

# Central Venous Catheter Insertion

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## Pre-insertion

- Review *indications, risks and benefits* with the care team *and* the patient
- Obtain *consent* when possible
- Perform a “Time Out” with team (confirm correct patient, correct procedure, consent has been obtained)
- Use the *central line bundle* to decrease risk for central line associate blood stream infection (CLABSI)
  1. Hand Hygiene (operator washes hands or uses alcohol based hand rub)
  2. Optimal catheter site selection, with avoidance of the femoral vein for central venous access in adult patients
    - a. *Subclavian (SC) is preferred site for reduced risk of CLABSI\**
    - b. Order of preference: Subclavian > Internal Jugular (IJ) > Femoral (FEM)
  3. Chlorhexidine Skin Prep
    - a. 30 second friction rub for a “dry” site (IJ/SC); allow to dry completely
    - b. 2 minute friction rub for a “wet” site (Femoral); allow at least 60 seconds to dry
  4. Maximal Barrier Precautions
    - a. Sterile gown, gloves, hat, mask and eye protection for inserter
    - b. Mask and hat required for all others present the bedside
    - c. Patient must be fully draped to the knees
  5. Aseptic technique with line access and dressing changes
  6. Daily review of line necessity and prompt removal
- For SC or IJ lines, place patient in Trendelenburg position. For IJ, rotate the head slightly away from IJ to be cannulated ( < 30° to avoid the risk of moving the carotid over the IJ vein)
- Use the *Seldinger* technique (catheter over wire)

## Insertion

- Flush all ports on catheter with sterile saline
- Place blue clave on each port (except port the wire will pass through)
- Use *US guidance* for IJ and FEM Lines; Consider US guidance for SC
- Anesthetize the superficial and deeper structures (If placing SC, be sure to anesthetize the clavicle periosteum)
- Using the large needle, cannulate the vein while aspirating; cannulation is confirmed with return of dark, nonpulsatile venous blood
- Remove the syringe without removing the needle from the vein
- Advance the guidewire no more than 12-15 cm
- Nick the skin with the scalpel
- Advance the dilator over the guidewire and dilate the vein
- Advance the catheter over the guidewire (see table 1 for depth of insertion based on site)
- Ensure there adequate return of blood and easy flush for each port
- Suture the catheter in place
- Place a sterile dressing over the catheter

\* Several older non-randomized studies show that the subclavian vein site is associated with a lower risk of CLABSI than the internal jugular vein; newer data suggests that the site of insertion does not alter the risk of infection. The risk/benefit analysis of infectious and non-infectious factors (e.g., the potential for mechanical complications, the risk of subclavian vein stenosis, and catheter-operator skill) should be considered when deciding which vein is most appropriate for the patient. While the SC site is the preferred site (with regards to CLABSI) outlined in MMC central line insertion policy, it is not the intent of this policy nor the central line bundle to force a physician to take an action he or she feels is not clinically appropriate.

## Post-insertion

- Confirm correct placement of IJ/SC with *CXR, and US if appropriate*
  - Tip of line should be at the junction of the SVC and right atrium
- After confirmation of line placement with imaging, notify the nurse that the catheter is ok to use
- Documentation - Use the EPIC "Vascular Access Tab"
  1. Use the order set "Central Line Maintenance"
  2. Complete the Procedure Note

US guided Supraclavicular approach (Ctrl + Click to open)

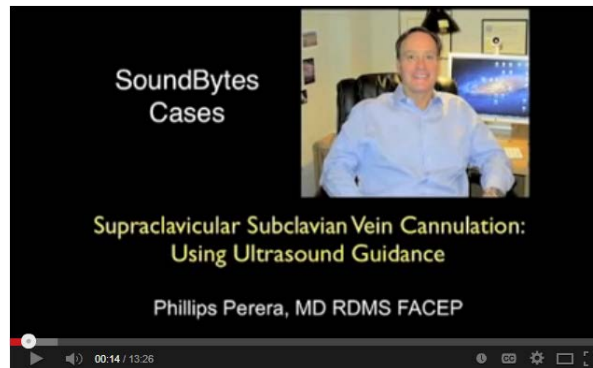


Table 1. Formulas for Catheter Insertion Length Based on Patient Height and Approach

Site	Formula	In SVC (%)	In RA (%)
RSC	(Hgt/10) - 2 cm	96	4
LSC	(Hgt/10) + 2 cm	97	2
RIJ	Hgt/10	90	10
LIJ	(Hgt/10) + 4 cm	94	5

From Czepizak C, O'Callaghan JM, Venus B: Evaluation of formulas for optimal positioning of central venous catheters. *Chest* 107:1662, 1995.

## Educational Videos (Ctrl + Click to open)

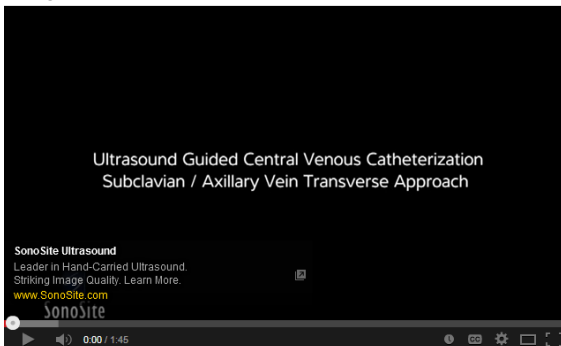
- US guided femoral line



- US guided IJ



- US guided Subclavian



This guideline was ratified by the emergency department faculty at Maine Medical Center in December 2013. It reflects our expert opinion and is not necessarily applicable to all institutions. It is intended to be a reference for clinicians caring for patients and is not intended to replace providers' clinical judgment.

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