

The Q-Net™ Monthly

Volume 8, Number 3

March 2002

What's News

On 11-30-01, and again on 02-27-02, Olympus America, Inc. recalled 15 bronchoscope models, because of a potential design defect that can allow the biopsy port to become loose and trap microorganisms. Whether this defect caused two reported *P. aeruginosa* outbreaks is unclear. Information on this recall can be found at: <http://www.myendosite.com>

Infections following bronchoscopy are rare but have been reported. Excluding design defects, breeches in the reprocessing protocol have been identified as the cause of each reported nosocomial outbreak.

Editor-in-Chief

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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.

Aseptic technique revisited

This article is the second of two and discusses aseptic technique and its application to the administration of intravenous (IV) medications.

Question: "Please discuss the infection control implications of filling syringes with a medication in the morning for use throughout the day. The medications our GI endoscopy unit uses are propofol, midazolam and fentanyl."

Background: Discussed in last month's issue of this newsletter, aseptic technique is a set of practices designed to minimize the risk of nosocomial infections. This technique applies not only to the establishment and maintenance of a sterile field in the operating room, but also to the handling and administration of intravenous (IV) medications in a gastrointestinal (GI) outpatient endoscopy setting.

Patient infections due to contaminated medications have been reported when aseptic technique was not practiced.^{1,2} During GI endoscopy, many different types of IV medications may be used, including propofol, midazolam, and fentanyl. (Depending on the patient's level of comfort, some GI physicians may not use any medication during the procedure.) Strict adherence to aseptic technique during the handling and administration of IV medications is essential to prevent nosocomial infections.

Propofol: Whereas most types of intravenously administered anesthetic, analgesic

or sedative agents contain a preservative,¹ some, albeit few, do not. For example, propofol,³ a lipid-based anesthetic/sedative agent sometimes used during GI endoscopy,^{4,5} contains no preservatives or antimicrobial agents^{3,6} and has been shown to support rapid bacteria growth.⁷

As a result, it is not surprising that improper use of propofol has resulted in bacterial outbreaks.^{1,2,6} Contamination of propofol with just a few bacteria can result in clinical disease.¹ A lapse in aseptic technique can cause extrinsic contamination - that is, contamination that occurs after manufacturing and during handling - of propofol and other medications.^{2,8} When used in accordance with its label and in strict adherence to aseptic technique, propofol is safe and effective.³

Fentanyl, midazolam: Fentanyl, a short-acting narcotic analgesic, and midazolam, a short-acting benzodiazepine, both of which may be used during GI endoscopy, are rarely associated with bacterial contamination. A few cases caused by intrinsic contamination (e.g., contamination of the drug during the manufacturing process) have been reported.⁹

Administration of IV medications: According to the *Association of periOperative Registered Nurses (AORN)*, "sterile fields should be prepared as close as possible to the time of use." And, "There is a direct correlation between the time the sterile field is established and the length of exposure to airborne contaminants."¹⁰ This rationale would apply also to the

filling of syringes, and the opening of vials, ampules, and pre-filled syringes.¹⁰ According to the *American Society of Anesthesiologists*,¹¹ unless otherwise specified by its label, each medication should be discarded within 24 hours, or when completely used, whichever comes first.

As indicated on its label, propofol is an exception to this '24 hour' rule. Because bacteria have been shown to grow rapidly in propofol at room temperature,^{1,7,12} special precautions are warranted during its handling and use.^{3,11-13} Thorough review of propofol's (and any other medication's) label is recommended before its use to prevent nosocomial infection and other serious complications.

Recommendations: Strict adherence to the principles of infection control and aseptic technique is essential during the handling and administration of IV medications, to prevent nosocomial infections.^{1,2,6,14} The label of each IV medication should be read and understood before its use. Washing hands as often as possible and wearing new, disposable gloves as required are recommended. Several other practices are also recommended:

1. Read each medication's label and package insert to ensure compliance with its intended use and any special instructions. Check daily each medication's expiration date. Discard all expired medications.
2. Properly label each filled syringe. Include on the label the medication's name, the date and time the ampule or vial was opened, and when the syringe was filled.^{7,11} This is especially important when using propofol.
3. For each patient, use a new syringe and IV tubing line.² Large volume syringes filled with medications should be administered only to one patient and then discarded.
4. Whenever feasible, administer the IV medication promptly after opening the ampule or vial and filling the sterile syringe,^{11,14} to maintain the drug's stability and to minimize the potential for bacterial growth.^{1,7,15} Filling syringes in the morning for use throughout the day may not be advisable.^{3,6,14} Unless otherwise stated on the medication's label, discard all filled syringes within 24 hours, or when completely used, whichever comes first.
5. Propofol is an exception to this '24-hour' rule. Administer propofol promptly after opening its ampule or vial and filling the syringe.^{3,6,11-13} Discard any unused portions within 6 hours after opening its ampule, vial or pre-filled syringe.^{3,11,13} Propofol's label limits the use of each ampule and vial to one patient.¹
6. Before inserting the needle, disinfect the ampule's neck surface or the vial's stopper using 70% isopropyl alcohol, to decrease the risk of extrinsic bacterial contamination.^{3,16}
7. The use of single-dose vials is encouraged. Do not puncture a single-dose vial more than once.
8. Do not pool into a single vial residual medications from two or more other vials, for future use.¹⁷

9. Multi-dose vials have been linked to disease transmission,⁸ and, therefore, caution is warranted during their use. For example, do not use a syringe, which was used to draw blood from a patient's central venous catheter, to aspirate saline from a multi-dose bag as may be performed to flush the catheters of subsequent patients. This practice can result in contamination of the multi-dose saline bag. Discard multi-dose vials or bags whenever contamination is suspected, or if their expiration date has been reached, whichever comes first.
10. Do not mix more than one medication in a syringe for simultaneous administration, because it can increase the risk of patient infection.¹¹
11. Store all unused syringes and needles in a clean area. Promptly discard used syringes and needles into an appropriate container.
12. Establish a quality control program that encourages the medical care professional responsible for filling the syringe to also be in charge of monitoring and handling the syringe prior to its use.

Conclusions: Strict adherence to these recommendations is important, to prevent disease transmission and other types of patient injuries during the handling and administration of IV medications. The preparation of IV medications just prior to their administration is recommended,^{11,14} to prevent nosocomial (healthcare-acquired) infections.¹⁴ Special precautionary measures are necessary when using propofol. Implementation of quality controls that monitor the preparation and storage of IV medications is also recommended.

References to this article are available at:

<http://www.myendosite.com/refs0302.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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