Importance of instrument cleaning and cleaning monitors

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WHILE FUNDAMENTAL INFECTION CONTROL PRINCIPLES DO NOT CHANGE, improvements in procedures, practices, and equipment have resulted in greater practical applications over time. Dental professionals now use many of the scientific and clinical innovations that make routine infection prevention more efficient and reproducible.

Examples can be found in every clinical setting. These range from the switch to gloves and other personal protective equipment (PPE), use of automated instrument reprocessing equipment, computer chip-driven sterilizers with sophisticated information monitors, to treatment of dental water lines to reduce microbial colonization.

Technological advancements in infection control equipment have also led to an ongoing evolution of quality- control measures and devices. As an example, a major monitoring area is focused on heat sterilization of instruments and other reusable items. Multiple mechanical, chemical, and biological indicators (BI) have been introduced and refined over the last five decades to evaluate sterilizing conditions and process effectiveness. Routine use of these indicators and integrators ensures the success of a sterilization cycle by early detection and correction of possible errors that can lead to sterilization failure, such as overload of the unit, use of improper packaging material, and equipment failure. The role and usefulness of sterilization monitors is well documented in accomplishing infection-prevention goals.

A question to be asked here is what can be done to more effectively check the initial reprocessing step—*cleaning* instruments soiled with blood, saliva, and bodily fluids. The Centers for Disease Control and Prevention (CDC) Guidelines for Infecton Control in Dental Health-Care Settings state, "If visible debris, whether inorganic or organic matter, is not removed, it will interfere with microbial inactivation and can compromise the disinfection or sterilization process." It wasn't that long ago when most instruments were cleaned by hand scrubbing prior to placing them in an autoclave or other heat sterilizer. Monitoring this process was dependent on personnel visually assessing the presence or absence of debris. Practices now have the choice of using ultrasonic cleaning units, instrument washers, or washer-disinfectors, which accomplish the "clean it first" principle far better than using a scrub brush. These automated cleaners do not require presoaking or scrubbing of instruments and can increase productivity, improve cleaning effectiveness, and decrease personnel exposure to blood and bodily fluids. They are safer and more efficient than manual cleaning.

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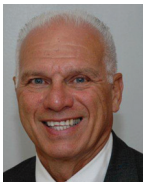
Ultrasonic units remove soil by a process that uses electrical energy to generate sound waves. When the sound waves travel through the liquid, millions of tiny bubbles are formed and continuously burst. This cavitation process disrupts the bonds that hold debris on instrument surfaces, thereby facilitating soil removal. Up until now, monitoring of ultrasonic cleaning in dental settings has typically used an aluminum foil test. Exposure of a piece of foil to cavitation while the unit is running is a simple and fast method to check for an even distribution of cavitation in the ultrasonic cleaner.

Instrument washers are also used in medical and dental facilities and have been proven to streamline the cleaning process. This type of equipment eliminates the need for manual presoaking, hand scrubbing, and rinsing and drying. Some washers, called washer-disinfectors, also have a high-temperature cycle to achieve high- level thermal disinfection along with cleaning.

Removal of accumulated soil and bioburden is the ultimate goal of instrument cleaning in all health-care settings. If instruments are not properly cleaned, they cannot be sterile. Additional factors also can affect cleaning processes. These include temperature, amount of cleaning solution, cycle time to maximize cleaning, and the number of instruments that can be effectively cleaned during each cycle. A basic question here is how to best validate effectiveness of the cleaning process.

The Association for the Advancement of Medical Instrumentation (AAMI) is the primary source of national and international consensus standards for the medical device industry. AAMI recommendations include frequent, periodic testing of mechanical cleaning equipment to emphasize the importance of cleaning process verification in helping to ensure effective sterilization. Clinically relevant monitors using nontoxic artificial test soils that simulate the presence of blood and tissue have been used in hospitals for years to routinely check cleaning equipment. They have been shown to provide consistent, reliable, and reproducible results, and are superior to visual inspection of instrument cleanliness. Unfortunately, to date, this technology has received little attention in dentistry, but that is changing. As criteria for cleaning effectiveness become more standardized in health care, dental professionals should be ready to be introduced to a new, more sensitive generation of instrument reprocessing quality-control monitors. DE



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