention teams.

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