Urology Overview: Part II
Cystoscope Processing and Handling Procedures

LEARNING OBJECTIVES
1. Identify the parts and functions of a cystoscope
2. Discuss the steps required to clean, disinfect, handle, and store cystoscopes

This lesson is the second in a two-part series providing an overview of urology for Certified Instrument Specialist (CIS) technicians. The first lesson addressed common urological procedures and terminology, and this lesson focuses on the components of and processing procedures for cystoscopes.

Cystoscopes are medical devices that allow surgeons to visually observe the body organs and passages of the urinary system to diagnose illness and treat medical conditions. Both rigid and flexible cystoscopes have been used for many years; however, as they have been improved, the cleaning, disinfecting, and maintaining of these complex medical devices have become more challenging tasks. Failure to properly clean and disinfect these urological instruments can have life-threatening consequences for our patients.

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Photo 1 shows the major components of a cystoscope. Basic information about the components in Photo 1 follows:

TELESCOPE LENS: This component couples into the light source with a fiber optic light bundle (cord). The cord plugs into the scope light source generator and provides light down the shaft of the telescope for visualization. It carries and receives light and transmits images back to the ocular (eye piece). The eyepiece or ocular can be viewed with the bare eye or attached to a camera. The camera trans-

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Photo 1: Major Components of Cystoscope
First Row: Telescope Lens, Bridge and Sheath
Second Row: Obliurator

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mits the image to a monitor (TV screen) where still photos or live video may be recorded.

The telescope lens contains a rod and mirror system that is very fragile and prone to damage if not handled with care. A drop of only four inches onto a hard surface, such as a table top, can damage the internal components. The scope’s overall length also makes it prone to bending if heavier instruments are stacked on top. Disinfectants and sterilization chemicals can have adverse effects on the components if they are not mixed to proper dilution, or if items are left soaking longer than recommended by the manufacturer.

**Cystoscope Bridge:** This is the part of the cystoscope into which the telescope lens (1) slides and attaches to the sheath (discussed below). The bridge shown in Photo 1 is a dual-lumen type with stopcock valves and seals. The bridge may or may not have an access port for instrumentation.

For example, Photo 2 shows a set-up for a resection of the prostate or a bladder tumor and is used in place of the bridge and sheath shown in Photo 1. If a prostate procedure resection or a bladder tumor procedure is planned, the cystoscopic bridge would be replaced with the working element shown in Photo 2. The working element, in turn, attaches the cautery loop (which is available in both mono-polar and bi-polar cautery power types), the cautery cord, and telescope to a resection sheath.

**Sheath andObturator:** This part of the cystoscope is inserted through the urethra and into the bladder cavity. An obturator is sometimes used by the surgeon to facilitate the passage of the sheath through the urethra. The obturator may be “blind” and allow for a less traumatic insertion of the sheath through the urethra, or it may be designed to allow the cystoscope lens to be inserted through the obturator. The latter gives the surgeon direct visualization of the entire length of the urethra.

The distal end of the scope with its lens and instrumentation protrudes slightly beyond the tip of the sheath. It has an inflow and an outflow port for irrigation which allows the surgeon to inflate/expand the bladder to better visualize the prostate, bladder walls, and ureteral openings for signs of disease. The cystoscope’s distal end is likened to an extension of the operator’s eyes and hands.

**Cystoscope Processing, Handling and Storing**

Each component of the cystoscope has a unique function, and each works together to provide a clear view of the pathology for the surgeon and the procedure team. If one component is missing, damaged, non-operational, and/or not adequately processed, the ability to render safe and effective patient care will be compromised. The CIS technician must be familiar with the operation and the use of the cystoscope to have a clear understanding of the importance of maintaining these devices in accordance with strict protocols.

Cystoscope lenses are available in different viewing angles. It may be a 0 degree lens which provides a straight-forward...
view, while a 12 degree lens provides a view deflected upward 12 degrees. Some procedures require the use of a 30 degree or 70 degree lens.

Cystoscope lenses are not interchangeable. The sheath and obturator are a matched set and are available in several sizes for pediatric and adult use. For example, a 26 French sheath requires a 26 French obturator for safe patient use. As well, urological instrumentation is designed differently by each manufacturer, so the components are not interchangeable between manufacturer models.

It is recommended that all recently employed and current Central Service (CS) staff members have adequate initial and ongoing instruction relating to the safe use and handling of these complex devices. A good source of information can be obtained by contacting the original equipment manufacturer (OEM) and requesting hands-on inservice programs. Additionally, a thorough review of the operator's manual and the Instructions for Use (IFU) will be helpful because they contain detailed protocols for the handling, cleaning, disinfection, sterilization, and storage of these devices.

A competency skills checklist should be used to ensure that all CS employees who work with cystoscopes can correctly handle and clean all of these instruments that are used in the facility. Also, annual hands-on inservice and skills labs are very useful to ensure staff competency.

Managers and supervisors should be monitoring all steps of the reprocessing procedure to ensure compliance with required protocols. This includes inspecting and verifying to ensure that staff members are consistently using safe handling techniques, including the use of appropriate personal protective equipment (PPE).

Careful compliance with the IFU at every step as cystoscopes are handled, processed, and stored is critical, and the importance of doing this should never be overlooked.

In compliance with manufacturer’s written IFU, scopes should be cleaned within 15 to 60 minutes after patient use. They should be transported in closed/coversed containers between the point-of-use and the CS reprocessing area. It is important to remember that heavy objects or instruments should never be placed on top of the delicate telescopes, sheaths and fiber optic cables.

Extra care should be taken during cleaning of the scope to prevent damage. The following procedures should be part of a general cleaning guide:

- All personnel cleaning the scope should use appropriate PPE while handling the contaminated scope. This consists of a fluid-resistant gown with full sleeves, gloves, and face and eye protection.
- Do not clean the scope in a sink with other instruments as this practice can damage the scope.
- Separate and clean the telescope lens first and then place the telescope lens into a protected area while cleaning other parts of the cystoscope’s system.
- The telescope must be removed from the sheath and should be cleaned and washed first. Wipe down the telescope’s lens with a clean, soft, lint-free cloth and water with a cleaning agent, following the manufacturer’s dilution concentration and usage instructions to remove all gross soil. There are specialty cleaning cloths and foam devices offered by third party manufacturers that are designed for this task. To protect the scope, never clean its lens and other components in the same sink at the same time.
- The lens should be inspected for image clarity and sharpness. A blurred image could be due to residual film on the tip of the lens. If so, follow the manufacturer’s recommendations to address this issue. Generally, a simple wipe with an alcohol pad, followed by use of a lint-free lens cloth or applicator, will resolve this challenge. A dark or partial image is a sign of rod lens damage, and the lens will then need to be removed from service for repair.
- All parts that can come apart should be done so for a thorough cleaning. The CIS technician should then immediately reassemble the parts and ensure their proper fit and functionality. For example,
the cystoscope’s bridge and sheath should be taken apart and submersed under water. The valves of the bridge and sheath should be opened, flushed and brushed to remove soil. If possible, disassemble the valves and clean the lumens. Note: After a resection procedure, tissue may be trapped within the valves and the sheath, and a good brushing is then required to address these concerns.

- If the cystoscope’s working element was used, the disposable loop should be removed and discarded. The cautery cord must also be removed and cleaned. Check the cord for any insulation nicks or cracks. If found, the cord cannot be reused as it will pose an electrical risk to both the patient and the surgeon. The tip of the working element is very delicate, and care must be taken to avoid bending it.
- Effective communication between CS and OR personnel is important to assure that everyone handling these devices know which components are reusable/reprocessable and which are disposable. Changes in vendors, manufacturers or surgeon preferences can lead to significantly increased costs if everyone is not properly informed.
- The telescope should be carefully placed into a transport container for movement to the next phase of its cleaning cycle. The sheath, bridge and other stainless steel parts can be placed into an automated washer. The telescope must never be placed into an automated washer as this will destroy the rod lens. As well, cautery cords can only be hand-cleaned, and they should never be placed in a washer. Note: the operating tip of a resectoscope is most often ceramic and should be inspected to ensure that no nicks or cracks occurred as a result of improper handling or usage. A qualified instrument repair technician can replace the damaged tip if identified early enough.
- The telescope’s lens must be inspected after it is moved to the clean reprocessing area. All scopes must be inspected before and after patient use to identify those that may be damaged and that may pose a risk to patient safety. Ideally, there will be a dedicated location for scope inspection. Clean, lint-free, white lens-quality cloths and disposable cotton applicators should be used for the final inspection task.
- CIS technicians should be trained to recognize, identify and report scope problems, and adequately decontaminate and disinfect scopes that are found to be damaged. Scopes that fail visual inspections and/or which have non-working bridges and accessories should be tagged for repair and removed from service. All scopes should be maintained and repaired according to OEM specifications. Note: it is important to keep a repair history log to validate that scopes are properly maintained.
- Scopes should never be stored wet because moisture will promote the formation of bacterial growth. If possible, the scopes and their various components should be stored sterile and ready-to-use. The best storage involves a tray system that allows for adequate sterilant penetration and protects the delicate parts by not allowing instruments to shift or move within the tray. The most effective storage system cannot provide 100% protection from improper handling.

IN CONCLUSION
Safe and effective handling of urology cystoscopes poses a significant challenge to CIS technicians. It is their responsibility to meet these challenges by staying current on all instrumentation and the procedures for which the devices are used. With adequate training and the use of effective strategies to prevent scope damage, these complex and expensive devices will last many years, while providing safe and reliable operation.

CIS SELF-STUDY LESSON PLANS

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Our Team will provide guidelines and help you with the lesson to assure it will be an enjoyable process. For more information, please contact Elizabeth Berrios (elizabeth@iahcsmm.org).