

The Q-Net™ Monthly

Volume 8, Number 2

February 2002

What's News

In January the FDA cleared the way for BioPort Corp of Lansing, MI, to resume production and distribution of its licensed anthrax vaccine, after four years of failed FDA inspections. The U.S. government has not decided who in the military, if anyone, will now be immunized.

'Q-Net 2001'

'Q-Net 2001', a bound collection of all of 2001's newsletters, is now available. Order your copy on-line at: www.myendosite.com



Editor-in-Chief

All articles published 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.

Aseptic technique

This article discusses aseptic technique and its contribution to the prevention of nosocomial infection.



Background: *Aseptic technique* is a set of practices designed to prevent nosocomial infection by providing a clean and safe surgical environment. This technique, which is applicable not only to hospitals' operating rooms but also to hemodialysis centers and out-patient gastrointestinal endoscopy clinics, is multi-faceted and spans many disciplines.

The practices of aseptic technique are many and include: preparation of the surgical site, instrument wrapping and sterilization, proper handling of sterile instruments, wearing appropriate attire (eg, gowns, gloves), environmental cleaning, hand washing, and administering of medicines. In addition to minimizing the risk of patient infection, some of aseptic technique's practices are designed to protect health care workers and minimize their exposure to blood-borne pathogens and other infectious agents.

Although the level of contamination necessary to cause infection is often not clearly defined and depends on many factors, including the virulence of the microorganisms and the status of the patient's immune system, the goal of aseptic technique is to provide an environment free of contaminants.

Drapes: Using sterile drapes to prepare the surgical site is an important practice

of aseptic technique. Drapes provide barriers that prevent the transmission of bacteria into the surgical site. Placing sterile drapes on all equipment in the sterile field is necessary.¹

Instrument sterilization: Sterile instruments are required for invasive surgical procedures. (High-level disinfection is recommended for semi-critical instruments, such as gastrointestinal endoscopes.²) The association between using unsterile critical instruments and patient infection is well-established. As part of an overall quality control program, monitoring periodically all of the facility's sterilization processes to ensure each is working properly further minimizes the risk of instrument contamination and patient infection.²

Wraps: Aseptic technique requires protecting the instrument from contamination after sterilization. Instruments are generally wrapped or packaged to maintain their sterility prior to use. If the wrapping becomes torn, punctured, wet, or its integrity otherwise compromised, the instrument is no longer considered sterile, as bacteria from the environment may have passed through the wrapping and contaminated the instrument.

Proper handling of the instrument as it is unwrapped and placed into the sterile field is also part of aseptic technique. Items, such as hands, arms and instruments, that drop below the level of the surgical site are considered unsterile.¹

Gowns, gloves: Wearing appropriate attire

is required of surgical staff operating in the sterile field. By providing barriers, gowns and gloves (and caps, face masks, and protective eyewear) not only minimize contamination of the surgical site by the staff but also minimize exposure of the staff to the patient's potentially contaminated tissues, blood and other body fluids.¹ Double gloving may be advantageous to decrease further the risk of staff exposure to blood-borne pathogens.^{3,4} Changing gloves between contact with patients, such as those undergoing hemodialysis, may be indicated to prevent cross-infection.⁵

Environmental cleaning: Cleaning surfaces in the surgical setting is another of aseptic technique's important practices, as it renders the environment cleaner and safer for both patients and health care workers.⁶ Inadequate cleaning of the operating room (or other areas where surgical procedures may be performed) has been linked to nosocomial infections.⁷ Cleaning the surgical procedure room, including the floor, is usually performed once at the end of the day (ie, terminal cleaning).⁶ (A perimeter of only a few feet around the surgical field requires cleaning after each surgical procedure. Data in support of cleaning the entire floor of the surgical room after each procedure are lacking.⁶) But when visibly soiled, furniture, equipment, and other horizontal surfaces require cleaning after the surgical procedure.⁶

Similarly, when visibly soiled with blood, tissue or body fluids, the walls, floor, doors and lights also require cleaning after the surgical procedure⁶ but only as needed. Of some concern, visual inspection of environmental surfaces to determine whether cleaning is warranted after a surgical procedure may not always be a reliable means for detecting blood and other contaminants.⁸

Hand washing: No discussion of aseptic technique would be complete without discussing the contribution of hand washing to the prevention of disease transmission. Indeed, hand washing is infection control's single most important procedure.^{2,9} Nevertheless, despite the plethora of data demonstrating the effectiveness of hand washing in preventing nosocomial infections, compliance with published hand washing guidelines is often poor.¹⁰⁻¹² Failure of health care workers to wash their hands has been reported to be the cause of many nosocomial infections.^{7,13-15}

Washing after each clinical procedure may not be necessary if the health care worker's hands are not in contact with contaminated surfaces. But hand washing is indicated: (a) before performing invasive procedures; (b) before caring for newborn infants and patients who are severely immunosuppressed; (c) between contacts with different patients in high-risk settings, such as hemodialysis centers,^{16,17} and (d) both before and after touching wounds.² Even if gloves are worn, hand washing is indicated after touching blood, body fluids or contaminated inanimate surfaces,² because gloves can become perforated and torn during use.^{3,4}

Administering medications: Aseptic technique requires proper handling and administering of parenteral medications. When sterile protocol is not followed, vials, ampules,

syringes and intravenous lines used to administer medications can become contaminated and result in nosocomial infection.

Conclusions: Strict adherence to aseptic technique is required to prevent patient infection and to protect health care workers. Periodic review of a facility's policies and procedures for aseptic technique is recommended, as is the establishment of educational sessions that discuss the details and significance of each of aseptic technique's many practices. Efforts intended to increase compliance with proper hand washing technique are encouraged. Finally, programs designed to improve compliance with 'Standard Precautions' are also encouraged to minimize exposure of health care workers to blood-borne pathogens.¹⁸

References

1. AORN. Recommended Practices. *AORN J* Oct 1991 54:819-23.
2. CDC Guidelines. *Am J Infect Control* 1986;14(3):110-29.
3. Kim LE, et al. *Infect Control Hosp Epidemiol* 2001;Aug;22:522-4.
4. Endres D, et al. *Clin Otolaryngol* 1990 Dec;15(6):535-6.
5. Welbel SF, et al. *Am J Nephrol* 1995;15(1):1-4.
6. AORN. Recommended Practices. *AORN J* 1998;67(2):448-52.
7. Roberts SA, et al. *J Hosp Infect* 2001;48(3):228-32.
8. Hall JR. *Anesth Analg* 1994 Jun;78(6):1136-9.
9. Ward D. *Br J Nurs* 2000 Jan 27-Feb 9;9(2):82-6.
10. Harris AD, et al., *J Hosp Infect* 2000 Aug;45(4):318-21.
11. Karabey S, et al. *J Hosp Infect* 2002 ;50(1):36-41.
12. Gopal Rao G, et al. *J Hosp Infect* 2002;50(1):42-47.
13. Chakrabarti A, et al. *J Clin Microbiol* 2001;39(5):1702-6.
14. Orrett FA. *Ethiop Med J* 2000 Apr;38(2):85-91.
15. Yu WL, et al. *Scand J Infect Dis* 2000;32(3):293-8.
16. Alfurayh O, et al. *Am J Nephrol* 2000 Mar-Apr;20(2):103-6.
17. Jimenez A, et al. *Nephrol Dial Transplant* 1999 Apr;14(4):1001-3.
18. CDC. *MMWR* 1988;37:377-88.

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:

Lawrence F Muscarella, PhD
 Editor-in-Chief, *The Q-Net™ Monthly*
 Chief, Infection Control



Custom Ultrasonics, Inc.

144 Railroad Drive
 Ivyland, PA 18974
 Tele: 215.364.8577; Fax: 561.258.8051

E-mail: editor@myendosite.com
<http://www.myendosite.com>



Copyright © 1995-2002. All rights reserved. *It is a violation of federal copyright laws (17 U.S.C. Sec. 101 et seq.) to copy, fax, or reproduce any portion of this newsletter without its editor's consent. Q-Net is a registered trademark of Custom Ultrasonics, Inc. feb_v10*