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Reducing human error in endoscope reprocessing: The crucial role of innovation as GI procedures shift to ASCs

Advances in minimally invasive surgery have enabled patients to visit outpatient gastrointestinal facilities for procedures rather than hospital operating rooms. Infection prevention is a top priority for ASC leaders, and that focus extends to reprocessing the endoscopes used in many GI procedures.

Becker's Hospital Review recently spoke with three experts from Olympus about endoscope reprocessing and how Olympus® technology and training is focused on improving patient safety:

- Melinda Benedict, Director of Infection Prevention and Control
- Jeff Daniels, Director, Marketing of Infection Prevention Solutions
- Carolyn Klimas, Executive Director, Marketing of Infection Prevention Solutions and Strategic Marketing

Endoscope reprocessing should eliminate cross-contamination – if each step is performed correctly.

Endoscope reprocessing requires multiple steps. From an infection prevention perspective, every step is important for different reasons. For patient safety, the steps of each reprocessing stage must be performed consistently and correctly every time.

The **pre-cleaning step** occurs immediately after a procedure. This removes any significant bioburden, which could dry on the instrument and make subsequent steps less efficient.

To detect endoscope damage, which can affect patient safety and scope reprocessing, leak testing must be performed as a next step. Traditionally, leak testing is conducted by pressurizing the scope, placing it in water and looking for bubbles that emerge from the endoscope. The presence of bubbles indicates a breach in the watertightness of the scope, which is often caused by physical damage to the scope itself. "Sometimes, small punctures can be very hard to see," Ms. Benedict said. "Proper leak testing requires sufficient time and a careful eye, and there's room for human error."

After leak testing comes **manual cleaning**, during which technicians use friction to brush the scope's channels. "A lot of the literature suggests that this is one of the most important parts of endoscope reprocessing," Ms. Klimas said.

Once manual cleaning of a scope is complete, it can be moved into **the high-level disinfection or sterilization step**. This process inactivates remaining microorganisms and renders reusable devices safe for use with the next patient.

The value of **drying and storage** can't be overlooked. Literature and peer-reviewed articles published in recent years have underscored the importance of drying flexible endoscopes inside and out before putting them into storage. "A lot of evidence suggests the best practice is to use drying cabinets for storage," Ms. Benedict said. "If an organization doesn't have those, it's a good idea to use a cabinet that circulates HEPA-filtered air around the scopes to maintain their cleanliness."

Automated endoscope reprocessing reduces the risk of human error.

A common complaint we hear from ASCs and Hospitals is regarding staff turnover. Endoscope reprocessing is often considered an entry-level job and turnover among technicians tends to be high. In addition, endoscope reprocessing has multiple steps, and many people may be involved in the cleaning and disinfection process.

"When you combine a high-turnover entry-level job with a process that includes manual steps, you need to remove as many human factors from the process as possible," Ms. Klimas said. "Olympus is focused on automating the maximum amount of scope reprocessing steps and training technicians, so each step is repeatable."

Healthcare organizations strive to follow scope reprocessing steps consistently. They also recognize this work demands a lot from employees, as the various processes require them to remember many things.

"At larger sites, there are new technicians in training most of the time," Ms. Benedict said. "Organizations are looking for anything they can do to make the new hires' learning experience easier and faster, while still being robust in order to reduce the chance of error."

At the core of Olympus' design philosophy is removing human factors and introducing automation that enables machines to do the work. "This allows for better repeatability and consistency in endoscope reprocessing, while allowing technicians to focus more on patient care," Ms. Klimas said.

Olympus incorporates smart technology to improve patient safety + operational efficiencies.

Olympus is continually listening to customer feedback, while staying abreast of industry trends and best practices identified by professional societies. This information influences the company's approach to designing scope reprocessing equipment.

The OER-Elite™ endoscope reprocessor, for example, mitigates risk by automating seven of the 11 manual cleaning steps. Smart navigation technology has been integrated into the user interface for technicians. The color-coded screen provides a step-by-step guide that shows how to set up and use the machine properly. It also detects if incorrect connections are made and demonstrates how to recover from those errors.[1]

"The system automatically identifies the scope and its serial number," Ms. Klimas said. "Scopes have several different channels, and technicians must ensure the appropriate connector is attached to the right area on the scope. Rather than trying to remember those details, the graphical user interface displays the information automatically for technicians."

The OER-Elite endoscope reprocessor also includes ergonomic improvements to the disinfectant testing location based on customer needs. "Technicians no longer have to crouch down in front of the machine to test the disinfectant," Mr. Daniels said. "Customers told us that this process was hard on users' knees. With the OER-Elite endoscope reprocessor, it's possible to conduct the test from the top of the machine before the processing cycle begins."[1]

One of Olympus' key differentiators is that it is currently the only major endoscope manufacturer with reprocessors created specifically for Olympus scopes. "When scope designs change in response to new technologies and expanding clinical applications, we consider reprocessing right from the beginning of the product development process," Ms. Benedict said. "When Olympus launches new scopes with new features, customers know that we will have a robust reprocessor that is designed to clean those specific products efficiently."

When performed properly, leak testing identifies damage to scopes, which can lead to fluid invasion and cross-contamination. Olympus' new dry leak tester, the ALT-Pro™ leak tester, automates this process. The ALT-Pro leak tester pressurizes dry scopes and measures pressure differentials, which are caused by even small leaks. The ALT-Pro ™ leak tester also conducts a self-check when powered on, potentially eliminating the need for daily pressure testing recommended by some societies.[2]

"The ALT-Pro leak tester reduces human error in leak testing," Ms. Benedict said. "Technicians simply 'set it and forget it.' They connect the scope, press a button and then return in a few minutes to review the results. The ALT-Pro leak tester can save time, as well, since it is designed to test two scopes simultaneously."[2]

Once scopes have been reprocessed, maintaining their cleanliness is key to infection control. Olympus' PROTECH™ flexible endoscope tip protector offers a protective barrier around the distal tip of instruments. This minimizes contact with other objects, protects the scope from distal tip damage and enables airflow and channel drying due to its open design. In addition, PROTECH tip protectors have removable clean and dirty tabs that indicate scope reprocessing status.[3]

Single-use accessories can also reduce the need for scope reprocessing. Olympus provides a portfolio of single-use sterile accessories that support the reprocessing cycle, such as single-use air, water and suction valves. Cleaning brushes are another important single-use accessory.

"Basic brushes are essential to scope reprocessing, considering how effective they are in removing bioburden from instruments," Mr. Daniels said. "Our brushes are specifically designed and sized to clean the channels and curves of Olympus endoscopes."

User education: an integral part of Olympus' multi-faceted approach

Olympus provides a robust team of field-based service professionals dedicated to visiting customers and educating them about scope reprocessing.

"Field Service Engineers install and conduct basic training on our reprocessors," Mr. Daniels said. "We also have our Endoscopy Support Specialists who are experts in scope reprocessing and repair reduction. They understand the aspects of reprocessing and caring for endoscopes. They are knowledgeable about society guidelines, new guidance, best practices and emerging innovations."

Olympus also offers on-site education for credit, as well as the Olympus Continuum® educational platform, which provides online education for technicians, supervisors and nurses. "Through the Olympus Continuum educational platform, we deliver continuing education on-demand," Ms. Benedict said. "We conduct regular webinars on hot topics in infection control and endoscopy, such as drying of endoscopes, proper endoscope storage and maintaining the cleanliness of scopes as they move through the reprocessing steps."

Additionally, as an industry thought leader, Olympus often presents at yearly conferences and events held by various professional societies.

As more GI procedures move to ASCs, streamlined scope reprocessing will become the norm.

Looking ahead, the number of procedures moving from ORs to GI facilities is expected to grow. This will drive advances in patient care, but it will also require advances in the technologies used to support those procedures. Over time, scope reprocessing will become even more automated and streamlined.

"We look at scope reprocessing as a complete cycle," Mr. Daniels said. "At every stage, we focus on instrument care and protection. Olympus is committed to working with customers to ensure patient care is as safe as possible."

[1] Data on file with Olympus September 1, 2020. Improper use of the OER-Elite endoscope reprocessor may pose an infection control risk to patients and/or operators.

[2] Data on file as of 2/04/2013. The ALT-Pro Automated Endoscope Leak Tester is intended to be used to perform and record leakage testing on Olympus flexible endoscopes. Failure to comply with the IFU could result in damage or malfunction to the equipment or electric shock to the user.

[3] Data on file with Meditech Endoscopy. Always utilize PROTECH according to the Instructions for Use, otherwise it may lead to improper use and lack of protection for the endoscope. PROTECH is not intended for use on a patient. The PROTECH flexible endoscope tip protector is not intended for use during sterilization. Always remove PROTECH before reprocessing an endoscope.

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