

The Q-Net™ Monthly

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What's News

In the April-May 1999 issue of *The Q-Net™ Monthly*, the raw data of a national survey, mailed to all subscribers in June 1998, were presented. A discussion of these data, originally scheduled for this month's issue, will instead be published in an upcoming issue of this newsletter. Due to a recent *MMWR Weekly* report (7-9-99), an editorial decision was made to publish "Deja Vu" this month.

Say it again ...

☞ *The importance of a 70% alcohol rinse (and forced air drying) to the prevention of patient infection was first published in this newsletter in its November 1996 issue.*

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.

Déjà Vu

... all over again?

The importance of a 70% alcohol rinse, forced air drying

In 1991 the Centers for Disease Control and Prevention's (CDC) *Morbidity and Mortality Weekly Report (MMWR)* 1991 Oct 4;40[39]:675-8) discussed an infection outbreak linked to endoscopes contaminated with waterborne microorganisms, including *Pseudomonas aeruginosa*.

More recently, the *MMWR Weekly* (1999 Jul 9;48[26]:557-60) again reported that endoscopes contaminated with waterborne microorganisms, including *P. aeruginosa*, were linked to several patient injuries.

OBJECTIVE: To determine what practices reduce the risk of patient infection (and death) caused by endoscopes contaminated with waterborne pathogens.

BACKGROUND: Although well-documented,^{1,2} clinical infections following endoscopy are rare.^{3,4} *To be sure, no cases of endoscopes transmitting disease has been reported when the endoscope was reprocessed (ie, pre-cleaned, disinfected, and dried before storage) in accordance with published guidelines.*

Nosocomial infections linked to contaminated water supplies and other

environmental sources,^{5,6} such as sinks, shower heads and faucet aerators, have been reported. For example, a hot-water system was recently identified as the probable source of an outbreak of Legionnaires' disease (*The Washington Post*, Saturday, July 10, 1999; p. B03).

FINDINGS: In the CDC's *MMWR Weekly* (July 9, 1999), the cause of several bronchoscopy-related infections (and pseudo-infections) was investigated. According to the report, improper connection of an automated reprocessor to bronchoscopes precluded effective reprocessing, resulting in multiple patient infections (and possibly one fatality). The identified microorganisms included *P. aeruginosa* and *Mycobacterium avium-intracellulare (MAI)*. Indeed, inferring from this report that proper connection of the automated reprocessor to the bronchoscopes would have prevented these injuries seems logical and understandable.

Noteworthy, although not discussed in this *MMWR Weekly* (1999) report, *P. aeruginosa* and *MAI* are waterborne microorganisms that may be present in drinking water⁶ and have been identified in both filtered and unfiltered rinse water.^{1,6-9} To be sure, whenever the final water rinse is contaminated with microorganisms, the possibility exists for the endoscope to become recontaminated (after chemical immersion) and transmit these microorganisms to the patient, giving rise to the question:

- *During the investigation reported in the MMWR Weekly (July 9, 1999), was the quality of the hospitals'*

(Continued on page 12)

water supplies, or the automated reprocessor's water filter,¹⁰ sampled and analyzed to rule out the possibility that the filtered rinse water was the source of the reported infections? †

Sampling the filtered rinse water to determine whether it could have been the source of the reported infections is crucial to the *MMWR Weekly's* (1999) investigation and its conclusions. For if the rinse water had been found to be contaminated with the same microorganisms that infected the patients, then the outbreaks could have occurred even if the bronchoscopes had been properly connected to the automated reprocessor.

Several reports that discuss waterborne microorganisms recontaminating endoscopes have been published.^{1,3,5} Each underscores the importance of drying to all but eliminate the risk of endoscopes contaminating patients with waterborne microorganisms,^{3,7,11} whether the source of the microorganisms is the environment or an index case-patient. Rinsing all of the endoscope's channels with 70% alcohol (to facilitate drying before storage), followed by forced air drying, has become the standard of care: ††

- In the *MMWR*, dated October 4, 1991 [40(39):675-78], it was reported that rinsing the endoscope's internal channels with 70% (isopropyl) alcohol, followed by forced air drying, significantly reduced the risk of contaminating patients with *P. aeruginosa*. (Surprisingly, the recently published *MMWR Weekly* [CDC; 1999 Jul 9;48[26]:557-60] did not discuss the essentiality of drying the endoscope before storage to prevent patient infection);
- Strulens et al.¹ reported that tap water, passed through a filter membrane designed to produce 'sterile' water, remained contaminated with *P. aeruginosa*, recontaminating the endoscope during rinsing. Transmission of waterborne microorganisms from the endoscope to the patient was eradicated only after the endoscope's channels were terminally rinsed with 70% alcohol, followed by forced air drying;
- Allen et al.³ reported patient infection and death linked to inadequately dried endoscopes contaminated with *P. aeruginosa*. This outbreak abruptly stopped only after the endoscope was dried before storage by suctioning 70% alcohol through its channels followed by forced air;
- And Alvarado et al.¹² reported that rinsing the

† For unclear reasons, the possibility that the filtered rinse water might have been the source of the identified waterborne microorganisms was not discussed in the *MMWR Weekly* (1999).

†† Forced air drying without the aid of a 70% alcohol rinse may be less effective.³

endoscope's channels with 70% alcohol, followed by forced air drying, eliminated the contamination of endoscopes with *P. aeruginosa* (even though the automated reprocessor remained contaminated).

CONCLUSIONS: To prevent the proliferation of waterborne microorganisms in the endoscope's internal channels during storage,¹³ thereby reducing the risk of patient infection, several practices are recommended:

- ★ Dry the endoscope before storage, whether using a tap or filtered water rinse (refer to the November 1996 issue of this newsletter).^{1-3,11-17} Drying can be achieved by rinsing the endoscope's internal channels with 70% alcohol, followed by forced air;
- ★ Vertically hang the endoscope in a clean, dry and well-ventilated cabinet.¹⁷ Storing the endoscope in a coiled position is contraindicated, as it may prevent drying and allow bacteria to colonize in its internal channels during storage.¹⁸ Also, remove the endoscope's control valves during storage to further facilitate drying;¹⁷
- ★ Leak test the endoscope, per manufacturer's instructions, not only to protect its functional integrity, but also to reduce the risk of cross-infection by detecting tears and punctures, capable of harboring microorganisms,^{14,19} in the walls of the endoscope's internal channels; and
- ★ Contact the automated reprocessor's manufacturer to ensure its device can connect to, and completely reprocess, each of the endoscope's internal channels.

References available upon request

Thank you for your interest in this newsletter. *I have addressed each issue to the best of my ability. Respectfully*
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