

# The Q-Net™ Monthly

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## WHAT'S NEWS

This month's double issue provides a discussion of the results of *The Q-Net™ Monthly's* first national survey. This survey was mailed to all subscribers of this newsletter in June 1998. The results of this survey were published in the April-May 1999 issue of this newsletter. Due to limited space, this discussion will be continued next month. Next month's issue will focus on the survey's results per the reuse of single-use devices.

## Q-Net '98



'Q-Net-98' is now available. This book contains all of the past year's newsletters in a bound booklet. Order your copy today. \$9.95 includes S&H.

## 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 not only to ask good questions but also to 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.

## Current Reprocessing Practices: Discussion of a National Survey

*In this newsletter's April-May (1999) issue, the results of a national survey were published.<sup>1</sup> Last year this survey was mailed to the subscribers of this newsletter.<sup>2</sup> A discussion of these results is presented below.*

*Part II-Discussion of Results:* The results of a survey, published in this newsletter's April-May 1999 issue,<sup>1</sup> were analyzed to assess current endoscope reprocessing and infection control practices. These data were compared with data published in 1991, 1992 and 1999:<sup>3-8</sup> (1) to assess the significance of the results of Q-Net's survey, and (2) to determine whether infection control measures have changed during the past decade.

Respondents representing a broad demographic mix responded to Q-Net's survey, which was mailed in June of 1998 to approximately 2900 healthcare professionals, almost all of whom subscribed to this newsletter. One hundred and forty six respondents, each of whose facility reprocessed flexible endoscopes, completed the survey and returned it by mail, fax, or e-mail.

On average, the typical respondent to Q-Net's survey was a registered nurse (RN) who worked for a non-profit, public healthcare facility located in an urban region of the United States (US). The mean number of beds and dedicated

endoscopic procedure rooms provided by the respondents was 260 and 3.1, respectively. A greater number of respondents resided in the north-east (26%) (eg, ME, CT, DE) and mid-west (26%) (eg, IA, OH, IN) regions of the US than in any other region.

*Glutaraldehyde:* The results of Q-Net's survey<sup>1</sup> revealed that some practices in endoscope reprocessing and infection control have changed during the past decade, while others have not. For example, in close agreement with another recently published survey,<sup>7</sup> 80% (117 of 146) of the respondents to Q-Net's survey reported using glutaraldehyde (ie, 14 and 28 day formulations) to reprocess flexible endoscopes. This percentage is similar to the data reported in 1991 and 1992,<sup>3-6</sup> indicating that the popularity of this product for reprocessing flexible endoscopes has remained fairly constant during the past decade.

Glutaraldehyde's soaking time in clinical practice has changed little over the past decade, its 45 minute label claim and the limited time between patient procedures notwithstanding. In agreement with the data presented in Q-Net's and another recently published survey<sup>1,7</sup> studies and surveys published in 1991 and 1992 reported that 20 minutes (or less) was the most frequently indicated immersion time for achieving

high-level of flexible endoscopes using glutaraldehyde.<sup>3,5,6</sup>

Although glutaraldehyde's soaking time has remained constant during the past several years, the clinical practice of heating it appears to have become more commonplace. In 1991 a survey<sup>3</sup> reported that as few as 3% of the respondents heated glutaraldehyde to achieve high-level disinfection, while Q-Net's survey<sup>1</sup> and another survey published in 1999<sup>7</sup> reported that at least 15% and 24% of the respondents, respectively, heated this germicide. The rationale for increasing glutaraldehyde's immersion temperature may simply be due to the public's clearer understanding of its label, which typically requires elevating it temperature to 25°C to achieve high-level disinfection. An alternative rationale for this practice may be attributed to increased awareness that, in general, increasing a disinfectant's temperature increases its biocidal properties, facilitating the more rapid destruction of microorganisms.

Interestingly, a significant number of Q-Net's respondents who reported using glutaraldehyde to process flexible (and rigid) endoscopes did not provide an immersion time and temperature, even though Q-Net's survey specifically requested this information. Not providing an immersion time and temperature for glutaraldehyde may be due simply to the respondent not knowing the exact time or temperature, or not noticing the question. Also possibly responsible was the format in which the question was asked. Q-Net's survey<sup>1</sup> asked respondents to specify the soaking time (and temperature) of the "liquid sterilant" used to reprocess flexible endoscopes. To be sure, 2% (and higher concentrations) of glutaraldehyde is a *sterilant* that destroys high numbers of bacterial endospores, albeit during a relatively long soaking time (eg, 10 hours). But glutaraldehyde is used almost exclusively to achieve high-level disinfection during considerably shorter soaking times (ie, between 20 and 45 minutes). The possibility therefore exists that some of the respondents did not provide an immersion time (and temperature) because, having concluded (erroneously) that glutaraldehyde is not a *sterilant*, they deemed the question inapplicable.

*Water quality:* Most of Q-Net's respondents (78%) reported that infection control measures in endoscopy have increased during the past few years. In support of this response, there is, for example, greater awareness today than in the past of the risks associated with rinsing endoscopes with unfiltered tap water, which has been reported to be contaminated with potentially pathogenic microorganisms (see the June 1999 issue of this newsletter). As a result, rinsing the endoscope's channels with 70% alcohol, followed by forced air drying, before storage has become a routine practice.<sup>9</sup> Another change in infection control that has increased patient safety is

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the routine practice of steam sterilizing biopsy forceps.<sup>7</sup>

As reported in June's issue (1999) of this newsletter, nosocomial transmission of waterborne microorganisms is a well-documented and timely concern. Eight (5%) of the 146 respondents that completed Q-Net's survey reported isolating *Pseudomonas aeruginosa*, *Mycobacterium chelonae*, *M. avium* and other atypical mycobacteria from tap water. This relatively low percentage, however, likely underestimates the actual number of responding facilities whose tap water was at some time contaminated with microorganisms. Sampling tap water to determine whether it is a source of contamination is expensive, onerous and not routinely performed. Furthermore, because the tap water's microbiological quality and source may change from one day to the next, sampling and determining its quality one day may not accurately reflect its quality on another day. More accurate results would require averaging the data of several samples taken over a number of days.

*Automatic flexible endoscope reprocessors ('AFERs'):* The results<sup>1</sup> of Q-Net's survey, in agreement with the results of another recent survey,<sup>7</sup> demonstrate that the use of automated devices to reprocess flexible endoscopes, often referred to as 'AFERs,' has increased significantly during the past decade. Almost three quarters of Q-Net's respondents<sup>1</sup> and 70% of the respondents to another recent survey<sup>7</sup> reported using an AFER, compared to only 20%, 29% and 34% of the respondents who reported using an AFER in three surveys conducted in 1991 and 1992.<sup>3,5,6</sup> The increasing popularity of AFERs is likely due to their standardization and automation of several essential reprocessing steps.

One of the more important infection controls, often lacking during manual reprocessing but routinely provided by AFERs, is the use of a bacteria-free rinse water. While filters cannot eliminate the risk of patient infection from microorganisms originating in the tap water, they reduce the risk by improving the rinse water's quality. Of the 108 Q-Net respondents who reported using an AFER,<sup>1</sup> 81% (n=88) of them also used a water filtration assembly designed to produce bacteria-free rinse water. In contrast, almost half (51%; n=23) of the 45 respondents who reported in Q-Net's survey that they manually reprocessed flexible endoscopes used *unfiltered* tap water as the final rinse. These data appear to suggest that facilities that manually reprocess endoscopes are more likely (than facilities that use an AFER) to use unfiltered tap water as a final rinse, whereas facilities that use an AFER are more likely to use bacteria-free (filtered) tap water. Using filtered (if not bottled, sterile) water as a final rinse is necessary to reduce the risk of patient infection.

Moreover, 120 of Q-Net's 146 respondents (82%)

terminally rinsed the endoscope's channels with 70% alcohol, followed by forced air, either after each final water rinse or only before storage. Demonstrating a significant change in endoscope reprocessing practices during the past decade, this percentage is significantly higher than reported in two surveys published in 1991 and 1992, when only 27%<sup>3</sup> and 12%<sup>5</sup> of the respondents reported rinsing endoscopes with alcohol after the final water rinse. Using alcohol to facilitate drying of the endoscope before storage is an important infection control that reduces significantly the risk of patient infection by preventing bacterial colonization during storage (see *Q-Net's June 1999 issue*).

Only 11% (16 of 146) of Q-Net's respondents reported that their facility's endoscope reprocessing regimen did not include either rinsing the endoscope with alcohol or drying it with forced air, with 11 of these 16 (69%) reporting that they used a specific automated system, labeled for 'sterilization,' that rinses the endoscope with filtered water after chemical immersion. While inconclusive, these data appear to suggest that users of this specific system might be inferring (erroneously) that its terminal water rinse is 'sterile' (see *Q-Net's June 1999 issue*). For if the rinse water were truly sterile, rinsing the endoscope's channels with 70% alcohol, followed by forced air, before storage would arguably be unnecessary. To be sure, the existing medical literature has not adequately described the parameters of 'sterile' water, how it is produced, and how it differs from bacteria-free filtered tap water.

In short, *sterile water* is water that has been sterilized using a process, such as steam sterilization. *Bacteria-free water*, on the other hand, usually refers to tap water that has been passed through a 0.2 micron membrane. Because bacterial filters do not produce sterile water from a hospital's tap, rinsing the endoscope's channels with 70% alcohol, followed by forced air, is necessary and recommended.<sup>9</sup> Omitting these two steps before storage can result in patient injury (see *Q-Net's June 1999 issue*).

**Bloodborne pathogens and endoscopes:** A survey in 1991<sup>3</sup> reported that 58% of the responding hospitals modified their disinfection procedures when the endoscope was used on a patient infected with HIV, hepatitis B, or another bloodborne pathogen. Two other studies in 1992<sup>4,5</sup> also reported that a significant number of hospitals deviated from their routine reprocessing procedures when endoscopes had been used on patients diagnosed with HIV, hepatitis B, or *M. tuberculosis*.

Indeed, altering the facility's written reprocessing protocol when the endoscope is used on a "high-risk" patient is not supported by the literature and is at odds with the Standard Precautions principle.<sup>3</sup> In contrast to the practices of the early 1990's,<sup>3-5</sup> only 5% of Q-Net's respondents reported altering their routine reprocessing regimen for endoscopes

used on patients known to be (or suspected of being) infected with a bloodborne pathogen, demonstrating a noteworthy change in endoscope reprocessing practices. Education and the public becoming more cognizant of the effectiveness of high-level disinfection against bloodborne pathogens are likely responsible for this change.

**Reported infections:** Seven (5%) of Q-Net's 146 respondents reported at least one patient infection in their facility following a flexible endoscopic procedure. This percentage, which is similar to the percentages reported by others,<sup>6-8</sup> is based on the number of respondents reporting patient infection, however, and does not account for the total number of procedures performed in the respondent's facility. The risk of a patient acquiring an infection following flexible endoscopy is reported to be approximately 1 in 1.8 million.<sup>10</sup>

For several reasons, including: (1) inadequate surveillance of out-patient procedures,<sup>3</sup> such as flexible endoscopy; (2) the common practice of patients returning to their primary care providers (not their endoscopists), were an endoscopy-related infection to occur;<sup>8</sup> and (3) the possibility of an asymptomatic (unrealized) infection, the infection risk may be higher than reported.<sup>11</sup> Conducting prospective studies that more closely follow the progress and improvement of patients following out-patient procedures is encouraged,<sup>11</sup> as these studies are bound to provide data more representative of the actual infection risk.

**Biopsy forceps:** Education and increased infection control awareness has also likely contributed to the changes in biopsy forceps reprocessing that have occurred during the past decade. Surveys and studies performed in the early 1990s reported that the majority of respondents (74%,<sup>3</sup> 78%,<sup>4</sup> 79%,<sup>6</sup>) disinfected - rather than steam sterilized - biopsy forceps. In contrast, more than half (55%) of Q-Net's respondents steam sterilized biopsy forceps.<sup>1</sup>

In agreement with Q-Net's data,<sup>1</sup> a recently published survey<sup>7</sup> reported that, in contrast to the practice of the early 1990s, the majority of respondents steam sterilized biopsy forceps. Whereas a flexible endoscope is classified as a *semi-critical* instrument that requires high-level disinfection, biopsy forceps are *critical* devices that, because they routinely enter sterile tissue, require sterilization. This change in practice from routinely disinfecting biopsy forceps in the early 1990s to sterilizing them today with pressurized steam is recommended and represents a significant increase in infection controls.

Also noteworthy, the results of Q-Net's survey suggest that the practice of using disposable biopsy forceps may have increased during the past decade.<sup>1,7</sup> Two surveys conducted in 1991 indicate that fewer than 2% of responding facilities<sup>3,6</sup> reported using disposable biopsy forceps, while 20 (14%) of

"Indeed, altering the facility's written reprocessing protocol when the endoscope is used on a 'high-risk' patient is ... at odds with the Standard Precautions principle."

Q-Net's 146 respondents reported using disposable biopsy forceps. Greater awareness of the physical complexity of these instruments and the formidable challenges their internal designs pose to sterilization in general and cleaning in particular may explain this apparent increase in their popularity over the past decade. Due to a lack of data, the extent to which replacing reusable with disposable biopsy forceps affects the risk of cross-infection is unclear.

*Rigid endoscopy:* A survey published in 1991<sup>3</sup> reported that more than 57% of the respondents disinfected (high-level) rigid endoscopes. (Data indicating the number of respondents in this survey that steam autoclaved rigid endoscopes were not provided.) Eighty five of Q-Net's 146 respondents reported reprocessing rigid endoscopes. Approximately one third (n=28) indicated that they disinfected (high-level) rigid endoscopes, and 19 reported using a steam autoclave to sterilize rigid endoscopes. While not necessarily statistically significant, these data appear to suggest that the practice of sterilizing rigid endoscopes may today be more common than reported in the early 1990s. Like biopsy forceps, laparoscopes and arthroscopes are *critical* devices, which may explain the rationale for facilities sterilizing them, even though the infection rate associated with disinfecting (high-level) rigid endoscopes has not been reported to be higher than sterilizing them.<sup>3,10</sup>

Of the 85 respondents who indicated in Q-Net's survey that they reprocessed rigid endoscopes, 5 (6%) reported at least one patient infection following rigid endoscopy. How this number relates to the reported infection risk of less than 1%<sup>3</sup> is unclear, as the number of rigid endoscopic procedures each responding facility performed is not available.

*Possibility for bias:* Q-Net's survey, which was published in this newsletter and sponsored by Custom Ultrasonics, Inc., a manufacturer of washer-disinfectors for flexible endoscopes, may have inadvertently biased the results in a number of ways. For example, the survey's data may arguably overestimate the percentage (43%)<sup>1</sup> of health care professionals using a Custom Ultrasonics device, if: (1) a disproportionate number of this newsletter's subscribers (and therefore presumably survey respondents) use its devices, or: (2) subscribers who purchased a Custom Ultrasonics device were more likely to participate in this survey than subscribers who purchased a competitor's device. But, while the specific numbers are unknown, this newsletter for the past five years has been mailed, each month and free of charge, to anyone requesting a subscription, irrespective of the brand of AFER their facility has purchased. Also, one quarter of Q-Net's respondents *manually* reprocessed flexible endoscopes (that is, did not use an AFER), having no anticipated bias either in favor of or against this newsletter's sponsor. Finally, the results of Q-Net's survey appear to be a fair representation of a random sample of health care professionals, as Q-Net's data

are in agreement with data published in another recent survey.<sup>7</sup>

**\* Discussion to be continued next month \***

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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 return completed survey to:*

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