TITLE: Peripherally Inserted Central Catheters (PICC) and Midline IV Catheters: Insertion, Removal, Care and Maintenance (pic00)

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ISSUED FOR: Nursing

RESPONSIBILITY:
RN and LPN’s-Care & maintenance
PICC Team RN-Insertion and Removal
Specially Trained RN’s
Sarasota Memorial Infusion RN’s
Radiology Technologists-
Insertion & Removal

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PURPOSE:
To establish a written procedure for inserting, discontinuing, caring for and maintaining a Peripherally Inserted Central Catheter (PICC) and Midline Intravenous Catheter in an adult patient. Refer to Venous Central Line Catheters: Insertion, Dressings, Blood Specimens and Removal cen01 for blood draws, aspiration, flushing, administration set changes and needleless connectors.

RESPONSIBILITIES:
Insertion and Catheter Exchange: Only RNs who are a member of the PICC Team, physicians and specially trained Radiology Technologists may insert and exchange PICC and midlines.

Removal: Specially trained RN’s, specially trained Radiology Technologists, physicians and PICC Team RN’s may discontinue PICC and midlines.

Troubleshooting and De-Clotting: Specially trained RN’s, Sarasota Memorial
Infusion RN’s, specially trained Interventional Radiological Technologists and PICC Team RN’s may troubleshoot PICC and midlines and may de-clot PICC lines as outlined in SMH Policy “Management of Vascular Access Complications” (cen05).

Care and Maintenance: All RN’s and LPN’s (who have completed the 30 Hour IV Course and have had competency validated) may provide care and maintenance to include blood sampling and infusions.

Dressing Changes: PICC Nurses, Specially Trained RN’s and Sarasota Memorial Infusion RN’s may perform routine or PRN dressing changes on PICC and midlines.

Deceased Patients: Any RN or LPN may discontinue a PICC or midline on a deceased patient unless it is a coroner’s case, in which case, the line will be left in place.

DEFINITIONS:

1. The PICC is a centrally placed catheter threaded into the cephalic, brachial or basilic vein of the arm with the tip terminating in the superior vena cava.
2. The midline is a peripheral IV catheter threaded into the cephalic, brachial or basilic vein of the arm with the tip terminating at or near the axillary vein level but below the shoulder joint.
3. Central Line Bundle - is a group of individual evidence-based interventions that when implemented together result in better outcomes.
4. Vascular Access Maintenance Bundle- is a group of individual evidence based interventions that when implemented together result in better outcomes. Includes hand hygiene, daily CHG bathing, standardized routine maintenance schedule and others.
5. Single Skin Prep: The site will be thoroughly cleansed with 3 ml Chlorhexidine applicator (2% Chlorhexidine and 70% Isopropyl alcohol). Use repeated back-and-forth strokes of the applicator for approximately 30 seconds or per package instructions over the immediate insertion site and then work outward with the same back-and-forth motion covering about a five inch radius from the puncture site. (Do not take the applicator back to the insertion site). Completely wet the treatment area with antiseptic. Allow the area to air dry. Do not blot or wipe away.
6. Double Skin Prep: (To be used if patient is allergic to Chlorhexidine only) The site will be thoroughly cleansed with 70% Isopropyl alcohol, followed by application of povidone-iodine solution. Allow the area to air dry thoroughly for a minimum of two minutes. DO NOT blot.
7. Hub: The female section of the catheter in which the needleless connector is placed.
8. Needleless Connector: The add-on device that is luer locked into the hub. All access with syringes and infusion equipment shall be through the connector.
9. Fluid Pathway: Includes any and all contact the infusate or patient’s blood will make with the tubing, add on devices, needleless connectors or hub. The fluid pathway shall always be kept sterile and free from contamination. If the fluid pathway becomes compromised, a new device shall be obtained.
10. Chlorhexidine Impregnated Patch: A patch impregnated with Chlorhexidine that must completely encircle the catheter to be effective. The patch is placed printing side up.
11. EKG Guidance: A method of following the tip of the PICC as it is advanced into
the SVC using a standard EKG monitoring machine while observing changes in the P wave configuration indicating proximity to the junction of the SVC and the right atrium.

**KNOWLEDGE BASE:**

1. The number of lumens and the larger the diameter (French) of the catheter, the more risk of thrombosis and infection. All catheters should be chosen based on the actual needs of the patient and select the smallest size with the least number of lumens to sufficiently meet the needs of the patient.

2. The PICC may be identified as a power PICC. Power PICC’s may receive high pressure infusions up to 5ml/second typical of some CT/MR procedures. High pressure infusions in non-power rated devices can result in catheter rupture and are contraindicated.

3. Brisk blood return shall be validated before infusion of any irritant, vesicant, Parenteral Nutrition (PN) or Intravenous Fat Emulsion (IVFE). Infusions shall be delayed until the lack of blood return can be investigated. Blood and blood product infiltrations are considered a class four infiltrate and should not be infused unless blood return is confirmed. Notify the PICC Team, Intervention RN or Nursing Supervision.

4. Only a 10 mL syringe or greater shall be used for PICC or midline infusions or IV pushes. 10 mL of normal saline flushes will be used to irrigate the catheter under the following conditions.
   a. Between different infusions when incompatibilities exist.
   b. When infusion rate is less than 50 mL/hr.

1. Blood sampling will be consistent with Appendix C “Procedures for Blood Sampling.”

2. If a patient arrives with an existing PICC, validate that it is a PICC line and not a midline. Obtain an order for a STAT portable chest x-ray to confirm proper location. After the chest film is done, consult the PICC Team for any questions. For serial patients with a PICC line not inserted at SMH, obtain an order for a baseline chest x-ray. For outpatients with a PICC line who arrive for a procedure (such as Endoscopy/Cath Lab/Cardiovascular Lab/etc.), initiate an alternate access in the other arm if IV access required for the procedure. If no alternate access, obtain a stat portable chest film for PICC placement. Check for patency of the PICC by aspirating for a blood return. If no blood return is present or if there is difficulty flushing, do not use the PICC. If further questions arise consult the PICC Team, Intervention, Specially Trained RN or Supervision for further guidance. If a radiology patient, a Radiologist or Interventional Technologist may determine tip position via fluoroscopy. Refer to SMH Procedure “Management of Vascular Access Complications” (cen05).

3. All patients that arrive to SMH with a PICC or midline catheter, or has one inserted on the unit or in Radiology, requires a PICC Consult order or Nurse Flush order to be placed in the EMR. This order will be placed by the inserter or the primary nurse before the end of the shift. In addition, a note will be placed under the “IV Lines Flow sheet” that included the date of insertion.

**PATIENT EDUCATION:**

All nursing staff and Interventional Radiology have the responsibility to instruct the patient on signs and symptoms of infection, phlebitis, and other complications. Include and instruct the patient and family in all aspects of care and discharge teaching when appropriate. If PICC/midline is newly inserted, verify that the patient has received written information regarding the PICC/midline.
SELECTION:

1. PICC: Indications for:
   a. Frequent re-starts of peripheral lines are needed to complete therapy
   b. the patient has limited peripheral access
   c. Requires long term infusion therapy
   d. Parenteral nutrition with dextrose concentration greater than 10%
   e. Infusion of vesicant medications
   f. Infusate has extreme variation in pH or osmolarity
   g. Requires inotropic therapies
   h. Anticipated therapy is greater than six days
   i. CVP monitoring with a non-valved PICC

2. Midline: Indications for:
   a. Requires frequent re-starts to complete therapy
   b. Has limited peripheral access
   c. Medications with pH of meds between 5 and 9
   d. Osmolality less than 600 mOsm/L
   e. Anticipated therapy is less than 30 days but preferred therapy less than 15 days
due to the high risk of asymptomatic vein thrombosis
   f. Not intended for blood draws

3. Consultation with renal, vascular surgeons or Infectious disease physicians on the case may be indicated.

4. PICC’s may be configured with valves and power infusion capabilities.

5. Site selection shall include assessment of the patient’s condition, age, diagnosis, past medical history, mastectomy history, pacemaker presence, DVT history, vascular condition, history of previous access devices and type and duration of therapy. Site selection will be preceded by assessment for previous venipunctures and subsequent injury to the vein.

6. Access sites in the following areas is not recommended and may place the patient at further risk for complications: the extremity on the side of a lymph node dissection or removal, a limb impaired as result of CVA, decreased circulation, partially amputated limb, reconstructive surgery, orthopedic injury, upper extremity paralysis, AV fistula, graft, shunt, or 3rd degree burns, the same side as existing PICC or Midline, or around a recent surgical site and the same side as a pacemaker or internal defibrillator that has been in place less than 6 months due to the risk of entanglement or may have altered coagulation or platelet values or bleeding disorders.

7. Avoid arms with compromised circulation.

8. The use of insertion sites in which the skin integrity is compromised is prohibited.

EQUIPMENT

INSERTION:

1. Modified Seldinger Technique Insertion Kit
   Note: Radiology Technologists will select supplies relevant to the procedure.
2. Appropriate sized lumen PICC line
3. Central Line Bundle Kit
4. 1 Sage cloth package
5. Ultrasound machine
6. 2 pairs sterile gloves
7. Xylocaine 1% without epinephrine  
8. Needleless access connectors for each catheter lumen  
9. Chlorhexidine impregnated patch (unless allergic)  
10. Non-sterile gloves  
11. Germicidal surface wipes  
12. EKG electrodes  
13. EKG monitor  
14. Sterile EKG clip  
15. Sterile sheath for EKG lead

PROCEDURE INSERTION:

Note: PICC and Midline insertion techniques may vary when lines are placed in Radiology. All insertions to meet Interventional Radiology sterile procedure standards.

Note: PICC Team may utilize heat wraps or other surface vein dilating procedures PRN.

Note: Nurses caring for patients with new PICC or midlines inserted may utilize heat wraps PRN for arm discomfort (refer to order set). If the heat wraps do not alleviate the discomfort, consult PICC Team.

1. Verify physician’s order for device. Review patient record and consider appropriateness of line to include consultation with Renal or Infectious Disease.
2. Verify patient allergies.
3. Ensure that informed consent has been completely executed consistent with Time Out Procedures.
4. Identify correct patient and assess patient to determine appropriateness for procedure. Conduct a Time Out with all participating team members.
5. Place sign on door to alert others that a sterile procedure is in progress.
6. Clean the workspace with germicidal surface wipes.
7. Perform hand hygiene and observe Infection Control precautions.
8. Explain procedure to patient and/or support persons.
9. Place patient in a recumbent position as tolerated and extend arm.
10. Visualize veins with ultrasound to determine appropriate vein and catheter size. Place tourniquet around the upper arm. Using ultrasound, locate a suitable vein and mark site with a sterile skin marker. Note location of the brachial artery to avoid inadvertent puncture. Release tourniquet.
11. Apply EKG electrodes and determine baseline cardiac rhythm. Obtain rhythm tracing. Determine if P wave is clearly identifiable. Do not rely on EKG guidance if P wave is not identifiable, or unstable rhythm is present, or if in the judgment of the inserting PICC nurse EKG guidance should not be used.
12. Remove right shoulder EKG lead.

13. Fully extend patient’s arm at a 90-degree angle to the body. Measure the distance from intended catheter insertion site to desired tip location and add 2 to 3 cm as needed for EKG guidance. Measure the upper arm circumference at a point halfway between the antecubital fossa and axilla.

14. Foam hands and don non-sterile gloves, cap and mask. Remove Sage cloth from package and use immediately. Gently cleanse the arm for approximately one minute in a circular or up and down motion. Start at the insertion site first for approximately 30 seconds and then work outwards. Allow to air dry. Sage cloths act as a cleanser, degreaser and exfoliator. Sage cloths leave behind chlorhexidine providing up to six hours of inhibition of new pathogen growth.

15. Remove gloves and foam hands.

16. Arrange supplies on a cleaned surface and open insertion kit. Open additional sterile items and place on sterile field.

17. Apply tourniquet.

18. Assure all persons within three feet of the patient wear a mask. Patient is under full body drape.

19. Perform hand hygiene. Don sterile gown and gloves. Observing sterile technique, prep insertion site per the Central Line Bundle procedures and drape arm. Assure every team member adheres to sterile procedure. Stop the procedure if aseptic technique has been compromised.

20. Apply sterile probe cover to ultrasound transducer and right shoulder EKG lead.

21. While prep solution is drying on the arm, draw up 1% Xylocaine in TB syringe.

22. Use ultrasound to locate vein. Administer up to one (1) ml Xylocaine intradermally.

23. When insertion area is sufficiently anesthetized perform venipuncture.

24. Thread introducer wire through the safety needle. Slowly advance wire into vessel while maintaining control of the wire and make certain not to pull wire back through the needle to reduce risk of wire embolus, shredding or fraying. Do not withdraw a catheter or guidewire through a needle.

25. Remove the tourniquet.

26. Remove the safety needle.

27. Place the vein dilator over the wire and advance. The skin may be nicked with a safety scalpel.

28. Trim the catheter to the appropriate length and flush all lumens and connect needleless connectors to non-wired hubs.

29. Position guidewire so the end is completely covered by the catheter tip or if
using EKG guidance, it is within 1 cm from the tip of the catheter. Bend outer portion of guidewire at 90-degree angle to prevent in and out movement and to indicate depth of tip. Do not advance stylet past the tip of the PICC catheter.

30. Slowly remove the introducer wire.

31. Remove inner sheath from the tear away introducer.

32. Thread the catheter through the tear away introducer. If using EKG guidance, thread to just past the shoulder.

33. If resistance is met during advancement, stop immediately. Techniques that can be used if resistance is met include changing the angle of the arm, rotating the wrist, or having the patient open and close his or her fist. Catheter may be slightly withdrawn until blood return is aspirated and slowly advanced while continuing to flush with Normal Saline. If resistance continues to be met, catheter insertion in this site must be discontinued until further understanding of resistance is discovered.

34. If using EKG guidance, attach the sterile clip to the metal PICC stylet. Continue to slowly advance the PICC and observe for P wave changes. When the biphasic P wave is seen, obtain an EKG tracing. Retract the PICC until the P wave is ¾ to equal the height of the QRS. Obtain EKG tracing.

35. Utilizing ultrasound, visualize neck veins to assure PICC is not present in the Internal Jugular if indicated.

36. With fingertips, apply gentle pressure over vein greater than 2 to 3 cm above introducer tip to stabilize the catheter. Gently remove tear away introducer from vein and peel apart as per manufacturer’s directions.

37. Remove wire and attached flush port from catheter hub. Secure needleless access connector to hub with a firm, gentle twist. Attach syringe with Normal saline and aspirate catheter for brisk blood return to confirm patency. Flush each lumen with 10 ml Normal Saline maintaining constant positive pressure.

38. Secure external portion of catheter and hub to skin with a securement device. Place Chlorhexidine impregnated patch at insertion site and must completely encircle the catheter to be effective (Exception: the patch doesn’t have to be used if line is to be discontinued in 48 hours or if patient has an allergy to Chlorhexidine). If needed, apply pressure to site with gauze until bleeding stops. Dress site with gauze under transparent dressing, or apply pressure dressing of gauze 4 x 4s and roll bandage PRN. Use Medipore dressing if the patient is allergic to Tegaderm. Dressings will be completely occlusive. Portions of catheter and hub under dressings will be considered sterile. Tape for patient safety and comfort. Apply Curos cap.

39. If EKG guidance used, obtain final EKG tracing post-insertion.

40. Apply label to dressing that identifies the initials of the inserter, date of insertion, type and external length of catheter and arm circumference.

41. Fasten limb alert band securely to wrist of cannulated arm. Mark band with identification of IV device.
42. Provide post-insertion instructions and education materials to patient and nursing staff if needed.

43. Document procedure in the electronic record, including measurements of arm circumference, total length of catheter placed and external length of catheter.

44. Place post placement orders in the electronic record.

45. Prior to initiating therapy, PICC insertions (midlines do not) require radiological confirmation that catheter tip is located within the superior vena cava.

46. Advise primary nurse that the PICC or midline has been inserted, not to use the PICC until tip location has been confirmed by x-ray (midlines typically do not require x-rays) and that heparin has not been instilled.

47. Document time and name of the primary care RN notified that the PICC placement has been successful utilizing the following statement- “Placement has been verified by Chest X-RAY” and location. Document the Central line Bundle Check List in the electronic record.

**EQUIPMENT**

**CATHETER EXCHANGE:**

Same equipment as PICC insertion.

**PROCEDURE**

**CATHETER EXCHANGE:**

A PICC catheter exchange may be performed for the following reasons.

a. Leaking or broken catheter.

b. Occlusion clearance was not successful or otherwise contraindicated.

c. Alternate lumen size is required.

A PICC catheter exchange **may not** be performed for the following reasons.

a. Catheter related infection.

b. Thrombus in the arm.

c. Contaminated line.

Procedure is the same as insertion with the noted additions below.

**Note:** Techniques may vary when lines are replaced in Radiology. All replacements to meet Interventional Radiology sterile procedure standards.

1. Review previous PICC placement x-ray or report to determine catheter tip location.

2. Measure distance from insertion site to desired catheter tip location to determine length of new catheter and compare this measurement with that of the previously inserted catheter.

3. Utilize techniques consistent with the Central Line Bundle, hand hygiene, and placing equipment on a cleaned surface as in the insertion procedure and EKG guidance.

4. Remove the PICC dressing consistent with dressing procedure as below.

5. Prepare the site as described above in the insertion procedure.

6. Withdraw the existing PICC line leaving 20cm in the patient.

7. Cut the existing PICC at 20cm maintaining care to prevent catheter migration.
8. Thread guide wire into the remaining PICC.
9. Remove the remaining length of the PICC.
10. Proceed as described above in the insertion procedure at step #11 as relevant.

**PROCEDURE**

**DAILY SITE ASSESSMENT:**

1. Verify PICC tip placement has been radiographically confirmed and documented since insertion.

**NOTE:** Any intrathoracic pressure changes, such as vomiting, coughing, general movement, sneezing, etc. can cause tip movement. See SMH Procedure “Management of Vascular Access Complications” (cen05) if migration is suspected.


3. Perform hand hygiene and observe standard precautions.

4. Explain assessment procedure to patient.

5. Assess from “bag to site” to make sure all of the connections are correct.

6. Visualize and palpate the site and the dressing. The site assessment should include skin, tenderness (pain), the infusion equipment and catheter assessment.

7. Confirm that the site is labeled with date of the last dressing change.

8. Notify the PICC Team, Intervention nurse or Supervisor if complaints or evidence of complications are present.

9. Measure, in centimeters, the external length of the catheter using a disposable tape measure. Measure from the catheter insertion site to the most proximal centimeter mark.

10. Measure the upper arm circumference midway between insertion site and axilla.

**NOTE:** If swelling is present, consider infiltration versus upper extremity DVT.

11. Disinfect needleless connector(s) by scrubbing vigorously with alcohol wipe for 15 seconds and allow to air dry prior to access.

12. Ensure Curos cap is intact or apply if needed.

13. Flush each lumen with 10mL Normal saline using the push-pause technique and heparin consistent with inv01 Summarized Protocol for the Management of Intravenous Therapy for the Adult Patient and the Flushing Guidelines found in the same policy.

**NOTE:** If resistance is met and/or in the absence of blood return, notify the PICC Team, Intervention Nurse or Supervision to further assess the PICC / midline.


**EQUIPMENT**

**DRESSING CHANGES:**

1. Sterile central line dressing kit
2. Extra masks as needed for patient and visitors
3. Stabilization device  
4. Non-sterile gloves  
5. Germicidal surface wipes  
6. Skin Preparation equipment  
7. Chlorhexidine impregnated patch (unless allergic)

PROCEDURE  
DRESSING CHANGES:

Transparent dressings may remain in place for up to seven (7) days unless wet, soiled, or non-occlusive in which case they should be changed ASAP. The PICC Team RN/Specially trained RN will change transparent dressings. Any dressing containing gauze shall be changed every 2 days. Dressings that are compromised should be reinforced with tape wrapped with a roller gauze if appropriate until a qualified RN can manage the dressing change. Notify the PICC Team, Intervention Nurse, any Specially Trained RN or Supervisor for assistance.

1. Perform hand hygiene and observe Infection Control precautions.

2. Identify patient and explain procedure. Position patient’s arm for comfort and to permit full access to dressing.

3. Place supplies on a cleaned surface.

4. Open outer cover of dressing kit. The nurse involved with the dressing change must don mask at this time. The patient needs to turn away from the dressing side. If the patient is unable to turn away from the dressing, him them apply a mask. All persons within 3 feet of the patient are to don a mask.

5. Foam hands. Don non-sterile gloves.

6. Palpate the site and surrounding area (with the dressing on).

7. Gently remove old dressing from proximal end of catheter with one hand while holding catheter hub firmly with other hand. Peel dressing toward insertion site parallel to skin, taking care to not pull on the catheter. This will prevent in-and-out catheter movement.

8. Remove stabilization device.


10. Inspect the insertion site: Assess length of external catheter, site appearance, and presence of drainage, odor, tenderness, or abnormal coloring of skin.

11. Using Chlorhexidine prep applicator, vigorously scrub the skin area consistent with the directions for use on the package. Clean the site large enough for new dressing to cover. Include the sutures if present and any of the catheter that will be under the dressing. Allow to air dry.

12. Skin protectant barrier at the dressing perimeter may be used at this time if the patient has sensitive skin.

13. Apply stabilization device arranging catheter on skin to reduce direct exit site tension. Change stabilization device with each dressing change taking care not to move or reposition the catheter and avoiding any in or out motion.
14. Apply the Chlorhexidine patch consistent with the directions for use.

15. Apply transparent dressing over the insertion site, stabilization device and exposed catheter pressing lightly from the center out to form an occlusive seal around the edges. Do not stretch the dressing.

16. Measure external catheter length and arm circumference.

17. Apply label to dressing that identifies the date of dressing change, type & external length of catheter and upper arm circumference.

18. Apply Curos cap.

19. Assure the limb alert band is in place.

20. Document in the electronic record. Include upper arm circumference and external catheter length.

**Flushing:**

1. Enter a Nurse “Flush” order in the EMR.

2. When flushing peripheral and central IV lines, only sterile saline will be used. Any saline flushes drawn up by the nurse will only be used one time for one patient and will then be discarded.

3. Pre-filled normal saline syringes may be used for flushing.

4. When administering incompatible medications, flush with at least 2.5 ml normal saline between the medications.

5. Central IV lines will be checked for patency, aspirated for good blood return and irrigated with 5 ml to 20 ml of sterile normal saline every shift and before each infusion and documented on the medication record. Flush with Heparin (5ml of 10 (ten) units per ml=50 units) unless physician order states otherwise or contraindications. Heparin decreases thrombotic occlusions which may play a role in infection prevention. (INS 2010 pg.219).

6. Use only a 10ml syringe or larger when flushing central lines.

7. Flushing of all lines will require the use of the “push-pause” technique.

8. When flushing- follow the 10-10 change rule after blood draws or blood administration.

9. 10-10 change rule: Flush with 10ml of NS twice and if not clear, change the needleless connector.

NOTE: CT Techs and PICC Team nurses will flush only with normal saline. Notify receiving nurse that heparin flush is to be administered.

10. Ensure Curos cap is applied.

**Attaching Administration Set and Needleless Connector Changes:**

1. Obtain administration set, including extension tubing and add on devices as needed. (refer to Attachment A).

2. The primary nurse will change administration sets and needleless connectors.
every Thursday and Sunday and PRN for suspected or actual contamination or damage. Needleless connectors will also need to be changed if it cannot be cleared of blood and precipitates with flushing or is cracked or damaged.

3. Do not re-attach an existing administration set from one site to another site.

4. Apply the IV tubing label below the drip chamber.

5. Attach the solution bag to the tubing and purge air.

6. Stop electronic regulator and close the clamps on the existing administration set if relevant.

7. Perform hand hygiene.

8. Don gloves.

9. Place an alcohol swab under the catheter hub and vigorously scrub the connection for 15 seconds and loosen the tubing and catheter connection.

10. Disconnect tubing.

11. Remove the previous needleless connector.

12. Clean the hub with an alcohol swab with friction for 15 seconds and allow to air dry naturally before attaching a new connector.


14. Attach the new tubing. Apply Curos cap to unused ports.

15. Open clamps and resume IV infusion at the ordered rate.

16. Check to see that all of the connections are secure.

17. Protect the IV tubing ends by applying a red cap.

18. Document on the medication record and in the electronic record in the IV Lines flow sheet and document the needleless connector change and other maintenance related functions.

IF HEPARIN DRIP INFUSING AND LABWORK NEEDED:

1. Heparin starts working quickly and stops working quickly with a half-life of 1 - 2 hours. **It is important to minimize interruptions of the Heparin drip.**

2. **Do not stop the Heparin drip unless** the phlebotomist is unable to draw from the opposite arm that the heparin is infusing into. If the phlebotomist needs to draw from the same arm that the heparin drip is infusing, you must stop the drip for 5 minutes.

3. **Do not draw a PTT from a central line.** The heparin from the flushes adheres to the line and can affect PTT results. **PTT draws for patients on a Heparin drip need to be peripheral sticks.**

   **NOTE:** In the event the Phlebotomist cannot access a peripheral stick, a line draw would need to be completed and communication to the Lab about the line draw should occur. Documentation of a line draw should be included on the tube (such as ‘central line draw”).

**EQUIPMENT REMOVAL:**

1. Non-sterile tape measure
2. Non-sterile gloves
3. Chlorhexidine swabsticks
4. Sterile 2x2 gauze
5. Tape strips
6. Tourniquet available
7. Sterile scissors and specimen cup (if catheter tip is to be cultured) and patient ID labels.
PROCEDURE
REMOVAL:

1. Verify physician’s order to remove the catheter.
2. Clean the workspace with germicidal surface wipes.
3. Perform hand hygiene and observe Infection Control precautions.
4. Identify patient and explain procedure.
5. Arrange supplies on a cleaned surface near the patient.
6. Position patient in sitting or recumbent position if a midline is being removed. (INS 2011 Guidelines pg. 93-94)
7. Position patient supine if a PICC is being removed.
8. Foam or wash hands. Don non-sterile exam gloves.
9. Remove dressing and stabilization device.
10. Inspect catheter-skin junction.
12. Open gauze and place first two fingers of non-dominant hand lightly above catheter-skin junction with gauze between finger tips.
13. If catheter tip is to be cultured, open sterile container and scissor package.
14. Grip catheter hub firmly with one hand and using slow gentle even pressure, slowly retract catheter from site with dominant hand while holding site with gauze.

NOTE: Use extreme caution when removing a PICC or a Midline to prevent air embolism. Air embolisms occur due to overt air entering the system during removal or as a consequence of persistent skin to vein tracking due to residual fibrin sheaths lingering in the vein lumen.

NOTE: If resistance is encountered, interventions may include the following:
   a. never pull against resistance as catheter breakage or vein wall damage can occur
   b. stop the procedure and apply a sterile dressing
   c. use a warm compress to dilate the vein proximal to the exit site
   d. consider the use of relaxation techniques
   e. try hand and arm exercises
   f. reattempt removal after a short or intermediate time period
   g. if above interventions fail, contact physician and consider interventional radiology for evaluation and removal

15. Just after the catheter tip exits the vein, apply firm pressure to the site for at least 30 seconds with 2x2 to prevent bleeding. Do not press on the catheter with the gauze. This may transfer skin bacteria to the catheter tip, contaminating the
culture specimen. Apply a 2 x 2 and a transparent dressing.

16. Keep patient sitting, recumbent or supine for 30 minutes.

**NOTE:** If the catheter breaks during removal this is a MEDICAL EMERGENCY. If the severed portion is unable to be retrieved

a. Tie the tourniquet firmly around the upper arm.
b. Stay with the patient and summon another nurse to call the physician.
c. DO NOT REMOVE OR LOOSE THE TOURNIQUET. Doing so may allow the catheter to enter the central venous circulation.
d. Monitor arterial pulses and observe patient for signs of distress.
e. Prepare for transport of patient to Interventional Radiology emergently.
f. Consult PICC Team, Specially Trained Nurse, Intervention Nurse or Supervision for assistance.
g. Refer to SMH Policy “Management of Vascular Access Complications” (cen05).

17. To obtain culture specimen, hold catheter tip over open specimen cup. Cut off 5 cm of the tip with sterile scissors so it drops into the cup. Secure lid on container immediately. Label specimen consistent with SMH policy and identify as a PICC or Midline tip. Refer to SMH Procedure “Management of Vascular Access Complications” (cen05).

18. This length, plus the culture specimen, should total the same or slightly longer than pre-insertion length. If culture is not needed, simply measure catheter length tip to hub after removal to assure that the entire catheter has been removed.

19. Dispose of catheter and all other used equipment in designated areas.

20. Instruct patient to report the following to his/her physician:
   - Bleeding from exit site that will not stop with pressure.
   - Sudden bruising or swelling around the exit site.
   - Fever above 100 degrees F
   - Redness, pain or swelling along the vein track.
   - Pain in the upper arm or shoulder area.
   - Circulation changes in extremity, re. color changes or coolness.

21. Document in the EMR.

**DOCUMENTATION:**

a. All PICC and midline starts and attempts are to be documented in the electronic record.
b. All documentation will be in PICC or Midline A.
c. PICC or Midline B, etc. shall only be used if the patient has multiple PICC or Midlines present at the same time.
d. If the patient reverts to one site only, charting will commence in PICC or Midline A.
e. Site assessment shall be documented at least once per shift in the electronic record.
f. Document in the electronic record as needed if the site requires more frequent assessment.
g. All discontinued sites will be documented.
h. Enter a nursing protocol flush order that will include heparin.
i. Flushes will be recorded on the medication record.

j. If the site infiltrates or extravasates or develops other complications, and document in the Central Line Complications flow sheet once per shift until resolved or until the patient is discharged and complete an incident report.

REFERENCES:


REVIEWING AUTHORS:  
Gregory Reisinger, RN, PICC Team Nurse
Julie Tierney, MSN, RN, APN, PICC Team/Float
Mary Moretti, RN, PICC Team RN

APPROVAL:  
Clinical Practice Council 1/5/17
### Administration Set Changes

(INS 2011 Guidelines pg. 84- CDC 2011 Guidelines pg. 19).

<table>
<thead>
<tr>
<th>Administration Set Device</th>
<th>Infusion Status</th>
<th>Frequency of Administration Set &amp; Needleless Connector Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Every time an access site is initially inserted, changed or moved and PRN diminished flow rates due to drug or blood precipitates, damage, and actual or suspected contamination.</td>
</tr>
<tr>
<td>Primary &amp; Secondary Sets</td>
<td>Continuous &amp; Intermittent</td>
<td>Every Sunday and Thursday, with a new site, and PRN Exception: IV PCA tubing will be changed every 96 hours with the IV PCA bags.</td>
</tr>
<tr>
<td>Add on devices including Dial-a-flow, filters and all other add on devices</td>
<td>Continuous or Intermittent</td>
<td>With each device change or administration set change.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Infusate</th>
<th>Administration Set</th>
<th>Frequency of Administration Set &amp; Needleless Connector Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood &amp; Blood Components</td>
<td>Intermittent</td>
<td>At the end of 4 hours (unless indicated otherwise)</td>
</tr>
<tr>
<td>Parenteral Nutrition with or without Intravenous Fat Emulsion</td>
<td>Continuous or Intermittent</td>
<td>Every 24 hours</td>
</tr>
<tr>
<td>Propofol</td>
<td>Continuous</td>
<td>Every 12 hours</td>
</tr>
<tr>
<td>Cleviprex</td>
<td>Continuous</td>
<td>Every 12 hours</td>
</tr>
</tbody>
</table>
Appendix B: Patient has Central Line (Internal Jugular, Subclavian and PICC) upon Arrival

Suspected Midline?
If Unable to determine if a PICC Line or a Midline, Do Not Use Line
Consult PICC Team and Insert Peripheral Site

- Is Patient Serial?
  - Yes
    - Obtain a baseline chest film
    - With 1st visit-assess and use with subsequent visits
  - No
    - Is CXR Already Ordered?
      - Yes
        - Initiate Flush Order
        - Set in SCM
      - No
        - Is Patient Potentially Pregnant?
          - Yes
            - Sign form & Shield for CXR or Insert Peripheral
          - No
            - Obtain CXR
            - Notification of CXR Results

- CL Tip in Place
  - Use CL
  - CXR Abnormal
    - Notify Physician
- CL Tip Not in Place
  - Do Not Use CL
  - Insert Peripheral
  - CXR Abnormal
    - Notify Physician

If ECC Patient and expected to be discharged, consider risks versus benefits and assess site.
If questionable, obtain alternate access.
Appendix C

Procedures for Blood Sampling  (only for PICC Lines)

1. Identify the patient
2. Stop the administration of the IV solution for no longer than 2 minutes.
3. Perform hand hygiene and don clean gloves
4. Scrub the hub and allow to air dry.
5. Flush the selected lumen with 10 mL of sterile normal saline (with TPN infusing, flush with 20 mls)
6. Using the same syringe, aspirate a small amount of blood and fluid (5-10mL minimum) by slowly pulling and holding the plunger. Discard the syringe.
7. Using a second 10 mL syringe, slowly withdraw the specimen (NOTE: Do NOT use a vacutainer).
8. Flush the catheter using a “stop-start” or ‘pulse” technique with a minimum of 20 mL of sterile normal saline immediately following withdrawal of a blood sample. Use a 10 mL or larger syringe.
9. Change connector if unable to clear the blood.
10. Transfer the blood specimens into the vacutainers using a needleless transfer device.
12. Apply Curos caps.