

THE MOUNT SINAI HOSPITAL, NEW YORK POLICIES AND PROCEDURES	SUBJECT NO. A2-410 PAGE 1 OF 3
DEPARTMENT: ADMINISTRATION SUBJECT: CENTRAL VENOUS CATHETERIZATION SAFETY POLICY	

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POLICY:

CENTRAL VENOUS CATHETERIZATION SAFETY POLICY

This policy pertains to all elective central venous catheterizations. The policy does 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. All elective central line insertions on patient floors will be performed by dedicated central line placement teams, such as the Surgical and Medical Intensive Care Unit Line Placement Services.
2. Appropriately privileged physicians who practice anesthesia, emergency medicine, critical care, and interventional procedures (interventional cardiologists, interventional radiologists, and nephrologists) may insert elective central lines in their procedural areas. The Chief Medical Officer may identify other physicians that may receive privileges to insert elective central lines in specific procedural areas.
3. The attending physician must be present and visually supervise critical portions of the procedure, especially the confirmation of catheter placement within the central venous circulation.
4. A surgeon who has privileges to insert surgical central lines (e.g., Broviac catheters) in the operating rooms shall not place elective central lines outside of the operating room setting unless he/she is a member of a

dedicated central line placement team or otherwise qualified as defined by the Chief of Service and the Chief Medical Officer.

5. Non-contrast radiographic examination will NOT be used to confirm the venous position of central venous catheters. 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.
6. For all central venous lines, the techniques to be considered for confirmation of venous placement include the following. At least one method must be performed for each central venous line insertion and results must be documented in the procedure note:
 - 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. Analysis of the PO₂ of a blood specimen drawn from the needle/catheter;
 - d. Using real-time fluoroscopic, echocardiographic, or portable ultrasound confirmation of venous catheterization (e.g., visualizing the guide wire or catheter within the superior vena cava); or
 - e. Using a contrast study to opacify the venous structures.
7. **For Insertion of Large-Bore Catheters and Introducers**

To prevent inadvertent arterial cannulation with large-bore catheters (>5 French diameter or equivalent pediatric sizes), 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.
8. In the event that no confirmatory test is conclusive, then the catheter must be removed.
9. The medical and nursing personnel present at the central line insertion must complete all applicable checklists, follow strict asepsis, and use all precautions currently required by the Central Line Associated Bloodstream Infection (CLABs) protocols of The Mount Sinai Hospital. Nursing personnel will retain the authority to supervise and intervene to ensure that CLABs protocols are followed by the physicians and teams that are placing the central lines. The current checklist for central line insertion is attached to this policy.

10. The primary service responsible for patient care shall monitor central lines for duration of insertion and signs of CLABs. If the patient has a positive blood culture (as defined by CDC guidelines), the primary service will complete and forward a Root Cause Analysis (RCA) form to the Director of Epidemiology. The current RCA form is attached to this policy.
11. The Materials Management service shall only distribute central line insertion materials and catheters to dedicated central line placement teams, and the procedural areas and patient care units where the physicians have privileges to insert central lines (see #2 above). Sterile tubing to facilitate venous manometry shall be distributed with central line insertion materials. Central line insertion supplies shall be restricted to resuscitation carts and other emergency supply locations on patient floors.

NOTES ON LIMITATIONS OF THE TECHNIQUES TO PREVENT INADVERTENT ARTERIAL CANNULATION:

No one technique is guaranteed to be completely accurate in confirming venous location of a needle or catheter.

The following issues must be considered in interpreting these tests:

- a) The "arterial-like" blood spurt and "arterial-looking" blood color are unreliable markers of the exact arterial location of a catheter and should not be used as confirmation of position, except in dire emergencies, such as CPR.
- b) Manometric observation of a liquid column in the tubing connected to the catheter will provide a rough estimate of the venous or arterial nature of the intravascular pressure. However, manometric observation can be misleading in circumstances where the arterial pressure is low and the venous pressure is high.
- c) Blood gas analysis is most effective when the sample from the central line is compared with a known arterial sample, or is <50 mm Hg in the presence of a high arterial saturation (>90%) as assessed using pulse oximetry.
- d) Radiologic interpretation of a single planar image is not conclusive evidence of central venous catheterization due to the proximity of arterial and venous structures in the thorax.