

BACKGROUND

Founded in 1985, Main Line Health is a not-for-profit health system with over 2,000 physicians serving portions of Philadelphia and its western suburbs.

Main Line Health has within its healthcare system four of the regions most respected acute care hospitals. Lankenau Hospital, Bryn Mawr Hospital, Paoli Hospital and Riddle Hospital as well as one of the USA's premier facilities for rehabilitative medicine, Bryn Mawr Rehabilitation Hospital.



APPROACH

Main Line Health is an experienced user and purchaser of UVC Environmental Decontamination products and in 2018 wished to test the market for better product and greater technologies. The Board of Riddle Hospital was elected to carry out the market test and was allocated budget for the purchase of a new UVC unit. Full analysis was carried out of product and the Infection Prevention team was elected for the testing of short listed product.

*** (Please see the attached clinical poster of the THOR trials and tests) ***

Mainline Health performed their own scientific study to validate the true power of THOR UVC® and based on these findings as well as the competitive price of the system, THOR UVC® is now the UVC system of choice for this Hospital group.

Key Findings:

- Telescopic extension vital for efficacy and ease of deployment.
- Integrated LiDAR enabled accurate UVC dosage in every room.
- Demonstrable improvement in colony reduction with THOR UVC.

SOLUTION

The superior power, technology, reporting for IP surveillance and the value for money of THOR was proven and the Board of Riddle including the EVP of Administration for 2 hospitals within the group, Director of Infection Prevention, Director of FM Services, Finance Director and the EVS services (Aramark) passed the business case and a THOR unit was purchased at less than half the cost of alternatives and indeed the then incumbent device.

RESULTS

A review of the performance over the previous year was carried out in February 2020. Director of IP stated that the C-Difficile Infection rates had reduced due to the introduction of THOR. 5 more THOR units were purchased immediately new budget was allocated at the beginning of the fiscal year (July) and were delivered and commissioned in August. (THOR is in stock and Finsen Tech Group are able to deliver within 4 weeks from order) since then Aramark have made additional purchases of THOR for other client locations across their network.

Improving Environmental Cleaning in a Community Hospital with THOR High Output Rapid UVC Technology

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Background

The importance of environmental cleaning in an acute care hospital cannot be overstated. UVC radiation is commonly used to disinfect hospital cleaning equipment. However, for almost a decade, Whole UV has been recognized as a disinfecting technology for more than 20 years. The effectiveness of these UVC technologies for surface disinfection in healthcare has more recently been established with numerous studies and their successful integration in hospital cleaning programs.

Our organization had the opportunity to be the first hospital to use THOR in the US. THOR is a powerful High Output Rapid UVC system. It is a new generation UVC system that meets all the industry standards with new capabilities for enhanced UVC disinfection. A small group was formed to evaluate the use of THOR. We used the system in a variety of rooms including critical care, isolation and emergency rooms.

Methods

THOR uses Philips High Output UVC lamps. The Shadow Reduction Capabilities and ergonomic design of the unit allow for easy maneuvering into awkward spaces. The telescopic arm and the control panel are mounted on a swivel to allow the operator to rotate a particular area of UVC energy for negative and sterile rooms.

The following 10 phases were completed in 100 rooms, patient rooms and a waiting room:

- Culturing SDR75 Bacterium, Pseudomonas Discharge
- Culturing BSL2 UVC Disinfection of Bacterium
- Culturing BSL2 UVC Disinfection Cycle

All cultures were obtained from the same surface locations in each room, as directed. 10 of 10 cultures in each room were negative. Each location was rechecked once in each phase.

10 of 10 cultures were cultured for each room.

10 of 10 cultures were cultured with moving components and DVD to identify target rooms.

10 of 10 cultures were based on a disinfection cycle and logged on a central dashboard. Plates were incubated at 35°C for 24 hours as directed.

Cultures were incubated and read in Media and April 2020.

Visual comparison of samples from each phase were made by Infection Prevention.

We used direct contact BOD42 plates to collect and culture bacteria from surfaces.

BSL 2 UVC Revealing Agar BOD42 21230 with remaining agents to investigate a variety of conditions and antibiotic resistance. These plates are used in a variety of programs to establish and monitor cleaning techniques and protocols.

These images represent the results of the study with comparison to a surface control. There is a change that demonstrates an absence of bacteria. This is due either to disinfection due to enhanced disinfection or a change in the surface. "White background" "White background"

All slides are not shown here, a sampling was chosen

Results

10 of 10 (100%) sets of culture showed Growth in Phase 1, reduction growth in Phase 2 and no growth in Phase 3. This is the expected result.

18 of 20 had no or very minimal growth in Phase 2 which indicates very effective cleaning by UVC.

20 of 20 showed no growth in Phase 3.

2 sets showed more growth in Phase 2 than Phase 1 which may increase contamination of open techniques if using the surface sample.

2 culture plates had more growth in Phase 3 than Phase 2 which may indicate poor technique in getting the surface sample.

Conclusions

This was a very successful trial. We had a visual test to see the efficacy of THOR UVC disinfection. The goal of disinfecting surfaces to prevent cross contamination of samples from patients or visitors to reduce the spread of infection was met. The results clearly showed great improvement after THOR. THOR's lower profile made THOR easy to use and the telescopic arm allowed for easy access to difficult areas. The placement of lamps in the base allows for easy setup and lower placement areas. Our EVS technicians have reported that with the use of their best technique and manual cleaning, it is difficult to get the very resistant pathogens that colonize hospitals. The remote monitoring and reporting of the unit was a great asset and shows the ease with which we can use our cleaning efforts. The cultures were also collected and this was seen as a benefit and done by our technicians.

Setting a disinfection cycle was made during the trial.

Phase 1 or other parts of the cycle may have improved parts of the particles. This was the first use using these surface culture plates.

Phase 2 and 3 were used to test the system to ensure no growth in the same results. Disinfect and plates should be open, bathroom door open and furniture moved away from walls. By setting up with the sliding out table, the floor will be cleaned better than if they are folded.

Crucially though, by using the remote monitoring, the UV light will go under and around things. Some of our rooms are extremely small so it may be harder to get all surfaces. It will be beneficial to have rooms of which there are more and when we have other items were positioned. For example, you may wish to allow or position disinfect and an extension to get these areas. The use and equipment to a room and disinfect multiple points, underneath or underneath etc.

THOR uses High Output UVC lamps, reduces cross contamination of BSL 2 UVC plates when available, is designed to reduce bacterial load and uses non-sterile containers to clean rooms and containers to prevent reducing germination cycle times.

