



Sterile Processing In-Service

Protecting Your Surgical Instrument Investment

- A good maintenance program protects the considerable financial investment you have made in these devices. Surgical instruments can be expensive. The cost of preventative care is minimal when compared to the cost of replacing instruments.

The Look and Feel of New Instruments

- Most professionals will recognize that new instruments feel different. Newer instruments tend to be harder, with a stiffer feel to them. That's because as instruments age, they soften with use and sterilization. With proper care, these devices can last a lifetime. It's important to realize, however, that all surgical instruments will experience softening over time. Remember, new instruments are designed to be stiff at the onset of use. The idea is to use them for their designed purpose and always properly clean, lubricate, and perform preventative maintenance.

Sterilization of Surgical Instruments

- All surgical instruments must be sterilized prior to surgery to prevent infection. But even sterilization can leave contaminants behind if not properly cleaned. Sterilize instruments with the ratchets open. This allows for better steam penetration. Plus, it prevents the box locks (hinge area) from cracking. If using a pan or tray, we recommend one with perforations. This will also enable better steam penetration and aids in more effective drying as well. For efficiency, place heavy instruments at the bottom and lighter, more delicate instruments on top. If sterilizing in paper or plastic pouches, do not stack pouches on top of one another during sterilization. When possible, pouches should be sterilized on their side, leaning against a pack or sterilizer chamber wall.

Surgical Instrument Testing

Scissor Sharpness

- Using scissor test material, make several complete cuts through the material, cutting all the way through to the distal tip (where scissors most often dull). Red material is used for scissors measuring 4.5" to 12" in length, while yellow material is used for scissors measuring 3" to 4" in length. The test will indicate satisfactory sharpness. Be sure scissors cut all the way to the tip.

Needleholder Jaw Wear

- Visual examinations best. Jaw wear at the distal tips will be noticeable, needle holder jaw "tread" always wears out and always wears out at the tip.

Kerrison Rongeur

- Sharpness of a rongeur can be tested by using a 3" x 5" index card. The rongeur should take a clean bite out of the card.

Bone Cutter

- Bone cutting rongeurs should be able to cut through a 3" x 5" index card.

Laparoscopic Scissor

- To test the sharpness, cut through a single layer of tissue paper. The scissor should cut through cleanly.

Proper Care and Scheduled Preventative Maintenance

- Proper care of surgical instruments begins with appropriate cleaning. This guide discusses various proper washing, cleaning and sterilization of many types of surgical instruments. Proper care also means maintenance of German-made instruments on a regular basis, consisting of sharpening and restoration. A general rule of thumb for busy practices is to schedule maintenance every six months.

Instruments that may require this maintenance include:

- Scissors
- Needleholders
- Bone Cutters
- Hemostats
- Osteotomes
- Rongeurs
- Chisels
- Bone Curettes
- Knives
- Punches

Sharpening Surgical Instruments

- Discovering in the operating room that your instruments or scissors do not cut would be frustrating for anyone. Precision sharpness is an absolute prerequisite for any surgical procedure. The best strategy is a proactive approach with an established routine inspection and regular sharpening maintenance program. Cutting devices should be sharpened every 6-8 months. Those instruments which require sharpening most often include:

- Scissors
- Bone Cutters
- Osteotomes
- Rongeurs
- Chisels
- Bone Curettes
- Knives
- Punches

Enemies of Surgical Instruments

- Water and moisture of any kind (especially blood, pus, surgical debris and chlorhexidine solutions) are the primary causes of staining and pitting of surgical instruments allowing any type of moisture to air-dry on your instruments will cause severe damage. Other enemies include cold soaking or washing instruments with inappropriate solutions such as dish or laundry soap, bleach, iodine-type solutions, general disinfectants, surgeon's hand scrub and most importantly, any solution that contains chlorhexidine or is a chloride-based solution. Surgical instruments are made from 300 and 400 series stainless steel. Despite its name, stainless steel definitely stains and it can also rust and become pitted.

Cleaning Surgical Instruments After Surgery

- The washing process should begin within 20 minutes after surgery, even if sterilization will take place much later. Washing surgical instruments within a few minutes of surgery prevents blood from drying and is your best defense against corrosion, pitting and staining.

- Only use approved solutions for washing, disinfecting and lubricating. Non-approved solutions are any that do not specifically state on the label: "for surgical instruments".
- Approved solutions are specially designed for surgical instruments and the sterilization cycle. Their product labels will state this use.

Lubrication

- One of the easiest, yet most effective ways to keep instruments in excellent condition is to lubricate them after every cleaning. Proper lubrication keeps the moving parts of instruments from rubbing and scraping, thus preventing dulling and strain to joints and hinges. Moving parts on instruments, such as joints, box locks, ratchets, and screw joints, should be lubricated regularly. Before autoclaving, lubricate all instruments that have moving parts. Only use water-based surgical lubricants because they are steam penetrable.

TIP: It is not recommended to use a lubricant bath because the container of the lubricant solution may contain certain bacteria from previous instruments dipped into this bath. A lubricant spray is advised. Sprays are safer, cost less, and take up less counter space.

Causes of Corrosion (Staining, Pitting, and Marking) on Surgical Instruments

Surgical Residues

- Blood, pus, and other secretions contain chloride ions which lead to corrosion most often appearing as dark spots. If blood is left on the instruments for any period of time (20 minutes or longer), the instrument will mark and stain, especially if these residues are allowed to dry. Therefore, always clean and dry every instrument thoroughly after use. Only sterilize a clean instrument. The most damaging procedure is to allow dried-on debris to become baked-on stains in the autoclave. The temperature of the autoclave (250°-270°) will cause chemical reactions that can make the stain permanent. Remember, an autoclave does not clean; it will only sterilize.

Tap Water

- Even tap water can stain an instrument. Tap water contains a high concentration of minerals which can contain chlorine which can be seen as a fine deposit (water spots) on the instrument surface. Rinsing with distilled water eliminates such deposits. Water with high mineral counts left to sit on an instrument can cause severe stains. Therefore, it is important to towel dry your instruments immediately and thoroughly, and never allow air-drying.

Cleansers

- The cleansers and cleaning agents you use could also be a cause of corrosion. Strong substances, as well as those containing a chemical make-up of acid or alkaline-based solutions can lead to pitting and staining. Wash instruments with a neutral pH soap (between 7pH - 8pH) that is designed for surgical instruments for optimal results. Anything with a higher pH may damage the instrument. Do not use dish soap, iodine, bleach, cold-soak solution, chlorhexidine-based solutions, laundry soap or surgeons hand scrub. These products will cause spotting and corrosion. Using an instrument cleaning brush is recommended, especially for jaw serrations, teeth and hinged areas.

Rust vs. Stains

- Stains can be removed, whereas rust will leave permanent damage. To determine if a brown/orange discoloration is a stain or rust, use the eraser test. Rub a pencil eraser aggressively over the discoloration. If the discoloration is removed with the eraser and the metal underneath is smooth and clean, this is a stain. If a pit mark appears under the discoloration, this is corrosion or rust.

Pakistan-Made Instruments

- These lower-cost, lower-quality instruments can be processed and sterilized along side German-made instruments. However, Pakistan-made products rust quicker and this rust can damage your high-quality instruments during sterilization. Therefore, if instruments begin to break down (rust), remove them from the surgery pack and dispose of them immediately. Always remember, when it comes to surgical instruments, the lower the price, the lower the quality and the lower the durability.

Wrapping Materials, Surgical Towels, and Drapes

- Wrapping of surgical instruments is essential in the sterilization process. If your practice uses re-usable towels and drapes, please be certain to use as little laundry detergent as possible. Towels and drapes can retain soap particles. During the autoclave cycle, steam passes through the fabric, picking up these soap particles and depositing them on the surface of the instruments. One suggestion for preventing this is to run an extra rinse cycle to remove excess soap particles. Also, if your instrument packs are coming out wet, we suggest a towel be placed inside the pack to absorb moisture and that you increase the dry time of the autoclave cycle.

Testing Your Ultrasonic Cleaning Machine

- To determine if your machine is working properly, simply put water and properly mixed ultrasonic solution in the tank. Turn on machine and view the surface of the water. If you see "sonic" waves your machine is working. If the surface of the water is totally flat, your machine may have a problem with the transducer(s).
- The second test is called the foil test. Simply place a small piece of aluminum foil in the bottom of a filled tank and run for 5-8 minutes. Remove foil and it should be pelted with small holes and dents. This verifies that the ultrasonic machine is working properly.