Welcome to
S&T’s
World of Microsurgery
Chapter 3 - Maintenance
Stainless steel is rather easy to “stain” and so its name is somewhat ironic.
The only material easier to corrode is standard steel.
Corrosion:

Typical signs of pitting
(chloride ions)
The worst enemy usually encountered by stainless steel happens to be

- blood
- saline solution.

Corrosion:
Corrosion:

Tension crack corrosion induced through fretting corrosion
Corrosion:

Crack corrosion, intensified by multiple phases in soldering area.
Corrosion:

Contact corrosion: The two instruments on left and right are made of stainless steel and were somewhat boring before they met the instrument in the middle while autoclaving.
Corrosion:

Organic residues, detected by using hydrogen peroxide
Instrument Cycle
• Remove all blood
• Lubricate
• Sterilize

Cleaning

Stock
• Dry
• Functional testing
• Keep in case

Use
• Handle with care
• Never let blood dry
• Develop routines
Special attention:

- Hinges
- Springs
- Approximators
- Hand grip
- Crevices
- Surface
Problem zones for your instrument - and for you
General guide lines and hints that reveal well-made instruments:

- No unnecessary nooks and crannies (clear and elegant lines of the device):

  Cleaning, cost

- No sandblasting (S&T instruments are bead blasted):

  Less potential for corrosion

- “Good” finish:

  Less potential for microbial nesting
General guidelines and hints that reveal well-made instruments:

- Forceps have a “spacer” (where possible): *Easier cleaning*

- Hinges and slides will not squeeze or cut tissues and sutures: *Avoiding Trauma*

- Passivation of the instrument is necessary for less corrosion: *Life time of the instrument*
Basics in handling of microsurgical instruments:

• New instruments need to be washed and sterilized prior to first use.

• Keep micro instruments separate from standard surgical instruments.
Basics in handling of microsurgical instruments:

- Never let the working tips of micro instruments touch other instruments.
- Avoid magnetization as small devices such as micro sutures will become extremely hard to manage during procedures.
Basics in handling of microsurgical instruments:

To ensure a long life of your instruments, we feel it is important to clean instruments right after use.

In cases where this might not be possible, we recommend keeping the instruments in a little basin covered with water, to ensure that no organic material will dry on the instrument (avoid air bubbles).
Basics in handling of microsurgical instruments:

As soon as possible, rinse instruments under running water (open joints, ratchets and locks, move slides) to ensure removal of all organic matter.

Before cleaning open hinged instruments.
Basics in handling of microsurgical instruments:

Clean in washing machine with designated “micro” holding area or in an ultra sonic (Please note: Vibrations might let the instrument wander against unsecured basket sides, destroying tips and blunting edges).
Beware of sound shadows.
Basics in handling of microsurgical instruments:

Rinse instrument after cleaning with desalinated water to avoid water spots due to cleaning agent residues and silicates. Keep in mind that calcium residues which are found in most “natural” water supplies are not exactly helpful in retaining sharp cutting edges in scissors and similar instruments.
Basics in handling of microsurgical instruments:

Dry instruments after cleaning.
Check for cleanliness and functionality of instruments (ratchets and locks should not be engaged).
Do not forget to lubricate moving parts prior to sterilization.
After that prepare instruments for sterilization.
Basics in handling of microsurgical instruments:

If in doubt concerning rust spots being possibly organic matter, a little hydrogen peroxide will help (this material is cheap and easily available to any surgeon). Some hospitals generally use diluted hydrogen peroxide to remove organic matter from instruments.
Basics in handling of microsurgical instruments:

Washing or sterilizing corroding instruments with intact instruments ensures the continued well-being of the instrument manufacturer but not of your wallet. Remove damaged instruments.
Always keep an eye on your micro instruments!!
Thank you for your attention and enjoy convincing your surgeon to buy the **trustworthiest**: 