Suggestions for Cleaning & Sterilization of Fine Surgical Instrumentation

Water

Tap water should not be used for cleaning surgical instruments as it frequently contains significant quantities of foreign ions that can damage instruments.

High concentrations of chlorides, for example, can lead to pitting and stress-related fractures. Also, the presence of minerals in the cleaning water can discolor the instrument. (These discolorations can be removed by using the appropriate cleaning products.)

To prevent these problems, it is recommended that only salt-free, demineralized water be used for instrument cleaning.

Preparation For Cleaning

Instruments should be cleaned immediately after use. If that is not possible, they should be placed in a basin of distilled water or a solution of neutral pH detergent until such time as cleaning is possible. However, instruments should not be stored in aqueous solutions for prolonged periods. If they are placed in a basin prior to cleaning, the basin should be drained and cleaned daily.

Manual Cleaning Suggestions

1) Check instrument for cracks and chipped areas.
2) Clean instruments immediately after use with a neutral pH solution. Be sure to follow manufacturer's instructions for soak time and mixture ratio.
3) When cleaning, use a soft brush, NOT a steel brush or scouring pad. Clean in open position and pay special attention to removing debris from box locks.
4) Rinse instruments thoroughly after cleaning. Use distilled water, not tap water.
5) Dry instruments with clean, dry, lint-free towels.
6) Before sterilizing, soak the instruments in lubricant for one minute. Do not use dry heat sterilizers.
7) Autoclave according to manufacturer's instructions.

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Carefully follow all manufacturers' instructions regarding solution temperatures, soaking times and mixture concentration. If powdered cleaning solutions are used, be sure that the mixture has had adequate time to dissolve. We recommend using a neutral pH cleaner. Products other than neutral pH can result in instrument damage.

Change the cleaning solution daily. Evaporation can increase the concentration and cause corrosion. Dirty solutions do not clean as effectively.

For manual cleaning, use lint-free, soft textile cloth, paper cloth, soft plastic brushes (toothbrush) or water spray guns.

After manual cleaning, instruments should be rinsed twice, first in tap water and then in distilled water. This two-step rinsing will remove any remnants of surgical debris as well as remove any contaminants that may have been in the tap water.

After rinsing, instruments should be thoroughly dried. If it is possible, forced air should be used for drying. If that is not possible, gently shake the excess water from the instruments and place them on clean, dry, lint-free towels to dry.

Ultrasonic Cleaners

As in all cleaning methods, the solutions used for cleaning must be prepared according to manufacturer's instructions. Failure to do so will result in either an acidic or alkaline pH, both of which can cause corrosion and breakage. We recommend using a neutral pH cleaner. Products other than neutral pH can result in instrument damage.

Breakage resulting from corrosion is called "stress corrosion cracking." This usually occurs around the box lock of needle holders and hemostats or on the screws of scissors. It appears as a buildup of what looks like rust. If seen, it should be cleaned away immediately with a soft toothbrush.

Steam Sterilization

Complete an "empty" cycle every day prior to sterilizing the instruments. To prevent corrosion damage to the instruments, it is important that the steam be completely free of foreign substances.

To avoid excessive condensation, stay with the manufacturer's recommended load for the sterilizing unit. If heavy sets are unavoidable, instruments should be spread out to reduce the condensation buildup. Care must be taken with delicate scissors to prevent tip breakage.

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Once sterilized, instruments must be dried completely before being stored away. Without proper drying times, "water spotting" can result.

Lubricants and Detergents

Besides lubricating moving parts, lubricants inhibit rust, corrosion and discoloration. As part of a regular instrument care program, proper lubrication helps reduce instrument wear. A one minute soaking prior to autoclaving is adequate to insure protection.

Neutral pH detergents are ideal for surgical instruments. The neutral pH will not damage stainless steel or tungsten carbide inserts. The solution is gentle enough for manual as well as ultrasonic cleaning.

Instrument Care Suggestions

1) Before cleaning, inspect instruments for damage. (Don't autoclave chrome plated and stainless steel instruments together.)
2) After each use, clean instruments thoroughly.

    - Use only neutral pH solutions for the pre-soak.
    - When cleaning by hand or with ultrasonic cleaner, instruments should be in the open position.
    - To remove stubborn stains, use a non-metallic brush (toothbrush). Abrasive cleaning solutions or scouring pads should NOT BE USED.
    - DO NOT USE bleach for cleaning.
    - Follow the mixture rations precisely for ALL solutions that will touch your instruments. Failure to monitor the acidic (PH 0-6) or alkaline (PH 9-14) balance will lead to instrument failure.

Even though instruments are passivated, serious damage can result if there is exposure to any of the following:

- Hydrochloric acid
- Ferric chloride
- Dilute suplhuric acid
- Iodine
- Bleach

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Whenever possible, the following substances should be kept away from instruments:

- Aluminum chloride
- Barium chloride
- Biochloride of mercury
- Calcium chloride
- Potassium permanganate
- Chlorinated lime
- Lysol
- Mercury chloride
- Phenol
- Carbolic acid
- Potassium thiocynate
- Sodium hypochlorite
- Dalkin's solution
- Ferrous chloride
- Stannous chloride
- Tartaric acid

Handling New Instruments

Following the procedures outlined previously, clean and rinse new instruments before their first sterilization. Instruments should not be stored in a cabinet with any chemical that produces a corrosive vapor.

Ultrasonic Cleaning Suggestions

1) Check instrument for cracks and chipped areas.
2) Clean instruments immediately after use with a neutral pH solution. Be sure to follow manufacturer's instructions for soak time and mixture ratio.
3) When loading ultrasonic cleaner, do not stack instruments on top of each other and be sure instruments are in the open position.
4) Follow manufacturer's instructions for cleaning cycle time. Remove instruments promptly when cycle is complete and rinse thoroughly in distilled water.
5) Dry instruments with clean, dry, lint-free towels.
6) Before sterilizing, soak the instruments in lubricant for one minute. Do not use dry heat sterilizers.
7) Autoclave according to manufacturer's instructions.

Next Page: Cleaning and Sterilization Trouble-Shooting Guide (Table)

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Cleaning and Sterilization Trouble-Shooting Guide

Issue	Cause	Prevention
Spotting	Mineral deposits left by slow or improper drying	1. Check operation of autoclave. 2. Use chloride-free solutions for sterilizing, disinfecting, rinsing, and cleaning. (Distilled or mineral free water.)
Rust (Corrosion)	Film left by steam	1. Check purity of water supply 2. If water softeners are used, check for composition. 3. Purge Steam pipes, especially new installations. 4. Clean inside of sterilizer regularly according to manufacturer's specifications.
Rust (Corrosion)	Deposit	1. Do not mix stainless steel with other metals, especially where there is evidence of defective plating. 2. Rinse with distilled water (important where tap water may have high metallic content). 3. Remove debris from box lock. 4. Dry all instruments thoroughly. Use fulltime cycle (important when instruments are wrapped).
Pitting	Chemical and electronic attack of surfaces	1. Rinse instruments thoroughly immediately after use. 2. Avoid long exposure to chlorides and acids. 3. Do not use detergents having high pH levels. 4. Do not mix metals in ultrasonic cleaners.
Black to purple stains	Ammonia	1. Avoid exposure to ammonia in solutions and cleaning compounds. 2. Rinse instruments thoroughly (distilled water preferred).
Brown stains	Minerals	1. Check water supply in sterilizer. 2. Check cleaning compounds and detergents. 3. Clean inside of sterilizer regularly according to manufacturer's specifications.

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