PERIPHERALLY INSERTED CENTRAL CATHETER (PICC) Learning Package

Return Test to Educator By:

Revised June, 2013
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Competency Evaluation & Objectives

**Competency Evaluation**

This learning package is one component of the peripherally inserted central catheter (PICC) competency.

To meet PICC competency, nurses must:
1. Review the self-learning package on Care and Management of PICCs
   OR Complete the PICC self-learning module on the Learning Management System
2. Successfully achieve 85% or greater on the PICC test
3. Successfully provide a return demo to a Clinical Nurse Educator on each of the following:
   --dressing change
   --flushing
   --changing a needless connector
   --blood sampling
   --removal

*Additional competencies are required for discontinuation/removal and management of an occluded PICC. ONLY nurses who are deemed competent by the Clinical Nurse Educator may discontinue/remove and manage occlusions*
4. Successful demonstration on discontinuation and removal
5. Successful demonstration of occlusion management of PICCs

**OBJECTIVES**

The following topics will be covered in this learning package:

1. Basic anatomy for peripherally inserted central catheter (PICC)
2. Indications & contraindications for a PICC line insertion
3. Possible complications associated with PICC lines
4. Nursing responsibilities for a) care and maintenance
   b) dressing & needle-less connector changes
   c) flushing guidelines
   d) changing needless connector
   e) obtaining blood samples

*Additional competencies are required for discontinuation/removal and management of an occluded PICC. ONLY nurses who are deemed competent by the Clinical Nurse Educator may discontinue/remove and manage occlusions*

5. Discontinuation/removal of PICC—see Appendix A
6. Occlusion management of PICC—see Appendix B
INTRODUCTION

Peripherally Inserted Central Catheters (PICC) are catheters that are peripherally placed (i.e. the arm) but they are considered a central catheter because the catheter tip sits in the central circulation (i.e. the superior vena cava). Central catheters are commonly used to provide a reliable infusion route for infusion therapy of all types, however they can put patients at risk for complications from catheter related bloodstream infections which can account for significant health care costs and be life threatening.

This learning package will empower clinicians caring for patients with these devices with the tools to prevent complications and promote positive outcomes for patients.

PERIPHERALLY INSERTED CENTRAL CATHETER

PICC lines can differ in size, make & care and maintenance routines. You might encounter different types of catheters when caring for a patient coming from the community or another institution. Therefore, it is important to know what type of PICC your patient has because care and maintenance practices may vary depending on the type. In general, PICC lines are specially formulated 45-60 cm long catheters and made of polyurethane or silicone. It may be a single, double, or triple lumen. The catheter could be valved (does not have a clamp) or non-valved (have an external clamp). Valved catheters such as the Power PICC Solo (inserted at NYGH) help prevent the passive entry of blood into the catheter. This provides safety for the patient by preventing blood from flowing backwards when the system is open. PICC line catheters are inserted through a peripheral vein (basilic, brachial, or cephalic) so that the tip lies in the distal third of the superior vena cava above the right atrium or at the caval-atrial junction.

Pressure Activated Valve

Consult with your clinical nurse educator and/or the physician for patients who come from another institution or the community with a PICC line that is not familiar to you. The following diagrams are some examples of PICC lines that you might encounter:
Power PICC Solo

Non-valved (i.e. clamps)

StatLock Securement Device

Valved (no clamps)

ClearClave Needleless Connectors used at NYGH

Cook PICC line with Non-Valved Technology, single and double lumen.

Groshong Non-Valved PICC Line Double Lumen
ANATOMY OF THE VEIN WALL

The following information is important for understanding the anatomy of the vein and those used for PICC lines:

**Tunica Adventitia (Outer Layer)**
- Composed of connective tissue
- Provides support for the vein and allows the vein to roll
- Blood vessels in this area provide nutrition to this layer

**Tunica Media (Middle Layer)**
- Largest layer of the vein, composed of elastic and muscle tissue.
- Innervated by the SNS (fight or flight response) - promotes venous constriction or dilation in response to anxiety, temperature, mechanical or chemical irritation. Pain can trigger vasoconstriction.

**Tunica intima (Innermost Layer)**
- Composed of one layer of smooth and elastic cells.
- The cells secrete tissue plasminogen activator and heparin to prevent platelet aggregation.
- Mechanical injury occurs when the vein wall is injured during insertion or ongoing exposure to the device.
- Chemical injury occurs when the vein wall is in contact with solutions or medications having hypo-osmolar, hyperosmolar properties, medications with pH< 5 or >9, and/or osmolarity >600 (per INS Standards).
- Beneath the intima is the subendothelial layer. Damage to this layer causes inflammation and adherence of cells and platelets, which may result in phlebitis, thrombosis, extravasation, and/or infiltration.

**Valves**
- Allow unidirectional flow of blood back to the heart and prevent pooling in the peripheral circulation.
- Veins dilate where the valve attaches, this creates a sinus that allows blood to become stagnant and lead to thrombus formation.
- Valves are present in most veins except in the head, vena cava, very small veins.
- The longer the vein the more valves it will contain.
- Difficulty is encountered when threading the vein passed the valves.
Veins of the Upper Extremities

1. Basilic Vein:
The basilic vein is the first choice for insertion due to number of valves. It originates on the ulnar or medial side of the forearm and ascends on the posterior surface of the arm. Just before reaching the elbow, it travels to the front of the arm until it arrives at the antecubital area where it joins the median cubital vein. The basilic vein joins the brachial vein becoming the axillary vein near the armpit. The number of valves located in the basilica vein is four to six.

2. Brachial Veins:
The brachial veins are a pair of veins of the brachial artery in the upper arm. Because they are deep to muscle, they are considered deep veins. They begin where the radial veins and ulnar veins (corresponding to the bifurcation of the brachial artery) and they end at the inferior border of the teres major muscle. At this point, the brachial veins join the basilic vein to form the axillary vein.

3. Cephalic Vein:
The cephalic vein originates on the radial or lateral side of the forearm near the thumb. It ascends the lateral side of the arm and is joined by the median cephalic vein just below the antecubital fossa. The cephalic vein is smaller than the basilic vein and may be tortuous as it ascends the upper arm. The accessory cephalic vein joins the cephalic vein at the lateral border of the arm. There is a risk of stricture formation at the junction of the accessory cephalic and the main cephalic vein, which makes this a less desirable point of insertion and passage of a catheter difficult. There are a total of six to ten valves. The cephalic vein may also join other veins, such as the external jugular vein. PICC inserted into the cephalic vein have a higher incidence of mechanical phlebitis.

3. Medial Cubital Vein
This vein drains the palm of the hand and ascends along the anterior surface of the arm to allow communication between the cephalic and basilic veins. It often forms a Y with one branch going to the basilic vein (called the median cubital basilic) and the branch going to the cephalic vein (called the median cubital cephalic). The median cubital vein is often prominent in the antecubital fossa and is frequently used for obtaining blood specimens by venipuncture. Catheters may be inserted into this vein and threaded into the main vessel. A venous valve may be encountered where the medial cubital vein joins the main vessel.

4. Axillary Vein
The axillary vein is a large vein that forms a direct link to the subclavian vein. The axillary vein lies on the medial side of the axillary artery. Nerves are present between the artery and vein. There is only one valve that needs to transverse before entry into the superior vena cava.
**Indications & Contraindications for a PICC Line**

**Indications Include:**
1. Compromised/Inadequate peripheral access
2. Infusion of hyperosmolar solutions or solutions with high acidity or alkalinity (eg. Total Parenteral Nutrition)
3. Continuous infusion of vesicant or irritant agents (Inotropes, Chemotherapy)
4. Short or long term intravenous therapy (eg. Antibiotics)

**Contraindications include:**
1. Inadequate veins
2. Pre-existing skin surface or subsurface infection at or near the proposed catheter insertion site.
3. Lymphoedema
4. Anatomical distortion from surgery, injury or trauma
5. Anatomical irregularities that may compromise catheter insertion or catheter care procedures.
6. Mastectomy surgery with axillary dissection +/- lymphoedema on affected side
7. Crutch walking as this causes pressure on veins of the arm.

Anatomy of PICC placement
**Orders & Guidelines for Physician Notification**

*A physician order is required for the following:*

1) PICC insertion  
2) X-ray or fluoroscopy to confirm placement or tip position (see Medical Directive—XII-141)  
   **note:** (PICCs inserted at NYGH in the Angio department are confirmed by fluoroscopy, nurses must review the chart and Angio department notes for details on PICC insertion)  
3) Flushing, including solution, volume and frequency (see Medical Directive—XII-141)  
4) PICC discontinuation and removal—see appendix  
5) Occlusion management (i.e TPA)—see appendix  
6) Blood draws from the PICC

**Guidelines for Physician Notification**

1) Excessive bleeding  
2) New and/or different cardiac arrhythmias  
3) Sudden and unexplained onset of respiratory distress  
4) Chest pain  
5) Onset of pain and/or edema in the cannulated arm  
6) Numbness or tingling in the cannulated limb  
7) Swelling or decrease circulation to affected arm

**Indication for Radiographic Confirmation**

1) Evidence of catheter migration  
2) Functionality changes (i.e. unable to flush or draw back blood)  
3) Signs or symptoms suggestive of complications  
4) Confirmation of tip placement may be required when patients are admitted with a PICC

**Post Insertion Documentation**

The following information should be included in the documentation by inserter:  
At NYGH you should be able to find this information in Powerchart in the Patient Care Summary for those PICCs inserted in the organization or in the paper chart in a PICC insertion order set.  

1) Date of insertion  
2) Insertion vein  
3) Tip location (as shown on fluoroscopy report)  
4) Location (right or left arm)  
5) Internal length  
6) Catheter type, gauge, length and number of lumens  
7) External catheter length based on catheter marking and measurement

**This information should be available and easily accessible to all healthcare providers caring for the patient.**
Nursing Responsibilities

Post PICC Insertion:

1. Verify tip location by reviewing Diagnostic Imaging results in Powerchart (ie. PICC/radiologist report):
   - Upper body insertions: tip is located in the lower half to third of the superior vena cava (SVC) or at the cavoatrial (CA) junction.
   - Review PICC orders, PICC information, and radiologist report

2. The following elements shall be assessed every shift and PRN and documented in accordance with the NYGH documentation guidelines.
   - **Insertion site and surrounding tissue:** Inspect site through the transparent semi-permeable membrane dressing checking for bleeding, exudate, leakage, kinking, redness and swelling. Gently palpate for pain and temperature.
   - **Vein track:** Visually inspect the site along the track of the vein to tip location. Note external catheter kinking, external catheter length and the presence of edema in the cannulated limb. Assess for sensory symptoms (tenderness, numbness). If patient verbalizes any pain, gently palpate the vein track checking for pain, induration and or palpable cord.
   - **Catheter malposition:** Malposition can occur upon PICC insertion or later, due to changes in intrathoracic pressure or catheter migration. A chest x-ray must be ordered if migration is suspected. Malposition can lead to serious complications such as arrhythmia, phlebitis and thrombus formation. Inspect PICC catheter “wings” are properly secured in securement device. Verify external catheter length to assess if catheter has migrated or moved from the insertion site (any amount of the catheter extending out or beyond the butterfly if not noted in radiologist report can indicate catheter migration). See Section on Complications (i.e catheter migration).
   - **Dressing:** Inspect the transparent dressing and securement device; they should both be dry & intact. Transparent dressing covering the puncture site and securement device should be adherent to the underlying skin to minimize the risk of catheter migration. The date of most recent dressing change should be visible on the transparent dressing. If patient has a transparent dressing “sensitivity” or irritation, a sterile gauze may be used and must be changed every 2 days (INS, p.S.63)
   - **Infusion tubing:** Inspect for precipitate and leakage of fluid. Check that all connections are securely luer-locked. Note: the use of tape around connections has been implicated in the transmission of bacterial contamination and is to be avoided. Tubing should have a label that includes: date that tubing was changed and next due date for tubing change.
PICC Dressing Changes

Did You Know?

*Catheter colonization is caused when organisms grow inside a portion of the catheter. A true bloodstream infection related to the central venous catheter occurs when the same organism is not only in the catheter segment but is also obtained from the blood culture with no other identifiable source of infection in the body.

Catheters become infected in several different ways. For example: an infection at the exit site may occur when the site becomes colonized by bacteria that migrate along external catheter surface. The site becomes erythematic and tender with purulent drainage within 2 centimeters of the exit site. Focusing on infection prevention best practices reduces catheter-related bloodstream infections.

PICC line dressing changes may need a second nurse to support and assist as needed.

1) Dressing change is a sterile procedure. Mask and sterile non-powered gloves required. Observers should wear masks during procedure. Patients who are actively coughing should also wear a mask.

2) A transparent semi-permeable membrane dressing shall be used except in cases when the patient is known to have allergy to this type of dressing.

3) The initial gauze and tegaderm dressing should be changed **48 hours after PICC line insertion** and **every 7 days thereafter** and or when the dressing becomes soiled, wet, no longer occlusive, or if the patient complains of unexplained pain at the site; or if moisture, exudates, or bleeding are present or suspected at the site. Daily dressing changes are indicated for suspected or confirmed site infections or if daily treatment/observation of the site is required.

**Supplies:**

<table>
<thead>
<tr>
<th>Gather equipment:</th>
<th>• clear clave needle-less connectors (1 or 2 dependent on number of lumens)</th>
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<tbody>
<tr>
<td>• mask</td>
<td>• Securement device (eg. Statlock,)</td>
</tr>
<tr>
<td>• sterile non-powered gloves</td>
<td>(1-2) 10 mL syringe/s filled with 0.9% normal saline to prime clear clave needle-less connector/s and flush each lumen</td>
</tr>
<tr>
<td>• clean gloves</td>
<td>• If discharge or redness is visible, bring a C&amp;S swab for culture of site</td>
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<tr>
<td>• two sterile towels or dressing tray</td>
<td>• sterile transparent semi-permeable dressing</td>
</tr>
<tr>
<td>• sterile gauze 2X2</td>
<td>• (3) 2% chlorhexidine swab sticks</td>
</tr>
<tr>
<td>• (3) 2% chlorhexidine swab sticks</td>
<td>• (3-4) alcohol swabs</td>
</tr>
<tr>
<td>• sterile transparent semi-permeable dressing</td>
<td>• sterile transparent semi-permeable dressing</td>
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</table>

**PROCEDURE:**

A. Explain procedure to patient and family.

B. Position patient supine or upright in sitting position.

C. Wash hands, don mask, and clean gloves.

D. Offer mask to patient to put on, or ask them to turn face away from PICC site. If patient is actively coughing or on droplet precautions they must wear a mask.

E. Prepare a sterile field by placing sterile towel around site and under extremity (may use green towel or drapes from a sterile dressing tray).

F. Using sterile technique, place sterile transparent occlusive dressing, securement device, 2% chlorhexidine swabsticks, Steri-strips™ (available in the StatLock package), clear clave needle-less connector/s and sterile gloves onto field.
G. To prevent accidental dislodgement of catheter during procedure, anchor catheter extension legs(s) with one steri-strip (provided in the StatLock device package).

H. Carefully remove old transparent dressing: Anchor the hub with non-dominant hand and using stretch-technique starting from bottom to top (to prevent dislodgement). Discard dressing.

I. Assess catheter insertion site and surrounding tissue. Note external catheter length to verify that the line position has not changed. Obtain a physician order for culture if site is suspicious for an infection (e.g. redness, presence of drainage and/or foul smell).

J. Stabilize catheter while holding the StatLock® stabilization device.

K. Use thumb of opposite hand to gently lift retainer door from behind. Reposition hands and repeat process to open second retainer door.

NOTE: It is best to grasp the plastic doors from the bottom edge. They are difficult to open if grasped in the middle.

L. Carefully remove PICC from securement device.

M. Use 3-4 alcohol swabs to lift the corner edge of the anchor pad. Continue to stroke under surface of the pad with generous amounts of alcohol.

N. Fold the StatLock® device anchor pad under itself and repeat on opposite side. Do NOT pull or use force to remove the pad. The more alcohol used, the easier the removal.

O. Remove the remaining portion of the transparent dressing.

P. Assess catheter insertion site and surrounding tissue. Note external catheter length to verify that the line position has not changed. Culture site if suspicious for infection: redness, presence of drainage or foul smell.

Q. Discard dressing and remove gloves. Wash hands with hand sanitizer. Air dry for 30 sec.

R. Don sterile non-powdered gloves

S. Cleanse insertion site with 2% chlorhexidine swabsticks. Work in an up, down, side to side friction for 30-60 seconds. Cleanse from clean to dirty and do not go back over previously cleansed area with the same swab. Repeat process using new swabstick each time. Extend on both sides to an area larger than where the anchor pad will be placed and cleanse portion of catheter that will remain under dressing and ensure you allow complete drying.

T. Apply provided skin protectant to stabilization site. Extend to both sides of the stabilization site covering an area larger than where the StatLock® device anchor pad will be placed. Allow skin protectant to dry completely (for 10 to 15 seconds) until the skin is smooth to the touch. Protectant should not be applied over the insertion site.

U. Orient the StatLock® device anchor pad so directional arrows point toward the insertion site. Place one catheter wing hole over one post, then slide the StatLock® CV Plus stabilization device to capture second hole in opposite post. Support undersurface of StatLock® device anchor pad and catheter while closing retainer doors.

V. Hold the StatLock® device retainer securely and peel away paper backing from anchor pad one at a time and place on skin.

W. Apply transparent dressing over entire dressing covering insertion site and StatLock device. Label dressing with date, time, and initial.

X. Remove dressing and discard gloves and any foam tape not used. Wash hands.
DOCUMENTATION OVERVIEW

Units using electronic documentation, will document in the Central Line Assessment/Care/Removal powerform located in the PRN tab under activities/intervention section

Document as per NYGH documentation standards:
- Date and time of dressing change
- Appearance of insertion site and surrounding skin
- External measurement of the catheter (if x cm out).
- Patient tolerance of procedure.

The orders will populate and can be viewed as follows:
1. The CVAD dressing and needle-less connectors changes will display on the Patient Care Summary — Under Recommendations/Plan — IV Therapies Considerations

3. Document your Assessment/ Care and Management from the Activity & Intervention Tab and select the “ALL PRN/Continuous Tab” — on the Central Line Care and Management PowerForm

or in the ADHOC folder under Venous/Subcutaneous Access
2. The CVAD Normal Saline 10mL Flushes will populate on the eMAR – under the Scheduled Medications tab.

**Medications**

<table>
<thead>
<tr>
<th>Time View</th>
<th>Scheduled</th>
<th>PRN</th>
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<tbody>
<tr>
<td></td>
<td>normal saline (NS flush)</td>
<td>10 mL, IV (CENTRAL LN), q7d, Start Date 12/02/11 10:35:00, PICC Flush: Range Dose – 10-20mL. Flush dormant lines using a 10mL syringe or larger, using Sodium Chloride 0.9%</td>
</tr>
<tr>
<td></td>
<td>PRN normal saline (NS flush)</td>
<td>10 mL, IV (CENTRAL LN), as directed, PRN for Maintaining Patency/Troubleshooting, Start Date 12/02/11 10:35:00, PICC Flush: Range Dose – 10-20mL. Sodium Chloride 0.9%</td>
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**Intervention/Removal**

<table>
<thead>
<tr>
<th>Flow/Patency Lumen 1</th>
<th>Flow/Patency Lumen 2</th>
<th>Flow/Patency Lumen 3</th>
<th>Line Removal</th>
<th>Direct Pressure Duration (min)</th>
<th>Site/Line Care</th>
<th>Unexpec Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cap(s) changed</td>
<td>Secondary tubing changed</td>
<td></td>
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<td></td>
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<tr>
<td>Hep locked</td>
<td>Flushing</td>
<td></td>
<td></td>
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<tr>
<td>Cold compress</td>
<td>Secured with sterile tape</td>
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<tr>
<td>Warm compress</td>
<td>Sutured</td>
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<tr>
<td>Extension tubing changed</td>
<td>Site cultured</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Line/Fluid reconciliation</td>
<td>Unlinked</td>
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<tr>
<td>Manual pressure held</td>
<td></td>
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<tr>
<td>Primary tubing changed</td>
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</tbody>
</table>

**CVP**

Comment

Withdrawn (cm)
**PICC Flushing Guidelines**

**Did you know?**
Bacterial contamination may also come through the catheter hub. Using friction with an appropriate disinfectant such as 70% alcohol before accessing the hub will decrease the potential for a catheter related bloodstream infection.

**For Accessing a Dormant PICC**

**PRE-PROCEDURE:**
1. Verify physician order.
2. Gather supplies: 2% Chlorhexidine & 70% Isopropyl Alcohol wipe (x1 per lumen), 10 ml luer lock syringe filled with 10 mls of 0.9% sodium chloride (x1 for each lumen), and clean gloves.

(a) **Non-valved (clamped/open ended) PICC:** Flush each lumen **every 24 hours** with 10 mL of 0.9% Sodium Chloride for injection (using 10 mL syringe) using stop/start technique (turbulent technique).

(b) **Valved PICC (non-clamped/closed ended)** eg. Power PICC Solo, Groshong) Flush each lumen **every 7 days** with a minimum of 10 mL 0.9% sodium Chloride using a stop/start (turbulent) technique and maintaining positive pressure on the syringe plunger when disconnecting the syringe.

**PROCEDURE:**

**Dormant Non-valved or Valved PICC:**
1. Explain procedure to patient and their family.
2. Wash hands. Don clean gloves.
3. Scrub needle-less injector with 2% chlorhexidene & 70% Isopropyl Alcohol wipe. Air dry for 30 seconds.
4. Attach 10 mL syringe filled with 10 mLs 0.9% normal saline.
   5. **For Non-valved PICC** – open clamp.
   6. **Gently** draw back on plunger of the syringe to check for blood return.

**TIP: For Power PICC solo:** Pre flush with 1-2 mL of normal saline and then attempt to verify blood return.

**IF ANY RESISTANCE, STOP:**
- Have patient change position, raise arms, and cough.

**IF RESISTANCE STILL MET, DO NOT CONTINUE:**
- Notify physician for further instructions
7. If no resistance, flush each lumen with 10 mL of 0.9% normal saline using the stop/start and positive pressure technique.
8. Disconnect syringe slowly while injecting the last 1-0.5 ml of saline.
9. Remove syringe.

10. Repeat steps 3-8 for each lumen.
11. Attach administration set and anchor to patient’s arm.
12. Discard used equipment/supplies, remove gloves, and wash hands.

**For De-Accessing a PICC**

**Non-valved (clamped) PICC:**
1. Explain procedure to patient.
2. Wash hands and don clean gloves.
3. Stop infusion; remove IV tubing leaving needle-less connector in place. Discard IV tubing.
4. Scrub needless connector with 2% chlorhexidine 70% Isopropyl Alcohol wipe. Air dry for 30 seconds.
5. Attach 10 mL syringe filled with 10 mL 0.9% normal saline.
6. Flush lumen with 10 mL of 0.9% normal saline using the stop/start and positive pressure technique.
7. Disconnect syringe slowly while injecting the last 1-0.5 ml of saline.

**IF ANY RESISTANCE, STOP:**
- Have patient change position, raise arms, and cough.

**IF RESISTANCE STILL MET, DO NOT CONTINUE:**
- Notify physician for further instructions.

7. Remove syringe.
8. **For each additional lumen**: repeat steps 3-9.
9. Discard used equipment/supplies, remove gloves, and wash hands.

**Valved (non-clamped/closed ended) PICC:**
1. Explain procedure to patient and family.
2. Wash hands and don clean gloves.
3. Stop infusion; remove IV tubing leaving needless connector in place. Dispose administration set.
4. Scrub needless connector with 2% chlorhexidine & 70% Isopropyl Alcohol wipe. Air dry for 30 seconds.
5. Attach 10 mL syringe filled with 10 mL 0.9% normal saline.
6. Flush lumen with 10 mL of 0.9% normal saline using the stop/start technique.

**IF ANY RESISTANCE, STOP:**
• Have patient change position, raise arms, cough

**IF RESISTANCE STILL MET, DO NOT CONTINUE:**
• Notify physician for further instructions

7. disconnect syringe slowly while injecting the last 1-0.5 ml of saline
8. **For each additional lumen:** repeat steps 3-7.
9. Discard used equipment/supplies, remove gloves, and wash hands.

**DOCUMENTATION**
Units using electronic documentation, will document in the Central Line Assessment/Care/Removal powerform located in the PRN tab under activities/intervention section or in the ADHOC folder under Venous/Subcutaneous Access

Document as per NYGH documentation standards the following elements:
- How patient tolerated procedure
- Ease of flush and blood return verified
- Condition of insertion site
- Update treatment plan

<table>
<thead>
<tr>
<th>Intervention/Removal</th>
<th>Activity</th>
<th>Implanted Port Access Needle</th>
<th>Catheter Size/Length</th>
<th>Total Blood Vol Withdrawn (incl waste)</th>
<th>Line Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central IV #1</td>
<td>&lt;MultiAlpha&gt;</td>
<td>&lt;Alpha&gt;</td>
<td>&lt;Alpha&gt;</td>
<td>&lt;MultiAlpha&gt;</td>
<td></td>
</tr>
<tr>
<td>Central IV #2</td>
<td>&lt;MultiAlpha&gt;</td>
<td>&lt;Alpha&gt;</td>
<td>&lt;Alpha&gt;</td>
<td>&lt;MultiAlpha&gt;</td>
<td></td>
</tr>
</tbody>
</table>

**Result Details**

- Access
- Assist with procedure
- Capped
- De-access
- Device removed
- Discontinue Central Line
- Flushed
- Blood withdrawal

- Flushed with 10mL NS
- Flushed with 20mL NS
- Occlusion management
- Waste drawn
- Other:
Changing Needle-less Connector/s

Needle-less connector should be changed:

- Initially with the first dressing change in **48 hrs after insertion**
- At least **every 7 days** with dressing changes
  1. With presence of blood or precipitate.
  2. With any sign of connector damage (i.e. cracking, leaking or contamination)

**PRE-PROCEDURE:**

<table>
<thead>
<tr>
<th>Gather equipment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• mask</td>
</tr>
<tr>
<td>• sterile non-powered gloves</td>
</tr>
<tr>
<td>• clean gloves</td>
</tr>
<tr>
<td>• two sterile towels or dressing tray</td>
</tr>
<tr>
<td>• (2 per lumen) 2% chlorhexidine swabs</td>
</tr>
<tr>
<td>• clear clave needle-less connectors (1 or 2 dependent on number of lumens)</td>
</tr>
<tr>
<td>• (1-2) 10 mL syringe/s filled with 0.9% normal saline to prime clear clave needle-less connector/s and flush each lumen</td>
</tr>
</tbody>
</table>

**PROCEDURE:**

1. Explain procedure to patient and family.
2. Wash hands, don mask and clean gloves
3. Offer mask to patient to put on, or ask them to turn face away from PICC site. If patient is actively coughing or on droplet precautions they must wear a mask.
4. Prepare sterile field and equipment. Prime needleless connector(s) by attaching a 10mL syringe with 10mL normal saline. Flush until air is removed from needless connector. Leave syringe attached.
5. Stop any infusion(s) and remove IV tubing(s) leaving needless connector(s) in place. Discard IV tubings. **Non-valved PICC:** clamp the catheter line(s).
6. Grasp catheter lumen with non-dominant hand, and hold in the air. Place a sterile towel under the catheter to create sterile field. Scrub the outside of needless connector 8-10cm up the catheter, including clamp (if **non-valved PICC**). Repeat with second swab. Allow to dry. **For non-valved PICC:** clamp catheter.
7. Remove and discard gloves. Don sterile gloves.
8. Remove existing needless connector(s) and discard.
9. Replace with the new **primed** needless connector(s).
10. Repeat Steps 7-10 for each lumen.
11. **Non-valved PICC:** unclamp the catheter line.
12. Follow steps 7-10 for each catheter lumen and as per flushing guidelines (See – PICC Flushing Guidelines).
13. Discard used equipment/supplies, remove gloves, and wash hands.
Units using electronic documentation, will document in the Central Line Assessment/Care/Removal powerform located in the PRN tab under activities/intervention section or in the ADHOC folder under Venous/Subcutaneous Access

Document as per NYGH documentation standards the following elements:

- How patient tolerated procedure
- Ease of flush and blood return verified
- Condition of insertion site
- Update treatment plan
Blood Sampling

As per Medical Directive XII-141, a competent RHCP may obtain blood sample(s) for the purpose of Laboratory testing from a CVAD if there is no peripheral access.

PRE-PROCEDURE:

a. Verify physician order  
b. Verify requisitions and labels with patient’s ID.  
c. **Drawing blood from a lumen used for TPN infusion is highly discouraged, as this may increase the risk of infection and alters the patient’s blood results.** **However** if there is no other option, you can draw blood from a lumen used for TPN as long as the lumen is first flushed with 20 mL of Normal Saline using turbulent flush to clear the line first.

d. Collect sample vials and follow order of blood draw  
e. A minimum of 20mL of 0.9% normal saline flush is required post-sampling, using “start-stop” turbulent flush technique and positive pressure technique.

Gather supplies:

<table>
<thead>
<tr>
<th>Gather equipment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• clean gloves</td>
</tr>
<tr>
<td>• clear clave needle-less connector</td>
</tr>
<tr>
<td>• disposable vacutainer sleeve</td>
</tr>
<tr>
<td>• 10mL “discard” tube</td>
</tr>
<tr>
<td>• 10mL syringe with 0.9% Normal Saline (pre-flush)</td>
</tr>
<tr>
<td>• 10mL syringe(s) x 2 post flush</td>
</tr>
<tr>
<td>• blood collection tubes for required samples</td>
</tr>
<tr>
<td>• (3) 2% chlorhexidine gluconate and 70% isopropyl alcohol wipes</td>
</tr>
<tr>
<td>• (1) 4x4 sterile gauze, and labels</td>
</tr>
</tbody>
</table>

**Warning:** Frequent blood draws from the PICC can contribute to catheter occlusion, especially if the catheter is not flushed adequately after the blood is drawn.

PROCEDURE:

1. Explain procedure to patient  
2. Wash hands. Don clean gloves.  
3. Assemble necessary equipment.  
4. **STOP all IV infusions running through any lumen for one minute prior to blood sampling.**  
   **NOTE:** For double and triple lumen catheters, all lumens must have all infusions stopped prior to and during blood sampling to prevent dilution of sample and inaccurate blood levels

5. Select the largest available lumen for the blood draw whenever possible.
6. Disconnect IV tubing from needless connector and protect the sterility of the IV tubing with a sterile cap.

7. **Scrub needless connector** with 2% Chlorhexidine Gluconate and 70% Isopropyl Alcohol wipes. Air dry for 30 seconds.

8. Using 10mL of 0.9% normal saline syringe in a 10 mL syringe, verify blood return before **flushing the line**.

9. **Clamp non-valved line**. Attach vacutainer sleeve & needleless luer-lock adapter with “discard” tube.

10. **Unclamp non-valved line. Discard 5mL of blood.**

11. Proceed with specimen collection (see Appendix D for **Order of draw for multiple tube collections**). For **Non-valved PICCs**: close clamp each time you change the blood collection tube.

12. Gently rotate each vial 4-8 times (as per recommended order of draws).

13. When the last tube has been removed, clamp **non-valved PICC**. Remove vacutainer sleeve and needless luer-lock adapter and discard.

14. Scrub needless connector with 2% Chlorhexidine Gluconate and 70% Isopropyl Alcohol wipes. Air dry for 30 seconds.

15. Attach 10mL syringe with 10mls of 0.9% Normal Saline. **For non-valved PICC; unclamp catheter.** Flush the catheter using “stop-start” technique and positive pressure technique using a total of **20mL flush**.

16. Check needless connector to make sure all blood is cleared. Change needless connector is unable to clear blood from this device (**follow Changing Needless Connector**).

17. Scrub needless connector with 2% Chlorhexidine Gluconate and 70% Isopropyl Alcohol wipes. Air dry for 30 seconds.

18. Re-connect IV tubing and initiate therapy.

19. Label specimens at the bedside, verifying patient ID.

20. Initial and time the specimen label. Send to the lab via pneumatic tube system or by porter. Any blood sample not signed that goes to Blood Bank will be discarded and will need to be re-drawn.

**POST PROCEDURE:**

Units using electronic documentation, will document in the Central Line Assessment/Care/Removal powerform located in the PRN tab under activities/intervention section or in the ADHOC folder under Venous/Subcutaneous Access

Document as per NYGH documentation standards the following elements:
- total blood volume withdrawn (including waste)
- patient tolerance of procedure
- ease or degree of difficulty with blood flow
- any adverse effects
<table>
<thead>
<tr>
<th>COMPLICATION</th>
<th>PREDISPOSING FACTORS</th>
<th>SIGNS &amp; SYMPTOMS</th>
<th>TREATMENT</th>
<th>PREVENTION</th>
</tr>
</thead>
</table>
| 1. Catheter Migration              | 1. Increased thoracic pressure  
2. High-frequency ventilation  
3. Frequent vomiting  
4. Severe coughing  
5. Extreme physical activity  
6. Rapid infusion of fluid/forceful flushing | 1. None  
2. Sluggish flushing  
3. Inability to aspirate blood from catheter  
4. Pump occlusion alarms  
5. Erythema or edema of shoulder, neck, or arm for arm insertions  
6. Pain, irritability  
7. Dysrhythmias due to catheter migration into the right atrium of the heart | 1. Obtain x-ray verification of catheter tip location  
2. Determine safety of leaving catheter in current position (may not be acceptable, especially if symptomatic)  
3. Consult Interventional Radiologist prior to considering removal of catheter if: (1) tip location unacceptable, (2) may be able to pull back into an acceptable location, and (3) utilize as a peripheral tip. If catheter is left in place but outside of the vena cava, only solutions and medications that can safely be given into a peripheral vein should be infused.  
4. Do not attempt to reinsert catheter. Place a “do not use” sticker over the PICC site. May consult with your Clinical Nurse Educator. | 1. Maintain security of catheter by intact dressing and securement (StatLock) device.  
2. Verify catheter tip location upon insertion, repositioning, and ongoing |
| 2. Cardiac Tamponade               | 1. Catheter migrated with arm movement | 1. Acute presentation of tachycardia (HR > 90bpm)  
2. Hypotension  
3. Distended Neck veins  
4. Distant or muffled heart sounds  
5. Dyspnea/SOB  
6. Tachypnea  
7. Pulsus paradoxus  
8. Hypoxemia  
9. Restlessness  
10. Confusion | 1. Prompt recognition  
2. Notify physician  
3. Have emergency equipment readily available  
4. Prepare for pericardiocentesis | 1. Be aware that although this is very rare complication, it is could occur.  
2. Monitor for signs and symptoms of the complication. |
| 3. Leakage at the catheter insertion site | 1. Forceful flushing using a syringe smaller than 10 cc.  
2. Rapid fluid administration with high pressures.  
3. Using solutions such as alcohol or | 1. Presence of drainage of fluid leaking from the insertion site. | 1. Consult Interventional Radiologist to investigate and treat the cause | 1. Use proper technique when flushing the line  
2. Administer fluids at the manufacturer recommended rate  
3. Cleanse the site with the recommended |
<table>
<thead>
<tr>
<th><strong>4. Phlebitis</strong></th>
<th><strong>5. Air embolism</strong></th>
<th><strong>6. Catheter Embolism</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inflammatory condition of the vein secondary to tissue damage because of mechanical (foreign body in the vein), infectious or chemical (irritant medication)</td>
<td>1. Catheter damage 2. Line not flushed 3. Air trapped in the line 4. Disconnection of the line 5. No occlusive dressing post removal 6. Improper flushing technique 7. Needless connector change without properly clamping a non-valved PICC.</td>
<td>1. Catheter rupture 2. Use of a syringe that is smaller than 10cc to irrigate or declot the catheter. 2. Forceful irrigation 3. Use of scissors or other sharp instruments during dressing change or reinsertion over a guide wire.</td>
</tr>
<tr>
<td>1. Obtain physician order and prepare for catheter removal.</td>
<td>1. Notify physician STAT 2. Place the patient in left lateral, Trendelenburg position 3. Prepare for stat chest x-ray 4. Provide supportive care, such as oxygen</td>
<td>1. Notify physician STAT 2. Place the patient in left lateral, Trendelenburg position 3. Prepare for stat chest x-ray 4. Provide supportive care, such as oxygen</td>
</tr>
<tr>
<td>1. Use aseptic technique in care an maintenance of the line 2. Change tubing and IV bags according to hospital policy 3. Whenever possible dilute chemical irritants, and administer at slower rates</td>
<td>1. Prime all the lines adequately 2. Flush ports according to manufacturer’s recommendations (valved vs non-valved catheters) 3. Secure all connections 4. Apply occlusive dressing post removal for at least 72 hours.</td>
<td>1. Flush ports with 10 cc syringe 2. Avoid excessive fluid pressure to avoid catheter rupture</td>
</tr>
<tr>
<td><strong>8. Dysrhythmias</strong></td>
<td>1. Improper catheter tip placement on insertion 2. Lack of chest x-ray confirmation of catheter location 3. Migration of the catheter particularly high risk in those catheter that were not fully inserted</td>
<td>1. Cardiopulmonary S&amp;S dependent upon dysrhythmias 2. New onset of ECG irregularities 3. Pulse irregularities</td>
</tr>
<tr>
<td><strong>9. Catheter occlusion</strong></td>
<td>1. Thrombus formed as a result of an injury to the vein wall 2. Hardened blood in the catheter lumen 3. Drug precipitate formed by incompatible medications and/or solutions</td>
<td>1. Complete occlusion - unable to flush, infuse IV fluids and/or aspirate from the catheter 2. Partial occlusion – resistance to flushing and/or absence of blood return with aspiration.</td>
</tr>
</tbody>
</table>

**Note:** Another possible complication is a formation of a DVT, manifested by swelling/edema in the arm, hand &/or neck the same side of the PICC. Treatment could be to notify the physician, stop all infusions if the patient is experiencing pain, prepare for possible removal. Upon removal monitor for signs of embolism. Prevention may include ensuring proper flushing of catheter as well as patency (following declotting policy where necessary).
Appendix A

Discontinuation & Removal

Additional competencies are required for discontinuation/removal and management of an occluded PICC. ONLY nurses who are deemed competent by the Clinical Nurse Educator may discontinue/remove and manage occlusions.

PICC discontinuation and removal requires a second nurse readily available to provide support and assistance as necessary.

PRE-PROCEDURE:
- Verify MD order
- Verify PICC length from insertion documentation
- Consider lab values prior to discontinuing PICC catheter (eg. Platelet count, PT, PTT, INR) to predict any potential for bleeding complications that may occur on removal.

Gather supplies:

<table>
<thead>
<tr>
<th>Gather equipment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>mask</td>
</tr>
<tr>
<td>sterile non-powered gloves</td>
</tr>
<tr>
<td>two sterile towels or dressing tray</td>
</tr>
<tr>
<td>sterile gauze 2X2</td>
</tr>
<tr>
<td>(2) 2% chlorhexidine swab sticks</td>
</tr>
<tr>
<td>1-2 suture removal kit/s (if PICC is sutured in &amp; another if a culture of the tip is required)</td>
</tr>
<tr>
<td>sterile specimen container (if catheter tip is to be cultured)</td>
</tr>
<tr>
<td>swab for C&amp;S (if culture of insertion site required),</td>
</tr>
<tr>
<td>occlusive sterile dressing</td>
</tr>
<tr>
<td>bacteriology requisition(s) (if required)</td>
</tr>
</tbody>
</table>

PROCEDURE:

1. Explain the procedure to the patient and family.
2. Position patient supine, or remain upright in sitting position.
3. Position bedside table or procedure cart to ensure both sterile field with supplies and patient are within your field of vision throughout the procedure.
4. Wash hands and don mask.
5. Offer mask to patient to put on, or ask them to turn face away from PICC site. If patient is actively coughing or on droplet precautions they must wear a mask.
6. Remove the patient gown or clothing near the PICC insertion site.
7. Don clean gloves.
8. Extend and externally rotate the cannulated extremity
9. Prepare a sterile field by placing towel around site and under extremity (may use green towel or drape from dressing tray).
10. Remove transparent dressing and securement device (follow Procedure for PICC Dressing Changes).
11. Simultaneously place the sterile 2x2 gauze over the insertion site and apply light pressure
12. Remove gloves.
13. Wash hands with hand sanitizer.
15. Cleanse insertion site with the 2% Chlorhexidine swabsticks working in an up, down, side to side friction for 30-60 seconds.
17. Grasp and pull gently on the exposed catheter, not the hub. Remove the catheter slowly and in small increments, keeping the distal end of the catheter sterile. Do not apply pressure at or above the insertion site when removing as this may cause breakage. Catheter should slide out easily. Place catheter on sterile field.
18. If resistance is met, stop pulling. Wait for one minute. Re-attempt withdrawal of catheter. If removal is still difficult, stop.
19. Place a warm saline gauze dressing on site for 2 - 3 minutes. Re-attempt catheter withdrawal. If resistance met, stop. Place a sterile dressing over the site and notify physician immediately.
20. If no resistance and catheter slides out easily, immediately apply direct pressure over the insertion site with sterile 2x2 gauze until bleeding stops.
21. Apply sterile gauze and occlusive dressing over the insertion site for 24 hours.
22. Inspect the removed catheter to verify inserted length is removed intact, observe for any signs of breakage, jagged or uneven end.
23. If required culture catheter tip (if required), using second pair of sterile scissors. Cut distal end of catheter (at least 5 cm) and place in sterile container.

**POST PROCEDURE:**

- Document as per documentation standards the following elements:
  1. Date and time of catheter removal
  2. Appearance of insertion site and surrounding skin
  3. Appearance of catheter e.g. intact
  4. Patients tolerance of procedure
  5. Send off any collected specimens.
  7. Any resistance experienced during removal of catheter
Appendix B

**Occlusion Guidelines**

Additional competencies are required for discontinuation/removal and management of an occluded PICC. ONLY nurses who are deemed competent by the Clinical Nurse Educator may manage occlusions.

Physicians order is required for occlusion management. An interventional radiologist may be consulted.

i. **Blood-Related Occlusion**
   1. Indications: blood sampling, blood administration and/or blood backed up in infusion
   2. Attempt to:
      a. Aspirate
      b. Flush lumen with 0.9% sodium chloride in 10 mls syringe for injection. If able to flush line but unable to obtain a blood return, notify physician.

ii. **Chemical-related Occlusion**
   1. Indications: infusion running, followed by sudden unexplained occlusion
   2. Attempt to:
      a) Flush lumen with 0.9% sodium chloride in 10 mL syringe for injection
      b) If unable to flush line, reposition or extend the patient arm out (catheter could be pinched under clavicle) and/or ask patient to take a couple of deep breaths and cough. Attempt to flush again. If still unable to flush, notify physician.

iii. **Instillation of Thrombolytic agent**

**PRE-PROCEDURE:**
   a. Verify physician order
   b. Gather supplies: Prepared medication, Mask, One (1) 10 mL luer lock syringe, Clean gloves, Sterile 0.9% normal saline for injection, Three (3) 2% Chlorhexidine Gluconate and 70% Isopropyl Alcohol wipes, Two (2) - 4 x 4 sterile gauze, Two (2) – large gauge needles
   c. Explain the procedure to the patient and family.
   d. Wash hands. Don mask and clean gloves.
   e. Offer mask to patient to put on. If patient is actively coughing, a mask is a must.
   f. Scrub connection site between the catheter and IV tubing with a 2% Chlorhexidine Gluconate and 70% Isopropyl Alcohol wipe. Air dry for 30 seconds.
   g. Disconnect the IV and discard.
   h. Scrub needless connector with chlorhexidine for 30 seconds. Air dry for 30 seconds.

**PROCEDURE:**
Preparation of Solution:

Reconstitute Cathflo Activase to a final concentration of 1 mg/mL:
   1. Aseptically withdraw 2.2 mL of Sterile Water for Injection. Do not use Bacteriostatic Water for Injection.
2. Inject the 2.2 mL of Sterile Water for Injection into the Cathflo Activase vial, directing the diluent stream into the powder. Slight foaming is not unusual; let the vial stand undisturbed to allow large bubbles to dissipate.

3. Mix by gently swirling until the contents are completely dissolved. Complete dissolution should occur within 3 minutes. **DO NOT SHAKE.** The reconstituted preparation results in a colorless to pale yellow transparent solution containing 1 mg/mL Cathflo Activase at a pH of approximately 7.3.

4. Cathflo Activase contains no antibacterial preservatives and should be reconstituted immediately before use. The solution may be used for intra-catheter instillation within 8 hours following reconstitution when stored at 2–30°C (36–86°F).

**No other medication should be added to solutions containing Cathflo Activase.**

**Instillation of Solution into the Catheter**

1. Inspect the product prior to administration for foreign matter, discoloration, and expiration date.

2. Withdraw 2 mL (2 mg) of solution from the reconstituted vial.

3. Instill the appropriate dose of Cathflo Activase (see DOSAGE AND ADMINISTRATION) into the occluded catheter.

4. After 120 minutes of dwell time, assess catheter function by attempting to aspirate blood and catheter contents. If the catheter is functional, go to Step 7. If the catheter is not functional, go to Step 6.

5. If catheter function is not restored after one dose of Cathflo Activase, a second dose of equal amount may be instilled. Repeat the procedure beginning with Step 1 under Preparation of Solution.

6. If catheter function has been restored, aspirate 4–5 mL of blood in patients ≥10 kg or 3 mL in patients <10 kg to remove Cathflo Activase and residual clot, and gently irrigate the catheter with 0.9% Sodium Chloride, USP.

7. If unable to aspirate drug, notify physician.

Any unused solution should be discarded.

**POST PROCEDURE:**
Document as per documentation standards the following elements:
- Indications of occlusion
- **Successful** clearing of occlusion: volume of drug in the electronic Medication Administration Record (eMar) and blood aspirated
- **Unsuccessful** attempt. Physician notification
Appendix C:

CVAD Care and Management

1. Nurse to determine the type of CVAD (PICC – either a Closed Ended or Opened Ended PICC) or Short Term CVC, may consult with the Educator to identify the type of device.
2. Based on your assessment select the most appropriate CVAD CareSet and place the order as per Medical Directive.

Closed Ended Valved PICC (eg: PowerPICC Solo/ PASV) – CareSet

<table>
<thead>
<tr>
<th>Component</th>
<th>Order Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Case</td>
<td></td>
</tr>
<tr>
<td>PICC Info (Bag)</td>
<td>PICC type: Closed Ended/Valved</td>
</tr>
<tr>
<td>PICC Dressing Change</td>
<td>T.N. as directed, PRN, Instructions: Change any transparent dressing with GAUZE component in 48 hrs and then change transparent dressing q4d and PRN if loose, soiled or contaminated</td>
</tr>
<tr>
<td>PICC Needleless Connector Change</td>
<td>T.N. q4d, PRN</td>
</tr>
<tr>
<td>Medication</td>
<td></td>
</tr>
<tr>
<td>normal saline (NS flush)</td>
<td>10 mL, IV (CENTRAL LN), q24h. Start T.N. PICC Flush: Range Dose = 10 - 20mL. Flush patient lines using a 10mL syringe or larger, using tubulating technique (stop/start technique)</td>
</tr>
</tbody>
</table>
| normal saline (NS flush)               | 10 mL, IV (CENTRAL LN), as directed, PRN for Maintaining Patency/Troubleshooting, PICC Flush: Range Dose = 10 - 20mL. Flush after each access, using a 10mL syringe or larger, as per care}

Opened Ended Valve PICC – CareSet

<table>
<thead>
<tr>
<th>Component</th>
<th>Order Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Case</td>
<td></td>
</tr>
<tr>
<td>PICC Info (Bag)</td>
<td>T.N., PICC type: Open Ended</td>
</tr>
<tr>
<td>PICC Dressing Change</td>
<td>T.N. as directed, PRN, Instructions: Change any transparent dressing with GAUZE component in 48 hrs and then change transparent dressing q4d and PRN if loose, soiled or contaminated</td>
</tr>
<tr>
<td>PICC Needleless Connector Change</td>
<td>T.N. q4d, PRN</td>
</tr>
<tr>
<td>Medication</td>
<td></td>
</tr>
<tr>
<td>normal saline (NS flush)</td>
<td>10 mL, IV (CENTRAL LN), q24h. Start T.N. PICC Flush: Range Dose = 10 - 20mL. Flush all distant lines using a 10mL syringe or larger, using tubulating technique (stop/start technique)</td>
</tr>
</tbody>
</table>
| normal saline (NS flush)               | 10 mL, IV (CENTRAL LN), as directed, PRN for Maintaining Patency/Troubleshooting, PICC Flush: Range Dose = 10 - 20mL. Flush before and after each access, using a 10mL syringe or larger, as per care}

CVAD Tunneled CVC Closed Ended/Valved CareSet – (eg: Groshong)

<table>
<thead>
<tr>
<th>Component</th>
<th>Order Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Care</td>
<td></td>
</tr>
<tr>
<td>Tunneled CVC Info (Routing)</td>
<td>Tunneled CVC type: Closed Ended/Valved. Routing: DVC/Right Anterior Artery</td>
</tr>
<tr>
<td>Tunneled CVC Dressing Change</td>
<td>T.N. as directed, PRN, Instructions: Change any transparent dressing with GAUZE component in 48 hrs and then change transparent dressing q4d and PRN if loose, soiled or contagious</td>
</tr>
<tr>
<td>Tunneled CVC Needleless Connector Change</td>
<td>T.N. q4d, PRN</td>
</tr>
<tr>
<td>Medication</td>
<td></td>
</tr>
<tr>
<td>normal saline (NG flush)</td>
<td>10 mL, IV (CENTRAL LN), q4d, Tunneled Closed Ended Flush: Range Dose = 10 - 20mL. Flush all distant lines using a 10mL syringe or larger, using tubulating technique (stop/start technique)</td>
</tr>
</tbody>
</table>
| normal saline (NG flush)               | 10 mL, IV (CENTRAL LN), q4d, Tunneled Closed Ended Flush: Range Dose = 10 - 20mL. Flush before and after each access, using a 10mL syringe or larger, as per care}

CVAD – Short Term CVC – Care set (eg:- Subclavian, Cordis, Femoral)

<table>
<thead>
<tr>
<th>Component</th>
<th>Order Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Care</td>
<td></td>
</tr>
<tr>
<td>Short Term CVC Info (Routing)</td>
<td></td>
</tr>
<tr>
<td>Short Term CVC Dressing Change</td>
<td>T.N. as directed, PRN, Instructions: Change any transparent dressing with GAUZE component in 48 hrs and then change transparent dressing q4d and PRN if loose, soiled or contagious</td>
</tr>
<tr>
<td>Short Term CVC Needleless Connector Change</td>
<td>T.N. q4d, PRN</td>
</tr>
<tr>
<td>Medication</td>
<td></td>
</tr>
<tr>
<td>normal saline (NS flush)</td>
<td>10 mL, IV (CENTRAL LN), bid. Start T.N. CVC Flush: Range Dose = 10 - 20mL. Flush all distant lines using a 10mL syringe or larger, using tubulating technique (stop/start technique)</td>
</tr>
</tbody>
</table>
| normal saline (NS flush)               | 10 mL, IV (CENTRAL LN), bid. PRN for Maintaining Patency/Troubleshooting, CVC Flush: Range Dose = 10 - 20mL. Flush before and after each access, using a 10mL syringe or larger, as per care}
References


BARD Medical StatLock Securement Device, 2011 website @ http://bardmedical.com/VascularAccess


Cathflo Activase website @ http://www.cathflo.com/home/index.jsp


CVAD Learning Package (2006). Trillium Health Centre. Developed and reviewed by the Clinical Educator department


Mount Sinai Hospital. April 1996. Departmental Manual Procedure – Removal of a Central Venous Catheter (CVC); PICC, or Central Venous Line from the Jugular, subclavian or femoral vein.


A tip for sending a tip...

![Diagram of catheter segments](image_url)

**Figure 9-2.** Segments of vascular catheters cultured semiquantitatively. (Reprinted with permission of D.G. Maki and Little, Brown & Co. © 1986.)
Circle the most appropriate answer to the following questions:

1. Nurses that can provide care for patients with PICC lines:
   a) Have completed an educational program and have the knowledge, skill and judgement to perform this procedure.
   b) Do not need any special training.
   c) Must obtain a discontinue order from a physician immediately because this type of central access device is not appropriate on inpatient units.
   d) Must be an RN.

2. Some of the indications for PICC line insertion are:
   a) Poor venous access and/or long term IV therapy
   b) Agitated patient
   c) Physician did not have the time to insert subclavian line
   d) For access to blood draws only

3. What are some of the contraindications for PICC line insertion?
   a) Patient’s urinary output is less than 30 mls/h
   b) Patient is unable to get out of bed
   c) Patient has inadequate antecubital veins, anatomical distortion, injury or trauma to the area.
   d) Patient is going to be in CrCU more than a week

4. To verify the location of the tip of the PICC line:
   a) A chest x-ray must be obtained every week for continued confirmation
   b) Fluoroscopy must be obtained immediately after insertion and a chest x-ray any time migration is suspected
   c) After insertion confirmation of placement is no longer required
   d) none of the above

5. To minimize the pressure per square inch exerted within the PICC catheter when flushing, the nurse must use:
   a) 1 mL syringe
   b) 10 mL syringe
   c) 3 mL syringe
   d) 5mL syringe

6. Some of the major complications that are associated with PICC lines are:
   a) Pneumothorax, hydronephrosis and hydrocephalus
   b) Migration, Central Line Catheter Related Blood Stream Infection (CLCRBSI), air embolus, blockage and dysrhythmia
   c) Oliguria, hypotension and bradycardia
   d) Hypovolemia, tachycardia and hypertension
7. The initial gauze and tegaderm dressing should be changed _____hours after PICC insertion:
   a) 24 hours
   b) 48 hours
   c) 72 hours
   d) 96 hours

8. When flushing a valved or non-valved PICC line, the nurse should use the:
   a) stop/start turbulence technique and positive pressure technique
   b) stop/start turbulence technique only
   c) positive pressure technique only
   d) one continuous flush technique

9. Changing of a needle-less connector should be done:
   a) Every 7 days with dressing changes
   b) With presence of blood or precipitate
   c) With any sign of connector damage (cracking, leaking or contamination)
   d) All of the above

10. Before drawing blood from a PICC line:
    a) Ensure patient has no peripheral venous access.
    b) Ensure you have an order for blood draw from a PICC
    c) Verify physician order for blood work, requisition, and labels.
    d) Turn off all IV infusions through any lumen for one minute.
    e) All of the above

11. PICC dressing changes:
    a) Require sterile technique to prevent, blood stream related infections
    b) Should routinely include gauze at the insertion site to absorb secretions
    c) Are performed Q 7 days or when soiled, wet or no longer occlusive
    d) Include the change to the statlock securement device & needless connectors
    e) all of the above
    f) a,c,d only

12. PICC site assessment Q shift will include:
    a) Visually checking for redness, swelling, drainage, kinking
    b) Observing and comparing external length measurement to previous documentation
    c) Inspect dressing and securement (statlock) device for intactness and dryness &
       date of last dressing change
    d) All of the above

13. PICC Flushing includes:
    a) Using aseptic technique to prevent bacterial contamination
    b) Scrubbing the needle-less injector cap with 2% chlorhexidine wipe & letting it dry 30 seconds is best practice
    c) Flush using 5 ml normal saline syringe with a stop/start technique followed by a positive pressure technique
d) Flush using 10 ml normal saline syringe with a stop/start technique followed by a positive pressure technique

e) All of the above

f) a, b, d only

14. A patient with a PICC line demonstrates sudden & unexpected hypoxia, respiratory distress, tachypnea, chest pain and hypotension, the nurse should:
   a) suspect a air embolus
   b) place the patient in left side Trendelenberg position
   c) notify physician immediately
   d) Prepare for a stat chest X-ray & give the patient oxygen
   e) all of the above

15. Your patient is scheduled to receive their daily dose of IV medication. You attempt to access the PICC line, however you are unable to obtain blood return you then:
   a) Call the MD stat and prepare for the PICC to be removed
   b) Assess the site for migration of catheter
   c) If no resistance is met try to flush the PICC
   d) Ask the patient to cough, rotate the arm and check again for blood return
   e) Consult with the physician and advocate for chest x-ray for placement confirmation
   f) None of the above
   g) B, c, d, e

True or False: Circle the correct answer:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>When changing a picc line dressing, the nurse must wear sterile gloves and a mask</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>F</td>
<td>Non-valved PICC lines will require heparin flushes to keep them patent</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>The statlock securement device should be changed Q 4 days with the tubing change</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>If a patient with a PICC line has unexplained fever and elevated white blood cell count, PICC line infection is to be suspected</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>A nurse assessing the vein used for PICC line placement should palpate the vein along the track for presence of pain or edema</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>The physician orders the PICC tip to be sent for culture, you must cut at least 15-20 cm of the distal end and send in a sterile container</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>After a blood draw from a PICC a minimum of 10 mls of 0.9% normal saline is required to ensure blood is cleared from the line to prevent occlusions</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>When changing needle-less connector you must prime them first to remove air</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>The Cephalic vein is the first choice for PICC insertion because of number of valves</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>Valved PICC lines such as the Power PICC solo used at NYGH have clamps</td>
</tr>
</tbody>
</table>

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Please submit the completed test to your Clinical Nurse Educator.