



By Erica Smith, MBA, and John Sullivan

As new technologies emerge and the heightened awareness of disease transmission increases, more hospital systems and ambulatory surgery centers are using their Central Sterile Department to reprocess both flexible and rigid scopes. Regardless of the facility type or department responsible for scope reprocessing, the process starts the minute the scope is finished being used on a patient. Utilizing available educational resources and following best practices can help reduce stress on the reprocessing staff and increase patient safety.

Accessing reprocessing education about surgical instruments has become more accessible in today's healthcare landscape. In 2021, the Association for the Advancement of Medical Instrumentation updated ST91, its comprehensive guide, which extensively covers the processing of flexible and semi-rigid endoscopes in healthcare environments. The Society of Gastroenterology Nurses and Associates and the Association of periOperative Registered Nurses also updated their standards for reprocessing scopes in 2021. Each organization provides vital resources for not only protecting the patient, but also protecting the employees who work every day to make sure scopes are processed and ready to go for the next patient.

AAMI, SGNA and AORN make it clear that the process begins immediately after use on a patient. Endoscopes are complex devices that require careful handling and reprocessing and should be treated in this manner. No step in the reprocessing process is more critical than another, and shortcuts cannot be taken.

Processing Room

An endoscopy processing room should have a minimum of one suite that divides the decontamination area from the clean area. Whether the facility is using one room or two for processing, there must be a distinct divider between the spaces. If the processing area is one room, there must be a minimum three-foot barrier between the decontamination area and the clean area. If there are two rooms, there should be a pass-through window or a door to separate the two areas (AORN INC, 2021). This setup lowers the chances of cross-contamination of the endoscopes. To help maintain a low cross-contamination rate, there should also be a unidirectional workflow that starts from the decontamination area into the clean area, and even into clean storage in another location (AORN INC, 2021). Perform risk assessments often to ensure the processing area is still limiting any cross-contamination on the endoscopes. If changes need to be made based on the risk assessment, make the changes immediately and train the staff on them.

Reprocessing Scopes

The first step in reprocessing is being aware of Instructions for Use (IFUs) for the specific scope being reprocessed. All scopes are different and require different methods for reprocessing. IFUs can be obtained from the device manufacturer and should always be handy when reprocessing.

AAMI, SGNA and AORN each stress the importance of pre-cleaning instruments before reprocessing. Before handling any scope, even if it has been reprocessed, ensure that you are wearing personal protective equipment (PPE). The Joint Commission recently indicated that endoscope infection transmission is frequently associated with inadequate cleaning prior to reprocessing, and that a greater focus is needed on properly accomplishing this part of the process.

Handling the scope is where it all begins:

- Never coil the insertion tube tightly. Doing so can cause damage and require expensive repairs.
- Once the scope is away from the patient, pre-cleaning should begin. Fresh solutions and sponges should be used when beginning the pre-cleaning process.
- Suction the solution through the scope to loosen any free matter and fluids, then wipe down the exterior of the scope, paying extra attention to the distal end.
- Flush channels and finish with air if possible. Also, dispose of any debris and cleaning material.

Tracking

If your facility has a tracking system, note the serial number on the scope before transporting. Scope tracking systems are an important tool, no matter the size of the facility. Tracking systems tie scopes to specific patients, help identify each of the steps in reprocessing, then follow the scope back to the next patient. This identification is key in reducing hospital-acquired infections and is important information to have when the Joint Commission or other audits are performed in a facility. This data is also helpful in evaluating the life cycle of a scope.

Also, keep a record of all leak tests for the endoscopes. This will provide documentation of which endoscopes passed and which did not. If an endoscope does not pass the leak test, immediately remove it from rotation and follow the manufacturer's instructions for sending it in for repair. When sending the endoscopes to repair, be sure to disinfect the endoscopes and place a biohazard label on the container (AORN INC, 2021).

Transport

Once the initial pre-cleaning has been performed, it is time to prepare the scope to be transported. Scopes should be transported to their reprocessing point as soon as possible. The scope must be placed in a container and/or bag that is marked with a biohazard label for transportation. If the scope is coiled, ensure that it is not over-coiled or tightly coiled, or you risk damaging the insertion tube. When possible, keep the scope moist to prevent drying. This will increase the chance of a successful reprocessing. Place the scope accessories in the container or in a separate container (bag) that travels with the scope.

Testing

When the scope has arrived in the reprocessing area, a leak test should be performed. This vital step should not be done too quickly or incorrectly. Leak testing detects fluid invasion in an endoscope. This can lead to damage to the scope, and—more important—if not detected, can lead to transmission of infection. When performing a leak test, consult the device's IFU to ensure that it is correctly performed.



Pre-Cleaning

Once leak testing has been completed and the scope is free from leaks and thoroughly inspected, it is time to pre-clean. While all steps in reprocessing a scope are important, pre-cleaning may be the most important when it comes to reducing hospital-acquired infections. Shortcuts in this step can lead to an increase in infection rates. Not all scopes are the same and a technician should always consult the device IFUs when pre-cleaning.

Duodenoscopes are considered one of the more difficult endoscopes to clean because of their multiple channels and elevator mechanism on the distal tip. From pre-cleaning to drying, there are more than 100 separate steps to reprocessing a reusable duodenoscope.

- To start, use a freshly prepared cleaning solution. For best results, follow the manufacturer's recommendation for dilution. Be sure to completely submerge the endoscope and accessories.
- Don't make the mistake of brushing the scope above the waterline, which can lead to bioburden being transferred to other instruments. Use a clean sponge designed for cleaning endoscopes or a lint-free cloth and always use clean brushes and sponges for each scope. Clean

all accessible channels and the end of the endoscope with a cleaning brush of the length, width and material recommended by the endoscope manufacturer.

- Consult the IFUs for scopes that have an elevator. Raise and lower the elevator throughout the manual cleaning process and manually activate the valves and brush the accessible channels until no debris appears on the brush. Clean the debris out of the brush before reinserting it into a channel, and repeatedly flush the channels with clean solutions. Flush and rinse exterior surfaces and internal channels.
- Finally, dry the exterior surfaces and purge all channels with air.

Once pre-cleaning is complete, inspect the scope for cleanliness, missing parts and lens clarity. Make sure there is no damage and check the integrity of the seals and gaskets. Also, check that the scope is functioning appropriately and that there is no visible moisture.



High-Level Disinfection

Once the scope has been cleaned, then it's time for the high-level disinfection (HLD) stage. When using HLD, maintain a well-ventilated area to reduce exposure to hazardous fumes

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produced by HLD. Safety data sheets are required to be accessible to all employees so that instructions are quickly available if or when an accident occurs. Another requirement while using HLD is to have an eyewash station right next to where HLD is being used (AORN INC, 2021).

It is also important to check the minimum effective concentration (MEC) of the disinfectant each time with a manufacturer-specific test strip. Regardless of whether you are manually disinfecting a scope or using an automated endoscope reprocessor (AER), checking the MEC is a must. A variety of elements can contribute to the MEC falling quickly, including not pre-cleaning thoroughly, or over-dilution from a water leak. If your MEC is failing sooner than the label states, it is a warning sign that there is another issue, and it should be immediately explored.

When using an AER, follow the IFUs. The endoscopes must be placed in the bay so they are completely submerged in the HLD. Additionally, all connections should be secured, and when the HLD process is finished, be sure the endoscope is rinsed with sterile water. Lastly, the exterior of the scope and its components must be dry. If your facility uses a tracking system, it is critical to log each step of the process.

Endoscopes are easily damaged in any type of heat sterilization. Therefore, it is important to follow all the manufacturers' IFUs and make sure that the contact time for the HLD is completed.

It is imperative to follow all IFUs to ensure the safety of patients and staff. Most outbreaks have been traced back to poor reprocessing of endoscopes (McCafferty, et al., 2018). Due to the many intricate parts in an endoscope, it is easy for a pathogen to live through reprocessing. Each step in reprocessing scopes eliminates a certain number of pathogens (Rutala & Weber, 2014). Since the margin of safety is slim, if any action is skipped or not performed correctly, the chances of a pathogen transmitting are higher.

As a result of poor endoscope reprocessing, *Escherichia coli* (*E. coli*) and *Pseudomonas aeruginosa* outbreaks are common. An outbreak of *E. coli* in Washington state was traced back to poor reprocessing of the endoscope. The strain of *E. coli* was antibiotic-resistant, which unfortunately led to 10 patient deaths (Budryk, 2015). *Pseudomonas aeruginosa* is also an antibiotic resistance that thrives in damp environments (Gellatly & Hancock, 2013).

Candida auris is another antibiotic-resistant pathogen that can quickly spread and is currently being watched intensely to determine if treatment and efficient cleaning methods can be created (Jeffery-Smith et al., 2017). *Candida auris* dwells in multiple body areas, most often in the groin. Due to the nature of endoscope procedures, it is easy for *Candida auris* to transfer to the endoscope, which can transfer to another patient if the endoscope is not reprocessed correctly.



Storage

Inspect the storage cabinet for cleanliness before hanging the endoscope. Depending on the cabinet configuration, store flexible endoscopes horizontally or hang them vertically so they do not coil or touch the floor of the cabinet. If storing horizontally, do not over-coil the scope. Store each endoscope with valves open and all removable parts stored with it.

When handling an endoscope, even if the scope has gone through reprocessing, it is important to wear clean PPE.



Education

Today there are many available resources, including formal education, which is key to any successful sterile processing department. Local chapter meetings provide individuals with the opportunity to build strong networks and exchange best practices. Check AORN, SGNA, and HSPA (Healthcare Sterile Processing Association) websites for local chapter information. These organizations, along with the CDC and AAMI, have many online tools. And never overlook the manufacturers or distributors that can provide needed in-person training.

Henry Schein Medical suggests that part of the education process should include random assessments of the staff working with endoscopes. It will help ensure the staff is appropriately performing cleaning and disinfection, and that they are maintaining the endoscopes. If any guidelines or recommendation change occurs, ensure the staff is trained and tested on the changes. Given how quickly a pathogen can spread from one patient to the other by an endoscope, it is essential that staff education and training are current.

By following these best practices and continuing to utilize the resources available for sterile processing, facilities can help keep their patients and staff safe from infections.

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