

Trauma Surgery

Standard Operating Procedure: Central Venous Access

I. Purpose:

- A. Applies to all patients receiving a central venous catheter (CVC) on the trauma service at VUMC
- B. See also VUMC Institutional Policies: *Central Venous Access Devices: Insertion and Maintenance, and Discontinuation* and *SOP: Central Venous Access Device (CVAD): Insertion, Maintenance and Discontinuation for Vanderbilt University Adult Hospital and Clinics*
- C. Central venous catheter (CVC) or Central venous access device (CVAD) is defined as an intravascular catheter that terminates in the central veins. Includes:
 - a. Single and multilumen temporary catheters
 - b. Peripherally inserted central catheters (PICC)
 - c. Temporary hemodialysis and apheresis catheters
 - d. Long-term devices including cuffed, tunneled catheters or implanted venous access ports

II. Guidelines:

- A. Indications for CVC Placement
 - a. Sustained vasopressors
 - b. Parenteral nutrition
 - c. Ongoing hypertonic saline use
 - d. Lack of adequate peripheral access
- B. Catheter Selection
 - a. When available, antibiotic impregnated catheters should be utilized for all central line insertions
- C. Insertion Site
 - a. The subclavian position is the preferred site for insertion as the infection risk is lowest for this site.
 - b. Internal jugular is the second alternative
 - c. The femoral position is least preferred due to both infection and thrombosis risk.
- D. Insertion Technique
 - a. Full barrier precautions should be utilized for all invasive catheters. This includes:
 - i. Mask
 - ii. Cap
 - iii. Sterile Gown
 - iv. Sterile Gloves
 - v. Full body drape
 - b. Skin should be free of debris and adequately and widely prepped with alcoholic chlorhexidine preparation (Chloraprep) and allowed to dry.
 - c. For IJ or subclavian patients should be in "head-down" position to prevent air embolus unless contra-indication (particularly spontaneously breathing pts).
 - d. Ultrasound:
 - i. Ultrasound guidance should be used for all IJ and femoral lines. Subclavian lines may use ultrasound as an adjunct if preferred by provider
 - e. Venous access should be confirmed prior to dilation using one or more of the following:
 - i. Ultrasound evaluation of wire placement in the vein
 - ii. Transduction indicating venous return from access site
 - iii. Blood gas drawn from access site indicating venous sample
 - f. Transparent chlorhexidine containing dressing should be placed following insertion

- E. Site Confirmation
 - a. IJ and Subclavian line position confirmed with x-ray prior to use
 - b. In emergent situations line may be used prior to X-ray confirmation
- F. Line Maintenance
 - a. Insertion site and catheter assessed by nursing staff every shift
 - b. Transparent dressing changed under sterile conditions every 7 days or when damp, soiled or non-occlusive
 - c. Necessity of CVC assessed at least daily by clinical team
- G. Catheter Replacement
 - a. CVC placed under non-sterile conditions (ie during emergent conditions): replace using sterile techniques, as soon as clinical condition allows and within 48 hours
 - b. Lines placed at outside facilities should be considered for replacement (based on documentation of sterile technique, function, evidence of infection)
 - c. Suspected central line infection (ie purulence or erythema at site, bacteremia, hypotension): Change CVC to a new site
 - d. Catheter malfunction without evidence of infection: Change CVC over guidewire or to a new site
 - e. No need for routine CVC exchange in absence of infection or catheter malfunction

III. References

1. Buetti N, Marschall J, Drees M, Fakhri MG, Hadaway L, Maragakis LL, Monsees E, Novosad S, O'Grady NP, Rupp ME et al. 2022. Strategies to prevent central line-associated bloodstream infections in acute-care hospitals: 2022 update. *Infect Control Hosp Epidemiol.* 43(5):553-569.
2. O'Grady NP, Alexander M, Burns LA, Dellinger EP, Garland J, Heard SO, Lipsett PA, Masur H, Mermel LA, Pearson ML et al. 2011. Guidelines for the prevention of intravascular catheter-related infections. *Clin Infect Dis.* 52(9):e162-193.

IV. Endorsement

Authors:

Brad Dennis, MD

Elizabeth Krebs, MD

Christian Carpenter, RN

Revisions:

April 2024, Feb 2022, Feb 2019