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Impact of pulsed xenon ultraviolet disinfection on surface contamination in a hospital facilities expressed human milk feed preparation area: A quality improvement study and the lessons learnt

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Background: Expressed Human Milk (EHM) feed preparation areas represent a potential source of unintentional nosocomial infection. Daily disinfection of environmental surfaces remains an essential intervention to mitigate nosocomial infections but the inefficiency of conventional cleaning and disinfection practices remains concerning. “Non-touch” technologies such as the Pulsed Xenon Ultraviolet (PX-UVD) light device has documented sustained reduction in surface bacterial colonization and reduced cross contamination.

Aim: A quality improvement study evaluating efficiency of conventional cleaning and its impact on the surface bio-burden of feed preparation areas and subsequently following the introduction of a PX-UVD as standard of care.

Methods: A prospective interventional study documenting surface colony forming units per square centimeter (cfu/cm²) from 6 high risk feed preparation areas in a community care hospital in South Africa. Pre and post conventional cleaning neutralizing rinse swabs were collected over a 16 week control period prior to the introduction of the PX-UVD and compared to a matching set of samples for the PX-UVD period.

Results: Total Surface Bio-Burden (TSB) of 544 cfu/cm² during the control period showed a 90% reduction compared to the 50 cfu/cm² for the corresponding PX-UVD period. A consistent improvement in the pre:post cleaning ratios during the PX-UVD period approached statistical significance (p-value=0.08). The introduction of the PX-UVD had a cumulative suppressive effect on the pre clean bio-burden counts (p-value=0.018).

Conclusion: The study demonstrated the inefficiency of conventional cleaning. Persistence of pathological species in both periods highlights current health sector challenges. We discuss the multi-prong interventional strategy adopted to critically review current policy and re-evaluate potential weaknesses as well as the adoption of new technologies such as the PX-UVD which temporally resulting in a significant decrease in surface bio-burden.

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