Safe to Handle? Comparing Manually and Machine-Washed Medical Devices

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The goal of medical device reprocessing is to ensure that a given device is ready for safe use on the next patient. Effective cleaning of devices is critical to maintaining this goal. Device cleaning also has an ancillary goal: rendering the device safe for handling with ungloved hands by sterile-processing personnel. Such personnel are trained with preparing the device for further reprocessing steps, such as packaging for sterilization.

To answer the question of whether manually cleaned devices are safe to handle as machine-washed medical devices, the current study sought to gather data to help answer this question. Further, this study sought to evaluate the effectiveness of a relatively new test in the area of decontamination in healthcare settings—ultraviolet (UV) detection—and whether UV disinfection could effectively and efficiently be used to render manually cleaned devices safe to handle.

Mechanically washed reusable medical devices generally are considered to have a more reliable and effective level of cleanliness, as evidenced by the limited research available in this area.3 The unifying criteria for this assertion is that mechanical methods are more robust and reliably reproducible compared with manual methods.4 Machine-washing allows for the use of cleaning solutions at much higher temperatures. These higher temperatures typically include a detergent wash at 60°F (15°C), followed by thermal disinfection at 121°C (250°F) for one minute or longer.5 Further, the cycle settings are programmed into a machine and are repeated every 30 minutes. Conversely, manual cleaning depends on the individual performance of the person conducting the cleaning. These processes do not devolve the importance of experienced staff. To the contrary, even the most simply designed medical device requires proper and effective processing by manual means. Typically speaking, the more complex the device, the more important the manual steps to prepare the device for further cleaning by mechanical means. Further, a substantial number of medical devices cannot undergo mechanical cleaning. This is due to the materials used in construction (i.e., thermosets, nonwoven fabrics, and the complexity of the design).6 Effective cleaning of these devices is wholly reliant on manual processes.

In design, sterile-processing departments typically have a physical separation between the areas where items are cleaned (the "dirty side") and the area in which they are transported for further processing, such as sterilization (the "clean side"). Mechanical cleaning equipment typically is designed with a sealable door design, where the loading door is located on the dirty side and the unloading door on the clean side. For manually cleaned devices, the passing items back from the clean side to the dirty side for recontamination, sterile-processing departments typically have a "pass-through" window.