

Training Module

Cleaning: Instrumentation



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RINSING

Immediately after surgery, rinse instruments under warm (not hot) running water. Rinse should remove most blood, fluids and tissue.

DISINFECTING

To protect medical personnel from accidental contamination during cleaning, instruments should be disinfected.

1) Enzymatic cleaner.

To avoid blood and other proteins from sticking to instrument surfaces, an enzymatic cleaner bath (soak) should be used on all instruments. After soaking for at least 10 minutes, rinse instruments under running tap water.

2) Disinfectant

Immerse instruments completely in an EPA approved disinfectant for another 10 minutes or more. Then rinse again.



WARNING: BLEACH

Never expose stainless steel instruments to bleach or other corrosive chemicals for the purpose of disinfection. Exposure to bleach will result in severe pitting of your instruments and void all manufacturers' guarantees.



STERILE v DISINFECTED

Sterile: an absolute term, no living organism survives. Disinfected: a relative term, basically clean.



REMEMBER: PROPER TECHNIQUES

Always use the proper sterilization/cleaning technique to render the instrument in the required condition for use.

CLEANING

Instruments should be submerged in a solution of distilled water and neutral pH (pH 7) detergent such as MetriZyme (Dual Enzymatic Detergent). That said, there are three methods for cleaning your instruments:

1) Ultrasonic Cleaning

Place instruments in open position into the ultrasonic cleaner. Make sure that “Sharps” (scissors, knives, osteotomes, etc.) blades do not touch other instruments. All instruments have to be fully submerged. Instruments should be processed in the ultrasonic cleaner for the full recommended cycle time — usually 5 to 10 minutes. A lid should cover the ultrasonic cleaner during operation to avoid splashing.

Change solution frequently — at least as often as manufacturer recommends. Rinse instruments after ultrasonic cleaning with water to remove ultrasonic cleaning solution.

2) Automatic Washer Sterilizers

Follow manufacturers’ recommendations but make sure instruments are lubricated after last rinse cycle and before sterilization cycle.

3) Manual Cleaning

If ultrasonic cleaning is not available, observe the following 5 steps:

1) Use stiff nylon cleaning brushes. Do not use steel wool or wire brushes except specially recommended stainless steel wire brushes for serrated areas or on bone files, burs or on stained areas in knurled handles.

2) Use only neutral pH (7) detergents because if not rinsed off properly, low pH (acidic — less than 6 pH) detergents will cause breakdown of stainless protective surface (pitting) and black staining. High pH detergents (alkaline — more than 8 pH) will cause surface deposit of brown stain (phosphates) which will also interfere with smooth operation of the instrument. Most brown stains are not rust — but merely a high pH surface (phosphate) deposit.

3) Brush delicate instruments carefully and, if possible, handle them totally separate from general instruments.

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4) Make sure all instrument surfaces are visibly clean and free from stains and tissue. This is a good time to inspect each instrument for proper function and condition.

Check and make sure that:

- Scissor blades glide smoothly all the way (they must not be loose when in closed position). Test scissors by cutting into thin gauze or surgical glove material. Three quarters of length of blade should cut all the way to the scissor tips, and not hang up.
- Forceps (pickups) have properly aligned tips. Teeth must meet properly — without catching action. Hemostats and needle holders should not show light between the jaws — when closed in the first ratchet position (hemostats may show a small open space — half way in from the closed tips), lock and unlock easily and joints are not too loose.
- Needle holders show no sign wear on jaw surfaces.
- Suction tubes are clean inside.
- Biopsy Punches operate properly — try punching a clean hole through tissue paper.
- Retractors function properly.
- Cutting instruments and knives have sharp, undamaged blades.

5) After scrubbing, rinse instruments thoroughly under running water. While rinsing, open and close scissors, hemostats, needle holders and other hinged instruments to make sure the hinge areas are rinsed out, as well as the outside of the instruments.



WARNING: MIXING METALS

Do not place dissimilar metals (stainless, copper, chrome plated, etc.) in the same cleaning cycle.



CAUTION: MANUAL CLEANING

Most instrument manufacturers recommend ultrasonic cleaning as the best and most effective way to clean surgical instruments, particularly those with hinges, locks and other moving parts.



REMEMBER: AFTER CLEANING

If instruments are to be stored, let them air dry and store them in a clean and dry environment.

STERILIZING

There are two accepted ways to sterilize instrumentation: Autoclaving, and Cold Sterilization.

1) AUTOCLAVING

Perhaps the more popular of the two procedures, autoclaving is a simple process if instructions are learned and understood beforehand.

a) Lubricate all instruments which have any “metal to metal” action such as scissors, hemostats, needle holders and self retaining retractors, etc. Recommended non-silicone, water soluble surgical lubricants. Do not use industrial lubricants.

b) Put instruments up for sterilization either individually or in sets...

Individual Instruments

Disposable paper or plastic pouches are ideal. Make sure you use a wide enough pouch (4" or wider) for instruments with ratchet locks such as hemostats and needle holders so the instrument can be sterilized in an open (unlocked) position.

If you wrap instruments, make sure your towels do not contain detergent residue which can stain your instruments. Make sure the towels used in sterilization of instruments have no detergent residue and are neutral pH (7) if immersed in water. This can be a real problem as laundries frequently use inexpensive but high pH (9-13) detergents and do not properly rinse out or neutralize those detergents in the final wash/rinse cycle. Also, sometimes bleaches are added and are not neutralized. Hospitals use a “sour” rinse cycle to neutralize all detergent residue.

Instrument Sets

Unlock all instruments and sterilize them in an open position. Place heavy instruments on bottom of set (when two layers are required). Place towel

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on bottom of pan to absorb excess moisture during autoclaving. This will reduce the chances of getting “Wet Packs.”

With most portable, tabletop autoclaves, at the end of the autoclave cycle — before the drying cycle — unlock door and open it no more than a crack about 1/4" (6.4mm). Then run dry cycle for the period recommended by the autoclave manufacturer. If the autoclave door is opened fully before the drying cycle, cold room air will rush into the chamber, causing condensation on the instruments. This will result in water stains on instruments and also cause wet packs.



WARNING: LOCKED INSTRUMENTS

Locking instruments during autoclaving will cause cracked hinges (box locks) and other defects because of heat expansion. Also, locked instruments block steam from reaching the entire surface area, leaving the instrument contaminated.



WARNING: OVERLOADING CHAMBER

Do not overload autoclave chamber as pockets may form that do not permit steam penetration.



REMEMBER: CHANGE FILTERS

Make sure autoclave filters and chambers are cleaning periodically.

2) COLD STERILIZATION

Most cold sterilization solutions render instruments sterile only after a ten hour immersion. This prolonged chemical action can be more detrimental to surgical instruments than the usual 20 minute autoclave cycle. If the instruments need to be “disinfected” only, a cold sterilization soak is okay as disinfection will take place in 10 minutes or more. Check manufacturer specifications.



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CAUTION: SPECIAL CARE FOR TUNGSTEN

For instruments with Tungsten Carbide inserts (needle holders, scissors, dressing and tissue forceps, which are identified with gold handles), we do not recommend the use of cold sterilization solutions containing Benzyl Ammonium Chloride which will soften and deteriorate the Tungsten Carbide inserts.