



Ultra-V Decontamination Following New Build Ward Project

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Section 1 – Objectives

Walsall Healthcare NHS Trust has effectively used the Hygiene Solutions Deprox™ HPV decontamination system since 2011 to reduce the risk of contamination in the environment. However, this process takes approx 2 1/2 hours, introducing a significant downtime which both the Trust and Hygiene Solutions endeavoured to reduce. This has led to an evaluation of the Ultra-V system as adjunctive cleaning technology to reduce environmental contamination. The purpose of this evaluation was to assess the efficacy of UV-C decontamination (Ultra-V) on surfaces both directly and indirectly exposed to UV-C radiation, which was assessed using a Total Viability Count (TVC) method to culture aerobically forming colonies from the environment. The report below explains the methods, resources and personnel involved as well as results and subsequent conclusions.

Section 2 – Investigators and Researchers

Name	Role
Dr Amir Khan	Walsall Healthcare NHS Trust – DIPC/Medical Director Provided advice on correct procedures
Joanne Ellison	Walsall Healthcare NHS Trust – Head of Infection Control Ensured agreed methods of sampling, culturing and data recording were followed
Mr Colin Plant	Walsall Healthcare NHS Trust – Director of Facilities Ensured safe protocol was followed.

Section 3 – Resources

The resources used in this study where:

- Ultra-V decontamination System x2
- Rodac Agar Plates x170 - Pro-Tect TWI (Contact Plate) - Product Code PO0678D

Section 4 – Testing Methods

Walsall Healthcare NHS Trust had recently carried out a new build project to build a new ward on site. This gave the opportunity to evaluate the Ultra-V system in an area where building works had taken place and where staff and equipment from the hospital had passed through. This gave the opportunity to evaluate the level of contamination of the hospital environment during building or maintenance works.

Given the opportunity of testing the Ultra-V on the new ward, testing was carried out with in the following steps:

- 1 The bays and side rooms throughout the new ward had already been cleaned
- 2 Hygiene Solutions Research Engineer entered the side room/bay and took 13 samples from around the room. Touch plate samples and swabs were taken on the following locations: the bed foot board, mattress, bed rails, oxygen trunking (behind bed), patient chair arm, bed foot board, above sink (in bay area), above sink (in en-suite), handrail, toilet roll holder, toilet seat. See 'Method of Sampling' below.
- 3 The Ultra-V decontamination system was then deployed.
- 4 Samples were then taken again and recorded from slightly offset locations as before.

On a separate occasion, the Ultra-V was tested in the patient environment where there had previously been a clostridium difficile patient occupying the side room. Testing was carried out with the following steps:

- 1 Samples taken from 13 locations around the room before cleaning. Touch plate samples and swabs were taken on the following locations: the bed mattress, bed base, bed rails, patient call bell, bedside locker, bedside table, patient chair, windowsill, light switch, door handle, toilet handrail, taps on sink, toilet seat. See 'Method of Sampling' below.
- 2 The room was then cleaned and left to dry.
- 3 Once dry, samples were taken from slightly offset locations and recorded.
- 4 The Ultra-V decontamination system was then deployed.
- 5 Another 13 samples were taken and recorded in slightly offset locations as before.

Method of sampling:

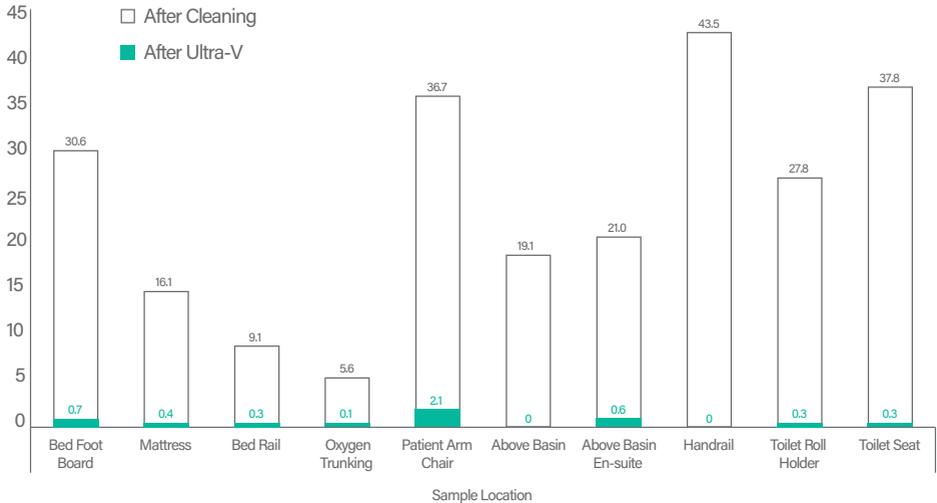
- 1 Don gloves.
- 2 Numbered rodac plate placed on surface to ensure contact, then lifted, lid replaced and positioned in insulated box.
- 3 Take off the gloves and place them into a bin for contaminated waste
- 4 Record the plate number and surface contacted in the table
- 5 Repeat process



Section 5 – Results

Below are the results from the Ultra-V process that were undertaken on Ward 29. It should be noted that this was a new build and the decontamination was carried out after cleaning in the ward but before the ward was opened. This gave an insight into the question of ‘what happens to environmental contamination in a hospital when building works take place?’

Figure 1. Average Total Viability Count by Stage for each location



Sub-conclusion:

Figure 1 above shows the average total viability counts at each stage of the process, with the different sites that were sampled around the room. Despite being a new ward, even after cleaning there was still a significant bioburden. However, after Ultra-V, consistently low counts were cultured, even on sample sites not directly exposed to the UV-C, for example in the en-suite.

Figure 1A. Average Total Viability Count by Stage in a Bay

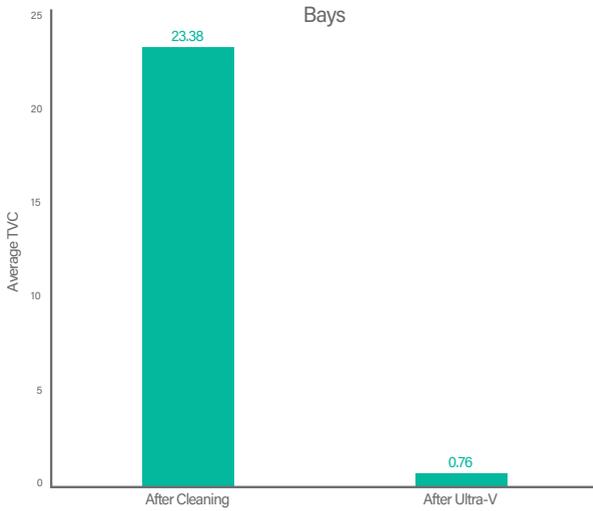


Figure 2. Average Total Viability Count from Toilet Seat in the En-Suite of the Bay

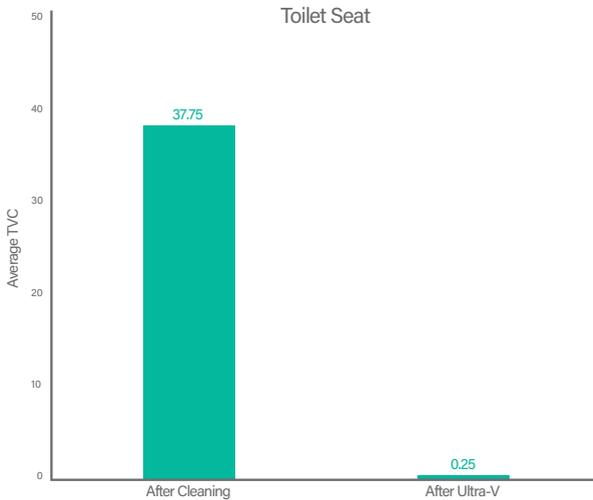


Figure 3. Average Total Viability Count from Patient Chair Arm

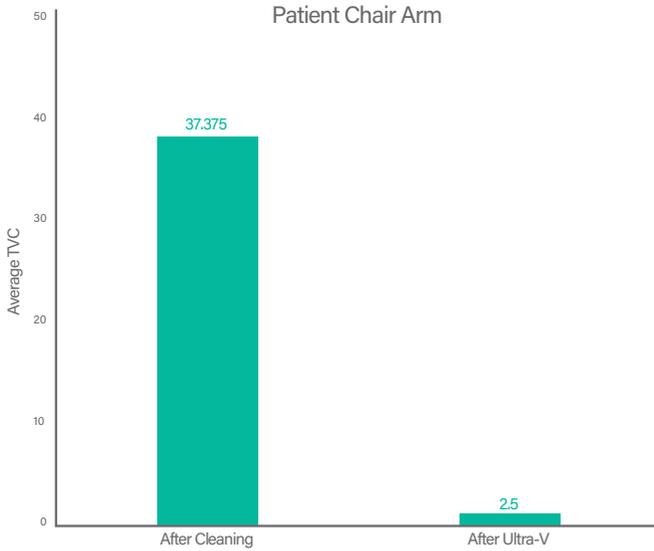


Figure 4. Average Total Viability Count by stage in Side Rooms

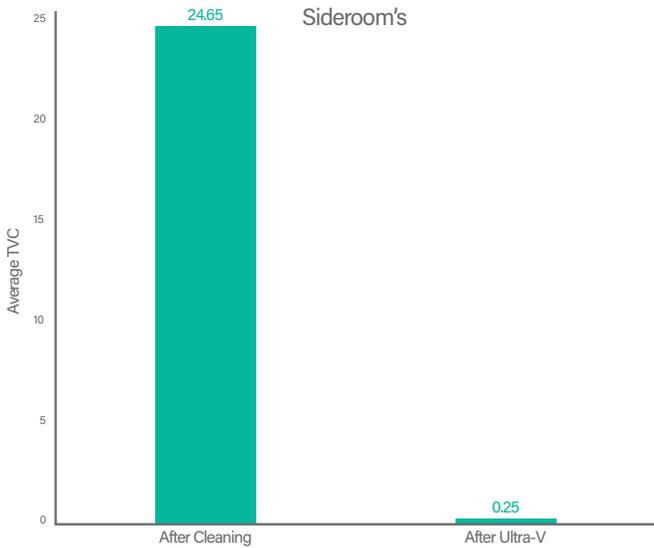
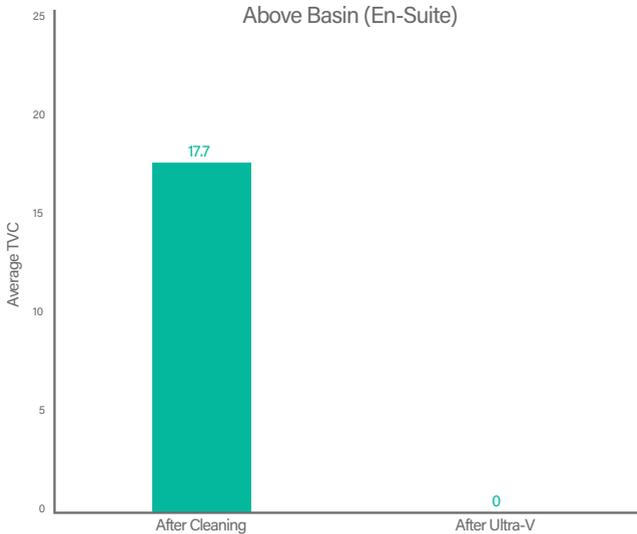


Figure 5. Average Total Viability Count from Above Basin



Conclusion

The results of the testing demonstrate that whilst manual cleaning is an essential process for the aesthetics of the environment, following a construction project, significant levels of contamination are still present in the environment (average 24.7) which could pose a risk to patients being admitted to the area. The Ultra-V system, taking an average of only 18 minutes per room, reduced this level of contamination to an average of 0.48. This reduction in environmental contamination could demonstrate a benefit in patient safety, reducing the risk of exposure to harmful pathogens.

With a faster turnaround time than traditional methods of decontamination, this could enable decontamination in high-throughput areas, for example ED, MAU and ICU that previously could not be decontaminated owing to time constraints.

A limitation of this evaluation is that it only assessed "Total Viable Counts" (TVC) which are not organism-specific. Further work could include sampling the environment with organism-specific media to evaluate which organisms are present after a new build project.





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