

Tips On Proper Instrument Cleaning, Handling and Maintenance

Rinsing

- Immediately after instrument use thoroughly rinse off all blood, tissue and other fluids.
- Using filtered water to rinse and wash your instruments will provide the best care for your instruments. Unfiltered water/tap water can introduce minerals onto your instrument's surface which can then oxidize during sterilization.

Cleaning: ultrasonic

- If cleaning is not to be done immediately after use keep your instruments in a solution of water and neutral PH (7) detergent.
- Ultrasonic cleaning is one of the most effective cleaning methods. When using the ultrasonic make sure to clean for the full recommended cycle time.
- Clean all hinged instruments in a fully open position. This will allow all parts of the instrument to be thoroughly cleaned.
- All instruments must be fully submerged in the cleaning solution for them to become thoroughly cleaned.
- Do not mix sharp instruments (like scissors or chisels) with other instruments (such as non-stick composite instruments) in the same cleaning batch. The movement caused during cleaning can scratch the surface of the less sharp instruments.
- Keep separate dissimilar metals during cleaning (don't mix stainless steel with chrome plated instruments for example).
- Change your ultrasonic solution frequently. Dirty solution does not make a clean instrument.
- Rinse instruments thoroughly with filtered/distilled water to remove cleaning solution. If tap water is used make sure to completely dry the instrument so no minerals are left behind.

Cleaning: manual

- If cleaning is not to be done immediately after use keep your instruments in a solution of water and neutral PH (7) detergent.
- Using filtered water to rinse and wash your instruments will provide the best care for your instruments. Unfiltered water/tap water can introduce minerals onto your instrument's surface which can then oxidize during sterilization.
- Ultrasonic cleaning is one of the most effective cleaning methods. If you are going to manually clean please follow these steps.
- Use stiff plastic or nylon cleaning brushes. Do not use steel wool or wire brushes except for stainless steel brushes. These stainless steel brushes are for cleaning items like bone files and getting stains out of the knurled areas on handles.
- Use only neutral detergent PH (7). If not rinsed properly low PH detergents will cause the breakdown of the protective coating on stainless steel and black staining. High PH detergents will cause a brown staining and surface deposits that will not allow smooth operations of hinged instruments.

- Manual cleaning is recommended for very delicate instruments like micro surgical and Castroviejo patterns for longer life.
- After thoroughly scrubbing, rinse the instrument completely. Opening and closing the hinged instruments to make sure that all debris and cleaning solution are out of the hinge.

Cleaning, automatic washers/sterilizers

- Using filtered water to rinse and wash your instruments will provide the best care for your instruments. Unfiltered water/tap water can introduce minerals onto your instrument's surface which can then oxidize during sterilization.
- Follow the manufacturer's recommendations for proper use of this type of equipment.
- Make sure to lubricate your instruments after the last rinse cycle and before the sterilization cycle.

Instrument inspection

- After the instruments have been cleaned and fully dried is a perfect time to inspect them for signs of wear, for proper function and/or breakage.
- Check scissors to see that they work smoothly and that they are not loose when in the closed position. Test scissors for sharpness by cutting some thin gauze. A good scissor should be sharp from the tip of the instrument to three quarters of the length of the blade. They should cut smoothly and not hang up in the gauze.
- Tissue and extraction forceps should have properly aligned jaws and operate smoothly.
- Needle holders and hemostats should have jaws that close securely. When they are closed look to see if light gets between the jaws, also check for wear on the jaw surface.
- Sharp edged instruments should have smooth un-chipped blades and working surfaces. Elevators and similar instruments should have unbent shafts.
- If any of these conditions show themselves take them out of circulation for resharpener, repair or replacement.

After cleaning and inspection

- If instruments are not to be reused, store them in a clean and dry place.
- If instruments are to be reused or autoclaved follow these steps.
- Lubricate all instruments that have any hinges (scissors, forceps etc.) Use a surgical lubricant like instrument milk. DO NOT use WD-40 type oil or other industrial lubricants.
- When you are ready to autoclave place your instruments in either disposable paper or plastic sterilization pouches or sterilization cassettes. Make sure that all hinged instruments are autoclaved in an open (not locked) position. Sterilizing in a locked position can cause two problems. One, steam may not reach into the hinged area to sterilize the instrument properly and two the hinge can develop cracks due to heat expansion.
- When autoclaving sets of instruments together place the heaviest instruments on the bottom of the pack to avoid damage to more delicate instruments.
- Do not overload your autoclave. Overloaded autoclaves can have places that the steam cannot penetrate and thus leaving areas unsterilized.
- Some practices like to place a towel in the bottom of the autoclave to absorb extra moisture during sterilization. If you use a towel make sure the detergent used to wash the towel is a neutral PH (7). This can be a bit of a problem since many laundries use high PH (9-13) detergents and they do not properly rinse out the detergent in the final wash/rinse cycle. Also many times the bleach is not neutralized.
- At the end of the autoclave cycle-before the drying cycle-unlock the autoclave door and just crack

it open slightly (around 3/4 of an inch). Then run the drying cycle for the time span recommended by the autoclave manufacturer. If the autoclave door is fully open during the drying cycle the cool air hitting the hot chamber will cause condensation on the instruments. This will result in water stains and wet packs.

Tips for long instrument life

- Use instruments only for their intended purpose. Improper use can cause damage and breakage. Always sharpen to proper angles. If one has no sharpening training leave this procedure for office staff that does or for a professional resharpener service. Handle your instruments gently and avoid overstraining them.
- Use distilled or demineralized water, tap water will leave stains.
- Do not use steel wool, wire brushes or high PH detergents. Your stainless steel instruments have a “skin” (formed during the passivation process). Treating this skin right (with proper care techniques) will cause the instruments to continually passivate themselves over the hundreds of cleanings, lubrications, dryings and sterilizations they will endure. In other words as your instruments get older they will get a thicker “skin” and continue to look good.
- Clean and sterilize hinged instruments in the open position. This will stop debris from building up in the hinge which can cause stiff movement, misaligned jaws and cracks in the hinge area due to heat expansion. Again always properly lubricate.
- For your carbide instruments, make sure that the detergents and lubricants are of a neutral PH (7). High PH will break down the carbide and it will deteriorate prematurely. Low PH will begin to break down the material that adheres the tungsten carbide to the stainless steel instrument and the carbide will lose hardness.

Types of instrument discolorations and causes

Spotting or staining can be avoided by using proper care techniques. Following are some of the types of stains that can occur and their causes:

- Light/Dark Spots: Slow evaporation of water condensation. Mineral deposits are left behind as a result of using tap water. Use of distilled or demineralized water will eliminate this problem. Spots can also be caused by opening the autoclave door before steam is completely gone and slow drying occurs. Spots can also be caused by reusable instrument wrappers. During laundering process make sure the wrappers are thoroughly rinsed of any detergent residues. Residues will be carried onto the instrument surface during steam sterilization.
- Slight Brown/Blue Stains: A dull brown or blue stain usually is a simple buildup of oxidation on the surface of the instrument (more noticeable on matte finished instruments than high shine instruments). This results from the formation of chromic oxide which forms naturally on stainless steel and prevents atmospheric corrosion.
- Blue Stains: Heavy blue stains are usually the result of cold sterilization solutions. To prevent this make sure the mix of the solution is proper (according to manufacturer specifications) and the solution is changed frequently (again according to manufacturer specifications). Overly long use of the solution will make the solution corrosive. Also use distilled or demineralized water when mixing the solution to help prevent these stains.
- Purplish/Black Stains: This may result from exposure/contact with ammonia. Many cleaning solutions contain ammonia and stains will result if the instrument is not cleaned thoroughly. This also can occur from amine deposits from the autoclave. Clean your autoclave with a cycle of distilled water.
- “Rust” Spots: It is unlikely that stainless steel instruments will rust. What appears as rust is in most cases left behind organic materials or mineral deposits that have baked onto the instrument during autoclaving. If you sterilize instruments with bad, cracked or chipped plating or badly plated carbon steel instruments electrolytic action will carry the carbon particles to the stainless steel and these

particles oxidize and leave “rust” behind. The surface underneath these spots is intact. Stains can be removed in most cases with a pencil eraser. A rust colored film can also be left on the instruments with the use of a water softener.

- Corrosion: The presence of blood or materials in the hinge section of moving instruments can cause corrosion. Corrosion can also be caused by excessive moisture left in instrument hinges, foreign matter in the autoclave and stress corrosion from not keeping hinged instruments open during sterilization. Always clean instruments thoroughly. Make sure to preheat your autoclave and don't rush the drying process. Also clean your autoclave regularly with a solution of equal parts vinegar and distilled or demineralized water (acetic acid). This will remove any impurities that can cause corrosion.
- Pitting: When instruments are exposed to saline solutions, blood, iodine, potassium chloride and other compounds pitting can occur if instruments are not rinsed immediately after exposure. Instruments can also pit when detergents with a high PH are used and they are not rinsed thoroughly and properly. A pitted instrument should be replaced because once pitting has occurred the “skin” of the instrument and it's hardened outer surface have been breached and further pitting and corrosion will occur.

In closing

- Stainless steel instruments are not impervious to stains or corrosion but with proper care and cleaning techniques are extremely durable and resistant to all types of stains and imperfections.
- Proper care (and sharpening) will help an instrument to last as long as possible and help you perform many, many procedures and perform them well.
- Remember sharpening instruments requires, training, skill and practice. Bad technique WILL shorten instrument life and make an instrument an ineffective tool for the professional. If you or someone in your office is not well versed in this skill use a professional sharpening service.
- Never use an instrument that is too dull to perform a procedure. This can result in instrument breakage or damage as well as an incomplete procedure.
- Replacing an instrument when its time has come is the best way to insure that your procedures will go smoothly and reap the most benefit for your patients.



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