

Application Note

Surface Disinfection



Healthcare acquired infections (HAIs) are a significant issue for patients, healthcare providers and hospitals. Each year, more than 700,000¹ patients in the U.S. suffer from an infection while hospitalized, and these infections contribute to 75,000 deaths annually. While there are multiple mechanisms of infection that are well understood, prevention and treatment remains difficult because patients have weakened immune systems; some pathogens have become resistant to antibiotics; and disinfection protocols are imperfect in their application.

On any given day, about one in 25 hospital patients has at least one healthcare-associated infection.

Center for Disease Control,
<http://www.cdc.gov/hai/surveillance/>

Surface contamination of counters, chairs, exam tables, etc., in hospitals, nursing facilities and other healthcare environments is regarded as one of the common sources of HAIs. Even with this knowledge and a variety of disinfectant chemicals, surfaces continue to represent an ongoing source of infection transmission. According to Boyce in *Antimicrobial Resistance & Infection Control*, experts agree that careful cleaning and disinfection of environmental surfaces are essential elements of effective infection

¹ <http://www.cdc.gov/hai/surveillance/>

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prevention programs; however, traditional manual cleaning and disinfection practices in hospitals are often suboptimal.²

The efficacy of traditional disinfectants relies on training, adherence to protocols, consistency of application, application materials and even appropriate mixing or dilution of the disinfectant chemicals. Further, many of the chemicals themselves require special handling and disposal regimes in order to prevent contamination and appropriate environmental care.

As a result, healthcare providers and those charged with disinfecting the healthcare environment are seeking new solutions that are more environmentally friendly and more importantly, provide superior efficacy against a broad range of pathogens.

The medical profession was the first to endorse germicidal effect of UV lamps³, and today, its attention is increasingly focused on the benefits of deep UV LEDs that offer new opportunities for disinfection.

Advantages of the mobile, continuous UV-C light devices include their ease of use, [and] minimal need for special training of environmental services personnel...

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UV LED Technology Advantages

- RayVio's UV light is highly effective against a wide range of microbes, including antibiotic and chemical resistant ones that cause hospital acquired infections (HAI).
- UV light does not change the odor or taste of water or air that has been disinfected.
- RayVio's small, compact, low voltage UV LED sources enable end-use locations like faucets and portable applications.
- RayVio's UV LEDs do not contain mercury or other hazardous substances that are found in other UV light sources.
- RayVio's UV LEDs turn on and off instantly.

² Reference: Boyce JM. Modern technologies for improving cleaning and disinfection of environmental surfaces in hospitals. *Antimicrobial Resistance & Infection Control*. 2016;5:10. DOI: 10.1186/s13756-016-0111-x

³ CPM. Acceptance of ultraviolet lamps for disinfection: Present status report of council on physical medicine. *JAMA* 1948;137:1600-3.

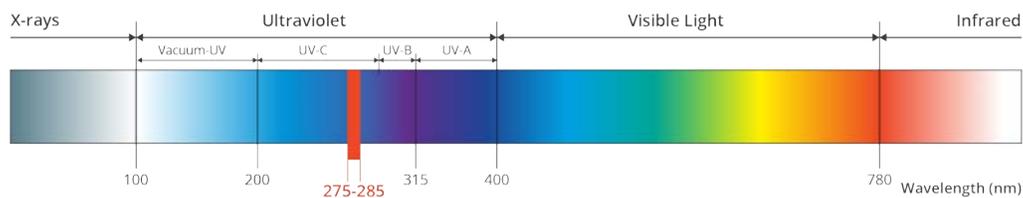
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Deep UV Surface Disinfection

RayVio's Disinfection Grade UV LEDs are the most advanced UV LEDs available and are characterized by their small size, power output and environmental safety – no mercury and no lead. Like other LEDs they are extremely rugged and enable mobile, portable, and battery operated solutions. For disinfection this means that entirely new classes of products are possible that can be quickly implanted to replace or supplant traditional disinfection regimes.



RayVio's Disinfection Grade UV LEDs emit ultraviolet light in the deep UV range typically 275nm to 285nm that can be used to irradiate surfaces, air and water.

The DNA, RNA and proteins of microorganisms absorb the ultraviolet light and in doing so initiate a photochemical reaction that breaks the DNA's chemical bonds thereby killing the bacteria, virus or fungi.

When applied to surfaces either as part of a "whole-room" system or via a portable or hand-held solution, harmful pathogens are eliminated and the risk of HAIs can be substantially reduced. RayVio's UV light offers a level of consistency that is often not possible with hand applied disinfectants and even hard to reach cracks and crevices can be disinfected. Disinfection Grade LEDs offer a safe and efficient approach to surface disinfection that cannot be achieved with conventional solutions.

For more info, visit RayVio.com.