

Enhancing
**Disinfection Times and
Environmental Hygiene**

at Heart of America Medical Center





The Facility

Heart of America Medical Center is a licensed 25-bed critical access hospital located in Rugby, North Dakota. Established and historically administered by Rugby's Good Samaritan Hospital Association, the Heart of America Medical Center has provided medical services to local residents for well over a century.

Currently, the hospital provides primary, rehabilitative, and elder care services, and also acts as a surgical center, nursing, oncological, and long-term care facility. Heart of America Medical Center also provides 24-hour on-call radiological and laboratory services and has active Emergency and Operating Rooms.

The Challenge

Heart of America Medical Center faced the challenge of providing safe, clean and disinfected environments for its patients, especially those going through the facility's high-volume areas.

This was the case in the hospital's Emergency and Operating Room areas. In the Operating Room, for example, cleaning and disinfection duties were not conducted by the hospital's normal complement of Environmental Services (EVS) workers, but by members of the nursing staff.

In this case, the nurses cleaned the Operating Room after every patient case and at the end of each day. The hospital, however, needed additional environmental disinfection technology for its Operating and Emergency Rooms.

The Solution

Heart of America Medical Center chose UVD Robots, a series of mobile, self-navigating disinfection robots produced by the Danish company Blue Ocean Robotics, to ensure the proper disinfection of the hospital's high-volume areas.

UVD Robots emit Ultraviolet (UV) light to disinfect areas of a room, including walls, floors, ceilings, and indoor surfaces. UVD Robots use Ultraviolet C (UV-C) light, which at wavelengths of 254 nanometers (nm) has been associated with germicidal disinfection efficacy rates of at least 4-log, or 99.99%.

In 2022, the nursing staff at Heart of America Medical Center implemented its UVD Robot in their Emergency and Operating Rooms. The mobile robot now operates 3 days a week and assists with post-manual cleaning and disinfection duties.

The UVD Robot complements the cleaning and disinfection process. After a patient case, nurses will clean a room manually. This process involves physical cleaning and the application of chemical disinfectants to the room's surfaces.

After the manual cleaning process, the UVD Robot is sent in. It performs its disinfection duties through the mobile application of 254 nm UV-C light. Once this process is completed, the robot leaves the room, which is ready for use again.



UVD Robots at a glance

- 99.99%** Eliminates at least **99.99%** of select pathogens in the environment
- 65%** **65%** reduction of labor time with UVD Robots vs. static disinfection systems
- 100%** **100%** autonomous features ensure extensive irradiation of UV-C energy on all environmental surfaces - from floor to ceiling.
- 10 min.** Disinfects a 269 sq ft room in less than **10 minutes**. Large area disinfection (over 2500 sq ft) typically in less than 1 hour
-  **Chemical-free** UV-C disinfection minimizes risks related to chemical agents

The Results

Heart of America Medical Center has tested the germicidal efficacy of the robot with a swab test, conducted 3 times during the cleaning process. The first swab is taken from a high-touch surface immediately after a patient case, the second after manual cleaning, and the third after the UVD Robot performs disinfection duties.

The testing has revealed steady disinfection results. After a dental case in the facility's Operating Room, for example, the first swab resulted in the growth of **10 bacterial colonies** on a sterile agar plate. The second swab, taken after manual cleaning, resulted in the growth of **6 bacterial colonies**. The third swab, taken after disinfection from the UVD Robot, resulted in the growth of **0 bacterial colonies**. Further testing will continue at the Heart of America Medical Center, but to staff, the UVD Robot is a welcome addition to the hospital's already well-established cleaning and disinfection process.

Operating Room Manager Chelsey Wyatt, CRNA, operates the UVD Robot on a regular basis. She has also been involved in the swab and laboratory testing.

"The benefits are there, and we can prove that the benefits are there," said Wyatt. "After the robot comes through, we've had zero growth on any swab we've done."

UVD Robots also have mapping abilities, which help with the mobile robots' autonomous disinfection processes. Wyatt has found these abilities to be beneficial.

"It's running a tested route, to make sure you're getting the best use of the equipment in the room," said Wyatt, "For the areas that the robot has mapped, you know, you can push the buttons, open the door, and it will get itself there."

Finally, Wyatt noted that UVD Robots helped both operations and patients at Heart of America Medical Center.



"It's beneficial to the staff. I think that providing this extra level of protection for patients throughout the hospital will be beneficial to everybody."

Chelsey Wyatt, CRNA, Heart of America Medical Center



99.99%

germicidal efficacy rate with UVD Robots*

*or more, depending on the UV light exposure time

Efficacy of UVD Robots

UVD Robots are self-navigating, mobile disinfection robots that utilize ultraviolet light to disinfect indoor environments.

Specifically, UVD Robots use 254nm UV-C light, a type of ultraviolet light used in a disinfection process known as ultraviolet germicidal irradiation (UVGI).

UVD Robots use UVGI to reduce selected microorganisms, including:

- *Clostridioides difficile* (*C. diff*)
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin-resistant *Enterococcus* (VRE)
- *Acinetobacter* spp.

In laboratory studies, 254nm UV-C light has been associated with 4-log reductions of these microorganisms, representing an efficacy rate of at least 99.99%.^{1,2,3}

1. Cadnum et al (2019) A comparison of the efficacy of multiple ultraviolet light room decontamination devices in a radiology procedure room. *Infection control and hospital epidemiology*, 40(2), 158–163;
2. Danish Technological Institute study: Danish Technological Institute: Report number 754372 rev. 1
3. Essential Microbiology Study, Melbec: Essential Microbiology Ltd. report id: uvdr-ict/ca



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