Standard Of Procedure for Central Venous Cannulation

Indications for Non-tunneled CVC placement include:

- Access to drugs
- Renal Replacement Therapy, plasma exchange.
- SVO2 blood oxygen saturation,
- pulmonary artery pressure monitoring, trans-venous pacing.

Potential relative contraindications:

- Coagulopathy
- thrombocytopenia

Other risks:

- Contralateral hemothorax or pneumothorax.
- Vessel thrombosis, stenosis, or disruption.
- Infection overlying insertion site.
- Ipsilateral indwelling central vascular devices.

Consent:

An individual risk-benefit assessment should be performed to decide whether insertion should be performed and select the suitable site

Insertion technique:

• Continuously monitor the patient with pulse oximetry and electrocardiography.
• Position the patient in such a way as to optimize vein exposure and reduce the risk of air embolism.

• Use a strict aseptic technique by thorough hand washing, use a sterile gown, gloves, mask, and cap

•place a sterile full body drape over the patient.

•Lay out all equipment on a trolley.

•Use a sterile ultrasound probe cover and sterile conductive jelly.

• The skin is prepared with a solution of 2% Chlorhexidine in 70% isopropyl alcohol.

• Identify landmarks and then use ultrasound to assess/confirm the anatomical location and patency of the vein.

• Following infiltration with local anesthetic, guided by real-time ultrasound imaging, insert a needle mounted on a syringe into the vein.

• Once blood is freely aspirated, remove the syringe from the needle.

•Blood flow from the needle should be non-pulsatile.

•If in doubt, before passing the wire, a blood gas may be taken from the needle and compared with an arterial sample.

•Don’t insert the dilator deeper than necessary, and certainly not to the hilt.

Safety Check 1: Confirm the guide wire position with ultrasound imaging in 2 planes.

• A small incision is usually needed to facilitate the passage of the dilator.

•Maintain control of both the guide wire and dilator at all times.

•Avoid wire kinking. Always have control of the guidewire.

• Remove the dilator. Pass the central venous catheter onto the guide wire and withdraw the guide wire until it protrudes from the end of the catheter

• Advance the catheter into the vessel and remove the guide wire.

• **Safety Check 2**: Remove the guidewire

• Using ultrasound, confirm the correct placement of the catheter in the vein.

• **Safety Check 3**: Check all ports aspirate freely. Take a blood gas from the CVC.

• **Safety Check 4**: Confirm that the CVC blood gas is compatible with venous placement, if in doubt compare with an arterial blood gas.

• Ensure all ports are flushed with 0.9% saline. Secure the catheter with four suture points and place an occlusive dressing over the insertion site.

•a CXR should be performed, viewed and recorded within 2 hours.

• **Safety Check 6**: Chest X-Ray to confirm tip position (upper torso lines only)
Chest X Rays A Chest X-Ray is performed to demonstrate the satisfactory position of the cvc

•A Chest X-Ray does not demonstrate that the catheter is intra-venous.

•The Chest X-Ray should demonstrate that the CVC lies along the contour of where one would expect the course of the vein to run.

•The line should be free of kinks and run in a straight line.

•The tip of the CVC should be around the level of the carina.

•To reduce the risk of perforation, the tip of the line should lie parallel to the wall of the vein - not abutting it.

•Significant events such as carotid puncture and pneumothorax should be reported immediately.

Infection control • Any lines inserted outside of Critical Care and Theatres should be deemed to be "at risk", Consideration should be given to remove/replace these.

• The Femoral route has the highest rate of infection and thrombosis.

• Each port on the Central Line should be capped with a hub featuring a non-return valve.

•Any handling of the CVC should be done in a sterile manner, and the ports cleaned with 2% Chlorhexidine in 70% Isopropyl Alcohol prior to connecting medication.

• Total Parental Nutrition (TPN) should be delivered by a dedicated lumen.

• Daily bathing of patients in antiseptic is recommended to reduce Catheter-Related Bloodstream Infections (CRBSI).

• Consider a diagnosis of Catheter-Related Bloodstream Infection in patients with signs of systemic infection in the absence of another identifiable source or who develop signs of systemic infection after flushing of the line.

• Inspection of the line site should occur daily, signs of inflammation, erythema, and discharge should prompt a review of the line and its removal.

• If CVC infection is suspected, then peripheral blood cultures should be taken and the CVC removed as soon as possible.

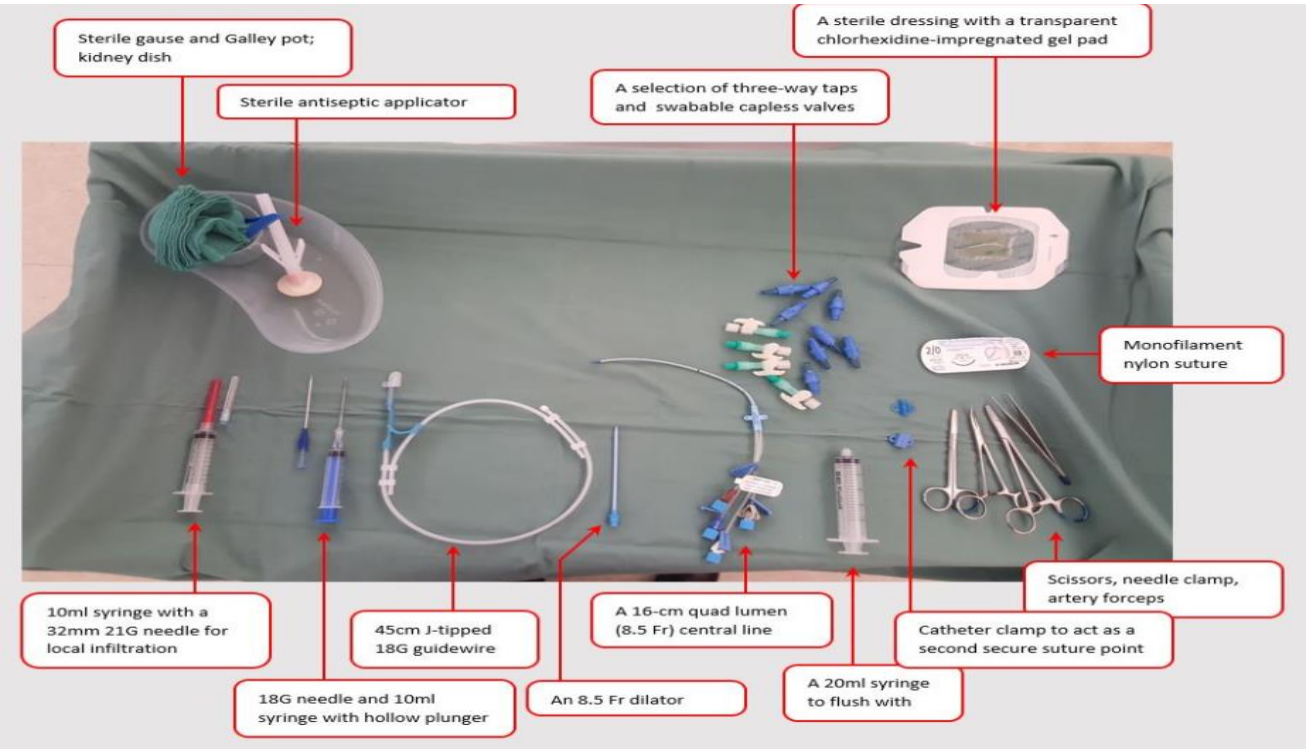
•CVC tips should not be sent routinely for culture and sensitivity if infection is suspected.

• A central line should be removed when it is no longer necessary.

• Do not guide wire exchange a new catheter through a line that is known to be infected.

SPARSH CRITICAL CARE

Sterile Set For Line Insertion

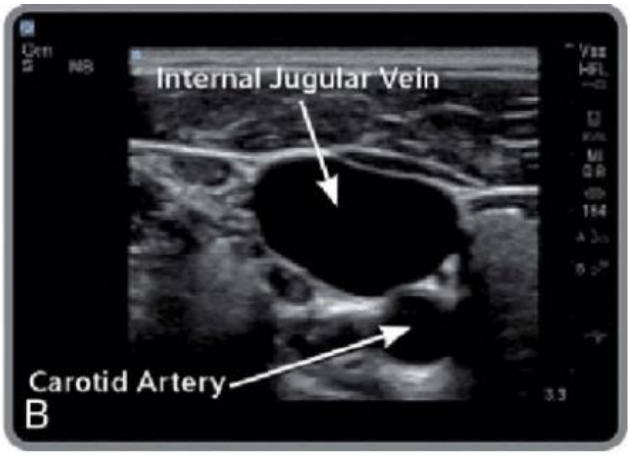


Position and draping for Rt IJV CVC insertion

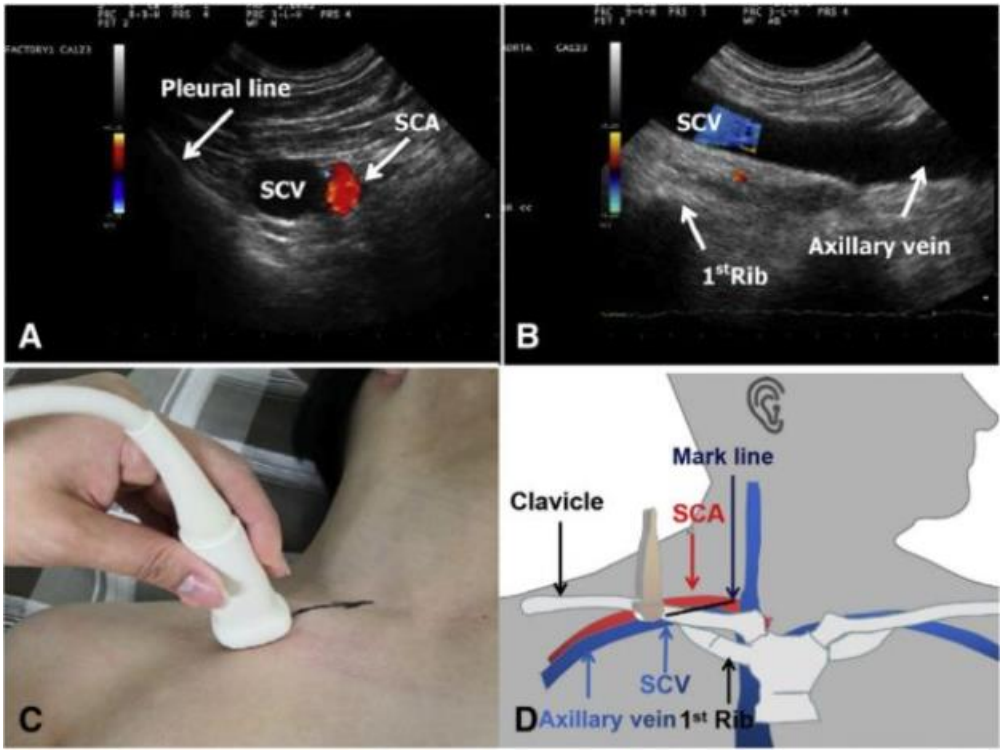
Position and draping for insertion of Rt Subclavian CVC insertion

Position and draping for Rt Femoral CVC insertion

USG image for the internal jugular vein



USG image for rt subclavian vein



USG image for femoral vein

Central Line Insertion Checklist – Template

Patient Name/ID#: _____ **Unit:** _____ **Room/Bed:** _____

Date: _____ **Start time:** _____ **End time:** _____

Procedure Location: (Operating Room / Radiology / Intensive Care Unit / Other: _____)

Person Inserting Line: _____ **Person Completing Form:** _____

Catheter Type: (Dialysis / Tunneled / Non-tunneled / Implanted / Non-implanted / Peripherally Inserted Central Catheter)

Impregnated: (Yes/No) _____ **Number of Lumens:** (1, 2, 3, 4) _____ **Catheter Lot Number:** _____

Insertion Site: (Jugular / Chest / Subclavian / Femoral / Scalp / Umbilical) _____ **Side of Body:** (Left / Right) _____

Reason for Insertion: (New indication / Malfunction / Routine Replacement / Emergent) _____ **Guide Wire Used:** (Yes/No) ___

Critical Steps	Yes	Yes with Reminder	No*	n/a	Comments
BEFORE the procedure:					
Patient is educated about the need for and implications of the central line as well as the processes of insertion and maintenance					
Patient's latex/adhesive allergy assessed (modify supplies)					
Patient's infection risk assessed. If at greater risk, why?					
Patient's anticoagulation therapy status assessed					
Consent form and other relevant documents complete and in chart (Exception: Emergent Procedure)					
Operator and Assistant used appropriate hand hygiene immediately					
Equipment assembled and verified—materials, medications, syringes, dressings, and labels					
Placement confirmation method readied					
Patient identified with 2 sources of identification					
Procedural time-out performed					
Site assessed and marked					
Patient positioned for procedure					
Skin prep performed with alcoholic chlorhexidine greater than 0.5% (unless under 2 months of age) or tincture of iodine or an iodophor or alcohol					
Skin prep allowed to dry prior to puncture					
Patient's body covered by sterile drape from head to toe					
All those performing procedure using sterile gloves, sterile gown, hat/cap, mask, and eye protection/shield					
Others in room wearing mask					
Catheter preflushed and all lumens clamped					
Local anesthetic and /or sedation used _____					
DURING the procedure: **If 'No' for any 'DURING the procedure' critical items, end the procedure.**					
Confirmation of venous placement PRIOR TO dilatation of vein by: ultrasound/ transesophageal echocardiogram / pressure transducer / manometry method / fluoroscopy					
Blood aspirated from each lumen (intravascular placement assessed)					
Type and Dosage (mL/units) of flush _____					
Catheter caps placed on lumens					
All lumens clamped (should not be done with neutral or positive displacement connectors)					
Catheter secured (sutured /stapled /steri-stripped)					
Tip position confirmation via fluoroscopy OR chest X-ray					
Sterile field maintained					
Lumens were not cut					
Qualified second operator obtained after 3 unsuccessful sticks					
Blood cleaned from site					
Sterile dressing applied (gauze, transparent dressing, gauze and transparent dressing, antimicrobial foam disc)					
AFTER the procedure:					
Dressing dated					
Verify placement by x-ray					
"Approved for use" writing on dressing after confirmation					
If a femoral line placed, elective PIC placement ordered					
Central line (maintenance) order placed					
Patient is educated about maintenance as needed					

*** Procedure Deviation: If there is a deviation from process, immediately notify the operator and stop the procedure until corrected.**

Procedure Notes/Comments: _____

Catheter Measurements: External length _____ **Internal length** _____

Distribution Instructions: Please return the completed form to the designated person in your area.