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Is the Pulsed Xenon Ultraviolet Light No Touch Disinfection System Effective on MRSA in the Absence of Manual Cleaning?

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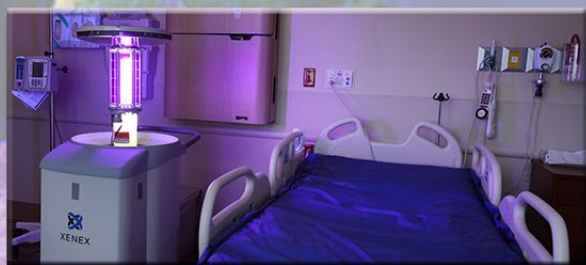
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Background

- Pulsed xenon ultraviolet no touch disinfection (PX-UV) devices are widely employed to disinfect surfaces in hospital rooms¹.
- A truncated manual disinfection followed by PX-UV has been shown to be more effective than manual disinfection alone against methicillin-resistant *Staphylococcus aureus* (MRSA)².
- Mercury-based ultraviolet disinfection alone is effective against MRSA in the absence of any manual disinfection³.
- But the effectiveness of PX-UV disinfection device on MRSA in the absence of any manual disinfection is largely unknown.



Objective

- Assess the effectiveness of the Pulsed Xenon UV disinfection (PX-UV) on MRSA in the absence of manual disinfection.

Methods

- Forty patient rooms that were occupied for a minimum of 48 hours were identified.
- MRSA samples were obtained from five surfaces per room (call button, bedrail, tray table, handrail and toilet) before and after PX-UV disinfection.
- The samples were collected using Rodac plates (Hardy Diagnostics, Santa Maria, CA).
- The plates were incubated for 48±4 hours at 32±2oC and colony counts were recorded.



Table 1. Results of rooms with MRSA Pre PX-UV

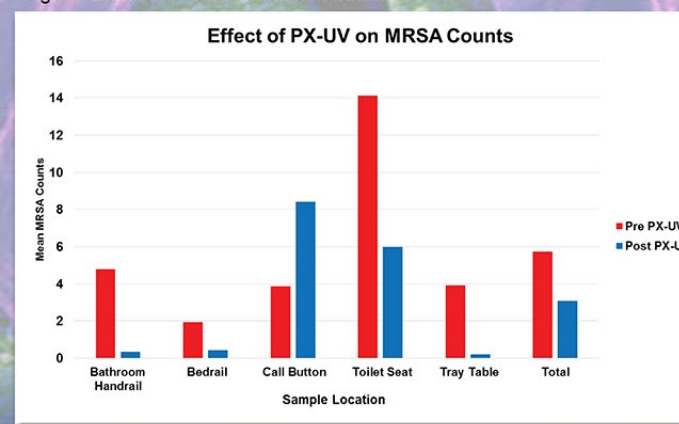
Location	No. Samples	Before PX-UV disinfection		After PX-UV disinfection		Count Reduction Mean Median (Min, Max)	P-value
		Mean	Median (Min, Max)	Mean	Median (Min, Max)		
Bathroom Handrail	14	4.79±0.0	1 (0, 35)	0.36±0.1	0 (0, 3)	4.43±0.5 1 (-3, 35)	0.02
Bedrail	14	1.93±0.3	0.5 (0, 10)	0.43±0.2	0 (0, 4)	1.50±0.2 0 (-2, 10)	0.13
Call Button	14	3.86±0.1	1 (0, 26)	8.43±7.8	0 (0, 116)	-4.57±20.6 0 (-108, 26)	0.28
Toilet Seat	14	14.14±2.3	0 (0, 90)	6.00±0.4	0 (0, 38)	8.14±3.4 0 (-10, 70)	0.31
Tray Table	14	3.93±0.2	0.5 (0, 23)	0.21±0.1	0 (0, 2)	3.71±0.2 0.5 (0, 21)	0.02
Total	70	5.73±2.1	1 (0, 90)	3.09±0.4	0 (0, 116)	2.64±1.5 0 (-108, 70)	<0.01

*Wilcoxon signed-rank tests were employed, assuming a significance level of α=0.05.

Results

- MRSA was found on 14 out of 40 rooms. Rooms where MRSA was present on at least one surface before and after UV disinfection, were included for analysis.
- The reduction of MRSA colonies were consistently observed across most surfaces and in most rooms (Table 1).
- The two surfaces most contaminated with MRSA were the bathroom handrail and the call button (Fig. 1).
- The increase in call button count post PX-UV was attributed to a large single outlier which is not consistent with the overall pattern of decrease.

Fig. 1. Effect of PX-UV on MRSA Counts



Conclusions

- PX-UV disinfection effectively reduced the MRSA in the absence of manual disinfection and in the presence of organic material.
- This study also provides an insight into what happens if a surface is missed during manual disinfection while PX-UV is deployed.

References

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