Reducing The Risk For Surgical Site Infections

A Q&A with John S. Foor, MD, a vascular surgeon and infection prevention specialist at Mount Carmel Vascular and Vascular surgeons of Ohio, Mount Carmel Medical Center in Columbus, Ohio.

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The government has cut reimbursement for treating certain healthcare-associated infections and has issued an action plan to prevent infections, including vascular catheter-associated bloodstream infections (BSIs) and surgical site infections (SSIs) following coronary artery bypass graft. The estimated annual cost of treating these infections is nearly $20 billion. Hospitals can improve patient care and their financials by reviewing their infection-control measures and enacting new protocols where needed.

What can surgeons and interventionalists do prior to a procedure to reduce the risk of infection?

John S. Foor: Two areas of concern are glucose control and skin preparation. Patients with consistently elevated blood sugars are at an increased risk of SSIs. Therefore, if you have a patient who is a known diabetic and scheduled

for an elective procedure, it is critical to evaluate their blood sugar levels in the weeks ahead of the procedure date. For levels above 150 or 200, it is best to reschedule the procedure, allowing time to control the glucose level and thereby decrease the risk of an SSI. In one case, I decided to postpone an amputation for a diabetic patient with glucose levels above 400. After a few days in the hospital, the patient's glucose level was reduced and I was more comfortable performing the procedure knowing that the patient would be more likely to heal successfully.

Regarding skin preparation, the evidence is not conclusive linking preoperative antiseptic showers to reduced SSI rates. However, such showers have been shown to reduce microorganism levels on patients' skin. Chlorhexidine gluconate (CHG) is a popular antiseptic for skin prep showers due to its residual antimicrobial effect. As a best practice, the Centers for Disease Control and Prevention (CDC) recommends that patients shower or bathe with an antiseptic agent on at least the night before their operation. In my practice, I instruct patients to have two CHG antiseptic showers the day before surgery—once in the afternoon and then again in the evening. I give the patient an antiseptic CHG scrub brush similar to the type used by OR personnel and I give them detailed instructions on effective technique.

What precautions can surgeons take the day of the procedure?

Foor: Most operating room and cath lab professionals have accepted the use of surgical clippers as the standard for preoperative hair removal, and current guidelines support their use as well. This practice results in a lower incidence of SSIs compared to traditional razors, which can create microscopic nicks and abrasions on the skin that lead to infection. That said, there are various clipper options on the market, so consider a clipper strong enough to allow for a fast and close clipping. As part of my preoperative regimen, I prefer using fully submersible electrical clippers that enable thorough cleaning and sterilization. Also, make sure the clipper comes with disposable heads to help prevent cross-contamination. And clippers with custom blades for all hair types tend to offer faster hair removal and clipper maneuverability, which in turn can help improve the work flow in pre-op. http://www.carefusion.com/ [1]

What are some of the factors to consider when selecting a preoperative skin preparation protocol?

Foor: The preferred solution should have the ability to kill skin-dwelling microorganisms immediately upon application, but should also exhibit persistent antimicrobial activity throughout the procedure and keep fighting bacterial growth once the procedure is complete. The three common choices for skin preparation—iodine-based products, alcohol and a combination of CHG with alcohol—all have benefits. Alcohol has an immediate presence and begins killing skin-dwelling bacteria as soon as it is applied. The effect, however, is not long lasting. Iodine is effective for a couple of hours after application, but iodine-based antiseptic products can be neutralized in the presence of body fluids. CHG provides bacteria-killing activity that persists for a longer stretch of time, lasting up to 48 hours post-procedure for prolonged antiseptic effect and is not affected by body fluids.

My preferred antiseptic is a combination of 2% CHG in 70% isopropyl alcohol (ChloraPrep) due to the combined immediate (by alcohol) and persistent (by CHG) action against microorganisms that increase the risk for SSIs and BSIs.I, II Further, studies have demonstrated that CHG in the solution provides continued activity even in the presence of protein-laden body fluids, specifically blood.III Literature demonstrates that iodine-based antiseptic products can be neutralized in the presence of body fluids, meaning the patient would not realize the full potential benefits of antimicrobial activity. In addition, a recent study published in the *New England Journal of Medicine* demonstrated that preoperative use of 2 percent CHG/70 percent isopropyl alcohol reduced total SSIs by 41 percent compared to use of povidone-iodine solution.IV

What tips do you have for wound care following the procedure to reduce the risk of infection?

Foor: Have a discussion with your patients to ensure they fully understand postoperative instructions, including any bandage care needed. Patients should leave the dressing on their incision for 24 to 36 hours. After that time, epithelialization has occurred and the wound can be cleaned with soap and water. The patient should employ special care to be certain that the wound stays clean.

With less reimbursement for health care-associated infections, what should facilities being doing to reevaluate their infection-control processes and techniques?

Foor: Each facility should consider which practices are contributing to successful patient outcomes and cost reduction and which areas could be improved. For the implementation of any new protocols to be successful, they have to have the buy-in and confidence of those healthcare professionals on the front lines of patient care. Not only should they be assured that suggested protocols are scientifically sound, but there also needs to be a collaborative culture that encourages adherence.

I Garcia R, Mulberry G, Brady A, Hibbard JS. Comparison of ChloraPrep and Betadine as preoperative skin preparation antiseptics. Poster presented at: 40th Annual Meeting of the Infectious Disease Society of America; October 25, 2002.

II Data on file. Enturia, Inc.

III Gottardi W. Iodine and Iodine Compounds. In: Block SS. Disinfection, Serilization, and Preservation. 5th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2001:159-183.

IV Darouiche RO, Wall MJ Jr, Itani KM, Otterson MF, Webb AL et al. Chlorhexidine-Alcohol versus Povidone-Iodine for Surgical-Site Antisepsis. N Engl J Med. 2010 Jan 7;362(1):18-26.

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