

INFECTION PREVENTION

Keeping IV infections out of site

by Susan Cantrell, ELS

Caring for infusion sites can be tricky business. There is the potential for so much to go wrong in such a tiny space: for example, infections; needlesticks, leakages, and the concomitant risks for exposures to bloodborne diseases; perforation of blood vessels; migration or dislodgement requiring replacement of the catheter, all of which may be uncomfortable or painful to the patient, all of which may present dangers to patient and/or clinician, and all of which may incur unexpected costs. To be fair, risk for catheter complications are low; however, the sheer volume and frequency of catheters used is colossal, which naturally raises the numbers to serious attention-getting level.

Securing the IV

One of the ways to prevent infusion-site complications is to use a secondary securement device to anchor the catheter. Even the tiniest movements, micromovements, have the potential to cause problems. Securement devices can help to reduce or prevent movement of the catheter by stabilizing it, which can help to prevent the catheter from migrating, possibly puncturing a blood vessel, or from being dislodged altogether. Stabilizing the catheter may also decrease risk for phlebitis and may help to prevent catheter-related bloodstream infections (CRBSIs).

The Centers for Disease Control and Prevention (CDC)'s "Guidelines for the Prevention of Intravascular Catheter-Related Infections"¹ explains: "Pathogenesis of CRBSI occurs via migration of skin flora through the percutaneous entry site. Sutureless securement devices avoid disruption around the

catheter entry site and may decrease the degree of bacterial colonization. [105]. Using a sutureless securement device also mitigates the risk of sharps injury to the healthcare provider from inadvertent needlestick injury. ... Use a sutureless securement device to reduce the risk of infection for intravascular catheters [105]. Category II."

David Sybert, MD, anesthesiologist, Riverside Methodist Hospital, founder and medical director, Linebacker Inc., Columbus, OH, described how their catheter securement device works: "Secondary catheter securement is a critical piece of the puzzle when it comes to reducing movement and keeping IV [intravenous] lines secure. This additional support helps provide valuable reinforcement to the primary securement, decreasing the potential for dislodgements to occur, which can cause discomfort to the patient and be costly for the facility. Our product, Linebacker, is a patented, tapeless, secondary securement device that was developed to help reduce inadvertent IV catheter dislodgements and improve the overall patient experience."

Anecdotal evidence cited in a white paper, "The Importance of Catheter Securement," by Gregory J. Schears, MD, a pediatric intensivist and anesthesiologist from Rochester, MN, supports Sybert's claims. "[A]t a four hundred bed acute care facility use of the LB [Linebacker] was positive 78% of the time. A product trial at a small Pennsylvania hospital also showed over a 75% reduction in IV restarts when the LB was used."

Linebacker Inc., recently announced release of the Linebacker NEONATAL

and Linebacker PEDS, new products developed as a more comfortable alternative to tape when securing IV tubing on infants and children.

To see how the Linebacker works or to request a free demo pack, go to <http://linebackerinc.com/>.

Educational event focuses on securement

The importance of catheter securement was just one of the issues addressed at the 3M I.V. Global Leadership Summit held last May. The conference was held in partnership with BD and Teleflex. The theme, "Raising the Standard: Uniting Global Perspectives," drew more than 100 infusion-care experts from 21 countries who met to explore catheter securement and other issues, including CRBSI, clinical practice guidelines, clinical evidence, and the value of technology.

Leaders from around the world attended educational sessions highlighting trends in IV-site care and new ways to advance securement and eliminate catheter-related bloodstream infections through knowledge, collaboration, and leadership.

Videos of the sessions are available online and definitely worth viewing. To see the keynote address by John Nance, go to <http://shows.implex.tv/3MTV/router.aspx?WebcastID=8267>. To see day 1, go to <http://shows.implex.tv/3MTV/router.aspx?WebcastID=8268>. For day 2, go to <http://shows.implex.tv/3MTV/router.aspx?WebcastID=8269>.

3M offers Tegaderm CHG Dressings, a transparent dressing integrated with a chlorhexidine gluconate gel pad. The transparent dressing enables caregivers to see what is transpiring at the infusion site without the need for removal and replacement of the dressing.

3M's Tegaderm IV Dressing for the BD Nexiva Catheter System is specifically designed to work with the BD catheter to address catheter movement, dislodgements and fall-outs. Tegaderm IV Dressing for



The Linebacker secondary securement device

INFECTION PREVENTION

the BD Nexiva Catheter System is specially designed to cover the size and contours of the built-in stabilization platform, which is unique to the BD Nexiva Catheter System. The dressing features a J-shaped slit that fits snugly around the built-in extension tubing, helping to secure both the tubing and the catheter.



3M Kind
Removal Silicone
Tape

3M Skin and Wound Care recently introduced 3M Kind Removal Silicone Tape with a new silicone-based adhesive technology that combines securement with gentleness to minimize the likelihood of tape-related skin injury. The tape's silicone adhesive works differently than acrylate adhesives, which are used on most traditional medical tapes. Silicone-adhesive tape can be removed with minimal disruption of fragile skin layers or pulling of hair, without compromising securement.

Another conference co-sponsor, Teleflex, offers the Arrow ErgoPack, a vascular access insertion system. The ErgoPack System is designed to allow catheters to be inserted more efficiently, which reduces procedure time. Its ergonomic design and compact size make it easy to store, and its components are easily identifiable during a procedure.



Arrow ErgoPack from Teleflex

Reducing needlesticks and blood exposures

Needlesticks and blood leakages, with the potential for exposure to bloodborne diseases, are serious concerns. Caregivers should not be burdened with the fear of endangering their own health as they care for their patients. BD is one company providing a solution.

Rudy Onia, MD, worldwide medical director, medical affairs, BD Medical-Medical Surgical Systems, Franklin Lakes, NJ, said, "The OSHA Bloodborne Pathogen Standard² states that the employer must use engineering and work-practice controls that eliminate occupational exposure or reduce it to the lowest feasible extent. BD Insyte Autoguard BC minimizes blood exposure to the lowest feasible extent in comparison with other IV catheters without blood control features by providing needlestick protection and controlling the flow of blood from the catheter hub."

Onia also referred to the Needlestick Safety and Prevention Act,³ a modification to the OSHA Bloodborne Pathogens Standard.² "Since its enactment," said Onia, "the Needlestick Safety and Prevention Act has had a significant impact in reducing needlestick injuries. However, blood leakage during peripheral IV catheter insertion still occurs approximately 39% of the time."⁴



BD Insyte Autoguard BC IV Catheter protects healthcare workers from needlesticks and blood exposures.

"In addition to providing proven protection against needlestick injuries, the BD Insyte Autoguard BC with blood control technology is a short peripheral IV catheter that has been proven to reduce blood exposure by 95%.⁴ Because there is dramatically less blood leakage at insertion, there is less potential for cross-contamination that may occur from blood on the clinician's gloves or accessories. Without having to worry about preventing the backflow of blood from the catheter hub, the clinician can focus on stabilizing the catheter and preventing contamination when connecting the IV administration tubing."

Onia referred to published scientific evidence of their product's efficacy. "In a clinical study, 98% of clinicians state they had no risk of blood exposure during insertion when using BD Insyte Autoguard BC,⁴ which means no risk of exposure to bloodborne pathogens, no clean up of blood spills, no need to worry about stopping blood, and no add-on cost for clean-up supplies."

Another product to help prevent needlesticks and blood exposures is available from B. Braun Medical Inc., Bethlehem, PA. The Introcan Safety 3 is a passive needlestick safety device that provides an added layer of safety and control with a bidirectional blood control valve, which aids in the prevention of blood exposure each time the device is accessed.



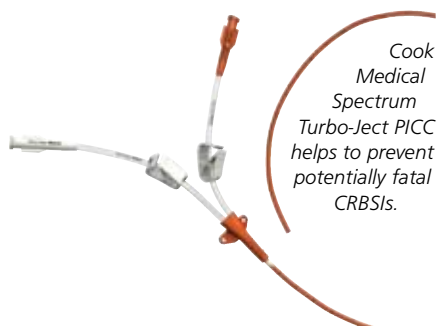
B. Braun Medical Inc.'s
Introcan Safety 3 Closed IV Catheter

Cheryl Wozniak, product manager, vascular access, described the product. "B. Braun Medical Inc. recently announced that the U.S. Food and Drug Administration granted 510(k) clearance of the company's Introcan Safety 3 Closed IV Catheter, the next generation of B. Braun's Introcan Safety IV Catheter. The Introcan Safety 3 features all elements of B. Braun's existing and proven Introcan Safety IV Catheter. From insertion to advancing the catheter to needle removal, the Introcan Safety 3 is designed to help protect clinicians and patients from needlestick injuries, as the device cannot be bypassed or activated inadvertently. Introcan Safety 3 provides protection through a passive safety needle shield, to aid in the prevention of needlestick injuries; a multiple-access blood control valve, to aid in the prevention of blood exposure; and an integrated stabilization platform, to improve catheter stability and minimize movement within the vessel."

"With B. Braun's Introcan Safety IV Catheter, all the user has to do is use it; the safety mechanism does not require any extra steps for activation. There is no risk of forgetting to make the needle safe. From insertion to advancing the catheter to needle removal, clinicians are protected, because they are using a fully automatic passive safety device that cannot be bypassed. Recent research⁵ confirms passive safety-engineered devices are most effective for needlestick injury prevention. The B. Braun Introcan Safety IV Catheter was one of the devices used in this study⁵ and is a market share leader in fully automatic, passive safety technology IV catheters."

INFECTION PREVENTION

The number of antibiotic-impregnated products has been growing in recent years, catheters among them. Regarding the use of antimicrobial-impregnated catheters, the CDC's guideline¹ says to "Use a chlorhexidine/silver sulfadiazine or minocycline/rifampin-impregnated CVC in patients whose catheter is expected to remain in place >5 days if, after successful implementation of a comprehensive



strategy to reduce rates of CLABSI [central-line-associated bloodstream infection], the CLABSI rate is not decreasing. The comprehensive strategy should include at least the following three components: educating persons who insert and maintain catheters, use of maximal sterile barrier precautions, and a >0.5% chlorhexidine preparation with alcohol for skin antisepsis during CVC insertion [106-113]. Category IA"¹

Dan Sirota, vice president and global leader, Interventional Radiology and Critical Care divisions, Cook Medical Inc., Bloomington, IN, talked about their antimicrobial-impregnated catheter. "Among the most important advances in infection control technology is the introduction of antimicrobial-impregnated peripherally inserted central venous catheters (PICCs) and central venous catheters (CVCs). In 2009, Cook Medical released an antimicrobial-impregnated PICC designed, when

used in conjunction with hygiene best practices and maximum sterile barriers, to help physicians reduce the likelihood of a CRBSI. The PICC's combination of minocycline and rifampin has proven to be an effective mixture in reducing the likelihood of CRBSIs while simultaneously avoiding antibiotic resistance."⁶

Sirota explained how and why their catheter works to reduce infection and yet avoid antibiotic resistance: "Minocycline and rifampin work synergistically to provide broad-spectrum protection against gram-positive, gram-negative, and fungal organisms in both short- and long-term use.⁷ Unlike most systemic antibiotics, this combination can penetrate the biofilm that forms on all indwelling catheters. Research shows that use of these catheters does not promote the growth of antibiotic-resistant strains of bacteria in patients.⁶ In another study, the use of CVCs impregnated with minocycline and rifampin proved to reduce the incidence of CRBSIs to nearly zero."⁸

"Numerous peer-reviewed publications,^{8,9} including a landmark study published in the *New England Journal of Medicine*,⁸ have demonstrated both the safety and effectiveness of Spectrum technology in helping to prevent the more than 78,000 CRBSIs developed each year," said Sirota. "Research has demonstrated that use of these catheters does not promote the growth of antibiotic-resistant strains of bacteria in patients receiving Spectrum catheters."

Sirota believes that, despite scientific evidence, antimicrobial-impregnated catheters are underused. "Antimicrobial PICCs and CVCs are a significant step forward in the effort to eliminate CRBSIs. Despite a category 1A recommendation from the CDC¹ for reducing CRBSI if maximal sterile barrier precautions haven't helped a facil-

ity reach its goal, these catheters comprise just a small percentage of the millions of CVCs sold each year in the U.S. To make further progress in infection control and saving lives, healthcare providers, government agencies, and device- and drug-manufacturing companies need to continue to work together to develop and drive the adoption of evidence-based technologies. A collaborative approach to infection control will result in better patient outcomes than process alone, changing the standard of care and saving countless lives." **HPN**

References

1. O'Grady NP, Alexander M, Burns LA, Dellinger EP, Garland J, Heard SO, et al. Guidelines for the prevention of intravascular catheter-related infections. *Am J Infect Control* 2011;39(4 Suppl):S1-S34.
2. United States Department of Labor, Occupational Safety and Health Administration. OSHA Bloodborne Pathogen Standard 29 CFR - 1910.1030 http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051
3. United States Department of Labor, Occupational Safety and Health Administration. Pub. L. 106-430. Needlestick Safety and Prevention Act. http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=106_cong_public_laws&docid=f:publ430.106
4. Onia R, Eshun-Wilson I, Arce C, Ellis C, Parvu V, Hassman D, et al. Evaluation of a new safety peripheral IV catheter designed to reduce mucocutaneous blood exposure. *Curr Med Res Opin* 2011;27:1339-1346.
5. Tosini W, Ciotti C, Goyer F, Lolom I, L'Hériteau F, Abiteboul D, et al. Needlestick injury rates according to different types of safety-engineered devices: results of a French multicenter study. *Infect Control Hosp Epidemiol* 2010;31:402-407.
6. Ramos ER, Jiang Y, Hachem R, et al. The risk of emerging resistance associated with prolonged use of antibiotic coated catheters: a seven year experience and >0.5 million catheter days. Society for Healthcare Epidemiology of America 18th Annual Scientific Meeting; April 5-8, 2008; Orlando, FL. Poster.
7. Schuerer DJ, Mazuski JE, Buchman TG, et al. Catheter-related bloodstream infection rates in minocycline/rifampin vs. chlorhexidine/silver sulfadiazine-impregnated central venous catheters—results of a 46 month study. *Crit Care Med* 2008;36(12) (Suppl):A199-A208. Abstract 454.
8. Darouiche RO, Raad II, Heard SO, Thornby JI, Wenker OC, Gabrielli A, et al. A comparison of two antimicrobial-impregnated central venous catheters. Catheter Study Group. *N Engl J Med* 1999;340(1):1-8.
9. Centers for Disease Control and Prevention. Vital signs: central line-associated blood stream infections—United States, 2001, 2008, and 2009: *MMWR* 2011;(60):1-6. <http://www.cdc.gov/mmwr/pdf/wk/mm60e0301.pdf>

Reprints courtesy of

B | BRAUN
SHARING EXPERTISE