LEARNING OBJECTIVES
1. Explain the cleaning process for ophthalmic instruments
2. Describe basic ophthalmic instruments and the processes for their inspection and assembly
3. Discuss the sterilization process for eye instrumentation

OBJECTIVE 1. EXPLAIN THE CLEANING PROCESS FOR OPHTHALMIC INSTRUMENTS

Eye instruments are very small and delicate with very fine distal tips that can easily be damaged from routine handling. It is always important to carefully follow the most current manufacturer’s Instructions for Use (IFU) when handling these instruments to help prevent damage. The human eye is also very sensitive and reacts to foreign material that can remain in improperly cleaned instruments. Note: Toxic Anterior Segment Syndrome (TASS) is an inflammatory response to this foreign material that can cause severe complications after surgery.

Gross debris on ophthalmic instruments should be removed, and instrument lumens should be flushed with sterile distilled water or another suitable agent, as recommended by the manufacturer during and immediately after the surgical procedure. All lumens should be flushed to remove any debris. Instruments must be thoroughly rinsed following the manufacturer’s IFU. Cleaning solutions, rinse water, and disposable cleaning tools and syringes used for eye instruments should be discarded, as recommended by the manufacturer.

Reusable cleaning tools should be
cleaned and decontaminated after each use, according to the manufacturer’s IFU. Many eye instruments cannot withstand mechanical cleaning, and if instruments are only manually cleaned, they should be carefully inspected with a magnifier for cleanliness after rinsing.

Ultrasonic cleaning is effective in removing soil from hard-to-reach areas; however, eye instruments should only be processed in an ultrasonic cleaner if that process is approved by the instrument’s manufacturer.

The ultrasonic cleaner should be filled and cleaning chemicals should be mixed as close to the time of use as possible. Allowing the solution to sit unused inside an ultrasonic cleaner for long periods of time may result in the creation of endotoxins, which can be a cause of TASS.

Instruments should be placed in an ultrasonic cleaner in a manner that keeps them from becoming damaged from the cavitation process; they should not be stacked on top of each other. Note: cavitation is the process used by an ultrasonic cleaner in which low-pressure bubbles in a cleaning solution burst inward to dislodge soil from instruments.

Following ultrasonic cleaning, the instruments should be carefully rinsed and inspected for cleanliness. ANSI/AAMI ST79, Annex N, states that the solution should be changed at least daily, but, preferably, after each use. When changing the cleaning solution, the ultrasonic cleaner should be rinsed, cleaned and dried before adding more solution.

Delicate eye instruments should not be processed in a washer-decontaminator, unless recommended by the instrument’s manufacturer. If a washer-decontaminator is used, always follow the instrument manufacturer’s IFU regarding proper cycles.

OBJECTIVE 2: DESCRIBE BASIC OPHTHALMIC INSTRUMENTS AND THE PROCESSES FOR THEIR INSPECTION AND ASSEMBLY

Ophthalmic instrument inspections should be done using some form of magnification to ensure the instruments are clean and damage-free. Many eye instruments look similar to those used in other specialties, so it is very important to ensure the proper instruments are placed into the sets. Each instrument type may have different inspection points, so becoming familiar with these instruments is a must for a CIS technician.

Eye scissors, like all ophthalmic instruments, are very delicate. Blades must be inspected carefully under magnification for nicks, burrs and sharpness. Also, inspect box lock areas for cleanliness, ensure the screw is in place, and confirm there are no stress fractures. Most eye scissors should be processed in the ultrasonic cleaner, but they are usually not recommended for washer-decontaminator processing as they may become damaged. Tips should be protected to avoid damage, and these instruments should be packaged in a manner to protect them from damage. Common ophthalmic scissors include Castroviejo, Vannas (see Photo 1), Westcott, and Enucleation.

Forceps used in ophthalmic surgery may be utilized in many other types of procedures, especially those for plastic surgery. These forceps are fine-tipped and should be carefully inspected to ensure they are clean and functional. They are very delicate and most are not recommended for washer-decontaminator processing as they may become damaged. Tips should be inspected to ensure they meet when closed and are burr-free. All serrations should be inspected for cleanliness, and the proximal end should be checked for stress fractures. The delicate tips of the forceps should be protected when packaging. Common forceps include Lens Tying forceps, Jewelers, Bishop Harman, Lens insertion, Arruga Capsule (see Photo 2), and Bipolar.

Clamps hold small vessels and suture, and they are used to hold and turn the eyelid during surgery. Shapes and sizes vary depending on their intended use. Be sure the tips are in the open position while the instrument is in the ultrasonic cleaner. Carefully inspect their fine tips for cleanliness and to ensure they meet evenly. Make sure all screws are intact and not loose. Some clamps are very small and should be packaged in a way that they do not become lost in the tray. Common clamps include Serrefine Bulldog (see photo 3) and Chalazion (see photo 4),
Retractors, also called speculum, hold the eyelids open during surgery and/or hold tissue away from the operative site. Designs vary from small delicate wire-type retractors to solid stainless steel hand-held instruments. Check the manufacturer’s IFU for specific cleaning and packaging requirements. Carefully inspect tips to ensure they are intact, and ensure wire retractors are not bent or damaged. Carefully package wire retractors to protect them from damage from other less delicate instruments. Common retractors include Barraquer speculum (see Photo 5) and Desmarres eyelid retractor (see Photo 6).

Needle holders found in ophthalmic instrument sets are also frequently found in vascular sets. These needle holders are usually spring action and five to six inches in length. Care must be taken when handling these instruments because they are very delicate. Always check the tension of the spring action to ensure the needle holder is in proper working order, and ensure the jaw insert is securely in place. Processing needle holders in a washer-decontaminator may not be recommended, so it is important to check the manufacturer’s IFU for proper processing instructions. Also, check the box locks for cleanliness, ensure the screw is intact, and confirm there are no stress fractures. Protect the tips when packaging. The Castroviejo Needle holder (see Photo 7) is an example of this type of instrument.

Lacrimal probes (see Photo 8) are used to dilate or probe the lacrimal ducts (tear glands) and are often made from silver to make them easily bendable and pliable. Most lacrimal probes are five inches in length, double-ended, and are available in sizes from 0000 through 8. Many probes have olive-shaped ends. Manual cleaning is necessary and, if an ultrasonic cleaner is used, it is best to separate these probes from stainless steel instruments to prevent damage or corrosion. Inspect the probes for cleanliness, ensure their shafts are straight and intact, and examine them under magnification to ensure there are no cracks in the shafts. Check to ensure all sizes requested are present in the set. When packaging, protect these instruments from bending or becoming caught in the tray mesh.

Phacoemulsifier hand pieces (see Photo 10) create ultrasonic vibrations, and are used to emulsify and remove cataracts during cataract surgeries. They resemble small powered surgical saws with power cords attached. Strict adherence to the manufacturer’s IFU for cleaning, rinsing and sterilizing these devices is vital for successful surgical outcomes. The lumens must be carefully brushed and irrigated. Failure to meet all processing requirements can result in the patient’s
OBJECTIVE 3: DISCUSS THE STERILIZATION PROCESS FOR EYE INSTRUMENTATION

Eye instruments should be sterilized using the methods and conditions recommended in the specific instrument manufacturer’s written IFU. Any discrepancies between the sterilizer manufacturer’s written IFU, the facility’s sterilization processing equipment, and the instrument manufacturer’s written IFU should be resolved by contacting the instrument’s manufacturer. The sterilization process should be effective, monitored and documented.

Immediate-Use Steam Sterilization (IUSS), formerly known as flash sterilization, should not be used as a substitute for an adequate quantity of instruments. IUSS may create an additional risk of infection to patients because of time pressures placed on personnel to rush the cleaning and sterilization processes which, in turn, could lead to skipping necessary steps. If IUSS is necessary due to an emergency situation, the instruments must still be subjected to the same decontamination process as those that receive terminal sterilization. Also, the instrument manufacturer’s recommended IUSS cycles must be carefully followed when performing IUSS.

IN CONCLUSION

Processing ophthalmic surgical instruments is a challenge due to their small and delicate composition. CIS technicians must commit the necessary time and effort required for thorough and efficient processing to ensure positive patient outcomes. The instrument manufacturer’s IFU must be carefully and consistently followed to avoid patient incidences of TASS. Careful handling and inspection will help preserve these instruments for many years.

RESOURCES


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WANT TO BE AN AUTHOR?

IAHCSMM is seeking volunteers to write or contribute information for our CIS Self-Study Lessons. Doing so is a great way to contribute to your own professional development, to your Association, and to your Central Service department peers.

IAHCSMM will provide guidelines and help you with the lesson to ensure it will be an enjoyable process. For more information, please contact Julie Williamson (julie@iahcsmm.org).
1. After the surgical procedure is completed, but before transporting ophthalmic instruments to the decontamination area, the instruments should:
   a. Be placed in a basin of water to keep the instruments moist
   b. Be placed back on the instrument stringer for protection during transport
   c. Have gross debris removed
   d. All the above

2. When possible, eye instruments should be processed:
   a. In a washer-decontaminator
   b. Separately from other types of surgical instruments
   c. In a small basin, so they won’t be damaged in the sink
   d. Using standard ultrasonic cycles

3. The cleaning agent of choice for eye instruments is:
   a. The chemical recommended by the instrument’s manufacturer
   b. A neutral-pH enzymatic cleaner
   c. A neutral-pH detergent
   d. None of the above

4. All reusable cleaning tools should be:
   a. Cleaned daily
   b. Cleaned at the end of each shift
   c. Cleaned after each use
   d. Disposed of after each use

5. Cleaning solutions and rinsing water for ophthalmic instruments should be discarded:
   a. Before each shift
   b. As recommended by IFU
   c. Hourly
   d. When the solution is no longer clear

6. After manual cleaning, all eye instruments should be processed in an ultrasonic cleaner.
   a. True
   b. False

7. When using an ultrasonic cleaner to process ophthalmic instruments:
   a. The cleaner should be filled and cleaning chemicals should be mixed as close to the time of use as possible
   b. The instruments should not be stacked on top of each other
   c. The instruments must be rinsed after the cleaning cycle
   d. All the above

8. Scissors used for eye surgery should be:
   a. Cleaned in a washer decontaminator
   b. Cleaned with an enzymatic solution
   c. Inspected for nicks and burrs
   d. All the above

9. One common type of ophthalmic scissors is:
   a. Metz
   b. Chalazion
   c. Barraquer
   d. Vannas

10. When inspecting forceps, the tips should meet when closed and the proximal end should be checked for stress fractures.
    a. True
    b. False

11. Serrefines are a type of:
    a. Clamp
    b. Scissors
    c. Retractor
    d. Forceps

12. Which is true about lacrimal probes?
    a. They should be separated from stainless steel instruments during ultrasonic cleaning
    b. They should be inspected under magnification
    c. They are used to dilate the lacrimal duct
    d. All the above

13. Which is true about calipers?
    a. They are used to measure the pressure in the eye
    b. They are used to measure different structures of the eye
    c. They are held in place with a spring action lock
    d. All the above

14. Phacoemulsifier hand pieces:
    a. Resemble powered surgical instruments
    b. Use ultrasonic vibrations to emulsify cataracts
    c. Require strict adherence to the manufacturer’s IFU for cleaning, rinsing and sterilizing.
    d. All the above

15. Immediate-Use Steam Sterilization of ophthalmic instruments:
    a. Is the sterilization cycle of choice for most ophthalmic instruments
    b. Is approved by most eye instrument manufacturers
    c. Should only be used if approved by the instrument’s manufacturer
    d. Should only be used if approved by the sterilizer’s manufacturer