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Hepatitis C virus

"What measures can be taken to prevent the transmission of the hepatitis C virus during endoscopy?"

An article published in the July 24 issue of the *New England Journal of Medicine* (337(4):237-240;1997) reports that several important instrument reprocessing steps were improperly performed, resulting in the transmission of the hepatitis C virus (HCV) from one patient to two other patients during colonoscopy.¹

What's News



'Q-Net-97,' a bound collection of all of 1997's newsletters, will be published this January 1998. Order your copy today.

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.

The steps that were improperly performed included the following: (1) The colonoscope's suction-biopsy channel was not brushed, which is a significant breach of all endoscope reprocessing guidelines;² (2) the colonoscope was soaked in 2% glutaraldehyde for 5 minutes, rather than soaked for at least 20 minutes, as necessary to achieve high-level disinfection;³⁻⁵ and, (3) the biopsy forceps and diathermic loop used during the procedures were soaked in 2% glutaraldehyde, rather than steam sterilized, as recommended.^{2,5}

In addition to this report's¹ acknowledgment that well-established procedures for reprocessing endoscopic instruments were not practiced, not to be overlooked is the formidable obstacles that the internal designs of many complex endoscopic instruments can impose on the execution of effective reprocessing methods.^{6,7}

For example, the colonoscope's air and water channels (and the biopsy forceps's internal shaft) cannot typically be cleaned with a brush. In as much as failure to adhere to published reprocessing guidelines can result in cross-infection,¹ the complex internal design of the flexible endoscope and biopsy forceps is not without culpability.

Apropos to any discussion of the limitations that some complex instrument designs may impose on thorough cleaning is understanding that the internal channels of flexible endoscopes and biopsy forceps often preclude the collection of accurate and meaningful microbiologic data.⁷

To assess the efficacy of a reprocessing method, the endoscope's suction-biopsy

channel may be flushed, via the biopsy inlet port, with a sterile fluid. The effluent is then collected and evaluated for the presence of microorganisms.

Does the absence of viable microorganisms in the effluent confirm that the endoscope's sampled channel is sterile?

No. While it is true that an effluent cultured positive for a microorganism likely indicates that the sampled channel is contaminated with that microorganism, the physical design of the endoscope prevents confirmation of the converse: That a negative effluent demonstrates that the endoscope's sampled channel is *not* contaminated (i.e., is sterile).

Simply stated, flushing a sterile fluid through the internal channels of an endoscope, each channel of which may contain lacerations, tears, and pits capable of harboring viable microorganisms,⁸ does not ensure that every adhering microorganism will be dislodged and recovered in the effluent.⁹

In general, confirmation that an endoscope's internal channels (or a biopsy forceps's internal shaft) are sterile after processing requires the instrument's destruction in order to directly sample each of its internal surfaces using proper microbiologic procedures.^{7,8,10}

Because the designs of flexible endoscopes and biopsy forceps do not necessarily facilitate cleaning (or disinfection or sterilization) of all of their internal surfaces,^{9,11} both types of instruments can contribute to the potential for cross-infection.¹ Therefore, to

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minimize the risk of cross-infection from the HCV (or any other virus or microorganism) during endoscopy, strict adherence to a standardized and validated instrument reprocessing procedure that accounts for all of the instrument's internal surfaces is recommended.^{1,2,5,10}

Other recommendations that minimize the risk of patient infection during endoscopy include the following:

- ✓ Ultrasonically clean and steam sterilize the biopsy forceps (and other endoscopic instruments not damaged by either ultrasonic energy or heat), per the instrument's reprocessing instructions.^{2,5,9,11,12} *No infections have been reported when the biopsy forceps were cleaned and steam autoclaved between uses.*¹²
- ✓ Thoroughly clean and high-level disinfect the endoscope. (High-level disinfection of cleaned endoscopes has not been reported to be associated with a higher infection rate than a 'sterilization' process, such as EtO gas.¹⁰)
- ✓ Terminally flush the endoscope's internal channel(s) with 70% alcohol, followed by forced air, to prevent colonization of bacteria during storage.¹³

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Reusing disposable sphincterotomes: *Is this a wise practice?*

Discussed in the March 1997 issue of *The Q-Net™ Monthly*, the reuse of most disposable instruments may be unwise because of, among other factors, the risk of cross-infection. Disposable items are not intended to be reused and therefore their internal designs often do not facilitate thorough cleaning. Also, the materials used in their construction usually cannot withstand steam sterilization.

Reuse of a few disposable instruments, however, may pose little risk. An article published in *Gastroenterology & Endoscopy News* (October 1997; pp. 17-19) suggests that the reuse of single-use sphincterotomes, 'sterilized' with ethylene oxide (EtO) gas after each use, may be safe and effective.

Sphincterotomes, which are used for cannulation (or cutting) during ERCP procedures, have very narrow channels that are difficult to clean. Because its complex design precludes simple verification that all organic debris was removed from its internal channels during cleaning, the reuse of disposable phincterotomes is controversial. Low-temperature sterilizing agents that are used to process instruments damaged by heat are likely to fail whenever cleaning is inadequate. (Refer to the July-August 1997 double issue of *The Q-Net™ Monthly*).

So what does a hospital do if a published study suggests a disposable device can be reprocessed and reused without posing a risk to the patient, but analysis of the device's complex design shows it does not facilitate cleaning (or disinfection or sterilization)?

Before considering reuse of any single-use device, each facility should have on file validated test data, from as many published studies and other sources as possible, demonstrating that reuse of the disposable item is safe and effective.

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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