

## Endoscopic hang time: Can we get some clarity?

Safe and effective reprocessing of GI endoscopes is imperative. There really is no other choice! Endoscopic procedures are critical in the diagnosis and therapy of much of GI disease, and ensuring that each endoscope is reprocessed effectively and is “patient ready” for the next procedure is of obvious importance to patients and practitioners alike. Multisociety guidelines exist to guide all steps in reprocessing and must be universally followed.<sup>1</sup> The 2011 Multisociety Guideline on Reprocessing Flexible GI Endoscopes includes a section entitled “Unresolved Issues Requiring Further Study”; the first issue discussed in that section was endoscope “hang time” or “shelf life,” defined as the interval of storage after which endoscopes should be reprocessed before additional use.<sup>1</sup>

Clarity on this matter is sorely needed. Appropriate endoscope hang time after reprocessing is a matter of great importance and is a very practical issue because it comes up in daily practice in every facility where endoscopy is performed. Moreover, although safety is at the heart of the issue, economic impact is also an important consideration. Reprocessing endoscopes is associated with substantial costs; if the appropriate length of time for safely “hanging” equipment after reprocessing were clarified, significant cost savings without affecting patient safety might be available.

Indeed, there is much uncertainty about the length of time endoscopes can be stored before they pose a contamination risk. What guidance do we have, and what is the evidence to support that guidance? Available data from several studies suggest that contamination of endoscopes after reprocessing when stored according to recommendations for 7 to 14 days is negligible. The Multisociety Guideline on Reprocessing Flexible Gastrointestinal Endoscopes states that “although reuse of endoscopes within 10 to 14 days of high-level disinfection appears to be safe, data are insufficient to provide a maximal duration for use of appropriately cleaned, reprocessed, dried, and stored flexible endoscopes.”<sup>1</sup> Agreement on this is anything but uniform.<sup>2-4</sup> For example, the Gastroenterological Society of Australia Infection Control Guidelines limits storage to 12 to 72 hours before additional reprocessing, depending on the type of endoscope.<sup>5</sup> The Centers for Disease Control and Prevention, in its

document “Guideline for Disinfection and Sterilization in Healthcare Facilities,” provides detailed steps for reprocessing endoscopes, but makes no recommendations about the length of time endoscopes can be safely stored before reuse.<sup>6</sup> The European Society of Gastrointestinal Endoscopy and the European Society of Gastroenterology and Endoscopy Nurses and Associates leave the endoscope storage interval before additional reprocessing to local policies.<sup>7</sup> The Society of Gastroenterology Nursing and Associates makes no recommendations because of a lack of scientific evidence.<sup>8</sup> Finally, the most recent recommendations from the Association for Operating Room Nurses and the Association for Professionals in

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Infection Control and Epidemiology recommend maximum storage intervals without reprocessing of 5 and 7 days, respectively.<sup>9,10</sup>

In fact, at the extreme, some facilities reprocess all endoscopes each morning regardless of whether they were used or reprocessed the day before. Daily or very frequent reprocessing of unused endoscopes is labor-intensive, time-consuming, and costly, and may well be unnecessary. Furthermore, potentially excessive reprocessing also may lead to increased environmental waste because high-level disinfectants are environmental contaminants and therefore require special disposal practices.

In this issue of *Gastrointestinal Endoscopy*, Brock et al<sup>11</sup> present information on this very topic. The aim of their study was to demonstrate whether endoscopes might be stored for up to 21 days after reprocessing without colonization by pathogenic microbes. The researchers examined gastroscopes, colonoscopes, and duodenoscopes. In each of 96 individual tests that were done, samples were collected from an endoscope channel by irrigation, and that fluid was then cultured; study plates were inspected on days 0, 7, 14, and 21.

What did they find? A total of 33 positive cultures were obtained; of those, 29 of 33 were typical skin or environmental contaminants and thus thought to be clinically insignificant. The other 4 were potential pathogens, but also were thought to be clinically insignificant because each was only recovered at 1 point in time at 1 site, and all grew in low concentrations. The researchers concluded that endoscopes could be stored for up to 21 days after standard reprocessing with a low risk of pathogenic microbial colonization.

Previous studies have looked at this same question, but typically for shorter durations. Generally, the outcome, endoscope contamination, has been measured by flushing endoscope channels with sterile water at various time periods and culturing the returns to determine whether microorganisms were present.<sup>2-4</sup> For example, 1 study demonstrated no clinically significant growth on gastroscopes, colonoscopes, and duodenoscopes after 5 days.<sup>3</sup> In this study, contamination by nonpathogenic organisms was noted on the exterior surface and valve ports of endoscopes, but none from culture of the effluent after biopsy channels were flushed. Other reports yielded similar results but looked at 7-day intervals.<sup>12</sup> A larger study that sampled endoscopes, colonoscopes, duodenoscopes, and EUS endoscopes showed no recovery of pathogenic microorganisms at 5 days and a single yeast when the study was carried out to 7 days.<sup>2</sup> Yet another study sampled reprocessed endoscopes periodically over the course of 14 days. In this study, no potential pathogens were found on 3 colonoscopes and 4 duodenoscopes.<sup>4</sup> Indeed, the length of “hang time” in previous studies has been limited by the predetermined time span of the study; the current work by Brock et al<sup>11</sup> supports expanding that time interval.

What is the importance of this new work? In fact, this is the first study that evaluates possible colonization of gastroscopes, colonoscopes, and duodenoscopes for up to 21 days after reprocessing. The findings (or lack thereof) are important. Of course, when assessing the length of safe storage, an assumption is made that the endoscopes were properly reprocessed, including thorough drying. Endoscopes must also be stored correctly by being hung vertically in a clean, well-ventilated cabinet with recommended temperature and humidity levels. The endoscopes must not have caps or valves attached during storage. Indeed, established protocols for cleaning and disinfection must always be followed meticulously. This cannot be overemphasized. All reprocessing must adhere strictly to guidelines that have been developed by various manufacturers and stakeholder groups to ensure appropriate outcomes.<sup>1</sup>

The findings by Brock et al provide evidence to expand the safe hang time for endoscopes after reprocessing to 21 days and add to a small body of literature noting continued safety when endoscopes are cleaned and disinfected properly and then stored appropriately. That

in and of itself is notable—but there is more. The implications of this study in terms of cost savings are significant. A change in the interval for reprocessing after storage from perhaps 5 to 7 days to a longer interval could result in considerable cost savings. These cost savings would be mainly in reduced staffing resources needed, decreased use of reprocessors, and fewer disinfectants used. There would be a positive environmental impact as well, with less toxic waste produced. Lastly, a less-frequent interval for reprocessing could potentially minimize delays in procedures in some facilities where limited availability of endoscopes is an issue.

Who is to say that 21 days is the correct interval? Indeed, perhaps the interval could be longer. That question could be the topic of yet another study. Will reprocessing guidelines incorporate this new information? That too remains for additional work to replicate these results. As the authors properly note, there remains much uncertainty.

Endoscopy is a potentially life-saving procedure. Endoscopes are contaminated with each use; proper cleaning and disinfection are critical. Understanding how long reprocessed endoscopes can be safely stored is crucial for preventing infection and controlling unnecessary costs. Additional clarity here is essential, and this study adds to the clarity in what has thus far been a very cloudy issue with few solid data. Here's to hoping for additional clear information to continue to guide endoscopists and facilities.

## DISCLOSURE

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