CENTRAL VENOUS CATHETERIZATION SAFETY GUIDELINES

These guidelines pertain to all elective central venous catheterizations; they do not apply during emergency circumstances. Ultrasonic guidance of central venous catheterization reduces the incidence of inadvertent arterial cannulation. Ultrasonic vessel finder usage is required in all non-emergency internal jugular central venous catheterizations performed without fluoroscopy.

1. Non-contrast radiographic examination will NOT be used to confirm that a central venous catheter is located in a vein. Radiologic examination is useful for determining the depth of insertion and the presence or absence of complications related to the central line placement, such as pneumothorax or hemothorax.

2. For all central venous lines, the techniques to be used for confirmation of venous placement include:
    a. Observation of the intravascular pressure waveform using an electronic transducer and pressure tubing
    b. Determination of the of the intravascular pressure using sterile tubing as a venous manometer
    c. When saline is rapidly injected through the catheter, there is opacification of the ultrasonic view of the right heart structures.
    d. Using real-time fluoroscopic or echocardiographic confirmation of venous catheterization (e.g., visualizing the guide wire or catheter within the superior vena cava/inferior vena cava); or
    e. Using a contrast study to opacify the venous structures.
    f. Analysis of the PO2 of a blood specimen drawn from the needle/catheter compared to simultaneously drawn arterial blood (this is the least appropriate confirmation method)

3. **<u>For Insertion of Large-Bore Catheters and Introducers</u>**
    To prevent inadvertent arterial cannulation with large-bore catheters (triple lumen catheters, percutaneous introducers, and dialysis catheters), venous localization of the introducing needle or (angio) catheter must be confirmed by one or more of several techniques noted above prior to vessel dilation. If technically unfeasible to conduct a confirmatory test with a short catheter or introducer needle prior to dilation, the recommendation is that a temporary catheter (<5 French) be placed to conduct one of the confirmatory methods.

4. In the event that no confirmatory test is conclusive, then the catheter must be removed.

5. All non-emergent central lines should be placed using full sterile technique with the equipment from a central line bundle kit.

If there is a placement of a catheter into an artery, please follow the following procedures:

Cordis or Dialysis Catheter

1. Leave line in situ, clamp and cap it
2. Call vascular consult and act as per their recommendations
3. These patients may need direct visualization of the injury in the OR

Triple Lumen Catheter

1. If the patient is on anti-coagulation, page vascular and let them decide treatment
2. If not: pull line, hold direct pressure for at least 10 minutes continuously (as in not removing to check the site for bleeding every 2 minutes). If the patient develops any neurodeficits or decreased consciousness, ease the amount of pressure, consult vascular, and possibly additional services.
3. Place a dressing and observe site for hematoma formation
4. Observe patient for neurological sequelae
5. These patients probably require admission or at least prolonged observation
   If they are admitted, the team needs to know that there was a carotid puncture/dilation.
6. Vascular does not need to be consulted unless there are problems.