GIGS

The dangers of immediate use (Flash) sterilization

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The ❤️ of the hospital

BIG responsibility to supply only **STERILE** goods to theatre!!

"Flash" Sterilization

Worth the risks??

….or is it convenience, perhaps done for economical reasons??

Tonsil set

THE BIG QUESTION

Should I “Flash” sterilize this instrument / set or not??

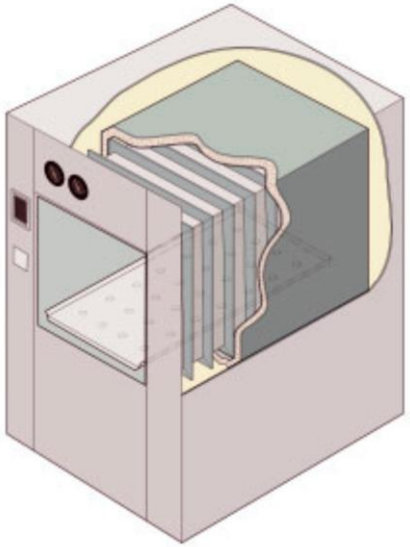
What are the risks??

What does the word “Sterilize” mean in the first place??

- Make (something) 100% free from bacteria or other living microorganisms.
- Not 99% but 100% elimination of all microbes

Steam sterilization

- Saturated steam under pressure (Water to steam)
- Surface sterilant
- Heat transfer (energy) 121°C - 134°C
- Air / water on instruments are insulators to steam – cold spots in the autoclave
- Energy transfer disrupts life function in microorganisms
- Low cost. safe and effective.

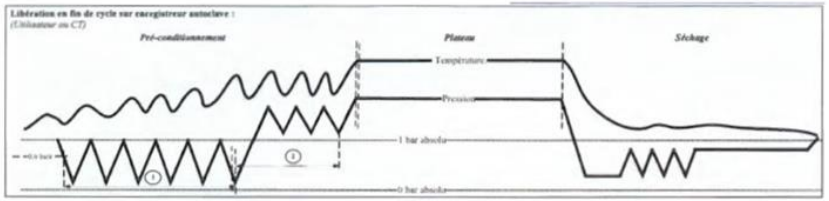


Some popular reasons given to “flash” sterilize in hospitals.

- CSSD staff under tremendous pressure to supply goods in time to theatre, looking for the shortest possible cycle. (Some doctors, a driving force of this practice.)
- Not enough instrument sets available for the day.
- Instruments that mistakenly fall onto the floor to be re-sterilized.
- Some suppliers indicate “Flash” sterilization to be used for

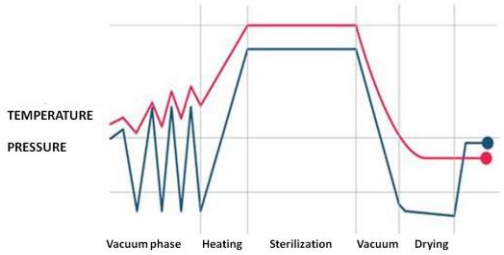
  some of their products – Example: Batteries, wrong perceptions

  of the actual sterilization cycle parameters like temperature exposure time.



Factors driving the decision

- Cleaning and drying of instruments before sterilization (Principle of sterilization)
- Possible contamination through touch or airborne contaminants during transportation to theatre.
  - Bacteria, fungi, viruses, Bacterial spores – Some Pathogens
  - Not a wrapped instrument set, no true bacterial barrier used on the item.
- Shortest cycle

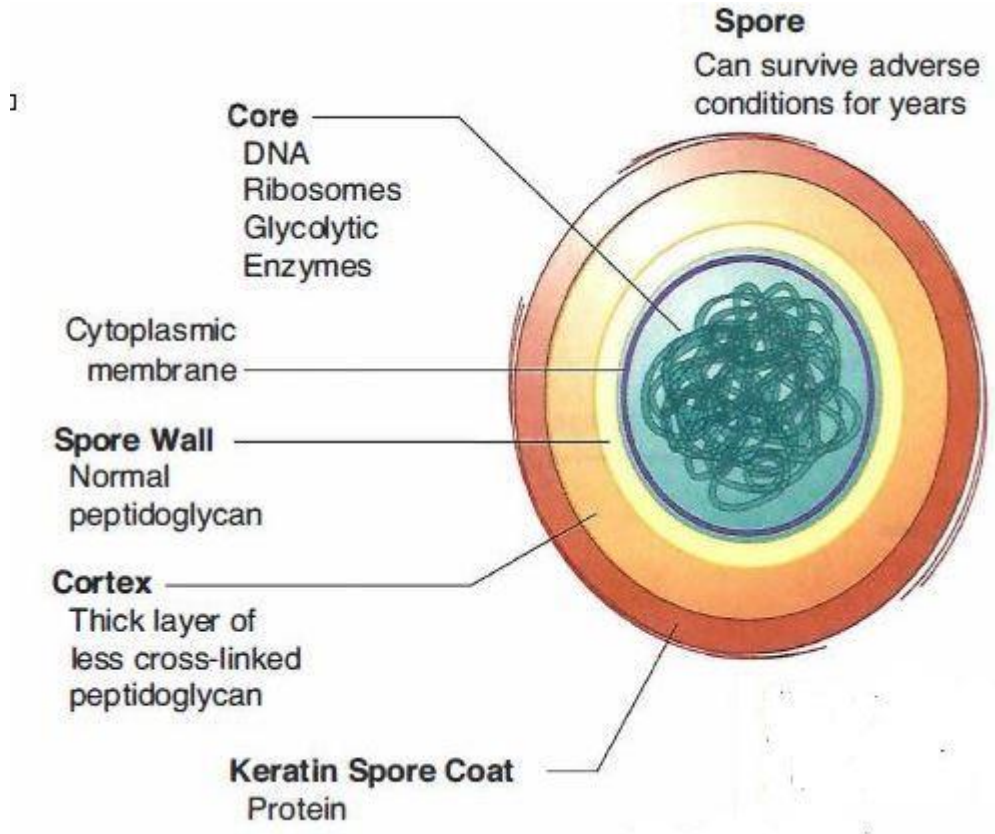


Principle of sterilization:

- “If you cannot clean / dry a item before sterilization, you cannot sterilize that item”

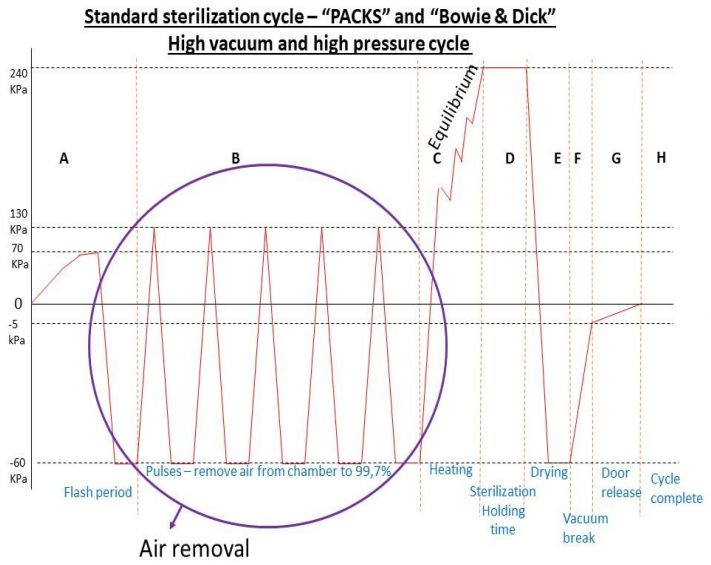
Bacterial spores can be incapsulated into blood or mucous and can survive steam sterilization.

Bacterial Spore Structure

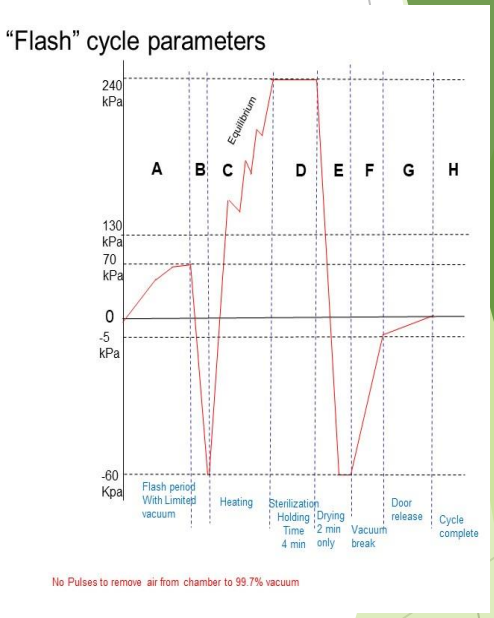


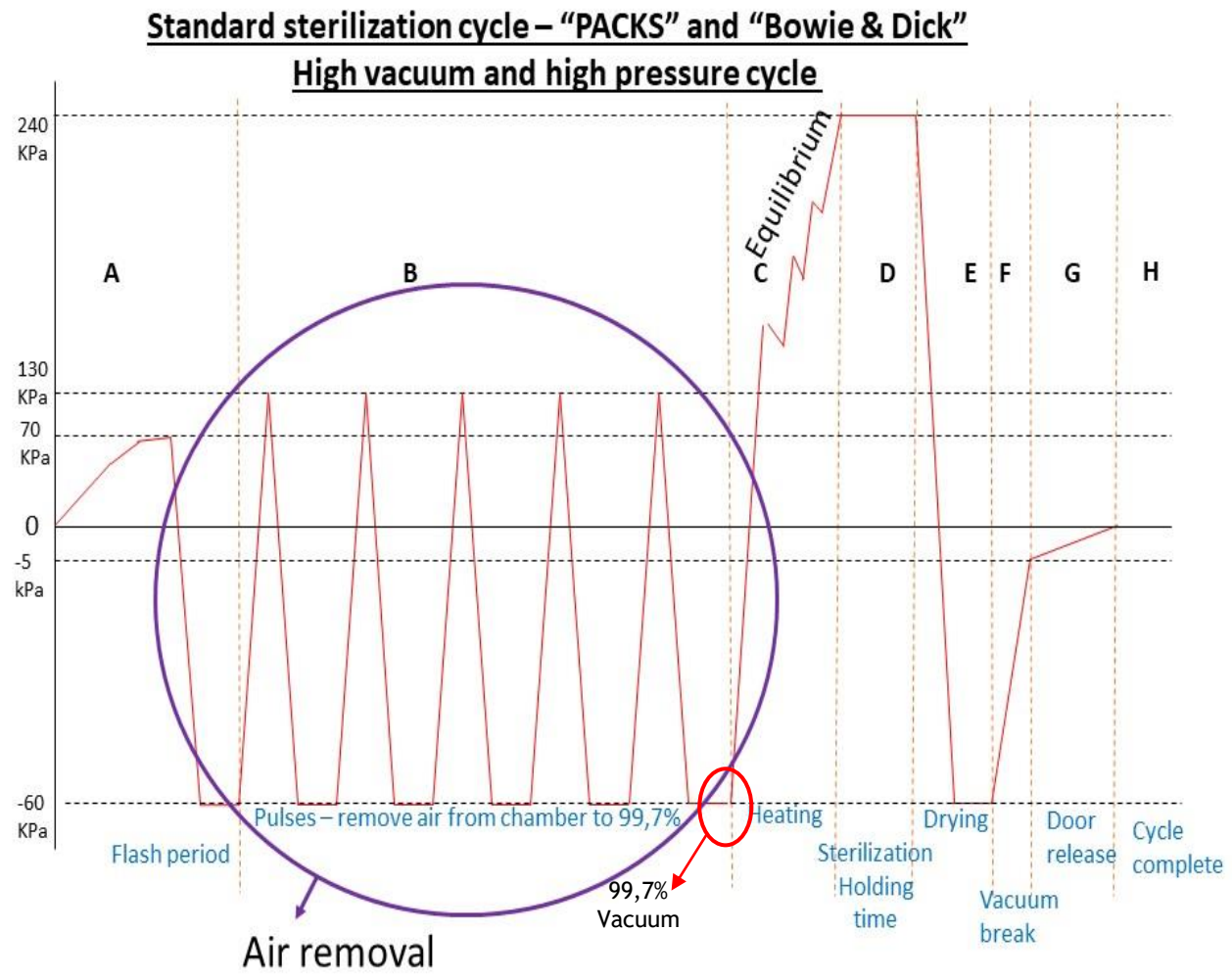
Very hard to kill
Can be a pathogen!!

Let’s compare a normal “Packs” cycle with a “Flash” cycle



To….



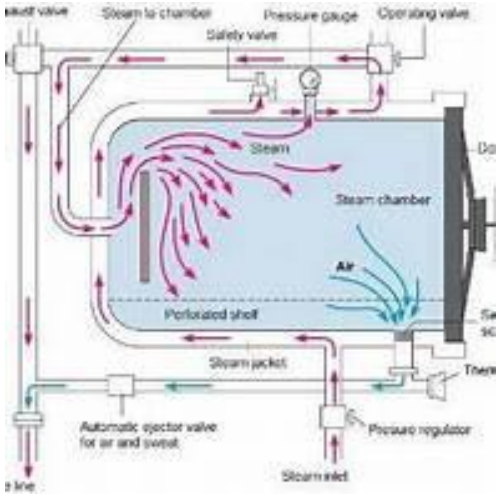


Sterilization holding time in a "PACKS" cycle (D) is 4 minutes at 134ºC
Sterilization holding time in a "Bowie&Dick" cycle (D) is 3,5 minutes at 134ºC (Dedicated cycle)
Total "PACKS" cycle time : 30 to 45 minutes (Size of autoclave and load dependant)

HIGH VACUUM / PRESSURE CYCLE, FACILITATE GREAT STEAM PENETRATION!!

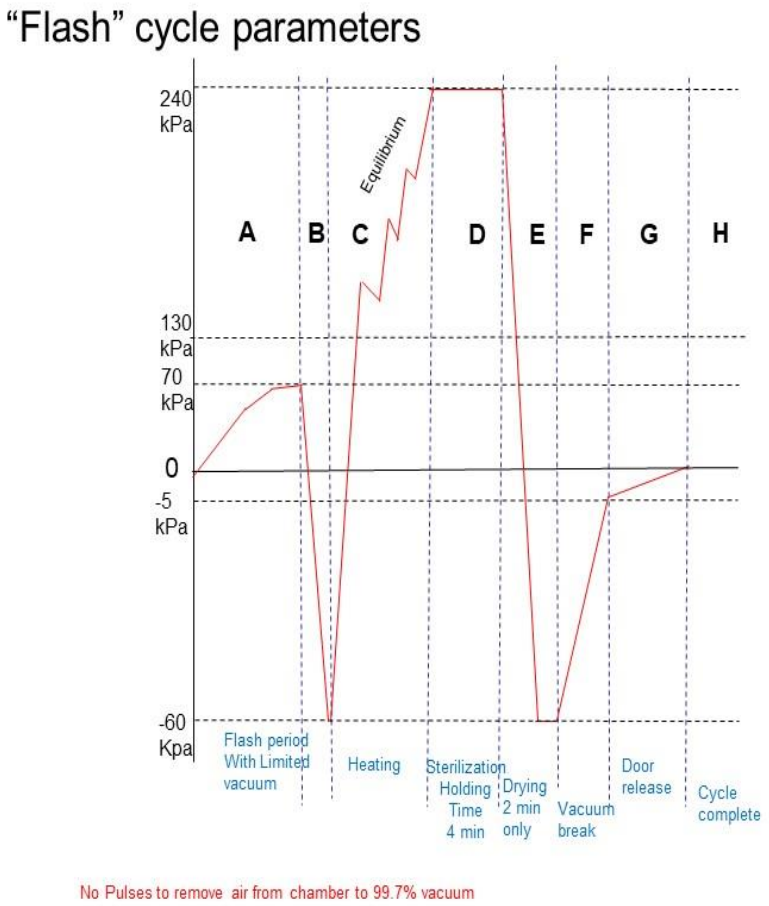
The importance of vacuum in a sterilization cycle – Air removal

- Air must be removed from the autoclave chamber – vacuum pump.
- Vacuum is replaced by steam to facilitate good steam penetration to all goods sterilized. Air / water are insulators to steam penetration (Cold spots)
- That is why a “Bowie&Dick” test is used before goods are sterilized. Checks the autoclave’s ability to remove air / correct temperature, 134ºC
  - Any air in the chamber and the B&D test will show that- possible air leak.
  - Steam cannot penetrate air!
  - Any air around a instrument and that instrument will not be sterilized!!



“Flash” cycle parameters.

- Not a high vacuum cycle – no pulses, does not remove air to 99.7% vacuum.
- Wet cycle – limited drying time.



Choose the right sterilization cycle to achieve the correct result!

- "Bowie & Dick" dedicated test cycle– ±25 Minutes (High vacuum / pressure cycle, 134°C) – Indicate correct steam penetration and temperature.
- "Packs" cycle – 30-40 minutes (High vacuum / pressure cycle, 134°C). Wrapped or porous packs.
- "Container" cycle – 45-50 Minutes (High vacuum / pressure cycle, 134°C). Containerized sterilization
- "Rubber" cycle - 121°C
- "Liquid" cycle - 121°C

- "Flash" cycle 134°C – 15 min but……

  This cycle should be used for what it was designed for!

  The first cycle in the morning, to remove condensate in the system after the autoclave was idle during the night and to optimally warm up the autoclave before doing the B&D, Biological indicator and normal "Packs" or "Container" cycles for the day.

So, what are the risks for immediate use “Flash” sterilization??

Summary
“Flash” sterilization risks

- Might not achieve 100% sterilization during a “Flash” cycle.
  - Not a high vacuum cycle, limited steam penetration as air is present and steam cannot penetrate air.
  - Wet cycle, lots of moisture present (Condensate).
- Temptation not to correctly clean the instruments before sterilization.
  - Possible encapsulation of bacterial spores into blood or mucous (Microbes not 100% killed)
- Contamination risk during transport to theatre - touch and airborne contamination.
- Risk of burns when instruments are used directly after the cycle.
- Patient safety – Sepsis and possible death.

Knowing what you know now, will you lie on the table knowing that an item will be used on you that was only “Flash” sterilized??

Nurse's Pledge of Service

The total health of my patients will be my first consideration.

I make these promises solemnly, freely and upon my honour.

References

- The Surgical Technologist – Jinnie Cook (March 2008)
- ISO 17665
- SANS 982-2009
- ISO 13485 - 2016
- AAMI
- CDC – Centre for disease control and prevention.
- EN 556-1
- Schneider Electric - Eurotherm