

CENTRAL VENOUS CATHETER (CVC) INSERTION AND MAINTENANCE PROTOCOL

Catheter Insertion

1. Handwashing with antimicrobial soap is required prior to placement. (IV)
2. Full barrier precautions (sterile gloves, long sleeve sterile gown, and mask will be worn and a large sterile sheet will be used during CVC insertion). (II a)¹
3. Tincture of Iodine (IV) or Chlorhexidine containing antiseptic (II a) will be used for skin site preparation prior to CVC placement (both preferred over providone-iodine).
4. Subclavian vein site is preferred over internal jugular (IJ) site to reduce infection. (III)¹

Consideration of very short-term access may favor IJ placement given its lower incidence of some non-infectious complications. Risk for infection and thrombosis associated with femoral vein insertion limits use of this site to circumstances where other alternatives are not available. (III)¹

If used, non-tunneled femoral vein catheters should not be maintained indefinitely, but should be considered short-term lines only. (IV)

5. Subcutaneous tunneling of internal jugular and femoral vein catheters reduces risk for catheter related blood-stream infection and should be considered, especially when catheters are not used for drawing blood. (II a)¹
6. Contamination-shielded pulmonary artery catheters will be routinely used. (II a)²
7. Catheters impregnated with minocycline and rifampin (Cook Spectrum Catheters) are preferred in non-allergic patients where bloodstream infection rates are expected to be high. (II a)³
8. Intravenous antibiotic prophylaxis at the time of CVC placement does not lower infection risk and will not be employed. (II a)¹

Catheter Maintenance

1. Routine replacement of CVC by guidewire exchange or new site is not indicated as long as the catheter is functioning properly and there are no indications of local or systemic sepsis. (IV)¹ CVCs that are questionably infected or non-functional can be removed and replaced over a wire at the same site provided it is cultured and subsequently removed if the culture shows significant growth on a plate (> or = 15 colonies forming units (CFU). (IV)
2. After insertion, irrigate with 5 ml normal saline. If Heparinization is required: flush with 2 ml dilute Heparin (100 units / ml) per Central Venous Catheter Care SOP.
3. CVCs should be removed as soon as the indication for their use is gone. (IV)¹ This should be reassessed daily.

RECOMMENDATIONS AND REFERENCES FOR CVC INSERTION

Recommendations for Prevention Strategies

- I. Evidence from a well-designed meta-analysis of randomized, controlled trials.
Trials met the following criteria: catheters were inserted into new sites, not old sites over a guidewire; catheter cultures were done by using a semi-quantitative or quantitative methods and catheter-related bloodstream infections were confirmed by microbial growth from percutaneously drawn blood cultures that matched microbial growth from the involved catheter.
- IIa. Evidence from at least one randomized, controlled trial meeting the preceding criteria.
- IIb. Evidence from at least one randomized, controlled trial that allowed catheter exchange over guidewires into old sites.
- III. Evidence from at least one well-designed clinical trial without randomization.
- IV. Evidence from opinions of authorities in the field based on clinical experience, descriptive studies or expert committee report.

References

1. Mermel L.A. Prevention of intravascular catheter-related infections. *Ann Int Med* 200; 132:391-402.
2. Cohen Y, Fosse JP, Karoubi P, Reboul-Marty J., Dreyfuss D, Hogan P, et al. The “hands-off” catheter and the prevention of systemic infections associated with pulmonary artery catheter: a prospective study. *Am J Respir Cont Care Med*. 1998; 157:284-7.
3. Darouiche RO, Raad II, Heard SO, et al. A comparison of two antimicrobial-impregnated central venous catheters. *N Eng J Med* 1999; 340:1-8.
4. Randolph AG, Cook DJ, Gonzales CA, Andrew. Benefit of heparin in central venous and pulmonary artery catheters: a meta-analysis of randomized controlled studies. *Chest*. 1998; 113:165-171.
5. Arepally G, Cines DB, Heparin-induced thrombocytopenia and thrombosis. *Clin Rev Allergy Immonol*. 1998; 16:237-47.