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Improving Vascular Access Outcomes

INFECTION PREVENTION CONSIDERATIONS

INTRODUCTION

There is a scarcity of available information in medical literature that addresses infection prevention and treatment specific to vascular closure devices. The existing cardiac infection prevention and treatment literature focuses on indwelling venous and arterial catheters, as well as intracardiac devices (pacemakers, cardioverter-defibrillators, ventricular assist devices, total artificial hearts, ventricular shunts, pledgets, vascular grafts, and arterial patches).

The following considerations for treatment were developed based on available literature, including the AHA Scientific Statement on Non-valvular Cardiovascular Device Related Infections (2003)[1] and CDC Guidelines for the Prevention of Intravascular Catheter-Related Infections (2002), as well as other infection-related articles.[2-5] The statements below are meant to be suggestions only and not a mandate for care of any specific patients when using or not using vascular closure devices.

PRE-PROCEDURE CONSIDERATIONS

The predominant source of pathogens in infection is the endogenous flora of the patient's skin. Therefore, attention to skin preparation is a major part of the infection prevention strategy.

- If hair is to be removed around the entry site, perform the removal immediately before the procedure, preferably with electric clippers.
- Prior to a diagnostic or interventional procedure, skin preparation should be performed. Consider use of an appropriate antiseptic preparation such as iodophor, alcohol-containing products, or chlorhexidrine. Apply the skin preparation solution in concentric circles, moving from the center to the periphery.
- Remove any pooled blood prior to beginning the arterial closure.
- Consider re-preparation of the skin insertion site, especially in the case of a prolonged procedure, or if compromise of sterile technique is suspected.
- Consider a change of gloves prior to beginning the arterial closure.
- Consider a change of towels around the skin insertion site, especially if the drape has become saturated with blood.

PROPHYLACTIC ANTIBIOTIC ADMINISTRATION

The decision as to whether to administer prophylactic antibiotics is solely within the discretion of the physician and remains controversial due to valid clinical and practical concerns both in favor and against prescription. Though data is limited and there is no consensus, some current literature appears to indicate that prophylactic antibiotics may be considered by physicians in certain patient populations.[1-5] The American Heart Association's (AHA) recommendation for the use of primary antibiotic prophylaxis with placement of nonvalvular cardiovascular devices is modeled after that used to prevent surgical site infection. As the AHA also states, "[I]n contrast to that used to prevent surgical site infections, primary prophylaxis for the prevention of

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device-related infections has not been examined in prospective randomized trials." In addition, "[b]ecause of the low incidence of infection for many of the devices, evidence based data have not been collected that prove efficacy." Nevertheless, the AHA notes that primary prophylaxis is "routinely given to patients who undergo placement of electrophysiological cardiac devices." The AHA states that one dose of antibiotic, usually Cefazolin, is administered to prevent methicillin-susceptible staphylococcal infection of the cardiovascular device. A single dose of vancomycin should be considered for use only in patients who are unable to tolerate beta-lactam antibiotics or for patients known to be colonized or infected with methicillin-resistant staphylococci.[1] Therapeutic antibiotic concentrations should be present in tissue from initiation to completion of device placement to achieve optimal prophylactic efficacy. This requires that prophylactic antibiotics be intravenously administered approximately one hour before onset of the procedure. Additional doses of antibiotic may be required intra-operatively for prolonged procedures. Repeat dosing during the operative period for the commonly used antibiotics Cefazolin, Cefamandole, Cefuroxime, and Vancomycin should be at 6, 2, 4, and 8 hours, respectively.[1]

PROCEDURAL CONSIDERATIONS

- Observe sterile technique throughout the procedure.
- Discard the scalpel used for the initial skin incision as it may be contaminated with skin flora.
- Cover the insertion site with a sterile dressing prior to removal of the drape.

POST-PROCEDURAL CONSIDERATIONS

- Consider use of sterile or "no touch" methodology for in-hospital dressing changes.
- Provide insertion site wound care instruction to the patient prior to discharge per hospital protocol.
- Consider including the following information to the patient as part of the patient discharge teaching:
  - Remove the dressing 24 hours after discharge.
  - Cleanse the skin incision site with soap and water from a standing position 24 hours post-procedure.
  - Keep the wound clean and dry.
  - Restrict tub bathing, hot tub, or other submersion in water for five days, or until the skin incision is healed.
  - Contact the physician if there is increased redness, pain, or swelling at the skin incision site, if the wound does not heal, or if fever or chills are experienced.

PATIENTS AT HIGH RISK FOR INFECTION

Certain patient populations may be at higher risk for infection and should be treated accordingly at the discretion of the physician. These patients include diabetic patients, renal dialysis patients, obese patients with skin folds, patients undergoing prolonged procedures, patients with multiple sheath exchanges and multiple device exchanges, patients with prolonged sheath insertion, immunocompromised patients, patients with prosthetic heart valves or significant valvular lesions, patients with prosthetic joints, patients with prolonged hospitalization, patients with ipsilateral groin access within two weeks, patients with poor hygiene, patients with co-existent infection at a remote body site, patients with femoral grafts, and home healthcare patients/ nursing home patients.[1-6]

This information is not intended to be a substitute for the independent care, determination, and judgment of healthcare professionals. Please consult the Instructions for Use and the Patient Guide for most current and accurate information concerning the Abbott product you are using.

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4. Heupler Fa, Jr. Heisler M, Keys TF et al. Infection prevention guidelines for cardiac catheterization laboratories. *Cathet Cardiovasc Diagn*. 1992 Mar, 25 (3): 260 3.
5. Dx Costa A, Kirkorian G, Cucherat M, et al. Antibiotic prophylaxis for permanent pacemaker implantation: a meta-analysis. *Circulation*. 1998 May 12; 97 (18): 1796 801.
6. Wiener RS, Ong LS, Local infection after percutaneous transluminal coronary angioplasty: relation to early repuncture of ipsilateral femoral artery. *Cathet Cardiovasc Diagn*. 1989 Mar; 16 (3): 180-1.

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