



Evidenced-based Success for HAI Reduction using UV Disinfection

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Speakers - Disclosures



Tru-D SmartUVC

Presenter:

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Director Clinical Affairs



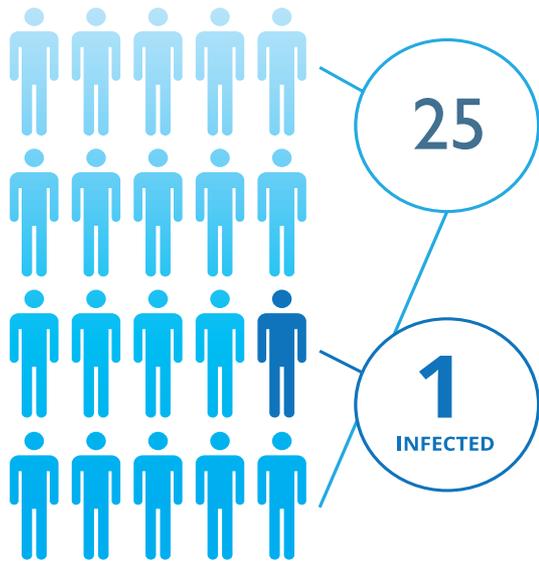
John H.- C. *diff* Survivor in California

“If only they’d taken precautions to ensure the cleanliness of a room where they perform something as basic as a general physical, I’m confident this would have been an unlikely occurrence.”

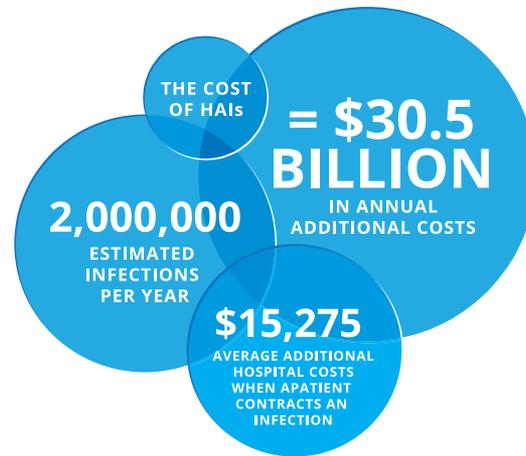
John H.- C. *diff* Survivor in California

“This experience translated into several weeks out of the office, significant out-of-pocket expenses and prolonged malaise. All of which were theoretically preventable.”

Statistics



- 2 million infected annually
 - 1 in 25 admissions contracts HAI
 - Increased mortality
 - Increased length of stay



The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention; R. Douglas Scott II; March, 2009.
http://www.cdc.gov/ncidod/dhqp/pdf/Scott_CostPaper.pdf

Action Plan to Prevent Healthcare Associated Infections; Department of Health and Human Services; June, 2009.
http://www.hhs.gov/ash/initiatives/hai/actionplan/hhs_hai_action_plan_final_06222009.pdf

Enhanced terminal room disinfection and acquisition and infection caused by multidrug-resistant organisms and *Clostridium difficile* (the Benefits of Enhanced Terminal Room Disinfection study): a cluster-randomised, multicentre, crossover study

Deverick J Anderson, Luke F Chen, David J Weber, Rebekah W Moehring, Sarah S Lewis, Patricia F Triplett, Michael Blocker, Paul Becherer, J Conrad Schwab, Lauren P Kneson, Yulya Lakhrygina, William A Rutala, Hajime Kanamori, Maria F Gergen, Daniel J Sexton; for the CDC Prevention Epicenters Program



INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY MAY 2013, VOL. 34, NO. 5

ORIGINAL ARTICLE

Decontamination of Targeted Pathogens from Patient Rooms Using an Automated Ultraviolet-C-Emitting Device

Deverick J. Anderson, MD, MPH;^{1,2} Maria F. Gergen, MT (ASCP);³ Emily Smathers, MPH;² Daniel J. Sexton, MD;^{1,2} Luke F. Chen, MBBS, MPH;^{1,2} David J. Weber, MD, MPH;^{3,4} William A. Rutala, PhD, MPH;^{5,6} CDC Prevention Epicenters Program



Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevierhealth.com/journals/jhin



Short report

First UK evaluation of an automated ultraviolet-C room decontamination device (Tru-D™)

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Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org



Major articles

Postdischarge decontamination of MRSA, VRE, and *Clostridium difficile* isolation rooms using 2 commercially available automated ultraviolet-C-emitting devices

Titus Wong MD, MHSc, FRCPC^{a,b,1}, Tracey Woznow BSc, BEd(Sec)², Mike Petrie^c, Elena Murzello BScN, MBA^d, Allison Muniak MASc^d, Amin Kadora MBA^e, Elizabeth Bryce MD, FRCPC^{a,b,*,1}

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^c Business Initiatives and Support Services, Lower Mainland Health Authorities, Vancouver, BC, Canada

^d Quality and Patient Safety, Vancouver Coastal Health, Vancouver, BC, Canada

^e School of Business, Capilano University, North Vancouver, BC, Canada

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY AUGUST 2011, VOL. 32, NO. 8

ORIGINAL ARTICLE

Terminal Decontamination of Patient Rooms Using an Automated Mobile UV Light Unit

John M. Boyce, MD;^{1,2} Nancy L. Havill, MT;³ Brent A. Moore, PhD³

Nerandzic et al. *BMC Infectious Diseases* 2010, 10:197
<http://www.biomedcentral.com/1471-2334/10/197>



RESEARCH ARTICLE

Open Access

Evaluation of an automated ultraviolet radiation device for decontamination of *Clostridium difficile* and other healthcare-associated pathogens in hospital rooms

Michelle M Nerandzic¹, Jennifer L Cadnum¹, Michael J Pultz² and Curtis J Donskey^{1,2}

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY OCTOBER 2010, VOL. 31, NO. 10

ORIGINAL ARTICLE

Room Decontamination with UV Radiation

William A. Rutala, PhD, MPH; Maria F. Gergen, MT (ASCP); David J. Weber, MD, MPH

UV Efficacy

UV-C line of sight

Organism	Inoculum	Total			Direct		Indirect		P
		No. of samples	Decontamination, log ₁₀ reduction, mean (95% CI)	No. of samples	Decontamination, log ₁₀ reduction, mean (95% CI)	No. of samples	Decontamination, log ₁₀ reduction, mean (95% CI)		
MRSA	4.88 log ₁₀	50	3.94 (2.54–5.34)	10	4.31 (3.13–5.50)	40	3.85 (2.44–5.25)	.06	
VRE	4.40 log ₁₀	47	3.46 (2.16–4.81)	15	3.90 (2.99–4.81)	32	3.25 (1.97–4.62)	.003	
MDR <i>A. baumannii</i>	4.64 log ₁₀	47	3.88 (2.59–5.16)	10	4.21 (3.27–5.15)	37	3.79 (2.47–5.10)	.07	
<i>C. difficile</i> spores	4.12 log ₁₀	45	2.79 (1.90–4.37)	10	4.04 (3.71–4.37)	35	2.43 (1.46–3.40)	<.001	

NOTE. Patient rooms had a mean area of 12.1 m² including bathroom. CI, confidence interval.

C. diff Kill Rates:

Direct exposure = 4.04 log₁₀ reduction
 Indirect exposure = 2.43 log₁₀ reduction
 Total room average kill rate = 2.79 log₁₀ reduction

Real World Evidence

University of Wisconsin Health Madison, WI

Prior to implementing Tru-D in Oct 2016, UW implemented a comprehensive CDI prevention bundle, yet rates held at ~10/10,000 patient days

Utilization

91.6% of all CDI discharges/transfers for 9 months

Pre UV: 9.7/10,000 patient days

Post UV: **4.7/10,000 patient days (p=0.000)**

Real World Evidence

Chesapeake Regional Healthcare: A BETR-D Study Participant Hospital Chesapeake, VA

Chesapeake Regional purchased four Tru-Ds after the BETR-D study was complete.

It experienced a significant decrease in both infection and colonization rates with all multidrug-resistant organisms (MDROs) and about **a 12% decrease in *C. diff* infections during the arms of the study that included Tru-D and bleach.**

Real World Evidence

Yavapai Regional Medical Center Prescott, AZ

For approximately 38 days, the focus was on all discharges in one unit that had experienced some ongoing transmission of *C. diff*.

From December 8, 2016 when the study concluded, until April of 2017* **there were zero reported hospital-acquired *C. diff* infections in the hospital wing used in the trial.**

*Last reported data from Yavapai RMC

How do we integrate evidence into practice?

- What should it look like?

Evidence-based Practice

What should it look like?

- Standard cleaning tasks (CDC, AORN)
- Hand hygiene (WHO, CDC, AORN)
- UVC as adjunct to terminal cleaning (AORN)
 - CDC-funded randomized clinical trial, *The Benefits of Enhanced Terminal Room-Disinfection (BETR-D) study*, 2017
 - Chemicals + UVC = 30% reduction of risk

The Benefits of Enhanced Terminal Room (BETR) Disinfection Study: A Cluster Randomized, Multicenter Crossover Study with 2x2 Factorial Design to Evaluate the Impact of Enhanced Terminal Room Disinfection on Acquisition and Infection Caused by Multidrug-Resistant Organisms (MDRO), Deverick Anderson, et al, 2015

Evidence-based Practice

What should it look like?

- Program model
 - Isolation
 - Perioperative
 - Both
- Prioritized focus
 - Pathogen
 - Room type
- Education
 - Staff
- Communication strategy
 - Key stakeholders
- Training
 - Regulatory ready
 - Certification
 - Validated competency
- Joint reviews
 - Follow up

Justification for adding UVC

ROI: Facility Specific

Data required to develop an ROI:

- Number of HAIs
 - Average cost \$15,275
- Number of SSIs
 - Average cost ~\$25,000
- Annual isolation cases
- Number of perioperative suites
 - Days of week OR suites are operating
- Cost of labor
 - Travel time
 - Productivity

After a Decade of Research, What are the Experts Saying?

- Is UVC an innovation you should invest in?

After a Decade of Research, What are the Experts Saying?

- There is increasing evidence to support the contribution of the environment to disease transmission.
- This supports comprehensive disinfecting regimens to reduce the risk of acquiring a pathogen from the health care environment/equipment
- Interventions such as effective surface disinfection and thoroughness indicators are not enough to achieve consistent and high rates of cleaning/disinfection
- ***“We need to say to our CFOs that we need these technologies, and we need to look at the data. The data shows a reduction in infections and we need to invest.”***

“What’s New: Strategies in Healthcare Environmental Infection Prevention” Webinar, August 9, 2017, Rutala.

**Rutala, William A. Role of the Environmental Surfaces in Disease Transmission: “No Touch” Technologies Reduce HAIs. Presentation at the Association for the Healthcare Environment Exchange. 2016 Sept. 25-28; Pittsburgh, PA.*

Q&A

www.tru-d.com