Ask the Epidemiologist

Is Eliminating Flash Sterilization Practical?

Q As the President of the American College of Foot and Ankle Surgeons, I am frequently asked about the latest trends in infection and disease control.

Recently, I have been advised by my hospital that they intend to switch to a system that will completely eliminate "flash sterilizing." All surgical instruments now will have to undergo a one-hour sterilization after each use. My hospital has stated that this is the new standard that will be used everywhere on all materials, instruments, and related products used during a surgical procedure.

Many of the instruments and power equipment we use in surgical procedures are extremely expensive. This new standard would necessitate buying several sets of instruments and power equipment that could easily cost $10,000 to $15,000 per set. The elimination of flash sterilization seems to be less than cost-effective in this day of trying to control healthcare costs. Our hospital's infection rate is less than 1% and on my personal patient load less than 0.5%. If these facts are true, why are we fixing something that doesn't seem to be broken? I would appreciate your comments on this subject, as well as the current standards and recommendations for flash sterilization of instruments to be used in orthopedic surgery.

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A I am not aware of any national organization that has advocated the elimination of flash sterilization in hospitals. The guidelines of the Centers for Disease Control and Prevention regarding flash sterilization, to my knowledge, are the same as those from other organizations. Flash sterilization is meant to be used, under defined conditions, only when it is absolutely necessary and is not considered a routine method to sterilize instruments and medical devices.

Steam sterilization cycles do not have to last one hour. The conventional sterilization cycle is 121°C for 15 minutes, or for shorter times if 132°C is used. You may wish to look into the purchase of small steam autoclaves that are designed to sterilize in a short time period.

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A Since its development more than 50 years ago as an *emergency* sterilization technique for contaminated surgical instruments,[1] flash sterilization has gained wide acceptance in many operating suites across the country.[2] Unfortunately, as Dr. Weil's letter illustrates, many hospitals and surgeons also have come to rely on this procedure for sterilization of instruments and devices used in less urgent situations because of its convenience.

Is this an acceptable practice when these items could undergo verifiable sterilization under a more controlled setting? From a hospital epidemiologist's perspective, the answer is a resounding "No." The main reason lies in the way flash sterilization is performed: exposing unwrapped objects to pressurized steam for a few minutes, with no reliable biological means of verifying that sterilization of instruments or devices has indeed occurred. Lack of a biologic "flash-verifier," an inherently low margin of safety due to the use of minimal cycle parameters (ie, time, temperature, and pressure) in flash sterilization,[3] and lack of protective packaging following sterilization obviously place patients' wounds at higher risk of exposure to nonsterile items during surgery.

In most emergency situations, the risk/benefit ratio is low enough that use of flash sterilized objects is justifiable. In nonemergency situations, however, the risk/benefit ratio is higher, particularly when implantable devices are involved. Given the difficulty

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of eradicating foreign body infections without removing the device, suboptimal sterilization of implantable devices may spell disaster for patients, as illustrated by reported cases of *Pseudomonas aeruginosa* meningitis or abdominal abscesses when implantable devices for neurosurgical shunting procedures were flash sterilized.[3]

Although I share Dr. Weil's concern over the high cost of surgical instruments, I cannot support the practice of routine flash sterilization of instruments or implantable items as a "cost-saving" measure at the expense of placing the patient at higher risk of wound contamination. When one considers patient morbidity (physical and mental) associated with surgical site infection at an additional average cost per infection of more than $3,000[4] (often not reimbursable by third-party payers), it is clear that investing in extra equipment to ensure sterility prior to use will more than pay for itself over a short period of time.

Finally, in this era of continuous quality improvement (CQI) and continuous practice improvement (CPI), one can no longer be lulled into a false sense of security that a "low" surgical site infection rate is acceptable and does not merit further improvement. The entire surgical process needs to be scrutinized continuously. Ensuring the sterility of surgical instruments and devices is an important part of this process. Routine flash sterilization of these items is a "break" that needs to be fixed before it's too late for the patient.

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