An inside job

Question: What can you tell us about **IN-OFFICE SPORE TESTING** *of* **sterilizers***?*

Answer: Universal sterilization means that all reusable patient-care items, including handpieces, are sterilized (not just disinfected) between patient uses. Following this concept will provide the greatest level of patient protection. Achieving universal sterilization only can occur through the practice of sterility assurance. Because it is not possible to determine the sterility of each processed item, following each step in the sterilization process carefully is essential. One of these steps is biologic monitoring.

Biologic monitoring (spore testing) is the main guarantee of sterilization. Biologic monitoring involves processing highly resistant bacterial endospores through a sterilizer cycle and then culturing the spores to determine if any viable bacteria remain.

Biologic indicators (BI) contain the endospores used in monitoring. There are two types of spores used. Spores used to monitor steam autoclaves and unsaturated chemical vapor sterilizers are *Geobacillus stearothermophilus* (formerly *Bacillus stearothermophilus*).

Monitoring dry heat or ethylene oxide requires the use of *Bacillus atropheaus* (formerly *Bacillus subtilus*) spores. The CDC, FDA, ADA, AAMI, and OSAP all recommend weekly monitoring of dental office sterilizers with a matching control (an unprocessed BI from the same lot as the test indicators). A BI is required for every sterilizer load containing an implantable device.

There are two forms of BI. Spore strips are made of paper and come coated with one or both types of test endospores. A glassine envelope protects the spore strips and prevents contamination of surfaces and hands. After processing, the strips undergo incubation. Depending on the type of strip and incubation medium used, incubation can last up to seven days. The presence of bacterial growth indicates sterilization failure.

The second form of BI includes self-contained vials, which contain a strip or disc covered with bacterial endospores and a growth medium that is usually in a plastic vial. A vented cap on the vial allows entrance of the sterilizing agent and leads to contact with the test spores. After processing, squeezing the vial breaks a separating diaphragm. This mixes the spores with the growth medium. If live spores remain, they will grow and change the color of the medium (usually from purple to yellow). This indicates sterilization failure.

Currently, most offices monitor their sterilizers using mail-in testing services. Such services perform many of the required duties — materials shipping, provision of properly prepared and unexpired BI, spore culturing, interpretation of results, and third-party documentation. Services should notify an office as quickly as possible when a positive result occurs.

Many services provide advice in the event of a failure. Some send informative newsletters to client offices. But the mail-in process takes time, perhaps up to 10 to 12 days. Generally, spore strips require seven days of incubation. There have been concerns that mailing spores twice could lead to false negatives. Several studies have reported that mailing delays do not have a substantial effect on final test results.

Today, there are increasing possibilities when it comes to in-office, self-contained biologic indicators, such as vials, ampoules, and strips. Offices can order BI, vial crushers, and a mini incubator. These BI test steam sterilizers and results are available in as few as 24 hours. Others require 48 hours.

Offices also can purchase spore strips, special growth media, and mini incubators. These BI systems test steam autoclaves, dry heat, and unsaturated chemical vapor sterilizers. Spore tests for steam autoclaves and unsaturated chemical vapor sterilizers incubate at 56°C while dry heat spores incubate at 37°C. Results are available in seven days.

In-house testing may be appealing to dental offices. Just as with mail-in services, weekly testing includes a control vial, ampoule or strip plus the processed spore tests. Controlling the complete monitoring process, paired with shorter incubation times, is attractive. Offices should purchase the spore type, culture medium, and incubator that correctly evaluate their type of sterilizer. It is imperative that offices maintain proper documentation. The spore tests must not be expired, and all results must be dutifully recorded. Offices should also determine if their product provider offers advice in the event of a sterilization failure. **DE**

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