What You Can't See Can Hurt You

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The importance of cleaning is well known, especially in our profession. However, do we really understand the impact of inadequate or improper cleaning of a flexible endoscope—on the endoscopist, the patient and the endoscope itself?

Cleaning is defined as the "removal of contamination from an item to the extent necessary for further processing or for the intended use." What does this mean? How do we really clean? If I take a cloth and detergent and wipe off an item, is that considered clean? Consider this: you take a shower by letting the water run off your body. Nothing else is done. But you did take a shower! If you use a washcloth and soap and scrub all parts of your body, you still took a shower, but the result would be very different.

Processing personnel do not make devices; therefore, we need to rely on the device manufacturer to provide specific written instructions for use (IFU) on the recommended chemicals and method(s) of cleaning. In addition, we need to follow:

- facility or departmental policies and procedures for processing endoscopes and associated processing equipment (e.g., automated flushing devices)
- recommendations from standards-setting organizations, e.g., the Association for the Advancement of Medical Instruction (AAMI), and Guidelines from SGNA, AORN, CDC, etc.
- specific instructions from the device (scope) manufacturer for the make and model scope being processed (IFUs can vary from model to model)
- IFUs for any chemicals being used

Training staff in the specific IFUs for each endoscope and/or processing accessory is necessary as well. The training, with a return demonstration for each task, should be documented. Annual competency verification should also be performed.

The American Journal of Infection Control found that in a survey of 88 endoscopy technicians and nurses, fewer than 15% "received formal training in endoscope reprocessing or infection prevention..." Although most of the survey subjects expressed high confidence in their ability to reprocess endoscopes safely, their tested knowledge of best practices in the field yielded an average score of just 62%. While technicians seemed to have better knowledge of endoscope reprocessing, they were less aware of infection-control issues than nurses. The nurses, for their part, were less aware of the nuances of endoscope reprocessing. And although technicians were reprocessing scopes without supervision less than a month after hiring, few were formally certified to do so. This study emphasizes the importance of the training component on effective cleaning.

We also know that there are two types of soils: visible (blood, pus, mucus, etc.) and invisible (microorganisms). Both types need to be removed to prepare the surfaces of the device for further decontamination, which can include high-level disinfection (HLD) or sterilization. The better the cleaning, the better the outcome of the HLD or sterilization process.

Cleaning endoscopes can be a challenging task because of their design. There are numerous lumens and channels that must be cleaned, whether they were used during the procedure or not.

Meticulous manual cleaning is the most critical step in the reprocessing procedure of endoscopes (Alfa, et al., 2006). "Because of the body cavities they enter, flexible GI scopes are prone to high microbial contamination during each use. According to the CDC, the bioburden found on flexible gastrointestinal endoscopes after use ranges from 105 (100,000) colony-forming units (CFU)/mL to 1010 (10 billion) CFU/mL, with the highest levels found in the suction channels" (CDC, 2008). This statistic clearly identifies the magnitude of the problem. When one considers that the average microorganism reproduces in 20 minutes and the amount of bioburden on the scopes after use, any delays in the cleaning process can have serious impact on the ability to effectively clean the scope.

Inspection is the Key

Endoscopes should be inspected for damage and cleanliness during each step of processing. Visually inspect endoscopes

and reusable accessories frequently in the course of their use and reprocessing. According to the Multi-Society Guideline on Reprocessing Flexible GI Endoscopes and Accessories, "This inspection may include before, during and after use. Exterior endoscope inspection should be done after each manual cleaning cycle and before HLD or sterilization."

In addition, the Association for the Advancement of Medical Instrumentation (AAMI), the Association of periOperative Registered Nurses (AORN) and the Society of Gastroenterology Nurses and Associates Inc. (SGNA) now state that "visual inspection is a separate step that should be performed before HLD or sterilization." They recommend using magnifying glasses with extra lighting, to visualize defects remaining on external surfaces after cleaning. Some facilities use handheld magnifying lights; however, they can be cumbersome. Using a lighted magnifying lamp that sits on the worktable or counter permits inspection of the scope with both hands.

There are two types of inspection: visual and enhanced visual. Visual inspection involves inspecting all surfaces of the scope for visible damage and/or soils. This should follow with lighted magnification five (5X) to inspect the scope's surfaces. For general endoscopes, the 5X magnification is sufficient. However, the Centers for Disease Control recommends using 10X magnification for ERCP scopes (elevator wire). The visual inspection should include the outside of the scope, including the distal end near and around the lens. But how do we know the inside of the scope is clean? Yes, there are cleaning verification tests and they, too, are an additional tool in the goal to ensure that scopes have been cleaned properly. But are we still missing something?

Identification of additional problems inside the endoscope (e.g., inside the ports and channels) can be facilitated by using a device known as a borescope. Since we cannot see inside an endoscope, how do we know it has been cleaned correctly? Do we know of any damage inside the scope that can cause microorganisms and/or debris to accumulate inside scratches or fissures and possibly avoid the cleaning process? Shouldn't we know this?

Borescopes can be used to provide visualization inside endoscopes and other lumened devices. As previously noted, lumened devices are known to be a challenge to clean. The usual method for cleaning is to use a cleaning brush of the recommended diameter and length to ensure the brush will create friction throughout the channel and along the walls. It is critical that all the scope manufacturer's instructions for use for cleaning, especially the channels and lumens, are strictly followed. This includes using the recommended cleaning brushes or equivalents.

With endoscopic procedures, instruments are used inside the channels. These instruments can unintentionally cause damage to the walls or channels inside the scope. The value of using a borescope to inspect the inside of endoscopes has been recognized by numerous professional and standard setting organizations, including the Association for the Advancement of Medical Instrumentation (AAMI), the Association of peri-Operative Registered Nurses (AORN), and the Association for Professionals in Infection Control and Epidemiology (APIC), among others. These small devices allow processing technicians to view the inside surfaces and channels using lighted magnification. Careful inspection can identify interior scope damage or debris that could impact patient safety or the outcome of the procedure.

For instance, a scope may be considered dry, but have fluid left behind. This fluid can lead to biofilm formation. Without use of the borescope, these problems are more likely to be missed. Borescopes allow processing technicians to view internal surfaces using lighted magnification. Careful inspection can identify damage or debris that could impact patient safety or procedural success.

In addition, from a liability perspective, you can take a photo of the inside of the channel documenting the condition of the channel at the time of the processing. Should the safety of the scope come into question (i.e., whether the scope was properly cleaned), the photos would verify the condition of the internal surfaces.

It's important to purchase a borescope of correct dimensions (diameter and length) for the endoscopes being inspected. Always follow the borescope manufacturer's instructions for use. In addition, plan routine inspections of the borescope. Will it be used after cleaning alone? After high-level disinfection only? Or after both cleaning and high-level disinfection? Infection prevention practices need to be established based on when the borescope will be used. Manufacturers of borescopes can assist with this.

According to the Centers for Disease Control, "Flexible endoscopes are particularly difficult to disinfect and easy to damage because of their intricate design and delicate materials. Meticulous cleaning must precede any sterilization or high-level disinfection of these instruments. Failure to perform good cleaning can result in sterilization or disinfection failure, and outbreaks of infection can occur. Several studies have demonstrated the importance of cleaning in experimental studies with the duck hepatitis B virus (HBV) and Helicobacter pylori. As practitioners who process reusable endoscopes, it is our responsibility to utilize every method available to ensure the safety of the scopes when used. Remember, "Quality is not what happens when what you do matches your intentions. It is what happens when what you do matches your customers' expectations." – Quote attributed to John Guaspari.

For article references, visit endopromag.com.

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