

HOW CLEAN IS YOUR SCOPE?

BY VICKY UHLAND



In 2015, the *American Journal of Infection Control (AJIC)* published a study on endoscopes conducted by researchers from the Mayo Clinic and St. Paul, Minnesota-based Ofstead & Associates. The conclusion? Despite following cleaning and high-level disinfection (HLD) processes in accordance with national guidelines and institutional protocols, the researchers found that viable microbes and residual contamination on the endoscope surfaces persisted throughout the stages of reprocessing.

“We had a physician and one of the researchers observe each step of the cleaning and disinfection process. We confirmed the techs did everything by the book, and the scopes were still contaminated,” said Cori Ofstead, MSPH, president and CEO of Ofstead & Associates. “So we started wondering: ‘Is there something about the scopes that makes them impossible to clean?’”

She noted that the endoscopes used in the study were about five to six years old and had been through more than 2,000 procedures each. Were the scopes simply

too old and beat up to get completely clean? Ofstead and her research team, along with a colleague from the University of Minnesota, decided to find out.

NEWER SCOPES, RIGOROUS REPROCESSING STILL RESULTED IN CONTAMINATED SCOPES

In a study published in the February 2017 issue of *AJIC*, the researchers tracked reprocessing effectiveness for 20 gastroscopes and colonoscopes from an ambulatory-care facility that only used each scope once a day,

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on average. The scopes ranged in age from three months to two years. The scopes were divided into a control group and an intervention group.

Over a seven-month period, the control-group endoscopes underwent a bedside precleaning process that involved wiping external surfaces and flushing channels with detergent immediately after procedures. This was followed by leak testing, manual cleaning, and HLD with a solution of 2.5 percent glutaraldehyde in automated endoscope reprocessing (AER) machines.

The intervention group process was the same, except for an extra cleaning step done in the AER and the type of disinfectant used. For this group, the endoscopes underwent automated cleaning with detergent before HLD with five percent peracetic acid (PA) solution. This was based on evidence that glutaraldehyde can cause protein fixation, and PA can remove that protein buildup.

Reprocessing technicians also did adenosine triphosphate (ATP) tests on both the biopsy port and suction-biopsy channels of the intervention-group scopes. If ATP levels were high, the scope was manually recleaned and tested again. Whenever the second test failed, the scope went through two AER cycles, with retesting after the first cycle.

At baseline, after two months, and at the end of the study, the researchers did microbial cultures, ATP tests, and protein biochemical tests on all the reprocessed scopes from both the control and intervention groups.

They also visually examined each scope with a borescope—a tiny endoscope that can look inside bigger endoscopes. According to Ofstead, “It’s like doing a colonoscopy and upper GI procedure on a scope—both the upper and lower GI sections.”

Despite the rigorous cleaning and disinfection methods, at the final assessment, the researchers found that all 20 endoscopes had visible irregularities, including fluid, discoloration, scratches, or debris in the channels. And 60 percent of the scopes had microbial growth. This occurred in both the control and intervention scopes. Every endoscope had ≤ 10 CFU except 1 intervention AC with 15 CFU. Two potential pathogens were found (*Corynebacterium* and *Methylobacterium extorquens*).

In addition, 20 percent of the endoscopes in each group had ATP and protein residue levels above benchmark, which indicated that cleaning procedures were not effective. ATP levels were also higher in gastroscopes than colonoscopes.

WHAT CAN INFECTION PREVENTIONISTS DO?

While this study may be disheartening, Ofstead said there are steps infection preventionists (IPs) can take to help improve scope reprocessing in their facilities.

- The Society of Gastroenterology Nurses and Associates (SGNA) and the Association of PeriOperative Registered Nurses (AORN) guidelines, along with the Association for the Advancement of Medical Instrumentation’s (AAMI) Standard 91 say that visual endoscope inspections, using lighting magnification, should be done after every reprocessing and before an endoscope is used on a patient. “This is a quick, easy solution,” Ofstead said. She suggests setting up an inspection station in the reprocessing room and designating someone to do a visual inspection on “every scope, every time.”
- Verify biochemically that scopes are clean before HLD. Otherwise, the debris can harden onto a scope and become difficult to remove. “Tests for ATP, hemoglobin, and protein are quick to do and not very expensive,” Ofstead said.
- Consider doing more frequent scope assessment and repairs, especially for new scopes. “Facilities can identify early on if a scope gets damaged so it can be repaired before contamination builds up,” she said.
- Have a checklist of protocols for scope cleaning and use, and do unannounced audits at least once a month. This includes checking the processes used at bedside, precleaning, leak testing, manual cleaning, disinfection, and drying.
- Regularly check material usage logs and ordering history in the reprocessing units. Per Ofstead, this can tell you if the staff is doing the proper tests and using the right amount of materials. For instance, the reprocessing team should be using test strips to see if the disinfectant is at the proper strength. Looking at the date on a bottle of test strips, checking how many

reprocessing cycles occurred since that date, and counting the number of strips in the bottle can tell you if the recommended amount of testing occurred.

In addition, keep an eye out for new endoscope designs, such as scopes that can be disassembled or have single-use components—including a single-use channel for cystoscopes. Ofstead said single-use bronchoscopes and ureteroscopes are now available, and there will be a single-use colonoscope on the market within the year. Her company has received research funding from both the ureteroscope and colonoscope manufacturer, as well as the companies that make the reprocessing and monitoring equipment used in the 2017 study. 



READ MORE ABOUT ENDOSCOPE REPROCESSING IN THE AMERICAN JOURNAL OF INFECTION CONTROL

Persistent contamination on colonoscopes and gastroscopes detected by biologic cultures and rapid indicators despite reprocessing performed in accordance with guidelines. Ofstead CL, Wetzler HP, Doyle EM, et al., *American Journal of Infection Control*, Vol. 43, Issue 8, p794-801.

Contamination of a purified water system by *Aspergillus fumigatus* in a new endoscopy reprocessing unit. Khalsa K, Smith A, Morrison P, et al., *American Journal of Infection Control*, Vol. 42, Issue 12, p1337-1339.

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Correlation between the growth of bacterial biofilm in flexible endoscopes and endoscopy reprocessing methods. Ren-Pei W, Hui-Jun W, Ke Q, et al., *American Journal of Infection Control*, Vol. 42, Issue 11, p1203-1206.