

# UV-C LED Bore Disinfection System

DISINFECT YOUR MR BORE & TABLE IN 3 MINUTES



CLICK HERE OR SCAN CODE TO WATCH VIDEO



COMPATIBLE WITH MR AND ALL OTHER IMAGING MODALITIES



2021 AuntMinnie.com's Minnies Semifinalist winner  
for 2021 Best New Radiology Devices



The UV-C System has received ETL (UL) approval.



Part # 1-07-000351 UV-C LED Bore Disinfection System  
Patent US 11,565,013 B2

# BENEFITS

## UV-C LED Bore Disinfection System

PDC's unique UV-C LED Bore Disinfection System technology was specifically designed to disinfect any MR imaging bore (60-80 cm wide and up to 200 cm long) and table, killing all pathogens with a 99.9% confidence level in under 5 minutes. Reduce risk while improving patient and staff safety with a disinfected table and bore every time, for every patient.

### Benefits include:

- Generates UV-C LED light energy across the Germicidal Spectrum at 260nm to 300nm - proven to kill 99.9% of all pathogens, including coronavirus
- Non-ferrous / MR-safe equipment
- Easy to operate
- Plug and play install / No construction or downtime
- Fast, simple & reliable disinfecting cycle times
- Reduces patient risk and anxiety. Delivers disinfection assurance to patients and caregivers
- Eliminates human error and hard to disinfect crevices
- Specifically designed to disinfect hard-to-clean imaging bores and patient tables
- Can be used on MR, PET/MR, CT, PET, PET/CT, MR-guided Linac, Nuc Med and any other imaging bore (60-80 cm)
- Includes an MR-safe portable cart for ease of use, transport and storage

Current users report the UV-C Disinfection System is being used throughout the imaging department in CT, MR and PET after known COVID patients and as part of their normal cleaning routine. The device is easy to move around, set up and operate.

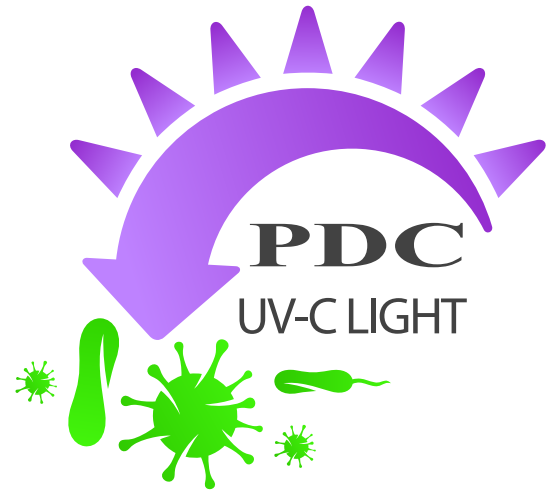


**Transport and Storage Configuration**

PDC's effective, affordable solution kills unwanted pathogens in the MRI bore and all other imaging modalities. We recommend using the UV-C LED Bore Disinfection System at regular intervals to enhance the cleaning process inside the bore where harmful pathogens may be present.

### Additional benefits include:

- Kills 99.9% of unwanted surface and airborne microbes in the bore and table
- Safe, effective and easy for technologists to operate
- Can be used after each scan to improve infection control practices
- Reduces wipes and disinfectant spray in the bore
- Use of LED lights vs. UV-C generating bulbs eliminates the possibility of broken glass
- UV-C disinfection alleviates anxiety and builds patient confidence in the fight against coronavirus



"Our team wants to make sure we are cleaning the imaging room the very best we can to reduce the risk of transmitting Covid. Our patients can take comfort in knowing that we are disinfecting and cleaning every part of the machine. I know patients are nervous to enter a hospital setting with the Covid pandemic going on. This extra level of disinfection helps ease their mind that we are working to protect them."

- Alyssa Byrd, Radiology Manager -  
Nor-Lea Hospital District



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# UV-C EVIDENCE

## Consider the following evidence:

**Validation that Environment Plays a Role:** Environmental contamination has been demonstrated to play a role in HAIs from MRSA, VRE, *C. difficile*, *Pseudomonas aeruginosa*, *Acinetobacter* species and Norovirus.<sup>1,2</sup>

**Disinfection Practice is Sub-Optimal:** Studies have shown that staff are cleaning and disinfecting only 30% to 50% of the surfaces they should be cleaning.<sup>3,4</sup>

**Pathogens Survive for Days to Months on Dry Surfaces:** Studies have found that both gram-positive and gram-negative bacteria can survive for months on dry surfaces; respiratory viruses can survive for days and gastrointestinal viruses for more than a week.<sup>5</sup>

**In Hospitals, Previous Occupancy Increases Risk:** It has been shown that patients are at higher risk of acquiring an HAI when their room was previously occupied by an infected patient.<sup>6</sup>

**UV-C Treatment is Cost-Effective:** Since an HAI can cost a facility up to \$45,000 (CLABSI),<sup>7</sup> the adoption of a UV-C surface treatment technology may be a cost-effective intervention.

- 1 David J. Weber, William A. Rutala, Melissa B. Miller, Kirk Huslage and Emily Sickbert-Bennett, "Role of hospital surfaces in the transmission of emerging healthcare associated pathogens: Norovirus, *Clostridium difficile*, and *Acinetobacter* Species," *Am J Infect Control* 2010; 38:S25 - 33.
- 2 C.J. Donskey, "Does improving surface cleaning and disinfection reduce health care-associated infections?," *Am J Infect Control* 41 (2013) S12-S19.
- 3 P.C. Carling, M.F. Parry, S.M. Von Beheren, "Identifying Opportunities to Enhance Environmental Cleaning in 23 Acute Care Hospitals," *Infect Control Hosp Epidemiol*, Vol. 29, No. 1 (January 2008), pp. 1- 7.
- 4 P.C. Carling, Michael M. Parry, Mark E. Rupp, John L. Po, Brian Dick, Sandra Von Beheren, "Improving Cleaning of the Environment Surrounding Patients in 36 Acute Care Hospitals," *Infect Control Hosp Epidemiol*, Vol. 29, No. 11 (November 2008), pp. 1035 -1041.
- 5 Axel Kramer, Ingeborg Schwebke, Gunter Kampf, "How long do nosocomial pathogens persist on inanimate surfaces? A systematic review," *BMC Infectious Diseases* 2006, 6:130.
- 6 Datta R, Platt R, Yokoe D.S., Huang S.S., "Environmental Cleaning intervention and Risk of Acquiring Multidrug-Resistant Organisms from Prior Room Occupants," *Arch Int Med* 2011; 171:4 91-4.
- 7 Zimlichman, E. et al, "Health Care-Associated Infections: A Meta-analysis of Costs and Financial Impact of the US Health Care System," *JAMA Internal Medicine*, published on-line September 2, 2013.

# What is UV-C?

## What is UV-C Light, and Why is it Important?

Light from the sun contains UV light that is invisible to the naked eye. UV light wavelengths are shorter than visible light, and is typically classified as UV-A, UV-B or UV-C as shown in table below.

Type of UV Light	Wavelength	Common Use
Ultraviolet A (UV-A)	400nm - 320nm	Tanning salons, black lights
Ultraviolet B (UV-B)	320nm - 280nm	Medical treatment, UV curing
Ultraviolet C (UV-C)	280nm - 200nm	Microorganism inactivation

**\*PDC's  
UV-C LED  
Bore Disinfection  
System Generates  
260nm - 300nm**

## How Does UV-C Light Work?

The use of UV-C light is a recognized method of inactivating a wide range of microorganisms in water, air and on surfaces.<sup>1</sup>

### UV-C light works primarily by inactivating the DNA or RNA (nucleic acids) in microorganisms

- Although several mechanisms for cell inactivation may occur, by far the most prevalent is a thymine dimerization reaction that occurs within DNA (or uracil dimerization in RNA).<sup>2</sup>
- A dimer is formed when two identical or similar compounds, in this case two thymine molecules (shown in blue to the right), are joined together (shown in pink to the right).
- When dimerization occurs, DNA no longer functions and the cells cannot grow or reproduce. Cells that cannot replicate are no longer infectious.<sup>2</sup> With appropriate UV-C exposure, pyrimidine dimer formation is widespread and cell death occurs.



### UV-C light is a line-of-sight technology

- Destruction of microorganisms can be achieved when microorganisms are in a direct line of sight of the UV-C device. All common touch surfaces should be exposed to UV-C in order to help accomplish cell destruction. This may require more than one placement of a UV-C device in an area with many hard-to-reach surfaces.
- Conventional UV-C lamps are subject to variables that PDC LED technology eliminate.

### UV-C efficacy is dependent on a number of variables, such as:

- Lamp intensity (output), number of lamps, height of lamp, lamp configuration on device, device attributes (reflective mast, etc.), exposure time, distance and placement of lamps, absorbance / reflectance of items in area, humidity and airflow patterns.
- PDC uses UV-C LEDs which eliminate these variables.

# Is UV-C Dangerous?

## **Safety:**

UV-C light is safe, provided the proper UV-C education is known by all staff operating the system. PDC uses LEDs to generate UV-C light. The energy is concentrated and emits from the LED diode in the shape of a cone. Peak energy is delivered to the bore and table approximately 6 inches to 12 inches from the LED. Beyond 12 inches the energy dissipates quickly. This makes it perfectly suited to clean hard to reach bores and tables.

Like any disinfection system, UV-C devices must be used properly to be safe. The PDC system generates UV-C light at a wavelength of 260nm - 300nm. This UV-C light can cause a severe sunburn-like reaction to your skin and eyes. This can only happen if skin is exposed to intense UV-C light for an extended period of time or the eye is exposed directly to UV-C light for an extended period of time.

## **UV-C LED Bore Disinfection System Safety Sensors**

- 8 independent motion (proximity) sensors for risk mitigation and safety
- Motion sensors trip if a person enters the room during the disinfection cycle.  
This will turn off the UV-C LEDs
- The LED Hubs are in the bore which absorbs a majority of the UV-C energy which greatly reduces the risk to anyone who accidentally enters the scan room

Regardless of the PDC safety precautions, regulatory requirements prohibit personnel in the room during a disinfection cycle.

# Is UV-C Dangerous? (CONTINUED)

## When the UV-C LED light is ON:

- Scan room should be unoccupied with the door closed the duration of the disinfection cycle
- UV-C light will not penetrate window glass
- UV-C light will not penetrate opaque surfaces such as walls, curtains, clothing, medical gloves, paper and any other opaque product or surface

## UV-C LED Bore Disinfection System

PDC's system generates UV-C light energy from 260nm to 300nm. This Germicidal Spectrum of UV-C light should not be confused with Far UV-C, which is 222nm. The dose from the PDC system is proven to kill all pathogens with a 99.9% confidence level for all pathogenic organisms, including coronavirus.

### OPTIONAL PPE:

- UV-C Safety Glasses
- Gloves
- Long sleeves or lab coat

**UV-C LED  
Bore Disinfection System  
on the CT Table  
(System is OFF)**



The UV-C System can be used on MR, PET/MR, CT, PET, PET/CT, MR-guided Linac, Nuc Med and any other imaging bore (60-80 cm)



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