Lowering CRBSI rates; single-use vs. bulk; infection control resources

Welcome to the first Q&A edition of "Infection Protection." Over the last two months we have asked you to submit your questions about infection control. We are pleased to publish your questions and hope you find the responses useful. To submit a question, email to jakridge@hpnonline.com or call (941)927-9345, ext. 202.

—Cynthia T. Crosby, Vice President, Clinical Affairs for Medi-Flex, Inc.

Follow-up to Infection Prevention

(*HPN*, October 2004)

Q: Our institution has been interested in initiating an education program to reduce our catheter-related bloodstream infection (CRBSI) rate. We are in the process of obtaining data to support our request for training. Do you have any other examples, besides the Hahneman Hospital experience, that report on results from infection control education programs?

A: Education has been shown to effectively reduce CRBSI. A self-study module directed toward nurses was developed at Barnes-Jewish Hospital in St. Louis, which required pre- and post- tests for those participating in the ICU. A 66 percent reduction of infection was reported, and 48 cases of CRBSI were avoided. Education of medical students involved in central venous catheter care resulted in a 28 percent decrease in CRBSI, and even greater results were achieved with education aimed at all clinicians involved in the care of central venous catheters. Citations that report these results are included here:

Coopersmith CM, Rebmann TL, Zack JE, et al. Effect of an education program on decreasing catheter-related bloodstream infections in the surgical intensive care unit. *Crit Care Med*. 2002;30(1):59-64.

Sheretz RJ, Ely EW, Westrbrook DM, et al. Education of physicians-in-training can decrease the risk for vascular catheter infections. *Ann Intern Med*. 2000;132:641-648.

Eggimann P, Harbarth S, Constantin MN, et al. Impact of a prevention strategy targeted at vascular-access care on incidence of infections acquired in intensive care. *Lancet*. 2000;355:1864-1868.

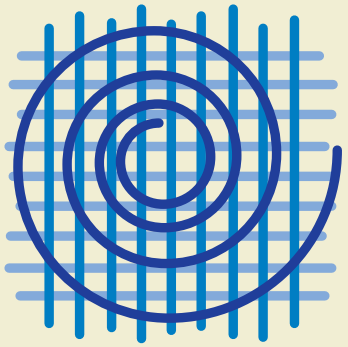
Follow-up to Bulk Solutions vs. Sterile Single-Use Applications

(*HPN* ,November 2004)

Q: If I adopt sterile single-use applications for infection control, rather than bulk solutions, how would that affect my skin application technique? Also, how would I learn about new application techniques?

A: Regardless of the antiseptic product you use, the solution must adequately penetrate into the layers of the epidermis and be allowed optimal contact time with the skin's surface to provide superior antisepsis. It is important to apply antiseptics with sufficient friction to ensure that the solution reaches into these fissures, where bacteria reside. A concentric circular pattern of antiseptic application is often recommended, but it is preferable to apply solutions with a horizontal movement first, followed by a vertical movement, and then a circular movement, as shown in Figure 1.[1]

Figure 1.



Application with horizontal movement first, vertical movement second, and a concentric pattern spiraling away from the center.

To learn how to properly use a specific antiseptic product, contact the manufacturer first. Many companies provide in-service training or materials. Your purchasing representative can provide you with contact information, or you can look at product websites to learn about training opportunities.

Q: In the article about sterile single-use applications (November 2004), the author mentioned the potential for lower costs with these products. Are there any studies that compare the costs of bulk solution to single-use applicators?

A: A prospective study was conducted to compare a one-step iodophor-in-alcohol skin preparation (DuraPrep Surgical Solution, 3M Company, St. Paul, MN) to a traditional aqueous iodophor scrub and paint applied for five to 10 minutes for skin antisepsis. Patients undergoing coronary artery bypass graft (CABG) surgery were randomly assigned to undergo skin antisepsis with either the one-step prep product or the traditional scrub and paint. The primary endpoint of the study was infection rate among patients in the two groups. Secondary endpoints included surgical skin preparation time and costs of the two skin prep products.

Of the 200 CABG patients enrolled in the study, 104 underwent skin antisepsis using the one-step product, and 96 underwent the traditional skin prep procedure. There was no significant difference in infection rates between the two groups, but there was a trend toward less infection in elderly or diabetic patients. Figure 2 illustrates the mean application time for the two skin preparations for the chest and leg sites, as well as for total skin prep of all sites. Three one-step applicators were used, including one for the chest and one for each leg. The one-step skin prep procedure took less time per application site, and the total skin prep time was reduced compared to the traditional scrub and paint procedure. Decreased

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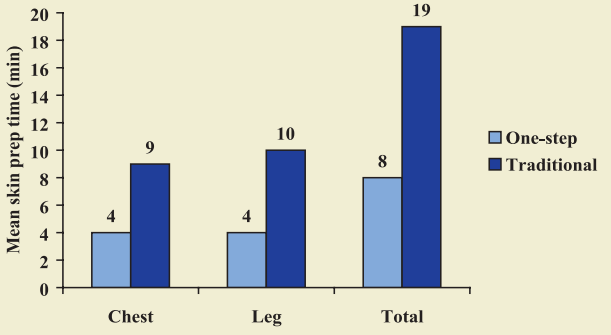
time for skin prep translated into significantly reduced costs. Operating room costs were estimated at $7.12 per minute (1995 dollars) for a total mean cost of $56.96 per patient prepped with the one-step product compared to $135.28 for patients prepped with the traditional scrub solution. The cost of the three one-step units used for whole-body preparation was $14.25 ($4.75 per unit) compared to $5.80 for the traditional scrub solution. The per unit cost was higher for the one-step product, but this was offset by the reduced preparation time for a total cost of $71.21 for the one-step product compared to $141.08 for the traditional scrub.[2]

Other published studies sometimes include cost information about antisepsis products and procedures within the discussion, but this study used a rigorous methodology for assessing time and costs for skin antisepsis. This methodology could be duplicated to compare costs within other institutions.

Figure 2.
Difference in skin prep time in minutes



Infection Control Information

Q: Is there a general clearinghouse of information about infection control products and procedures?

A: Several associations provide guidelines or information for healthcare professionals interested in infection control. As mentioned in Dr. Patrick's article (October 2004), The Centers for Disease Control and Prevention (CDC) *Guidelines for the Prevention of Intravascular Catheter-Related Infections* includes comprehensive information, as well as a list of the organizations that participated in the preparation of the guidelines.[3] To access the guidelines online, go to: www.cdc.gov/mmwr/preview/mmwrhtml/rr5110a1.htm

Other organizations that offer standards online include the Association of periOperative Registered Nurses (AORN) at www.aorn.org, the Association for Professionals in Infection Control (APIC) at www.apic.org, and the Intravenous Nurses Society (INS) at www.ins1.org.

References:
1. Crosby CT, Mares AK. Skin antisepsis: past, present, and future. *JVAD*. Spring 2001:1-6.
2. Roberts AJ, Wilcox K, Devineni R, Harris RB, Osevala MA. Skin preparations in CABG surgery: a prospective randomized trial. Comp Surg. 1995;14(6):741-744, 747.
3. Centers for Disease Control and Prevention. Guidelines for the Prevention of Intravascular Catheter-Related Infections. *MMWR*. 2002;51(RR-10). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5110a1.htm. Accessed on August 30, 2004.