

# The Q-Net™ Monthly

Volume 8, Number 1

January 2002

## What's News

Six articles written by this newsletter's editor will be published later this winter and spring in several journals. The topics discussed in these articles are: monitoring the rinse water used during endoscope reprocessing, anthrax, the hepatitis C virus, the labeling of liquid chemical sterilants, and outbreak investigations. These articles will be published in: *The American Journal of Infection Control*, *Infection Control and Hospital Epidemiology*, *Gastroenterology Nursing*, and *Infection Control Today*. Reprints will be available upon request.

## Editor-in-Chief

All articles published in this newsletter are written by: **Lawrence F Muscarella, PhD**, Chief, *Infection Control* at Custom Ultrasonics, Inc. Ivyland, PA 18974.

## 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.

## Common processing questions

### ***"Should endoscopes be disinfected in the morning before the first patient?"***

The *Association of periOperative Registered Nurses* (AORN) and several European organizations recommend disinfecting endoscopes before the first patient of the day.<sup>1,2</sup> This practice is intended to reduce the risk of patient infection and to ensure each patient is treated with an endoscope of the same "quality." Not every organization, however, agrees with this recommendation.<sup>2</sup>

Disinfecting (high-level) endoscopes before the first patient of the day appears unnecessary when the endoscope at the end of the previous day was terminally dried after reprocessing using a 70% alcohol rinse followed by forced air.<sup>2</sup> But this practice is recommended when:<sup>2</sup> it is unclear whether the endoscope was reprocessed and thoroughly dried before storage; or, the endoscope was improperly stored or removed wet from storage; or, the facility's water used to rinse its endoscopes after chemical immersion contains significant numbers of bacteria.

### ***"Has nosocomial anthrax infection been reported following endoscopy?"***

Anthrax is caused by *Bacillus anthracis*, a rod-shaped, spore-forming bacterium. When deprived of water or essential nutrients, the vegetative cells of *B anthracis* (and other spore-forming bacteria) may sporulate and form dormant and resistant endospores.<sup>3</sup> Once introduced into the body, these endospores germinate back

into vegetative cells, which are less resistant than endospores and as susceptible to biocides as non-sporulating bacteria.<sup>4</sup> Germination of endospores into vegetative cells is necessary for infection.<sup>5</sup>

To be clear, nosocomial anthrax infection has not been reported. Nor has *B anthracis* been cultured from a medical instrument. But if an endoscope during use were (hypothetically) to become contaminated with *B anthracis*, only its vegetative cells susceptible to cleaning and high-level disinfection would likely be present immediately after the procedure.<sup>4</sup> Therefore, adhering to current endoscope reprocessing guidelines appears adequate to prevent transmission of *B anthracis*.<sup>6</sup>

### ***"Are there any infection control or reprocessing issues that warrant discussion before purchasing new laparoscopes or arthroscopes?"***

Laparoscopes and arthroscopes are classified as critical instruments for which sterilization is recommended.<sup>7</sup> Many older designs of these instruments are sensitive to heat and therefore preclude steam sterilization, creating an interesting reprocessing dilemma.

Low-temperature alternatives, such as ethylene oxide (EtO) gas and liquid chemical sterilants (LCSs), can be used to reprocess heat-sensitive instruments. But none is as effective as pressurized steam.<sup>7,8</sup> Moreover, EtO gas requires the instrument be aerated for up to 24 hours, which can be problematic. And LCSs are used primarily to achieve high-level

disinfection, limiting their application.<sup>9</sup>

The development of steam autoclavable rigid endoscopes resolves this reprocessing dilemma. Steam sterilization is inexpensive, reliable, and readily available. Indeed, steam sterilization is recommended for critical instruments not damaged by heat.<sup>7,9</sup> (High-level disinfection is recommended for semi-critical items; however, this process is acceptable for arthroscopes and laparoscopes when sterilization is not feasible.<sup>7</sup>) When purchasing new rigid endoscopes, selecting models labeled for steam sterilization is therefore recommended.

○  
**“Our facility routinely high-level disinfects its flexible endoscopes. But if a patient is suspected of being infected with HIV or HBV, we instead sterilize the endoscope after use using ethylene oxide gas. Is this practice acceptable?”**

Although ethylene oxide gas (EtO) is an acceptable alternative for reprocessing flexible endoscopes, high-level disinfectants destroy HIV and HBV (and virtually every other pathogen.) Replacing high-level disinfection with EtO gas sterilization for an endoscope that may be contaminated with one of these viruses is therefore unnecessary and a dubious practice. Employing a single (and effective) reprocessing procedure is important to maintain a consistent standard of care. Moreover, treating each patient as a potential carrier of a blood-borne pathogen is crucial to protect healthcare staff (Standard Precautions). Consequently, it is not recommended to alter a facility's routine disinfection procedure for an endoscope that may be contaminated with HIV or HBV.<sup>10</sup>

A recent national survey<sup>10</sup> reported that only 5% of the respondents altered their reprocessing procedure for endoscopes potentially contaminated with a blood-borne pathogen. Marking an improvement in healthcare practice, this finding is in contrast to surveys published almost ten years ago that indicated more than 50% of the responding hospitals altered their disinfection procedure when the endoscope was used on a patient infected with a blood-borne pathogen.<sup>10</sup>

○  
**“Is it acceptable for our hospital's endoscopy unit to use a liquid chemical sterilant instead of pressurized steam to disinfect/sterilize biopsy forceps after cleaning?”**

Liquid chemical sterilants (LCSs) are convenient for reprocessing endoscopes near the patient's procedure room. Similarly, using a LCS for point-of-use processing of (reusable) biopsy forceps might have its benefits, such as a reduction in the instrument's turn-around time and allowance for a smaller inventory of biopsy forceps to meet the unit's clinical needs.

But biopsy forceps are critical instruments for which sterilization is recommended.<sup>7,11</sup> Because these instruments are not damaged by heat, pressure, or moisture and are sufficiently complex in design to hinder direct contact of low-temperature sterilizing agents with all of the instrument's internal surfaces, steam sterilization—not a low-temperature sterilization process—is recommended.<sup>7,12</sup> Steam autoclaved biopsy forceps have not been documented to transmit disease.

Reports of cross-infection following immersion of biopsy forceps in a LCS, however, have been reported.<sup>11,12</sup>

○  
**“Does passing a sterile biopsy forceps through a high-level disinfected flexible endoscope pose an infection risk?”**

Flexible endoscopes are semi-critical devices that during routine use contact intact mucous membranes and for which high-level disinfection is indicated.<sup>7,13</sup> In addition to intact mucous membranes being generally resistant to infection by bacterial endospores,<sup>7</sup> all spore-forming (and other) bacteria encountered in flexible (and rigid) endoscopy are reportedly destroyed by high-level disinfection. In fact, 'high-level disinfected' endoscopes have not been documented to pose a higher infection risk than 'sterilized' endoscopes.<sup>13</sup> Therefore, passing sterile biopsy forceps through a high-level disinfected endoscope neither re-contaminates the biopsy forceps nor has been reported to pose an infection risk to the patient.<sup>14</sup>

## References

- 1) Clinical Issues. *AORN J* 2000 Feb;71:398-403.
- 2) Muscarella LF. *AORN J* 2001 June;73:1159-63.
- 3) Botha SJ, Holzapfel WH. *Int J Food Microbiol* 1988 Oct;7(2):169-72.
- 4) Russell AD. *Clin Microbiol Rev* 1990 Apr;3(2):99-119.
- 5) Hachisuka Y. *Jpn J Microbiol* 1969 Jun;13(2):199-207.
- 6) Clinical Issues. *AORN J* 2002;75(1):194-8.
- 7) CDC guidelines. *Am J Infect Control* 1986;14:110-129.
- 8) Muscarella LF. *AORN J* 1998 May;67:966-76.
- 9) FDA. Content and format of premarket notification submissions for liquid chemical sterilants/high level disinfectants, dated 1-3-2000.
- 10) Muscarella LF. *Gastroenterol Nurs* 2001;24(5):253-60.
- 11) Bronowicki JP, et al. *N Engl J Med* 1997 Jul 24;337(4):237-40.
- 12) Dwyer DM, et al. *Gastrointest Endosc* 1987;33:84-7.
- 13) Rutala WA. APIC guideline. *Am J Infect Control* 1996;24(4):313-42.
- 14) Lee RM, et al. *Gastrointest Endosc* 1998;47(5): 377-81.

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, Editor in Chief.* Please mail all correspondence to:

**Lawrence F Muscarella, PhD**  
 Editor-in-Chief, *The Q-Net™ Monthly*  
 Chief, Infection Control



**Custom Ultrasonics, Inc.**

144 Railroad Drive  
 Ivyland, PA 18974

Tele: 215.364.8577; Fax: 561.258.8051

**E-mail:** [editor@myendosite.com](mailto:editor@myendosite.com)

**http://www.myendosite.com**



**Copyright © 1995-2002.** All rights reserved. *It is a violation of federal copyright laws (17 U.S.C. Sec. 101 et seq.) to copy, fax, or reproduce any portion of this newsletter without its editor's consent. Q-Net is a registered trademark of Custom Ultrasonics, Inc. jan\_v7*