

Level	Manual	Section	Originating Date	Revised	Reviewed
Regional	PMH Regional Policy & Procedure Manual	Clinical Services	2014-Dec-24	N/A	N/A
Scope	Applies to all clinical staff within the region				

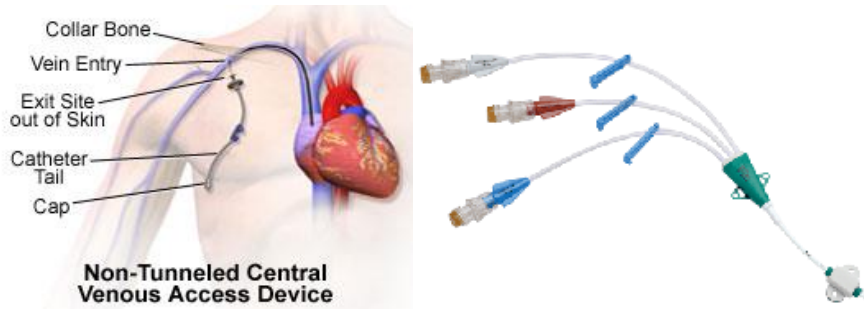
Approved by: Glenda Short, Director Clinical Programs and Services

DEFINITIONS

Central Venous Access Device (CVAD): a short or long term intravenous catheter inserted into a centrally located vein with the tip residing in the lower one third of the superior vena cava (SVC). Types are as follows:

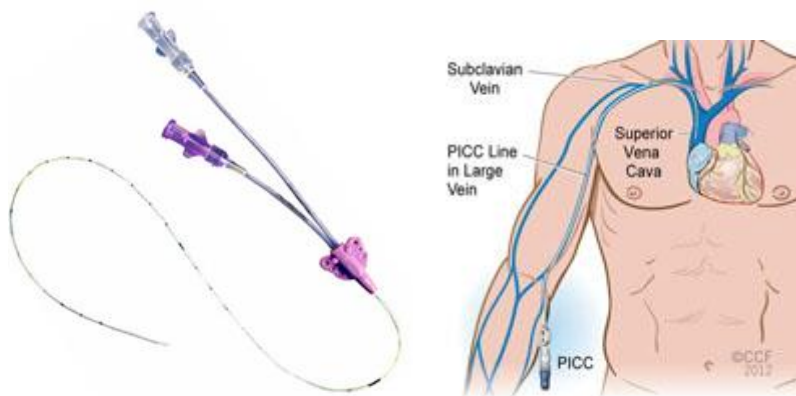
1. Non-tunneled:

- An open ended, short term percutaneous catheter inserted directly over the underlying central vein
- Can be single, double or triple lumen
- Inserted into the subclavian, jugular or femoral vein
- Secured at insertion site with a suture



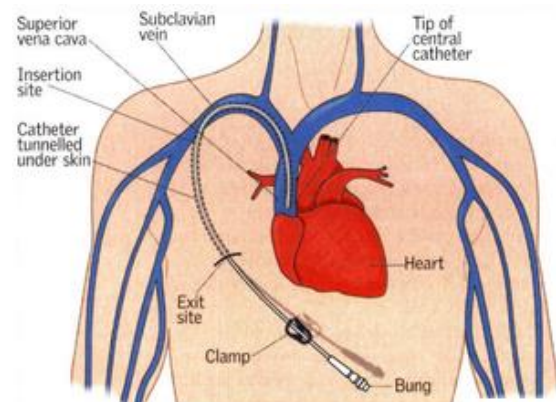
2. Peripherally Inserted Central Catheter (PICC):

- A non-tunneled, single or multi lumen inserted into a peripheral vein and advanced into the superior vena cava
- Most are valved (common – Groshong™) and therefore DO NOT need to be clamped and usually do not require Heparin
- Power PICCs are available which allow high pressure injection rates for the purpose of diagnostic testing
- Secured with sutures or a securement device



3. Tunnelled:

- Surgically tunneled to an exit site generally on the chest or abdominal wall
- Dacron cuff on the tunnel portion of the catheter facilitates in anchoring the catheter through granulation and acts as a barrier to infection
- Can be single, double or triple lumen
- Can be used for extended periods as required
- Sutures are removed approximately 10 days post insertion. Exception: dialysis lines 10 weeks post insertion.



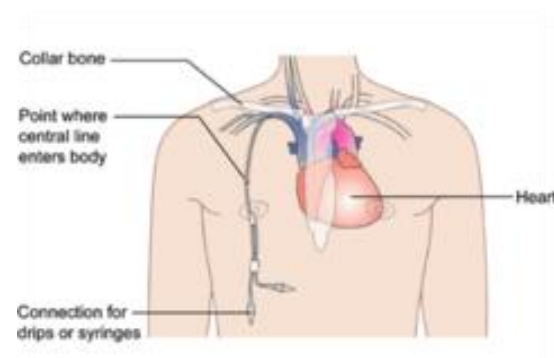
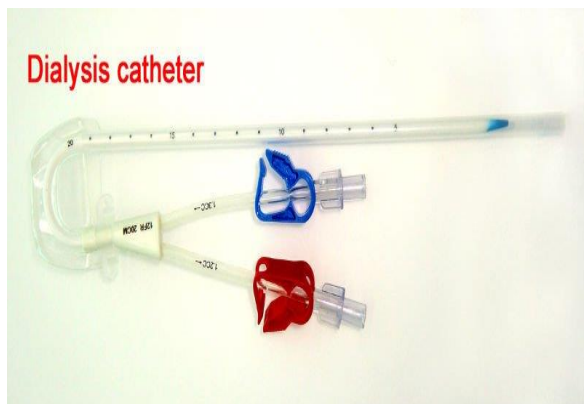
4. Implanted Venous Access Device:

- A long term surgically implanted catheter device which allows repeated access to the central venous system without multiple venipunctures
- Consists of a port or reservoir with a self-sealing septum connected to a catheter that has been threaded into the superior or inferior vena cava
- Commonly situated in the chest
- Accessed with a non-coring safety needle which is available in multiple lengths and gauges and single or double lumens
- Power ports are available which allow high pressure injection rates for the purpose of diagnostic testing. Access requires a special power port non-coring needle for dye injection



5. Dialysis Catheters:

- Double lumen catheters
- Large lumen - must accommodate up to 400 mLs per minute blood flow rate
- May be tunneled cuffed or non-tunneled (temporary dialysis lines)
- May be inserted jugular, subclavian or femoral
- Always sutured in place at insertion site (except tunneled - when healed - minimum 10 weeks post insertion)



Flushing: The act of moving fluids out of a vascular access device into the bloodstream to clear the lumen and verify device patency.

- **Turbulent Flush:** Utilizes a stop-start method when injecting the flush solution into the catheter. This allows the solution to scrub or clean the inside of the device wall to promote removal of blood/fibrin and helps to prevent build-up of medication precipitate on the internal lumen of the device.

Locking: Instillation of a solution into a vascular access device to maintain patency when lumen is not in use.

Patency: The ability to easily aspirate blood from a catheter lumen and to easily infuse or flush fluid through a lumen.

Sterile Technique: For the purpose of this policy sterile technique will mean the use of sterile field, sterile equipment and sterile gloves.

Valved CVAD: A CVAD that has a pressure sensitive valve that allows fluid infusion and blood aspiration however when not in use the valve restricts blood backflow and air embolism by remaining closed. These devices do not require clamping or locking with heparin. (e.g. Groshong™)

Vesicants: Medications that cause tissue necrosis if they extravasate.

POLICY

Prairie Mountain Health (PMH) supports a standardized approach for the care and management of Central Venous Access Devices (CVAD).

RESPONSIBILITIES

Licensed Practical Nurses (LPN), not trained for intravenous (IV) therapy during their basic nursing education, complete an Intravenous Therapy/Medication Administration Course prior to being eligible to care for a client's CVAD.

- Nurses caring for clients with a CVAD:
 - ♦ Complete the PMH Basic CVAD Learning Package
 - ♦ Self-declare competency or identify need for additional training on CVAD procedures prior to providing care for clients with a CVAD
 - ♦ Follow the process to achieve additional Nursing Competencies if required or applicable to their practice setting
 - ♦ Utilize the Nurse's Pocket Guide to CVAD, R.CS.CC.110-1a as needed for a resource.
- Nurses obtaining additional CVAD competencies:
 - ♦ Review and/or provide evidence of completion of the PMH Basic CVAD Learning Package to manager prior to seeking additional competency skills. This package is available on the PMH online learning management system (SPOT)
 - ♦ Complete the learning packages (located in SPOT) and applicable competency checklists for the following additional CVAD competencies prior to performing the skills and provide evidence of completion to manager for entry into Quadrant Human Resources (QHR).
 - **Partial/Complete CVAD Occlusion Management**
 - Complete the PMH Management of a Partial/Complete CVAD Occlusion learning package (located in SPOT).
 - **Removal of a Non-tunnelled CVAD**
 - Complete the PMH Removal of a non- tunnelled CVAD learning package (located in SPOT)
 - Removal of a Non-Tunnelled CVAD Competency Checklist, R.CS.CC.110-9a, signed off by a Clinical Educator or Clinical Resource Nurse (CRN)

- **PICC repair (PICC nurse inserters and Cancer Care Program (CCP) nurses only)**
 - Review the R.CS.CC.110-10, PICC Connector Repair policy
 - Complete the PICC Connector Repair Competency Checklist, R.CS.CC.110-10a with PICC insertion nurse
- Managers responsible for nurses caring for CVADs are responsible to:
 - ♦ Verify that LPNs have appropriate IV training and certification to be eligible to work with CVADs
 - ♦ Ensure all nurses working with CVAD's have completed the PMH Basic CVAD Learning Package located in SPOT
 - ♦ Arrange additional training and mentorship for nurses who self-identify or are identified to have additional CVAD learning needs
 - ♦ Ensure nurses complete the Management of a Partial/Complete CVAD Occlusion and Removal of a Non-tunnelled CVAD (as applicable to their areas) learning package located in SPOT
 - ♦ Arrange supervision and mentorship, for graduate and student nurses caring for clients CVAD, by a nurse that has completed the above competency requirements
- Clinical Educators (or designates) are responsible to:
 - ♦ Provide ongoing support and education for nurses caring for CVADs
 - ♦ Ongoing review and evaluation of learning packages located in SPOT to ensure they are updated with best practice/evidence based information
 - ♦ Provide supervision for nurses completing Removal of a Non-tunnelled CVAD Competency Checklist, R.CS.CC.110-9a.

PROCEDURE

Adult CVAD Care and Maintenance

- Guiding Principles for Device Selection:
 - ♦ Vascular access assessment and device selection is considered for all clients requiring IV therapy.
 - Select device based on client's needs, i.e. duration of therapy, type of infusate (refer to Vascular Access Assessment and Device Selection Algorithm, R.CS.CC.110-1b)
- Guiding Principles for Insertion:
 - ♦ Sterile technique and maximal sterile barrier precautions are used with all CVAD insertions.
 - ♦ Ultrasound guidance is used to place CVADs (if this technology is available) to reduce the number of cannulation attempts and mechanical complications. Ultrasound guidance is only used by those trained in this technique.
 - ♦ CVADs are x-rayed to confirm catheter tip placement:
 - Prior to use after insertion
 - Prior to administering vesicants it is recommended that all clients admitted with an established CVAD have a chest x-ray to confirm catheter tip placement.

- Guiding Principles for Equipment:
 - ◆ A 10 mL syringe is used on all CVADs, recognizing that smaller syringes exert excessive pressure which can rupture the device and larger syringes may not provide sufficient pressure to clear the lumen.
 - ◆ IV infusions per CVAD are infused through an infusion pump.
 - ◆ Alcohol pad is used to cleanse lumen ends, cleanse vigorously for 15 seconds and allow to air dry.
 - ◆ Chlorhexidine 2% with alcohol 70% swab stick is used for skin cleansing. If an allergy exists use povidone iodine.

- Guiding Principles for Maintenance:
 - ◆ CVADs are assessed for patency prior to access (e.g. establishing infusion, blood collection). Patency is determined by the ability to easily aspirate blood from a CVAD lumen and to easily infuse or flush fluid through a lumen.
 - ◆ If a CVAD is not patent consider possible causes of partial/complete occlusion. (refer to Thrombolytic Occlusion Management of CVADs Medication Standing Orders, R.CS.CC.110-7a, page 2 - Management of a Partial or Complete Occlusion Algorithm).
 - ◆ If, after considering and managing mechanical causes, CVAD is still not patent proceed with further treatment. **Do not leave an occluded lumen untreated because another lumen is functional.** (refer to R.CS.CC.110-7, Management of a Partial or Complete Occlusion Central Venous Access Device).
 - ◆ Using proper flushing techniques (e.g. turbulent flush) and volumes as well as acknowledging when a client's CVAD needs to be flushed are important in the prevention of an occlusion (refer to Adult CVAD Flushing and Locking Guidelines with Priming Volumes Reference Chart, R.CS.CC.110-2a).
 - ◆ A CVAD exit site is assessed every shift and before access for pain, redness, swelling, warmth, or discharge. Document assessment using the Central Venous Access Device Flowsheet, R.CS.CC.110-1c or Electronic applications (Central Venous Access Downtime G348) as applicable to unit.
 - ◆ IV tubing used for continuous infusion(s) is changed a minimum of every 96 hours. Any add-on devices, such as extension sets, filters, stopcocks, and needleless connectors are changed at the same time as the IV tubing.
 - ◆ IV tubing used as a primary intermittent infusion, secondary administration set, and IV solution bags are changed a minimum of every 24 hours.
 - ◆ Total Parenteral Nutrition (TPN) has a dedicated lumen in a multi-lumen CVAD. Tubing is changed every 24 hours.
 - ◆ All non-valved CVADs not in use are clamped. Clamp medial portion of line.
 - ◆ Blood withdrawal from the distal or largest lumen is recommended.
 - ◆ The use of CVADs is not recommended for therapeutic phlebotomy due to risk of thrombolytic occlusion or catheter damage. In clients who require multiple phlebotomies an apheresis catheter may be placed for this purpose.
 - ◆ If frequent access of CVAD is required consider establishing a continuous infusion to decrease risk of infection and anticoagulant complications. e.g. Heparin induced thrombocytopenia (HIT)
 - ◆ If client has a diagnosis of HIT, consult pharmacy regarding appropriate locking solution (e.g. Sodium Citrate). Dose amount is dependent on lumen volume of CVAD.
 - ◆ CVADs no longer essential for treatment should be removed.

Pediatric Care and Maintenance

The goal of insertion of a CVAD in the pediatric population is to preserve the client's peripheral venous system as extended IV support may be required.

- Guiding Principles for Equipment:
 - ♦ Infusion therapy extension tubing longer than 18cm is not used unless the child is chemically/physically paralyzed or is under direct supervision of a caregiver at all times due to entanglement risks.
 - ♦ A 0.22 micron filter eliminating air is used on children less than 10 kg, clients with cyanotic heart disease and as directed by the parenteral drug monograph.
- Guiding Principles for Maintenance
 - ♦ Proper flushing and locking technique are essential as this client population is at increased risk for catheter occlusion due to client anatomy, smaller catheter sizes and slower rates of infusion.
 - ♦ Chlorhexidine 2% without alcohol swab stick is used for skin cleansing for children under two months of age. Allow for three minutes of dry time.
 - ♦ Flushing volumes are established according to client's age, size and device. Attending physicians should refer to recommendations of program/physician who inserted the CVAD.

Dialysis CVAD Care and Maintenance

Dialysis CVADs are **ONLY** accessed under direct orders from dialysis physician or under emergency situations where peripheral access is not available.

- Guiding Principles for Equipment:
 - ♦ Tego™ connectors require a Luer Lock technique. Always hold on to the lower end of the Tego™ connector when attaching syringes
 - ♦ Chlorhexidine 2% with alcohol 70% swab sticks are used for skin cleansing during dressing changes allowing a dry time of two minutes.
 - ♦ Needleless connectors are cleaned with chlorhexidine 2% with alcohol 70% pads, scrub for 30 seconds and dry for 30 seconds.
 - ♦ A threaded lock cannula must be used on all administration set connections except with Tegos™ as the administration set is connected directly into the Tego™.
- Guiding Principles for Maintenance
 - ♦ **Always** aspirate a minimum of 5 mL from any dialysis catheter lumen to remove heparin. Discard this 5 mL prior to any instillation or flushing.
 - ♦ Notify Hemodialysis Unit when/if a dialysis line is accessed to obtain orders for anticoagulant lock. If unable to speak to dialysis nurse, lock with 1:1000 units/mL to length of lumen until further instructions.
 - ♦ If the client has been diagnosed with HIT, orders for locking of dialysis CVAD must be obtained through dialysis physician.
 - ♦ Dressing changes are done in the Hemodialysis Unit unless it becomes wet or soiled.
 - To change the dressing the client and the health care provider must be masked. Use sterile technique.
 - Povidone iodine ointment, polysporin triple ointment or mupirocin ointment at the exit site may be used with a physician's order. If using an ointment, a sterile 2 x 2 is placed on the exit site. If no ointment, the occlusive dressing is placed directly on the exit site.

ASSOCIATED DOCUMENTS and POLICIES

[R.CS.CC.110-1a, Nurse's Pocket Guide to CVADs \(PMH291\)](#)

[R.CS.CC.110-9a, Removal of a Non-Tunnelled CVAD Competency Checklist](#)

[R.CS.CC.110-10, PICC Connector Repair](#)

[R.CS.CC.110-10a, PICC Connector Repair Competency Checklist](#)

[R.CS.CC.110-1b, Vascular Access Assessment & Device Selection Algorithm \(PMH292\)](#)

[R.CS.CC.110-7a, Thrombolytic Occlusion Management of CVADs Medication Standing Orders
_____ \(PMHMSO.013\)](#)

[R.CS.CC.110-7, Management of a Partial or Complete Occlusion CVAD](#)

[R.CS.CC.110-2a, Adult CVAD Flushing and Locking Guidelines with Priming Volumes Reference
_____ Chart \(PMH294\)](#)

[R.CS.CC.110-1c, CVAD Flowsheet \(PMH293\)](#)

Central Venous Access Downtime (G348)

REFERENCES

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