

## CRITICAL CARE AREAS PROCEDURE


**CATEGORY:** System-Level Clinical

**REVISION DATE:** January 2024

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**TITLE:** **CENTRAL CATHETER INSERTION GUIDELINES  
– NON-TUNNELED AND PICC**

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<b>Update Schedule:</b> Every three years, or sooner if required.	
<b>Stakeholder Consultation and Review:</b> Chief of Anesthesiology Diagnostic and Medical Imaging Chief of Critical Care Services ( Dr. B. Nalla) Central Venous Catheter Working Group Medicine Program Council Surgical Program Council Critical Care & Cardiology Program Council Emergency Care Program & Nursing Professional Practice Program Council	<b>Date:</b> February 7, 2024 February 2, 2024 March 26, 2024 February 6, 2024 February 22, 2024 February 22, 2024 February 13, 2024 March 22, 2023
<b>Approval:</b> Lisa Grace, Executive Sponsor Clinical Policy and Procedures Committee 	<b>Date:</b> April 3, 2024

### PURPOSE

To ensure all non tunneled central line insertions performed by a qualified physician or delegate follows best practice guidelines with a standardized approach.

### PROCEDURE

#### Equipment

- Pressure Injectable Three Lumen CVC Kit or Line Insertion Tray should no kit be available (extra supplies may be required to obtain)
- Local anesthetic (i.e. 2% Lidocaine)
- Central venous catheter
- Sterile gloves (physician's specific size)
- Cap or Bonnet
- Portable ultrasound machine with sterile probe cover and sterile ultrasound gel
- 3- Sterile Normal Saline 10mLpre filled syringes
- 3- Displacement Caps
- HSN approved Antiseptic Solution
- Generic-Central Venous Catheter Insertion Procedure Notes
- ABG syringe

**Special Instructions**

- The physician or delegate will insert central venous catheters following evidence-based guidelines in order to prevent catheter-related bloodstream infections and other related complications
- Central line insertion is a two-person procedure. Unless line insertion is emergent in nature, healthcare personnel are required to **STOP** the insertion procedure if all of the required steps have not occurred.
- The physician or delegate will determine catheter size and location based on the patient's individual need.
- Upper body location is preferred and away from high-risk (burned or infected) skin areas.
- Clip or trim excessive hair, if necessary, using single-use device (e.g. disposable clipper head).
- Do not shave site.
- Make no more than 2 attempts per Health Care Practitioner and limit total attempts to 4.

**Method for Non-Tunneled Central Venous Line insertion**

1. The physician must wash his/her hands with soap and water or with an alcohol-based disinfectant prior to the line insertion procedure.
2. The physician/delegate must don a sterile gown, sterile gloves, procedure mask and cap.
3. The assistant must wash his/her hands and don a mask.
4. Position patient as per physician request. (e.g. Trendelenburg, supine with roll behind shoulder blades)
5. Have patient turn head in opposite direction of insertion site
6. Choose the subclavian or internal jugular site whenever possible, as these sites are least associated with catheter-related bloodstream infections. **Please provide rationale on the Central Venous Catheter Insertion Procedure Note (Appendix A) that supports use of an alternate site.**
7. Use an approved antiseptic to clean the insertion site. Use a horizontal back-and-forth motion for 30 seconds. Repeat vertically for 30 seconds with sufficient friction to promote penetration of the cleanser within multiple layers of the epidermis. This ensures the solution reaches into skin cracks and fissures. The area cleansed should be at least as large as the dressing would cover. **Allow to air dry completely (1-2 minutes) before puncturing the skin. Do not blot.**
8. Use a large sterile drape to cover the patient.
9. Use static ultrasound or real-time ultrasound guidance (preferable) to confirm wire placement for internal jugular prior to catheter insertion.
10. Once the Central Venous Catheter has been inserted, confirmation of line placement via 2 methods is required. (Venous blood gas from distal port, ultrasound and Central venous pressure)
11. Physician or delegate to order a Chest X-ray (CXR) ,or Fluoroscopy (DI only) and confirm Tip location
12. Post-procedure, the physician or delegate ( inserter) will complete and sign the *Central Venous Catheter Insertion Procedure Note (Appendix A)*.
  - A. Inserter indicates # Guidewires used and signs.
  - B. Inserter indicates Observed # Guidewire Removed and signs.
  - C. Observer (RN or MD) indicates Observed # Guidewire Removed and signs.
13. File the completed *Central Venous Catheter Insertion Procedure Note* in the patient's chart under the physician progress notes section.

**Peripherally Inserted Central Catheter (PICC) performed in the Department of Interventional Radiology**

- Method for insertion as per HSN Medical Imaging department guidelines
- See Appendix B for Insertion procedure note

**EDUCATION AND TRAINING**

1. Optimal Tip location for Central Venous Access Device (CVAD):
2. a) In distal superior vena cava (SVC) or cavoatrial junction (CAJ); if using CXR, measure from carina, trachea-bronchial angle, or thoracic vertebral bodies
3. b) Femoral VAD should have tip location within the inferior vena cava (IVC) and above the level of the diaphragm

**Definition**

1. Catheter-Related Blood Stream Infection: An infection associated with a central line if the line was in place during the 48-hour period before the development of the blood stream infection. If the time interval between the onset of infection and device use is greater than 48 hours, there should be compelling evidence that the infection is related to the central line.

**References and Related Documents**

Canadian Vascular Access Association (2019). *Canadian Vascular Access and Infusion Therapy Guidelines*. Pembroke, ON: Pappin Communications.

Intravascular Complications of Central Venous Catheterization by Insertion Site, The New England Journal of Medicine, March 2015.

Practice Guidelines for Central Venous Access: latest report from the American Society of Anesthesiologist. (2020). *Journal of Cardiothoracic and Vascular Anesthesia*, 34, 3.

Ventilator Associated Pneumonia and Central Line Infection Prevention Toolkit, Critical Care Secretariat, Ministry of Health and Long-Term Care, February 2012.

## APPENDIX A

## Health Sciences North/Horizon Santé Nord

Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Allergies: ☐ Yes ☐ No  
 Area where insertion occurred:  
☐ ICU ☐ SDU ☐ OR ☐ DI ☐ Other \_\_\_\_\_  
 Room # \_\_\_\_\_

The following required steps were performed during the insertion of the central venous catheter.			
Preparation	Yes	No	If no, provide rationale
• Standardized line insertion tray/supplies available	<input type="checkbox"/>	<input type="checkbox"/>	
• Hands cleaned with soap and water or alcohol-based hand rub	<input type="checkbox"/>	<input type="checkbox"/>	
• Chlorhexidine 2% with 70% alcohol used to prepare site (30 second horizontally, 30 seconds vertically), dry x 2 minutes	<input type="checkbox"/>	<input type="checkbox"/>	
• Large sterile drape used	<input type="checkbox"/>	<input type="checkbox"/>	
Insertion	Yes	No	
• Sterile gloves used	<input type="checkbox"/>	<input type="checkbox"/>	
• Gown, hat and mask used	<input type="checkbox"/>	<input type="checkbox"/>	
• Mask worn by assistant	<input type="checkbox"/>	<input type="checkbox"/>	
• Sterile field maintained	<input type="checkbox"/>	<input type="checkbox"/>	
Procedural Details			
1. Meds: Lidocaine <input type="checkbox"/> 1% or <input type="checkbox"/> 2% without epinephrine _____ ml			
2. <input type="checkbox"/> New line <input type="checkbox"/> Over-wire <input type="checkbox"/> Ultrasound guided (best practice for internal jugular)			
3. <input type="checkbox"/> Elective <input type="checkbox"/> Urgent <input type="checkbox"/> Emergent (crisis situation)			
4. <input type="checkbox"/> Right <input type="checkbox"/> Left			
5. <input type="checkbox"/> Subclavian <input type="checkbox"/> Internal jugular <input type="checkbox"/> Femoral (not recommended) <input type="checkbox"/> Other _____ If femoral, provide rationale: _____ <input type="checkbox"/> Short term less than 2 - 3 days			
<input type="checkbox"/> Local infection <input type="checkbox"/> High risk (pneumonia, sepsis) <input type="checkbox"/> Coagulopathy <input type="checkbox"/> Difficult anatomy			
6. <input type="checkbox"/> Single lumen <input type="checkbox"/> Multi lumen <input type="checkbox"/> Introducer (i.e. Cordis) <input type="checkbox"/> Dialysis catheter <input type="checkbox"/> Power CVAD			
7. <input type="checkbox"/> Multiple attempts (2 or more with introducer needle) <input type="checkbox"/> Arterial puncture <input type="checkbox"/> Pneumothorax <input type="checkbox"/> Hematoma			
8. Confirmation of placement (2 methods required, check all applicable): <input type="checkbox"/> Venous blood gas from distal port for analysis to verify placement <input type="checkbox"/> Central venous pressure confirmed <input type="checkbox"/> Ultrasound			
9. <input type="checkbox"/> Chest x-ray <input type="checkbox"/> Fluoroscopy (DI only)			
<b>Procedure Notes/Comments</b> (i.e. medications administered during procedure): _____ _____ _____			
<b>Safety Check:</b> # Guidewires used _____ (#) _____ Inserter Signature Observed # Guidewire Removed (#) _____ Inserter Signature Observed # Guidewire Removed (#) _____ RN Signature			
<b>Inserted by:</b> _____ (Print name)		<b>Signature:</b> _____	
<b>Assisted/Observed by:</b> _____ (Print name)		<b>Signature:</b> _____	

Legend: CAVD – Central venous access device  
 Form # 0030326 REV 12 Sept 2018

GENERIC – CENTRAL VENOUS CATHETER INSERTION PROCEDURE NOTES

## APPENDIX B (For Diagnostic Imaging Use Only)

Health Sciences North / Horizon Santé Nord

Date: \_\_\_\_\_

Start time: \_\_\_\_\_ End time: \_\_\_\_\_

Allergies: ☐ Yes ☐ No

Area where insertion occurred:

☐ Medical Imaging    ☐ Other: \_\_\_\_\_

Room #:

Place label here

The following required steps were performed during the insertion of the central venous catheter.			
Preparation	Yes	No	If no, provide rationale
• Standardized line insertion tray/supplies available	<input type="checkbox"/>	<input type="checkbox"/>	
• Hands cleaned with soap and water or alcohol-based hand rub	<input type="checkbox"/>	<input type="checkbox"/>	
• Chlorhexidine 2% with 70% alcohol used to prepare site (total of 1 minute), dry x 2 minutes	<input type="checkbox"/>	<input type="checkbox"/>	
• Large sterile drape used	<input type="checkbox"/>	<input type="checkbox"/>	
Insertion			
• Sterile gloves used	<input type="checkbox"/>	<input type="checkbox"/>	
• Gown, hat and mask used	<input type="checkbox"/>	<input type="checkbox"/>	
• Mask worn by assistant	<input type="checkbox"/>	<input type="checkbox"/>	
• Sterile field maintained	<input type="checkbox"/>	<input type="checkbox"/>	
For PICC insertion			
1. Verbal consent <input type="checkbox"/> Yes <input type="checkbox"/> No 2. Indication: _____ 3. Size/Lumens: <input type="checkbox"/> 4fr - Single <input type="checkbox"/> 5fr - Double 4. Medications: Lidocaine 2% subQ _____ mL 5. Tip in distal 1/3 of the SVC (Superior Vena Cava) 6. Exit: _____ cm      Total Length: _____ cm 7. X-ray verified: <input type="checkbox"/> Yes <input type="checkbox"/> No 8. Ultrasound guided insertion: <input type="checkbox"/> Yes <input type="checkbox"/> No      If yes: Vessel: <input type="checkbox"/> Basilic <input type="checkbox"/> Cephalic <input type="checkbox"/> Brachial 9. <input type="checkbox"/> Right <input type="checkbox"/> Left 10. Vessel size: _____ cm 11. Lumen(s) aspirated/irrigated freely with NS: <input type="checkbox"/> Yes <input type="checkbox"/> No 12. Radiologist: _____ Assisted <input type="checkbox"/> Yes <input type="checkbox"/> No 13. Wallet card: <input type="checkbox"/> given to patient <input type="checkbox"/> placed in chart 14. Fluoro Time: _____ min      DAP: _____ mGycm <sup>3</sup> Contrast: _____ mL Omnipaque 300 15. Chance of Pregnancy <input type="checkbox"/> Yes <input type="checkbox"/> No 16. Isolation Precautions <input type="checkbox"/> Yes <input type="checkbox"/> No      If yes, PPE worn: <input type="checkbox"/> Mask <input type="checkbox"/> Eye protection <input type="checkbox"/> Gown <input type="checkbox"/> N95			
Procedure Notes / Comments:			
<b>Inserted by:</b>		(Print name) Signature:	
<b>Assisted by:</b>		(Print name) Signature:	