

## Reader Suggests Additions to Discussion of UV Application

*Re: "UV antimicrobial devices used to combat HAIs in medical facilities: Is there a need to establish voluntary industry efficacy standards for their use" by Troy E. Cowan, IUVA News, 18(4), 4-8 (2016).*

I read your article on the need of establishing efficacy standards for UV Antimicrobial Devices Used to Combat HAIs. Even though I enjoyed it and – with almost 20 years in the UV industry – would very much like to see things happening in this direction, I think you did not mention two very important aspects of UV application against HAIs.

First: It is important to note that with germicidal UV we can only attempt to control the spreading of infections through the environment. However, the transmission routes are numerous (direct person-to-person, autoinfection in immunocompromised patients or from overuse of antibiotics, surgical site infections, infections through central line catheters, etc.), and the environmental route is one of the least important ones.

It is impossible to quantify exactly what percentage of HAIs are transmitted through the hospital environment, but my guess would be between 5 percent and 10 percent, including any of direct infections caused by nonsterile environment. It is important for the UV industry professionals to communicate a clear understanding of this limitation to avoid sounding superficial and uneducated in infection prevention.

When “before” and “after” studies are performed to compare the levels of HAI before and after implementation of germicidal UV the expectations must be set correctly. If the technology is presented as the silver bullet, which will eliminate the need of strict adherence to handwashing protocols and other infection prevention measures, the results will definitely be disappointing. On the other hand, understanding that the environmental route of transmission is responsible for only a small portion of the HAIs offers a clear explanation of why “the health care community has been slow to adopt” UV.

Second: Unlike water disinfection, which is achieved in the controlled environment of an enclosed chamber where the UV light is prevented from harming people, environmental disinfection of hospital rooms is not performed in uniform, let alone controlled, environments. And the risk of exposing

patients or staff to germicidal UV is always there. Because the uncontrolled environments differ greatly from each other, the efficacy of UV application becomes dependent on the training and common sense of the practitioners. The human factor makes establishing efficacy standards very difficult.

I wanted to mention these things because they are important if we want the germicidal UV technology to gain a solid traction in combating infections.

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*Response by Troy E. Cowan, managing member, Vision Based Consulting, LLC P.O. Box 1566; Lexington Park, MD 20653.  
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Many thanks for your email response to the article in *IUVA News*, Winter 2016. Your email included several good questions and points of discussion, which I hope to address below, while promoting dialogue and interest in furthering the application of UV technologies in improving health care delivery, reducing associated costs and saving lives.

The focus of the article was obviously on applying UV technologies to fight hospital acquired infections (HAIs), which as the article noted, result in 99,000 fatalities annually in the US. While your first point is valid that there are many types of HAIs and their infection pathways vary, please consider the following on the importance of the environmental pathway. A recent \$2M, two-year-long, CDC-sponsored study, spanning nine hospitals and covering more than 120,000 patient days, found “a contaminated health-care environment is an important source for acquisition of pathogens...” ([http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(16\)31588-4/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)31588-4/abstract)). One of the study’s specific findings was that admittance to a room previously occupied by a colonized or infected patient resulted in an increased risk of acquiring that pathogen of between 39 percent and 353 percent (<http://www.prnewswire.com/news-releases/>

[uv-disinfection-proven-effective-by-newly-published-duke-health-study-300391647.html](http://uv-disinfection-proven-effective-by-newly-published-duke-health-study-300391647.html)), affirming that the proper cleaning of contaminated room's surfaces is a critical component in HAI prevention.

To your second set of points, this same study compared four different terminal room disinfecting protocols (one of which included use of a UV-C antimicrobial device) and found addition of UV-C into the procedure resulted in the largest decreases (30 percent or more) in the multidrug-resistant organisms studied. While the study didn't address the safety issues you raised, a quick survey of UV antimicrobial devices on the market would show that most, if not all, room-sized devices require the room to be vacant for treatment, and they use motion sensor safety switches to cut off UV irradiation if motion is detected in the treatment area. Lower powered devices, designed for localized treatment of keyboards, remote controls, etc., have similar built-in safety protections tailored to their application, power output and frequencies.

The study also reiterated the need for additional studies and comparisons, stating, "The multitude of commercially available devices makes choosing a specific device difficult. UV devices may vary because of differences in UV wavelength, bulb size, energy output, ability to measure energy delivery, and cost" (ibid). Hence, this and the article's other cited studies would reinforce the primary assertion that the issue is the difficulty and complexity of the selection process, not that there's only a small degree of benefit to be gained. But, again to another one of your points, there is no question that UV is not a silver bullet in and of itself; it is only one component of the health care industry's arsenal. I would propose it is our task to help the health care industry figure out how UV best fits, based on UV industry standards that could be developed and certified.

Please also refer to the summary (on page 26) of our panel discussion on "Fighting HAIs and MDROs with UV-C using Industry, Health Care and Federal Collaboration" presented at IUVA Americas 2017 for additional information and resources.

Again, many thanks for your insightful questions and continuing support of UV technologies and their application to real world problems.

I hope you'll join us in our efforts to spread UV technologies into the health care industry, again, to reduce cost and save lives. ■

## To learn more...

If you would like to read the article mentioned in the Letter to the Editor – "UV Antimicrobial Devices Used to Combat HAIs in Medical Facilities" – visit [iuvanews.com](http://iuvanews.com) and click on the Articles link to view Vol. 18, Issue 4.



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