Subject: Peripherally Inserted Central Catheter (PICC) Lines: Insertion, Care of, Declotting, and Removal

Purpose: An alternate method of vascular access for extended IV therapy, failed IV access at peripheral sites, or for frequent blood draws.

May be Performed by:
Insertion: A Physician or Registered Nurse trained in the insertion technique, who has successfully completed an education program on PICC lines.
Care of and removal: RN or Physician

Equipment: (All equipment is located in the PICC cart on 2nd floor Clean Utility room Or may be obtained from Materials Management)
1. PICC catheter kit (Tourniquet, measuring tape, opsite, gauze, positive pressure cap, Lidocaine, and Stat lock device are included in kit) and additional Micro Introducer Tray
2. Sterile Gloves x2
3. Sterile Gown & Shield/Mask
4. (2) 30cc Normal saline vials, (2) 10cc or larger syringe
5. Ultrasound equipment if needed

I. Insertion
A. Pre-Procedure
1. Obtain order for PICC line, type of solution to infuse and lumen preference (single, double, or triple)
2. If renal patient, notify nephrologist for clearance for PICC insertion.
3. Notify staff who are qualified to insert PICC line
4. Explain procedure to patient
5. Obtain written consent

B. Vein Selection
1. 1st choice-Basilic Vein
2. Other choices include: Cephalic, Median cubital, or Brachial vein.
C. Tip Location
   1. Midline- catheter tip terminates below the axillary vein. Not in the Superior Vena Cava. Midline placement can be used for the majority of therapies that could be given through a conventional IV cannula. Tip placement MUST BE VERIFIED BY CHEST X-RAY.

   2. Central- catheter tip should be at the distal Superior Vena Cava or near the Cavoatrial junction. Tip placement MUST BE VERIFIED BY CHEST X-RAY.

D. Stie Preparation
   1. Wash hands according to hospital policy
   2. Place the patient in the supine position (or less than a 20 degree position). Extend arm as close to 90 degrees to the trunk of the body. Apply warm blankets or MHP to selected extremity.
   3. Select appropriate insertion site by placing tourniquet firmly around mid upper arm. After selecting the vein, release the tourniquet.
   4. Using a non-sterile tape measure, measure from the prospective insertion site up the arm to the right sternal notch, and down to the 3rd intercostal space.
   5. Open the PICC tray and establish a sterile field for the work area. Pre-flush all ports and caps with sterile saline from the kit (under sterile prep). Remove items from the tray and place on the sterile field for easier access.

E. Insertion
   1. Place sterile poly-lined drape under the arm and prep site in a sterile manner. One minute scrub with chlohexidine. The site should be prepped from three inches above the site of entry to three inches below and from one side of the sterile drape to the other. This allows for large enough area if an alternate site is needed.
   2. If using an ultrasound guided insertion, place a sterile cover over the ultrasound wand and insure the ultrasound gel is within the sterile sleeve.
   3. Place a fenestrated drape over the arm leaving the insertion site exposed.
   4. For comfort measures always administer 1% lidocaine as a skin wheal to insertion site.
   5. Reapply tourniquet. Replace the contaminated gloves and don new sterile gloves. You may have an assistant apply the tourniquet to maintain your sterile field.
   6. Place a sterile 4X4 over the tails of the tourniquet to allow you to release it during the procedure, or simply pull tourniquet through the drape.
   7. Stabilize the vein below the insertion site and perform the veni-puncture by touch or with ultrasound. Once blood return is noted, lower the needle until it is parallel to the vein.
8. Release the tourniquet and stabilize the needle by holding one wing.
9. Thread the guidewire through the needle hub.
10. Withdraw and remove venipuncture quick cath/steel needle cannula across guidewire. Leave guidewire in place and maintain constant hold of the guidewire at all times.
11. Place sterile scalpel parallel to the arm and make a small skin knick at the insertion site.
12. Slide winged cath introducer sheath over the guidewire with a continuous motion until the introducer is in.
13. Once you stabilize the introducer sheath, withdraw the twist cap hub and guidewire with one steady motion.
14. Hold introducer and peel away sheath steady and thread the PICC line to the premeasured cm mark. (Have the patient turn head toward the internal jugular Have an assistant place a mask on the patient to prevent contamination).
15. Once at the premeasured cm mark, check for blood return and flush with saline.
16. Call for portable Chest x-ray. Once placement is confirmed break introducer peel away sheath wings and peel and pull sheath until it is completely removed.
17. Secure the PICC line and gently withdraw the stylet.
18. After the stylet is removed you may trim the distal portion of the line (of single lumens only) and place the small flexible tipped “over sleeve” cap over the PICC until the PICC is visible. With a straight motion slide the extension leg connector into the PICC catheter end and click into the plastic “over sleeve” cap.
19. Place the positive pressure cap on the end. Again withdraw blood and flush with saline.
20. Secure the PICC line and place an opsite over the site. Place tubing & plastic wings within Statlock & secure adhesive side to arm. A sterile 2x2 gauze may be placed at the insertion site with an opsite to secure. Remove the 2x2 dressing at the 24 hour post insertion dressing change.
21. May place MHP to arm after site is secured for 24 hours to prevent discomfort and to decrease the risk of vein irritation.

F. Documentation (staff member inserting the line will document the following in the progress note.)
1. Time and date of procedure (start and stop time)
2. Catheter make, size and length (cath length and length of cath after trimmed)
3. Cm mark of catheter at insertion site
4. Insertion site (arm side, vein choice)
5. Catheter tip location and x-ray confirmation

6. Upper extremity circumference 4cm above, at, and 4cm below the insertion site.

7. Patient response, teaching and understanding
8. Initiate PICC documentation on computer IV Flowsheet.
9. Place product sticker on progress note if available.

II. Care and Maintenance of the PICC Line

Note: Pre-existing PICC lines in a patient admitted to the hospital must have a CXR prior to use to confirm placement.
Note: Any abnormal assessment findings must be reported to the physician and obtain appropriate orders.

A. Assessment
1. Redness
   a. May be present and is usually self limiting within 48 hours
   b. Encourage patient to use the accessed arm as much as possible. This will increase blood flow and reduce potential for phlebitis.
   c. Phlebitis usually occurs in the first 48-72 hours and more often in large sized catheters. Apply mansfield heating pad to avoid irritation.

2. Edema
   a. Measure upper extremity circumference at 4cm above, at, and 4cm below insertion site every shift and PRN s/s phlebitis. Document.
   b. Catheter tip migration symptoms may include referred pain to the jaw, ear or teeth, distended veins on the affected side, swishing sound when line is flushed or used. If migration is suspected or a change in catheter length of 2 cm or greater is noted, notify the physician and obtain a chest x-ray for placement confirmation.

3. Pain
   a. During infusion may be due to the type of fluid being infused.
      RN intervention: Assess for s/s phlebitis, slow IV rate, apply warm compresses.
   b. Air embolism (s/s chest pain, hypoxia, apnea, tachycardia, dyspnea, hypotension, nausea, substernal chest pain, confusion)
      RN intervention: Immediately reposition patient to the left side in Trendelenburg position.
4. Drainage
   a. Excessive bleeding for 24 hours after insertion is unusual. Causes may be coagulopathies, anti-coagulation therapy, vigorous physical activity or traumatic insertion procedure. Mild pressure dressings may be helpful.

   b. Drainage persistent after 72 hours may need to be cultured. Note amount and color of drainage.
   c. Expect a small amount of oozing of blood in the first 24 hours. Use 2x2’s folded at site to wick drainage. Recommend to not change dressing for first 24 hours unless necessary.

B. Dressing Change
1. Patients with a Peripherally Inserted Central Line are to have daily chlorhexidine baths.
2. Change dressing every 7 days or as needed for excess drainage. Following the manufactures guidelines for site dressing changes.
3. Obtain the Central Line Dressing Change Tray with Chloraprep
4. Place the patient supine with head turned away from catheter insertion site to decrease potential for contamination by the patient’s secretions. Place a mask over the patient’s mouth and nose.
5. Wash hands
6. Put on mask. Put on a gown if soiling is likely.
7. Put on clean gloves
8. Remove present dressing carefully to minimize trauma and prevent accidental dislodging of the catheter. Discard soiled dressing in proper trash receptacle.
9. Visually inspect the skin and catheter site for signs of infection, leakage, or other mechanical problems.
10. Remove soiled gloves.
11. Perform hand hygiene
12. Put on **STERILE** gloves
13. Working in a circular motion from the insertion site toward the edge of the dressing border cleanse the skin, insertion site and distal portion of the catheter with Chloraprep. *Allow to dry*
14. Apply a CHG impregnated foam disc around the catheter with printed side up.
15. Apply Sureprep Protective wipe and allow to dry.
16. Secure the catheter and disc to the skin with a transparent film dressing.
17. Loop and secure IV tubing to dressing and arm.
18. Label dressing with time, date of dressing change and initials.
19. Discard supplies used.
20. Wash hands.
21. Document the dressing change and the condition of the insertion site on the IV and dressing flow sheets.

C. Flushing the catheter
1. Use only 10cc or larger syringe for all pushes (smaller syringe may rupture the catheter).
2. Flush with saline every eight hours with a push/pause technique. Do not force solution.
3. Heparin flush is not needed with the current ‘Groshong’ catheters.
4. Prior to lab draws flush with 10cc normal saline. After blood draw flush with 20cc normal saline.
5. If TPN is infusing, flush with 20cc normal saline prior to lab draw, follow with 20cc normal saline flush after blood draw.
NOTE: The line must be flushed with saline immediately following blood draws or discontinuing IV medication

D. Cap change
1. Pre flush the cap (keep it sterile) with normal saline to prevent air embolism. Once connected to PICC flush line.
2. Change every 7 days and as needed if cap integrity is impaired.

III. Declotting the catheter
Note: Obtain a physician order for declotting

A. Equipment
1. 10cc luer lock syringe
2. 5cc luer lock syringe
3. 3 way stop-cock
4. Sterile gloves and mask
5. Thrombolytic agent (‘Activase Cath-flo, 2cc)
   - Reconstitute per package direction
   - Final concentration is 1 mg/ml. Total of 2mg/2ml. May repeat x1
6. 20cc syringe with sterile normal saline for post flush

B. Procedure
1. Wash hands
2. Mix ‘Activase’ as directed with medication instruction
3. Withdraw 2cc into the 5cc syringe
4. Don mask and sterile gloves
5. Remove PICC cap and place 3 way stop-cock directly to cath hub.
   Ensure the stop-cock is “off” to the patient (key will face 12:00 position)
6. Attach empty 10ml syringe with plunger depressed at the 6:00 position on the stop-cock.
7. Attach the 5ml syringe (with the 2cc of Activase solution) at the 3:00 position.
8. Turn the stop-cock “off” to the thrombolytic agent (3:00 position)
9. Pull the empty 10cc syringe (at the 6:00 position) plunger back as far as possible to create negative pressure. Maintain the negative pressure and turn the key “off” to the 10cc syringe (6:00 position), this will draw the thrombolytic agent into the catheter (a very small amount).
10. Once a small amount is instilled, turn the key “off” to the patient (12:00 position)
11. Allow for adequate dwell time (at least 30 minutes, may be up to 120 min)
12. When adequate dwell time is reached, turn the stop-cock key to the 5cc thrombolytic syringe (3:00 position), and attempt to aspirate by pulling back the 10cc plunger (at the 6:00 position)
13. Pull back at least 6cc of blood to remove the thrombolytic agent.
14. Flush with 20cc sterile normal saline.
15. If unable to aspirate, repeat procedure x1

III. Removal of PICC Catheter
   A. Purpose-PICC line will be removed per physician order. Removal may be due to, but is not limited to the following reasons:
      1. IV therapy program has been completed.
      2. Mechanical phlebitis does not resolve
      3. Suspected or documented catheter related venous thrombosis
      4. Catheter occluded
   B. Equipment
      1. Non-sterile tape measure
      2. Non-sterile gloves (Need sterile gloves if culturing catheter tip)
      3. Sterile 2x2 gauze
      4. Tape
      5. Sterile scissors and sterile container if culturing tip
   C. Procedure
      1. Wash hands and gather supplies
      2. Explain procedure to patient
      3. Measure and document circumference of upper arm. Document any redness, pain, edema, or drainage
4. Flush catheter with 10cc normal saline prior to removing
5. Remove opsite, statlock device
6. Grasp catheter as close to the insertion site as possible and gently retract catheter, occasionally re-grip catheter close to insertion site to decrease the risk of the catheter breaking.
7. Once completely removed, apply sterile gauze with firm pressure over exit site for 2 minutes, or until bleeding stops.
8. If physician has ordered catheter tip to be cultured, cut tip off immediately at the time of removal using sterile scissors and place in sterile container. Label the container at the bedside with correct patient label and verify patient name and date of birth, time of collection and initial as per hospital policy for sending lab specimens. Send specimen to lab and order appropriate tests.
9. Measure cath length and compare to insertion length. Document. *If catheter is shorter at removal and the catheter has not been cut or repaired, immediately apply a tourniquet proximal to the site to retain the fragment from traveling farther into the system and notify physician at once for catheter emboli. Ensure tip is intact and document.
10. Instruct patient to watch for signs and symptoms of infection, active bleeding, swelling, and extensive bruising at site.

D. Complications
1. Resistant Catheter
   a. Causes: Vasospasms, vasoconstriction, phlebitis, valve inflammation, thrombophlebitis.
   RN intervention: Do not force. Apply warm compress and withdraw slowly. If catheter remains resistant, apply tension to the catheter and redress with an opsite. Applications of a warm compress may help to Distend the vein and facilitate removal. Attempt removal in 24 hours.

E. Documentation
1. Date and time of PICC line removal
2. Reason for discontinuation
3. Measurement of catheter length
4. Catheter tip intact
5. Catheter sent for culture (if ordered)
6. Upper arm circumference
7. Appearance of site
8. Patient’s tolerance of procedure