

# The Q-Net™ Monthly

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## What's News

### Happy New Year

Welcome to Q-Net's 10th year! Q-Net would like to welcome its newest subscribers from Riyadh, Saudi Arabia; Calcutta, India; and Tokyo, Japan. Also, the December (2003) issue of *OR Today* published an article that discusses the risk of bacterial transmission associated with improper reprocessing of bronchoscopes. Read it at Q-Net's Web site: <http://www.myendosite.com>

## Editor-in-Chief

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## What is 'Q-Net'?

Q-Net is a technology-assessment network of questions and answers. Its newsletter is *The Q-Net™ Monthly*.

Q-Net's main goal is to encourage the infection control and endoscopy communities to not only ask good questions but to also demand succinct and well referenced responses.

Q-Net addresses the needs of both the health care provider whose goal is to provide the best care possible, and the patient who deserves affordable quality health care.

## Dear AORN

*Is the current standard of care safe or suspect?*



**Background:** The *Association of Perioperative Registered Nurses* (AORN) is an organization that represents more than 40,000 perioperative registered nurses in the United States and abroad.<sup>1</sup> On occasion AORN publishes *recommended practices* to guide nurses, improve patient care, and establish an "optimal level of practice."<sup>2-6</sup> Healthcare facilities may use these recommended practices to establish standards for patient care in a variety of clinical settings, including traditional operating rooms, ambulatory surgical care centers, and outpatient endoscopy suites. These recommended practices are comprehensive and cover many different healthcare fields, from such applications as radiological and laser safety to rigid and flexible endoscope reprocessing.

In February of last year AORN published its "*Recommended Practices for Cleaning and Processing Endoscopes and Endoscope Accessories*."<sup>2</sup> AORN encourages healthcare facilities to use these recommended practices, which are based on guidelines for endoscopes previously published by AORN,<sup>3,4</sup> to develop policies and procedures and to assist endoscopy staff in the "care,

cleaning ... handling, storage, and sterilization and/or disinfection of flexible and rigid endoscopes and related accessories."<sup>2</sup> Proper cleaning and processing of endoscopes is crucial to prevent nosocomial infection caused by both patient-borne and environmental pathogens.

Included in AORN's recommended practices for cleaning and processing endoscopes are sample protocols that describe how to clean, disinfect, and "sterilize" endoscopes.<sup>2</sup> In addition, these recommended practices stress the importance of having staff: (1) use endoscopes "immediately upon completion of the processing cycle"—that is, without delay following high-level disinfection or "just-in-time" liquid sterilization"; (2) demonstrate competency whenever new endoscopes are introduced into the clinical setting; and, (3) for quality control purposes obtain from its manufacturer documentation that demonstrates the automated endoscope reprocessor (AER), if one is used, is safe, effective, and operates as labeled.<sup>2</sup>

**Proposed "Recommended practices for high-level disinfection:"** Last year AORN posted on its Internet Web site ([www.aorn.org](http://www.aorn.org)) for public review and comment proposed recommended practices for high-level disinfection.<sup>5</sup> These proposed recommended practices, which are based on guidelines for high-level

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AORN's position on drying endoscopes	High-level disinfection, tap water rinse	"Liquid sterilization," sterile water rinse
● Between patient procedures	Not recommended	Not recommended
● Before storage	Recommended	Not recommended

**Table 1:** AORN recommends drying rigid and flexible endoscopes only before storage and after high-level disinfection (or after a tap water rinse). AORN's recommendations depend on the quality of the rinse water (e.g., sterile or tap water) and whether the AER (or LCS) is labeled to achieve high-level disinfection or "liquid sterilization."

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 disinfection previously published by AORN,<sup>6</sup> provide guidance that overlaps some sections of AORN's recommended practices for cleaning and processing endoscopes.<sup>2-4</sup> Once finalized, these proposed recommended practices will help healthcare facilities develop policies and procedures for high-level disinfection of, among other types of instruments, rigid and flexible endoscopes. (The deadline for public responses to these proposed recommended practices for high-level disinfection expired January 2, 2004.)<sup>5</sup>

**Incomplete 'recommended practices,' guidelines?** All of these recommended practices published by AORN for the cleaning, processing, and high-level disinfection (as well as "liquid sterilization") of rigid and flexible endoscopes are certainly important and comprehensive guidance documents.<sup>2-6</sup> These recommended practices, however, are arguably incomplete and may fall short of AORN's laudable goal to establish an "optimal level of practice" and to achieve "optimal outcomes for patients undergoing operative and other invasive procedures."<sup>7</sup> Specifically, whereas AORN recommends drying the endoscope (only) before storage and after high-level disinfection (or after a tap water rinse) using a 70% to 90% ethyl or isopropyl alcohol rinse followed by forced air,<sup>2,5,6,8</sup> AORN does *not* recommend drying the endoscope between patient procedures, after either high-level disinfection or "liquid sterilization" (Table 1).<sup>2,5,6</sup> (Similar in labeling to a FDA-cleared and currently marketed peracetic acid-based AER, another AER that uses performic acid, filtered rinse

water, and is labeled to provide rapid "liquid sterilization" of endoscopes has been submitted to and is pending 510[k] clearance by the Food and Drug Administration [FDA].)

Nor does AORN recommend drying the endoscope before storage and after "liquid sterilization" (or after a sterile water rinse; Table 1).<sup>2,5,6</sup> Instead, to minimize the risk of nosocomial infection due to bacterial colonization in the endoscope's internal channels during overnight storage or idle "down-time," AORN recommends reprocessing every endoscope immediately before its first use of the day (and immediately before each subsequent use throughout the day).<sup>9,10</sup> But this early morning practice can be time-consuming, onerous, and prohibitively expensive, making its implementation impractical for many busy endoscopy centers. Moreover, provided the endoscope the previous day was dried after proper reprocessing and stored in a dry and well-ventilated room, reprocessing each endoscope immediately before its first use of the day has not been shown to improve patient safety and therefore is not recommended by some other organizations.<sup>9,11</sup> Bacterial colonization and transmission resulting in nosocomial infection have been reported, but only when a wet or inadequately dried endoscope after reprocessing was placed in storage (with the possible exception of recalled endoscope models manufactured with a defective component).<sup>9,12</sup> (Only under specific circumstances does this article's author recommend reprocessing the endoscope before the first patient of the day,<sup>9</sup> a practice that in the opinion of this article's author should be the exception and not the rule.)

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APIC's position on drying endoscopes	High-level disinfection, tap water rinse	"Liquid sterilization," sterile water rinse
● Between patient procedures	Recommended	Not recommended <sup>†</sup>
● Before storage	Recommended	Recommended

**Table 2:** APIC's position on drying rigid and flexible endoscopes, which it recommends after completion of every reprocessing cycle, except when the endoscope is rinsed with sterile water between patient procedures.

<sup>†</sup> After high-level disinfection of rigid endoscopes, APIC recommends rinsing with sterile water followed by drying using a method that will not result in re-contamination.<sup>13,14</sup>

SGNA's position on drying endoscopes	High-level disinfection, tap water rinse	"Liquid sterilization," sterile water rinse
● Between patient procedures	Recommended	Recommended
● Before storage	Recommended	Recommended

**Table 3:** SGNA's recommends drying gastrointestinal (GI) endoscopes after completion of every reprocessing cycle, irrespective of the AER's (or LCS's) label claim or the rinse water's quality.

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**Other published guidelines:** Other published guidelines were reviewed for clarity and to determine whether any in the fields of infection control and endoscopy support AORN's position that it is unnecessary and unwarranted to dry the endoscope between patient procedures, after either high-level disinfection or "liquid sterilization" (Table 1).<sup>2,5,6</sup> This review revealed that few professional organizations agree that endoscope drying is unimportant. For example, the *Association for Professionals in Infection Control and Epidemiology* (APIC; www.apic.org) recommends drying flexible endoscopes between patient procedures, except, however, when sterile water is used for rinsing (Table 2).<sup>13</sup> In addition, APIC recommends drying the endoscope before storage, no matter whether using an AER (or LCS) that is labeled to achieve high-level disinfection or "liquid sterilization," or whether using tap water, sterile water, or bacteria-free water for rinsing. (After high-level disinfection of rigid endoscopes both between patient procedures and before storage, APIC recommends rinsing with sterile water followed by drying using a method that will not result in re-contamination.<sup>13,14</sup>) The *Society of Gastroenterology Nurses and Associates* (SGNA; www.sgna.org), on the other hand, recommends that the endoscope be dried after completion of every reprocessing cycle (Table 3) – that is, both between patient procedures and before storage, no matter the AER's (or LCS's) label claim or the quality of the rinse water.<sup>9,11,15,16</sup>

**Discussion:** Although AORN recommends drying the endoscope before storage and after high-level disinfection (or after a tap water rinse), it does not recommend drying the endoscope between patient procedures, after either high-level disinfection or "liquid sterilization" (Table 1). Noteworthy, failure to recommend drying the endoscope between patient procedures is, in effect, to support—if not to recommend and establish as the *de facto* standard of care—the clinical use throughout the day of *just-reprocessed-and-wet-with-rinse-water* endoscopes (Tables 1-3).<sup>2,5,6,13</sup> Instead of drying, AORN requires the endoscope be used *immediately* after reprocessing.<sup>2,5,9,10</sup> But this requirement is problematic, because it virtually ensures the endoscope and its internal channels will be wet with rinse water when inserted into the patient's lungs, biliary tract, knees, or peritoneal cavity.<sup>17</sup> Moreover, belying claims that the use of wet endoscopes is

safe, several published reports document patient infection (and pseudo-infection) caused by wet or inadequately dried endoscopes (and other types of instruments).<sup>18-31</sup> Rinsing with "sterile" water, although often (erroneously) presumed to be free of bacteria, does not necessarily eliminate the risk of nosocomial infection, as some of these reports document bacterial outbreaks linked to endoscopes rinsed with water claimed to be "sterile."<sup>29-31</sup>

Due to the well-documented risk of bacterial transmission and nosocomial infection associated with clinical use of wet endoscopes,<sup>18-31</sup> it is unclear why some published guidelines including AORN's do not recommend drying the endoscope immediately after every reprocessing cycle, as SGNA recommends (Table 3).<sup>11,15,16</sup> It is also unclear why the Food and Drug Administration (FDA) does not require that endoscopic equipment be labeled to instruct users to dry the endoscope after manual and automated reprocessing. Drying is inexpensive, a relatively rapid process, and does not require complex equipment. Most important, drying prevents nosocomial infections: Several reports describe outbreaks (and pseudo-outbreaks), caused by wet endoscopes contaminated with bacteria, that were abruptly terminated once the endoscope was dried after reprocessing.<sup>18-27</sup> Few "accepted" medical practices arguably present as significant a potential risk of nosocomial infection as the use of wet endoscopes—particularly bronchoscopes, endoscopes used for ERCP (*endoscopic retrograde cholangio-pancreatography*), and rigid endoscopes—on patients many of whom may be critically ill, immuno-suppressed, and at a "high risk" for bacterial infections. In short, it is hard to argue that clinical use of wet endoscopes, although supported by some professional organizations (Tables 1, 2),<sup>2-5,10,17</sup> is safe, appropriate, does not increase the risk of nosocomial infection, and is in conformance with AORN's goal to achieve "an optimal level of practice."<sup>2-5</sup>

Clinical use of *just-reprocessed-and-wet-with-rinse-water* endoscopes is of particular concern, because most healthcare facilities do not microbiologically monitor for waterborne bacteria the rinse water used during endoscope reprocessing. Failure to monitor the rinse water, which may be filtered through a bacterial membrane, however, precludes determination of its microbial quality (i.e., *Is the rinse water "sterile"?* *Is it "bacteria-free"?* *Is it contaminated?*). And, terminally rinsing reprocessed instruments with water of an

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unknown microbial quality arguably voids any claim or "guarantee" that the endoscope was successfully "high-level disinfected" or "sterilized" and therefore safe to use (since the terminal water rinsing step follows the chemical immersion step). Without knowing for sure that the rinse water is free of bacteria, the possibility exists, and such an outcome necessary to presume, that the reprocessed endoscope was re-contaminated with waterborne bacteria during terminal water rinsing. Even when not provided ample time to colonize and proliferate in the endoscope's internal channels during storage, small numbers of bacteria rinsed onto an endoscope just before its insertion into the patient could pose a risk of nosocomial infection, especially for immuno-suppressed patients. *To be sure, contaminated rinse water yields contaminated and potentially unsafe endoscopes irrespective of the potency, strength, or effectiveness of the LCS.*

**Conclusion:** As displayed in Tables 1-3, whereas some professional organizations do not recommend drying the endoscope, others consider it a requisite practice crucial to the prevention of bacterial transmission and nosocomial infection. Such differences placed on the importance of drying the endoscope, especially between patient procedures, not only causes confusion and variations in patient care but also increases the risk of patient injury. Therefore, for consistency, clarity, and improving and standardizing the standard of care, it is recommended that guidelines published by professional organizations and governmental agencies be modified or updated as required to include the following succinct text in accordance with SGNA's guidelines:<sup>11,16,34</sup>

► *Dry the endoscope after every reprocessing cycle, both between patient procedures and before storage, irrespective*

### Steam sterilization of surgical instruments?

AORN's proposed 'recommended practices' for high-level disinfection fail to recommend steam sterilization of *critical* (and *semi-critical*) instruments not damaged by heat (and pressure and moisture). Instead, AORN recommends reprocessing *critical* instruments using a LCS followed by water rinsing (with no drying step).<sup>5,6</sup> According to APIC and the Centers for Disease Control and Prevention (CDC), however, *critical* instruments not damaged by heat, such as biopsy forceps and steam autoclavable rigid endoscopes, require steam sterilization.<sup>13,32</sup> Use of a LCS or other type of low temperature sterilizing agent for reprocessing these types of instruments is contraindicated. Pressurized steam is the most available, inexpensive, and effective sterilization method available, and therefore it is recommended whenever feasible to minimize the risk of nosocomial infection.<sup>33</sup> It is unclear why AORN's recommended practices do not stress the importance and unrivaled effectiveness of steam sterilization. ●

of the claim of the AER (or LCS) (i.e., "high-level disinfection" or "liquid sterilization") or the quality of the rinse water (e.g., tap water or "sterile" water).

This all-inclusive recommendation will increase compliance with drying and reduce the risk of bacterial transmission via an endoscope. Use of a drying method that will not result in re-contamination of the endoscope is recommended.<sup>14</sup> Moreover, drying the endoscope after rinsing with "sterile" water is recommended,<sup>34</sup> because reports suggest "sterile" water can still pose an infection risk.<sup>29-31,35</sup> Bacterial filters used in conjunction with AERs can fail and allow bacteria in the general water supply to pass and re-contaminate the endoscope during water rinsing.<sup>35</sup> Storage of the endoscope in a dry and well-ventilated environment in accordance with the endoscope manufacturer's instructions is also recommended to prevent bacterial colonization and transmission.

Finally, it is also recommended that professional organizations and governmental agencies encourage healthcare facilities to consider monitoring the rinse water used during endoscope reprocessing to ensure it is safe and bacteria-free. The outcome of processes that use water to rinse instruments is limited by the microbial quality of the rinse water. Failure to monitor microbiologically the rinse water precludes assurances that the instruments were successfully "high-level disinfected" or "sterilized." Nevertheless, save for a few reports, monitoring the rinse water used during endoscope reprocessing is not generally recommended.<sup>35,36</sup> ● LFM

References to this article are available at:  
[www.myendosite.com/refs010204.htm](http://www.myendosite.com/refs010204.htm)

Thank you for your interest in this newsletter. *I have addressed each issue to the best of my ability. Respectfully, the Publisher: Lawrence F. Muscarella, PhD.* Please direct all correspondence to:

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