Food for thought: Flash sterilization

Just run it up before the case.” “Flash it.” “Put it in the flash sterilizer.” These are all phrases you hear in the OR. It has become increasingly clear to me that there is confusion about the words flash, flash sterilization, flash cycle, and flash sterilizer. There is general agreement by organizations that issue recommended practices, guidelines, and standards that flash sterilization is not good practice and should be reduced to the lowest level possible.

The Centers for Disease Control and Prevention in the 1999 *Guideline for Prevention of Surgical Site Infection* states, “Flash sterilization is not recommended as a routine sterilization method....” John Perkins, considered by many to be the father of sterilization, wrote in the early 1980s, “Speed is the militant force against sterilization.” But what is flash sterilization? As flash sterilization is practiced today, is it a cause for health care facilities to be cited or censured by regulatory bodies?

Years ago, flash sterilization described the practice of sterilizing an unwrapped item(s) in an open tray in a gravity-displacement sterilizer (air in the chamber is removed through gravity) at 121°C (250°F) for 20 minutes, at 132°C (270°F) for 3 minutes and no dry time with no porous items or lumens, or at 132°C (270°F) for 10 minutes for porous items or items with a lumen and no drying time. A gravity-displacement sterilizer was the only type of sterilizer available.

A sterilizer used for unwrapped items in an open tray came to be referred to as a flash sterilizer. Using this description, flash sterilization is certainly less than ideal. Though practice has changed dramatically since the 1980s, the words flash sterilization have not been redefined, and perhaps this is the reason for confusion.

**How flash sterilization has changed**

In hospitals, gravity-displacement sterilizers have largely been replaced by dynamic air-removal sterilizers that remove air in the chamber through a pump or a series of pulse pressure flushes. Most of these sterilizers may be set to operate using either a dynamic air-removal process or a gravity process to remove air from the chamber. (Trapped air is an impediment to sterilization.) Though often referred to as flash sterilizers, these are certainly not the same as the original gravity displacement-only sterilizers and may be used to sterilize wrapped goods.

Today when items are sterilized for immediate use, they are most often sterilized using a dynamic air-removal type of cycle, unless the manufacturer’s recommendations call for a gravity cycle. A dynamic air-removal process removes air more effectively than a gravity air-removal process, which increases efficiency and requires a shorter cycle. The cycle is typically 3 minutes at 132°C (270°F) for metal and nonporous items and 4 minutes for a mix of porous, nonporous, and lumened devices.

**Advent of containers**

Flash sterilization is often defined as “the unwrapped method of sterilization.” But with the advent of flash sterilization containers, this is no longer an appropriate description.

An unwrapped cycle raises concern about the potential for contamination during transport. Readers may remember when unwrapped, sterilized instruments were removed from the autoclave by the scrub nurse, placed on a ring stand that was covered with a sterile drape, covered with another sterile drape, and wheeled down a corridor to the operating room. Often, the scrub nurse had to regown and glove as
well.

With the advent of containers designed specifically for sterilizing instruments needed immediately, the concern over contamination just prior to surgery is probably the same as the concern about contaminating instruments delivered from the sterile processing department and opened for surgery. I was unable to locate any articles that indicated flash sterilization containers are ineffective in preventing contamination.

**New definitions needed?**

These developments lead to the following points:

- The process of flash sterilization as practiced today is not the same as flash sterilization years ago. Perhaps new definitions or terms are needed to describe current practice.
- Today’s practice is safer—items are contained, dynamic air removal reduces the margin for error, and the need for effective cleaning is well established.
- Nurses need to understand whether the cycle they select for sterilizing an item for immediate use is a gravity cycle or a dynamic air-removal cycle, what the difference is, and why the parameters are different.

It might be better to refer to the type of cycle and state the temperature, number of minutes for exposure, and the number of minutes for dry time (dry time is optional). See the following examples:

- **Cycle type**: Dynamic air removal
  - **Temperature**: 270°F (132°C)
  - **Time**: 4 minutes
  - **Dry**: 1 minute
  
  or

- **Cycle type**: Gravity
  - **Temperature**: 270°F (132°C)
  - **Time**: 10 minutes
  - **Dry**: No dry.

Perhaps the term flash cycle is also a misnomer. There is certainly no one flash cycle. Cycle parameters vary according to type of sterilizer and device.

**Cleaning is a crux**

One common objection to flash sterilization is the potential for instruments to be inadequately cleaned. Although I was unable to find any references in the literature of patient infections associated with flash sterilization itself, there are references to patient injuries from inadequately cleaned instruments. Cleaning is one of the most critical aspects of sterilization that must occur prior to sterilization. Without proper and adequate cleaning, the efficacy of the sterilization process can be compromised.

ORs typically don’t have the same personnel and resources for cleaning instruments sterile processing departments have. Cleaning may be inadequate if instruments are not cleaned in the sterile processing department or in an automated system. Though automated cleaning is preferable, manual cleaning can be effective. (For more on cleaning, see “The importance of cleaning in earnest,” May 2008 OR Manager, p 21.)

If devices are cleaned appropriately, packaged in a container validated for use in one of the above cycles, run in a dynamic air removal cycle in accordance with the sterilizer manufacturer’s and device manufacturer’s instructions for use, and transported in the protective container, is this poor practice? Should hospitals be censured for this practice?

Perhaps a more positive approach would be to research or verify through product testing what instruments and small instrument sets are appropriate to flash sterilize, what cleaning and other resources must be available, and what competencies must be demonstrated in order to practice flash sterilization. Food for thought!

**What about complex sets?**

Certainly, multi-instrument sets, orthopedic loaner trays, implants, trays for storage, and such should always be processed in the sterile processing department,
which are dedicated to instrument processing and have better resources for cleaning, packaging, and sterilizing than ORs. Sterile processing personnel also have the expertise to perform product testing to verify that multi-instrument and multilayered sets, complicated sets or instruments, and containers can be effectively sterilized in the facility’s sterilizers when certain parameters are used.

The ambulatory setting

Ambulatory surgery and office-based facilities often use table-top sterilizers. Many of these use a gravity air-displacement method, although several manufacturers offer table-top sterilizers that use a vacuum process for air removal. Some table-top sterilizers include a container for instruments. Cycles vary with the intended applications. As with any sterilizer or device, instructions for use must be followed, and instructions from the sterilizer and the device manufacturer must be reconciled before use.

—Cynthia Spry, RN, MA, MSN, CNOR
Independent Clinical Consultant

References

