Cleaning Packaging & Sterilization of Dental Instruments

Responsibility

- One of the most important responsibilities of the office is to process contaminated instruments for reuse.
- Instrument processing involves much more than sterilization.
- Sterilization is a process intended to kill all microorganisms and is the highest level of microbial destruction.

Sterilization

- Sterile is an absolute term. There is no such thing as "partially sterile" or "almost sterile."
- Sterilization destroys all microbial forms, including bacterial spores.
- All reusable items that come in contact with the patient’s blood, saliva, or mucous membranes must be heat-sterilized.
- It is advised not to use a liquid sterilant for any item that can withstand heat sterilization or is disposable.

Classification of Instruments

- Instruments and equipment are divided into three classifications:
  - Critical
  - Semicritical
  - Noncritical
- The classifications are used to determine the minimal type of post-treatment processing.

SIX RECOMMENDED STEPS

1. Cleaning
2. Inspection
3. Packaging
4. Sterilization
5. Storage & Delivery
6. Quality Assurance Program
**STEP 1 - CLEANING**

- Appropriate attire
  - PPE
- Transport
  - Rigid leakproof container

**Personal Protective Equipment**

You must *always* use personal protective equipment, when processing instruments.

- utility gloves
- mask
- protective eyewear
- clothing

**Instrument Processing Area**

- The *instrument processing area*, or sterilization area, should be centrally located in the dental office.
- The "ideal" instrument processing area should be dedicated only to instrument processing.
- Good air circulation is necessary to control the heat generated by the sterilizers. The size of the area should accommodate all the equipment and supplies necessary for instrument processing.
- There should be a deep sink with hands-free controls for instrument rinsing.

**Basic Principles for Work Flow Pattern**

- Processing instruments should proceed in a single loop, from dirty through clean to sterile, without ever doubling back.
- If the instrument processing area is small, you can use signs to separate the contaminated and clean areas.
- This method works well to prevent mixing of contaminated and sterile items in a small sterilization area.

**Contaminated Area**

- All soiled instruments are brought into the *contaminated area*.
- Any disposable items not already discarded in the treatment room are disposed of as contaminated waste.
- The contaminated area contains clean protective eyewear and utility gloves, counter space, a sink, a waste disposal container, holding solution, ultrasonic cleaner, eyewash station, and supplies for wrapping instruments before sterilization.
- *Note: Soiled and clean instruments are never stored in the same cabinet.*
NEUTRAL pH DETERGENT

• Mechanically clean
• Ultrasonic
• Instrument disinfectors
• Neutral pH detergent

Ultrasonic Cleaning

• Used to loosen and remove debris from instruments and reduce the potential of hand injuries from cuts and punctures during the cleaning process.
• Puncture-resistant utility gloves, a mask, protective eyewear, and a protective gown should always be worn when using the ultrasonic cleaner.
• The ultrasonic cleaner works by producing sound waves, which are beyond the range of human hearing.
• The time may vary from 5 to 15 minutes, depending on the amount and type of material on the instruments, and the efficiency of the ultrasonic unit.

ULTRASONIC CLEANER

Cavitation
- Microscopic bubbles that collapse and remove debris

Ultrasonic Cleaning Solutions

• Use ONLY the ultrasonic solutions that are specially formulated for use in the ultrasonic cleaner.
• DO NOT use other chemicals such as plain disinfectants in the ultrasonic cleaner.
• Specific ultrasonic solutions are available that remove difficult materials, such as cements, tartar, stains, plaster, and alginate.
• The ultrasonic cleaning unit should be labeled with both a chemical label and a biohazard label because it contains a chemical and contaminated instruments.

Automated Instrument Washers/ Disinfectors

• Automated instrument washers/disinfectors look and work very much like a household dishwasher.
• They must be approved by the U.S. Food and Drug Administration (FDA) for use with dental instruments.
• These units use a combination of very hot water recirculation and detergents to remove organic material, and then instruments are automatically dried.
• They have a disinfecting cycle that subjects the instruments to a level of heat that kills most vegetative microorganisms.
• Instruments processed in the automatic instrument washers/disinfectors must be wrapped and sterilized before use on a patient.
RINSE AND DRY

Prior to packaging

• Rinse
• Dry

STEP 2 - INSPECTION

Inspect each instrument for remaining debris or damage:

As needed

• Reclean
• Replace

RECLEAN or REPLACE?

STEP 3 - PACKAGING

• Clean area
• Low contamination
• FDA approved materials only
  • Pouches or Tubing
  • CSR wrap

PACKAGING with Pouches

Available in self seal or heat seal design for use with:

Steam
Dry heat
Chemical vapor

Internal and External Indicators
PACKAGING with Pouches

Select appropriate size and be sure to not over load instruments as to hinder sterilant contact.

PACKAGING with CSR Wrap

• Instrument cassettes
• Instrument trays

REUSABLE or DISPOSABLE?

Select appropriate size and be sure to use 2 sheets to meet the manufacturer’s performance claims.

Add multiparameter chemical indicator inside each pack.

STEP 4 - STERILIZATION

• Place pouched items on top shelf, using a rack
• Wrapped packs (being heavier) should be placed on the lower shelf.

BE CAREFUL

THIS MACHINE HAS NO BRAIN
USE YOUR OWN
**STEAM UNDER PRESSURE**

Example of exposure times:
- 250°F/121°C for 15 - 40 minutes
- 270°F/132°C for 3.5 - 12 minutes

**OTHER STERILIZERS...**

Although the CDC recommends STEAM sterilization where possible, Chemical vapor and Dry heat sterilizers are also used in dental offices.

**CHEMICAL VAPOR**

Limitations:
- Load size: maximum weight = 3.3 lbs per load.
- Packaging: paper/plastic pouches or disposable wrap only – do not use linen, textiles or fabrics. Also, no sealed containers, nylon tubing or nylon bags.
- CI’s & BI’s: use only FDA approved indicators.

**DRY HEAT - Convection**

CDC recommends
- 320°F
- 1 to 2 hours

Limitations:
- Load size
- Packaging
- Special CI’s & BI’s

Limitations:
- Larger loads will need long exposure times.
- Packaging:
  - Paper bags at lower temperatures
  - Use nylon tubing or bags at higher temperatures
  - No linen or disposable CSR wraps.
- CI’s & BI’s:
  - Use only FDA approved indicators.
Correct Loading of a Steam Sterilizer

Dry Heat Sterilizer

Statim

Dry Heat - Rapid Heat Transfer

Limitations:
- Load size: Very small sterilizer chambers.
- Packaging: Nylon tubing or bags only.
  - No paper or paper/plastic pouches,
  - No linen or disposable CSR wraps.
- CI's & BI's: Use only FDA approved indicators.

375°F for as little as 6 min. total time, unwrapped.

Limitations:
- Load size
- Packaging
- Special CI's & BI's

STEAM: THE PREFERRED

CDC as the sterilizing process of choice, where possible.

Advantages:
- Fast & reliable
- Choice of packaging
- Choice of CI's & BI's
STERILIZATION

Try to ensure that all the packs are completely dry before removal from the sterilizer.

STEP 5 - STORAGE & DELIVERY

The storage area for sterilized packages:
- Clean
- Dry
- Away from contamination

STERILITY MAINTENANCE

Remember:
Sterility is event-related - NOT time-related:
- inspect packs
- do not use
  - if opened
  - damaged

OPEN AT POINT OF USE

Opening sterile packages at the point of use:
- ensures patients’ confidence
- Compliant with CDC aseptic practices

STEP 6 - QUALITY ASSURANCE

Chemical indicators printed on:
- pouches
- autoclave tape

CHEMICAL INDICATORS

Indicators will turn with heat alone:
- not a sterility indicator
- only a process indicator
MULTI-PARAMETER CI’s

Chemical indicators that turn when all conditions for sterilization are met are called multiparameter indicators.

INSIDE EVERY POUCH

- Multiparameter indicator
- Remove excess air before sealing

Embedded Internal Indicator

SPORE TESTING

Biological indicators (spore tests) prove sterilization was achieved and should be run weekly in a full load, along with the other packs.

IN-OFFICE SYSTEM

STEAM
Self-contained BI’s have spores and media in a plastic vial.
The vial is activated after processing, then incubated for 48 hrs. at 56°C.

IN-OFFICE SYSTEM

Additional example of biological indicators for sterilizer monitoring via spore ampules.
IN-OFFICE SYSTEM

Steam, Dry heat, EO or Chemical vapor

Process strip, then transfer to media. Incubate at 56°C for Steam & C-vapor or 37°C for EO Gas & Dry heat.

MAIL-IN SYSTEM

ALL Processes - Steam, EO gas, Dry heat or C-vapor

Some users prefer to mail-in their test to an independent Lab for 3rd party verification.

PassPort®Plus SYSTEM

An Immediate Read-out Mail-In BI System

...certified for use with all Steam cycles (gravity, vacuum or flash).

STERILIZER FAILURE?

Human error is the most common cause:

• Cold start
• Wrong cycle
• Overloading
• Improper packaging

Remember and use these 6 steps for proper sterilization...

1. Cleaning
2. Inspection
3. Packaging
4. Sterilization
5. Storage & Delivery
6. Quality Assurance Program