

APPENDIX H

DECONTAMINATION, CLEANING, HLD AND CHEMICAL STERILIZATION OF LAPAROSCOPES

Surgical endoscopes (laparoscopes) are delicate instruments that must be handled with great care to prevent damage. The following recommendations will help to protect these instruments and prolong their use. Laparoscopes and accessories should be sterilized or high-level disinfected using chemical agents. Glutaraldehyde and formaldehyde are the best chemical high-level disinfectants for soaking laparoscopic instruments because they do not damage rubber, plastics or lens cements. Other high-level disinfectants, such as 6% hydrogen peroxide, may be corrosive.

HOW TO DECONTAMINATE AND CLEAN LAPAROSCOPES AFTER USE¹

Note: Because alcohol rapidly kills HBV and HIV, this step protects handlers against possible hepatitis B and AIDS infection.

STEP 1: Immediately after use, gently wipe the laparoscope, fiber-optic light source and cable and plastic tubing with Luer-Lok™ with a cloth soaked in 60–90% ethyl or isopropyl alcohol to remove all blood and organic material.

STEP 2: Completely disassemble the laparoscopic equipment: operating laparoscope or Laprocator™, trocar, uterine manipulator, cervical vulsellum forceps, Verres needle and Falope Ring® guide kit.

STEP 3: Place disassembled parts in a basin of clean water and mild, nonabrasive soap.

STEP 4: Wash all outer surfaces, using a soft cotton cloth.

STEP 5: Clean inner channels with a cleaning brush supplied with the laparoscope kit. Use a circular motion to remove particulate matter. (Organic matter hidden in the narrow channels may cause infection later.) Be careful not to forcibly push the brush against the closed end of the inner tube as this may damage it.

STEP 6: Rinse all parts thoroughly with clean water (running water or from a basin) three times. Use the brush to remove soap and particles from the inner channels. (Soap, if not thoroughly rinsed away, will decrease the effectiveness of the disinfectant.)

STEP 7: Dry equipment with a clean soft cotton cloth or air dry. (Excess water will dilute the disinfectant, decreasing its effectiveness.)

STEP 8: Clean lenses at least weekly, and more often as needed, but do not touch the lenses with fingers (see **STEP 3**, below).

STEP 9: High-level disinfect (for 20 minutes) or sterilize (overnight), or if not needed immediately, carefully store in instrument container after cleaning

¹ Adapted from: Altobelli 1980.

and drying until next use. (Instruments should be high-level disinfected **immediately prior to use** to prevent recontamination.)

HOW TO CLEAN LENSES ON LAPAROSCOPES

STEP 1: Remove the plastic eyepiece of the laparoscope prior to cleaning the proximal lens with acetone or 60–90% alcohol. (Acetone and other organic solvents can severely damage plastic.)

STEP 2: Clean lenses with a **cotton swab** soaked in alcohol or acetone. (Cotton will not scratch the lens, and alcohol and acetone will not weaken the cement around the lens.)

STEP 3: While cleaning, do not touch lenses with fingers. (Skin oils may damage the lenses.)

STEP 4: Clean lenses at least weekly, and more often as needed.

HOW TO STERILIZE LAPAROSCOPES

STEP 1: Decontaminate, wash and dry all instruments to be sterilized as described above.

STEP 2: In a well-ventilated area, wearing gloves to prevent skin irritation, **completely immerse** clean, dry, disassembled instruments and cleaning brush in a plastic container at least 8 cm (3 inches) in depth that contains either 8% formaldehyde or a 2–4% glutaraldehyde (e.g., Cidex[®]). The disinfectant must touch all surfaces in order to be effective. (See **Appendix F** for directions on how to prepare and use these disinfectants.)

STEP 3: Cover the container during the disinfection procedure. (This will decrease the rate of evaporation and will keep dust out of the solution.)

STEP 4: Allow to soak **8 to 10 hours** in most glutaraldehydes, and **at least 24 hours** in 8% formaldehyde. Both agents work best at room temperature. Sterilization cannot be assured at temperatures less than 20°C (68°F). Because instructions vary, carefully read manufacturer's instructions for each product.

STEP 5: Use sterile gloves to carefully remove instruments from the solution. (Forceps or lifters may damage the instruments.)

STEP 6: Rinse **three times** with sterile water to completely remove all traces of the disinfectant. If sterile water is unavailable, rinse in cooled water which has been filtered and boiled for 20 minutes. Use a sterilized or high-level disinfected brush to assist with rinsing the narrow channels of the instruments. (This keeps movable parts from sticking due to any remaining disinfectant.) Finally, rinse completely with 60–90% ethyl or isopropyl alcohol. Allow to dry and use immediately. Do not store laparoscopes that have been rinsed with alcohol because residue can cause movable parts to stick.

Note: Avoid placing instruments on top of each other, as this may damage them.

STEP 7: Air dry in a sterile container with a cover. (Laparoscopes and accessories can be stored for up to 1 week in this container.)

HOW TO HIGH-LEVEL DISINFECT LAPAROSCOPES

STEP 1: Decontaminate, wash and dry all items to be high-level disinfected.

STEP 2: In a well-ventilated area, wearing gloves to prevent skin irritation, **completely immerse** clean, dry disassembled instruments and cleaning brush in a plastic container (as above) containing either 8% formaldehyde or a 2–4% glutaraldehyde (e.g. Cidex) solution. The disinfectant must touch all surfaces in order to be effective. (See **Appendix F** for directions on how to prepare and use these disinfectants.)

Note: Avoid placing instruments on top of each other, as this may damage them.

STEP 3: Cover the container during the HLD process. (This will decrease the rate of evaporation and will keep dust out of the solution.)

STEP 4: Allow to soak for **20 minutes**.

STEP 5: After 20 minutes, use high-level disinfected or sterile gloves to carefully remove instruments from the solution. (Forceps or lifters may damage the instruments.)

STEP 6: Rinse **three times** with cooled water that has been filtered and boiled for 20 minutes in order to completely remove all traces of the disinfectant. (This will prevent the solution from irritating the client's skin and keep the movable parts from sticking.) Although not necessary, sterile water can be used in place of boiled water. Use a high-level disinfected brush to assist with rinsing the narrow channels of the instruments.

STEP 7: Allow to air dry in a high-level disinfected container or dry with a high-level disinfected soft cotton cloth and place immediately on the instrument table.

HOW TO STORE LAPAROSCOPES

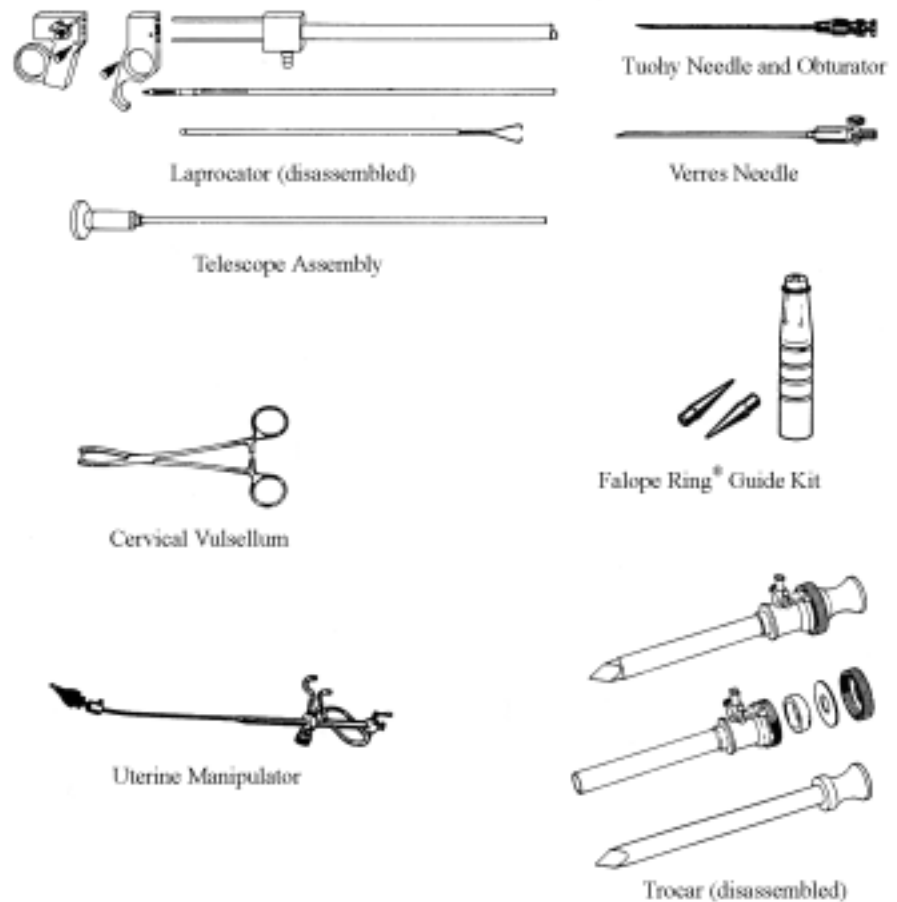
STEP 1: Decontaminate, wash and dry all instruments to be stored.

STEP 2: Assemble laparoscope and trocar.

STEP 3: Place laparoscope and trocar in the padded container supplied with the equipment and store in a cool, dry place.

Remember: Before using stored laparoscopes and accessories such as trocars, they must be disassembled, cleaned and either sterilized or high-level disinfected.

Figure H-1. Atlas of Laproscator System



Source: Altobelli 1980.

TIPS FOR PROLONGING THE LIFE OF LAPAROSCOPES²

- Failure to completely disassemble and clean the endoscope properly is the most common cause of problems. In addition, blood and other organic material left to dry on the instruments are difficult to remove and may be a source of infection.
- Never autoclave or boil laparoscopes because heat will damage the optics. Always **sterilize** or **high-level disinfect** with chemical sterilants or disinfectants such as glutaraldehyde or formaldehyde.
- Remove instruments from the disinfectant solution as soon as timing requirements are met. Prolonged immersion may shorten the life of the instrument.
- **Rinse at least three times** with cooled sterile (or boiled) water after cold sterilization or high-level disinfection respectively, to remove residue. Residue can cause movable parts to stick.

² Adapted from: Wolf R. 1984.

- Wear sterile or high-level disinfected gloves to handle instruments after final processing. Forceps and clamps may damage the laparoscope.
- Avoid picking up or handling instruments in groups or bunches.
- Always grasp the laproscator at the eyepiece end to avoid damaging the operative forceps.
- Avoid piling instruments or cables on top of each other to prevent damage or fiber breakage.
- Do not use Savlon[®] as it is not a high-level disinfectant and has been associated with clouding laparoscope optical lenses.

REFERENCES

Altobelli LC et al. 1980. *LaproscatorTM Preventive Care and Maintenance*. JHPIEGO Corporation: Baltimore, MD.

Wolf R. 1984. *Instruction Manual: Gynecological Laparoscopy Instruments*. (Ref. E1-05-82). Richard Wolf Medical Instruments Corp.: Rosemont, IL.

