

The Q-Net™ Monthly

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What's News

This newsletter is the second in a series of articles. Last month's issue recommended more active surveillance in endoscopy to improve quality controls and prevent patient infection. Specifically, routine monitoring of the water used to rinse endoscopes was recommended.

This month provides more background and rationale for this recommendation. A future issue of this newsletter will discuss simple and inexpensive water test kits that can be used to sample the rinse water for bacterial contamination.

Editor-in-Chief

Unless noted otherwise, all articles 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.

Periodic surveillance revisited

Second in a series of articles that address the importance of more active surveillance in endoscopy



Review of the CDC's position: In general, the Centers for Disease Control and Prevention (CDC) does *not* recommend routine sampling in the health care setting.³ According to the CDC, data showing that culturing microorganisms on environmental surfaces presages clinical infections are lacking.³ (*Refer to last month's issue of this newsletter.*)

There are a few applications, however, for which the CDC does recommend routine sampling. For instance, due to the risk of pyrogenic responses and bacteremia, the CDC recommends periodic environmental monitoring of (among other dialysis fluids) the water used to rinse and reprocess hemodialyzers.³⁻⁵

Differing views: But not everyone agrees with the CDC's limited recommendations *vis-à-vis* periodic surveillance. Some reports suggest that increasing the number of applications for which the CDC recommends periodic environmental sampling may aid in the prevention of certain types of nosocomial infections.¹⁶ For example, some researchers recommend periodic culturing of the hospital's water supply, to reduce the risk of nosocomial Legionnaires' disease.¹⁷

Despite the CDC's position that sampling a hospital's water supply is indicated only in a few instances, such as

after an outbreak has been identified,^{3,16} there is growing evidence that suggests that water supplies contaminated with *Legionella* (and possibly other waterborne bacteria) can be a portent of patient infection.^{16,17} And, further, reports in the Food and Drug Administration's (FDA) MAUDE database suggest that contaminated rinse water used during bronchoscope reprocessing may increase significantly the risk of patient infection and death caused by gram-negative bacteria, including *Pseudomonas aeruginosa*.

Review of this newsletter's recommendation: Last month, this newsletter noted that, like during hemodialysis, multiple outbreaks and patient deaths caused by gram-negative bacteria (and atypical mycobacteria) have been reported following endoscopy.¹⁰⁻¹³ The source of some of these outbreaks (and pseudo-outbreaks) was reported to be the rinse water used during endoscope reprocessing.^{11,12,18} Whether the frequency of these types of outbreaks is on the rise is debatable.

Until such sampling guidelines and techniques might be established and standardized, this article's author (LFM) recommends sampling the water used to rinse endoscopes at least once a month, to assess whether its total microbial concentration exceeds 200 CFU/ml. Provided certain criteria are satisfied, less frequent monitoring and a higher microbial concentration may be acceptable. (*Refer to last month's issue of this newsletter.*)

Monitoring rinse water? Several organi-

zations, including the CDC and FDA (and JCAHO, APIC, and AORN), recommend monitoring sterilization processes periodically (e.g. at least once a week) using biological indicators (BIs).^{3,15,19} Validating the a sterilizer's effectiveness is an important infection and quality control.

The CDC and the Association for the Advancement of Medical Instrumentation (AAMI) also recommend periodic monitoring of the water used to rinse and reprocessor hemodialyzers.³⁻⁵ Interestingly, the CDC, AAMI and the FDA (and JCAHO) do *not* recommend periodic sampling of rinse water used during endoscope reprocessing,^{3,19} even if the rinse water is produced on-site and claimed to be *sterile*. Automated endoscope reprocessors (AERs) are often attached to a water filtration system that features a 0.2-micron bacterial filter. This system filters the water used by the AER to rinse the endoscope after chemical immersion. The rinse water produced by this filtration process is typically claimed by the AER's manufacturer to be either *sterile* or *bacteria-free*.

To be clear, recommending microbiologic monitoring of sterilizers using a BI and the rinse water used during hemodialyzer reprocessing - while not recommending periodic sampling of filtered water that is used to rinse endoscopes and claimed to be *sterile* (or *bacterial-free*) - seems incomplete. If the filtered rinse water is labeled as *sterile*, then monitoring it periodically seems necessary, if for no other reason than to ensure the rinse water's quality satisfies an established microbial (and endotoxin) standard (eg, less than 10^{-6} CFU/ml).²⁰

Implications of periodic sampling: The implications of the recommendation of this article's author to sample periodically the water used to rinse endoscopes are not trivial. By detecting bacteria in the rinse water *before* the identification of an outbreak, health care facilities may be more likely to avert patient injury and a costly epidemiological investigation. Further, adoption of this recommendation may provide data crucial to determining whether disinfecting endoscopes before the first patient of the day, as currently recommended by some organizations including AORN, is really necessary (refer to the June 2000 issue of this newsletter).

Of particular concern is whether water filters used with AERs might be providing a false level of assurance and producing, despite their label claims, contaminated rinse water.²¹⁻²³ In addition to improving infection controls in endoscopy, particularly bronchoscopy, periodic surveillance of the rinse water may provide health care facilities a more quantitative and reliable method to determine when the water filter: (a) requires replacement, and/or (b) its housing requires thorough decontamination (ie, cleaning and sterilization).

In general, facilities do not sample periodically filtered rinse water to confirm its microbial quality. Instead, facilities using an AER equipped with a water filtration system are usually instructed by the AER's manufacturer to change the bacterial filter when indicated either by an automatic diagnostic cycle or once a differential water pressure across its bacterial membrane equals 25 PSI. This pressure differential is

determined using two water pressure gauges located just before and after the bacterial filter. As microbial debris is collected and retained, the bacterial filter's resistance, as measured by a pressure differential, increases.

But using pressure gauges to indicate when the bacterial filter may require changing is inexact at best. Of important clinical significance, although for which clinical data are lacking, is whether a bacterial filter might fail before achieving a 25 PSI pressure differential across its membrane (or before activation of a diagnostic alarm) and allow bacteria to pass, resulting in instrument recontamination.¹³ To be sure, periodic sampling of filtered rinse water would provide a more reliable method for monitoring the filter's effectiveness.

Sampling the rinse water periodically is also recommended by this article's author (LFM) to confirm whether the filter was installed and inserted properly in its housing. If the filtered rinse water is cultured and found to be contaminated just after changing the filter, then the filter may have been improperly installed. Alternatively, this same result may indicate that either the filter's housing, or the plumbing line between the filter and sampling site, contains a biofilm complex and therefore requires decontamination.

In conclusion, the CDC and FDA are therefore encouraged to consider whether formally advocating the recommendation of this article's author (LFM) - which is to sample periodically the water used to rinse endoscopes, at least filtered rinse water labeled as *sterile* - is indicated to improve quality controls and reduce the risk of nosocomial infection caused by *P. aeruginosa* and other gram-negative bacteria.

To view the REFERENCES to this and last month's article, visit: <http://www.myendosite.com/refs0301.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, Editor in Chief.* Please direct all correspondence to:

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