FLASH STERILIZATION (STEAM)

Author: *Barbara Bolding RN, BSN, MBA. Barbara Bolding is a Sterile Processing educator and consultant based in British Columbia. She currently works as a clinical educator for Johnson & Johnson Medical Products.*

Flash sterilization is an integral part of every OR nurses job and like everything else in health care, the processes and recommended practices regarding it are constantly evolving. A number of years ago flash sterilization used to be defined as "steam sterilization using the unwrapped method" (AAMI Recommended Practice 1986). The more current definitions describe it as steam sterilization of items for immediate use or emergency sterilization. You may also hear it referred to as "just in time" sterilization. However it is described, the underlying premise of flash sterilization is that the goods have not been pre-packaged and conventionally sterilized (AAMI ST37-1992). The absence of packaging creates good news and bad news. The good news is that items can be sterilized more quickly than those in conventional packages. The bad news is that items must be used immediately because they cannot be stored.

In order to ensure "flashed" products are safe for patients, there are a number of things that you should know about the process. *ORNAC*, The Canadian Standards Association (CSA), AORN, and the Association for the Advancement of Medical Instrumentation (AAMI) all have recommended standards of practice related to flash sterilization. They are in general agreement regarding the conditions under which flash sterilization may be undertaken. These are:

- There is an urgent need for the item;
- Work practices ensure proper preparation (cleaning, inspecting and arrangement) of the items prior to sterilization;
- The physical layout of the area ensures direct and aseptic delivery of the freshly sterilized item to the sterile field; and
- Implants should not be flashed.

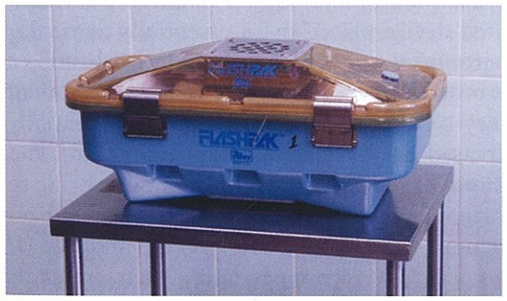

Photo by J. Porteous

Riley flashpak container

Flash Sterilization Exposure Times

Most flash sterilizers operate at a temperature of 132° C (270° F). At that temperature, the standard exposure times for flashed items will depend on two things:

- the contents of the load i.e. hard goods or porous (soft) goods; and
- whether air removal in your sterilizer is vacuum assisted or operates via gravity displacement (Check your operator's manual).

At 132° C- GRAVITY	
Hard Goods*	Porous/Soft Goods**
3 min.	10 min.
At 132° C- VACUUM	
Hard Goods*	Porous/Soft Goods**
3 min.	4 min.
At 132° C- FLASH CONTAINER IN GRAVITY *(as per manufacturer's instructions for use)*	
Hard Goods*	Porous/Soft Goods**
5 min.	10 min.

* Hard goods are non-porous items. They are solid metal instruments that require outer surface sterilization only.

** Soft goods are any items that could absorb or trap air, such as towels, plastic items, or items with lumens such as needles or fine suction tips.

The Importance of Proper Preparation

No item will be sterile if it has not first been properly cleaned. Protein soil cannot be sterilized and any soil left on an instrument will prevent complete sterilization from occurring. Items for steam sterilization must be completely opened and/or disassembled because steam is a surface sterilant and any instrument surface not fully exposed will not be completely sterilized.

Improper preparation of instruments is one of the main reasons for flash sterilization failure. There is little enough time available between cases for even the most routine tasks. When

FLASH STERILIZATION (*cont.*)

trying to fit thorough cleaning and preparation of instruments into the limited time of change-over and trying to clean and prepare instruments in an OR area that often does not have adequate cleaning space and equipment there are numerous opportunities for error.

Aseptic Transfer

Because aseptic delivery from sterilizer to the sterile field is a problem for most ORs, many centres are using some type of closed container to protect the sterility of items during transfer. One commonly used flash container is a plastic instrument tray with an inner mesh basket and a lid that snaps in place. Properly prepared instruments are put into the container along with a sterility integrator, the lid is secured and the entire container is placed in the flash sterilizer chamber for the appropriate time. Upon cycle completion, the entire container is transferred to the theatre where the circulating nurse removes the lid allowing the scrub nurse access to the instruments.

In order to use a flash container, there are a number of checks that should be performed daily. These will be detailed and illustrated in the "Instructions for Use" that accompany each container. One particular type of container requires the user to:

- Ensure the container is clean;
- Vent the valves in the lid and in the tray. This should be done at the beginning of the day when they are cold;
- Verify that both valves are correctly seated; and
- Remove residual water between uses.

Some flash sterilizers have a setting that will allow the item(s) to be lightly wrapped for flash sterilization, The item must still be used immediately, but the wrapper protects the items during transport between the sterilizer and the sterile field. The use of a flash container, a specially designed sterilizing cycle, or a similar system addresses the problem of aseptic transport between the sterilizer and the sterile field. It greatly reduces the chance of post-sterilization contamination and thus improves the safety of flash sterilization. However, it alone does not ensure effective sterilization.

Monitoring

Even with proper preparation and aseptic transfer between the sterilizer and the sterile field, sterilization is still not guaranteed. Flash sterilizers must be kept in good working order. Their monitoring and maintenance standards should be no different from the sterilizers in the Sterile Processing Department. The monitoring standards include the following :

- The parameters (time at temperature) of each cycle should be recorded. For Q.A. purposes the record should be verified and initialled by the person removing the item(s) from the sterilizer. The record should include information to connect the instrument(s) and cycle to the patient on whom the flashed items were used
- A chemical process indicator or integrator should be placed in each container or basket prior to sterilization, and the correct change to the indicator should be verified on completion of the cycle. If the sterilizer is a vacuum type, an air removal test (Bowie Dick) should be performed daily and results recorded; and
- A biological test of the sterilizer should be performed daily in each machine and on each type of cycle that will be used.

There are two types of biological indicators (B.I.) on the market today –standard and enzyme fluorescence. It takes up to 48 hours to obtain final results from a standard B.I. The enzyme type test is much quicker and can provide a flash sterilization results in one hour. The advantage of a quick result is obvious. In some instances B.I. results can be available before an item is used, and often results can be known before a patient leaves the OR. This is especially important when implants are involved.

Implants

As the 1997 *AORN* Recommended Practice: Sterilization, points out, "a minimally contaminated device placed in an essentially avascular environment and left there at the conclusion of the procedure could increase the risk of patient injury or infection". Because of the potentially increased risk of infection from an implant, and because of the risk of sterilization failure due to shortcomings in work practices and/or sterilizer function, *ORNAC*, *AORN*, *CSA*, and *AAMI* all make the recommendation that implants should not be flashed. Most ORs follow this recommendation to the best of their ability.

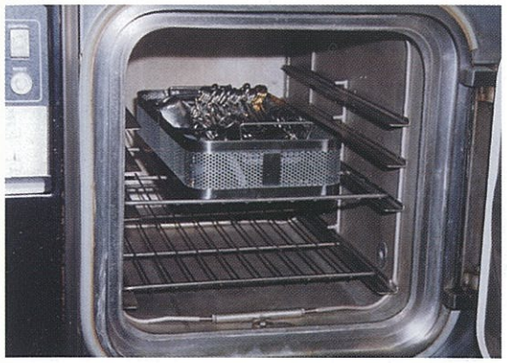

Photo by J. Porteous

Gravity displacement sterilizer with pan of instruments inside

Although manufacturers now supply many implants in a sterile state, not all are pre-packaged and sterilized. Large, small, and mini fragment sets with their numerous plates and screws are obvious examples to the contrary. If these sets have to be flash sterilized, a fast B.I. result provides an additional measure of assurance that the product is safe to use.

Conclusion

The message to take away from this brief review of flash sterilization is that there are many factors that contribute to the safety of the process. Failure of any of the steps can lead to sterilization failure and subsequent harm to patients. Cleaning and preparation of instru-ments, loading and unloading of the sterilizer, selection of sterilization time and temperature, and sterilizer function must all be correct in order to achieve sterilization and to protect patients.

References:

1. CSA International 2001. *Recommended Standard Practices for Emergency (Flash) Sterilization* Z314.13-01. 10-11.
2. CSA International 2001. *Recommended Standard Practices for Emergency (Flash) Sterilization* Z314.13-01. 11-13.
3. AORN 1997. *Recommended Practices for Sterilization in the Practice Setting.* Standards, Recommended Practices, & Guidelines 1997. 269.

KEY NOTE ADDRESS *ORNAC* 18TH NATIONAL CONFERENCE

Val Sherriff Memorial Lecturer – Kate Woodhead, SRN
Sponsored by Johnson & Johnson, Canada

Perioperative Nursing: From Little Acorns, Great Oaks Grow

Kate Woodhead is an internationally recognized expert in perioperative nursing. Currently President of the International Federation of Perioperative Nurses (*IFPN*), Kate is Past Chairman of the National Association of Theatre Nurses (*NATN*) in the United Kingdom. Kate is a frequent presenter throughout the UK, and won the Best Lecture Award at the 2nd European Operating Room Nurses Association Conference in 2000. **This year she will present the key-note address at the *ORNAC* National Conference.**

Kate is an experienced theatre manager, whose main practice is project and consultant contracts. She has recently been involved in several quality and risk management projects, including the modernization of sterilisation and decontamination, skill mix review and audits. Kate also has extensive experience with the variant Creutzfeldt-Jakob Disease outbreak in the UK.

Kate has been making her own personal contribution to the dissemination of perioperative knowledge in less privileged parts of the world. Along with a colleague, she has provided programs on perioperative nursing to colleagues in two African countries, where our colleagues face unbelievable challenges every day to provide the absolute basics of care to their patients – with no electricity or only intermittent supply, no run-ning water, theatres that had no roof, few drug supplies, and so on. In one country, no perioperative education had been given in 36 years!

Kate's insightful and thoughtful presentation will expand your perioperative nursing horizons far past the shores of Canada and North America – a wonderful way to kick start our Conference!