Process for PICC Placements in PCICU and PICU Patients

EVALUATION:

1. Primary team to identify need for PICC line
   - Indications include:
     - Limited / difficult intravenous access
     - Parenteral nutrition, antibiotic therapy, and/or central medications anticipated for 5 days or more
   - Relative contraindications for placement include:
     - Emergency venous access (PICC lines are NOT appropriate for placement in urgent/emergent situations, consider obtaining initial central access with non-tunneled line)
     - Bacteremia / concern for sepsis (ideally 48h of no-growth from blood cultures prior to line placement along with appropriate antibiotic treatment)
       - Consider ID consult if concern for fungemia, ideally >72h of no-growth from cultures
     - Short term access of < 5 days
     - Known venous thrombus in selected vein
     - Inadequate vein size (relative contraindication if catheter occupies > 45% of native vessel)
     - Bleeding risk, coagulopathies (consider obtaining baseline platelet count/coags)
     - Inappropriate candidate for sedation / high risk (discuss with ICU attending)

2. Patient Evaluation for PICC line Candidacy - see **"PICC Line Types"** box (page 2) for details
   - Considerations for age:
     - Neonates/Infants:
       - Consider NeoPICC vs PICC, dependent on patient weight (< 3.5 kg for NeoPICC vs > 3.5 kg for PICC) and/or vein size (if vein diameter > 1.5mm, consider PICC)
       - Consider catheter size; determine least number of lumens needed
     - Children/Adolescents: Consider catheter size (2.6, 3, or 4 Fr); determine least number of lumens needed
   - Procedural considerations:
     - Prior PICC attempts, line placements and procedures
     - Current indwelling catheters, cannulas (ECMO cannulation, port, vascath) – avoid PICC placement into same vein if possible – discuss with ICU attending)
   - Special populations:
     - PCICU patients: consider upper extremity vessel preservation for future surgical options (ie. patients with single ventricle physiology) – discuss with PCICU attending

3. Inappropriate Candidate / Unsuccessful Bedside PICC Attempts
   - If central access required for < 7 days, consider temporary CVC (IJ, Fem)
   - If central access required > 7 days, consider consult to:
     i. Pediatric interventional cardiology (fluoroscopy-guided PICC and / or tunneled femoral line)
     ii. Pediatric surgery (Broviac and / or implanted port)
     iii. If >/= 14 years old, adult VIR (tunneled line / fluoroscopy-guided PICC)

PICC Line Types			
	NeoPICC	**PedsPICC**	
Sizes (Fr) / Lumens	▫ 1.0 Fr (SL) ▫ 1.4 Fr (SL) ▫ 1.9 Fr (SL & DL)	▫ 2.6 Fr (DL)	▫ 3 Fr (SL) ▫ 4 Fr (SL & DL)
Placement by	▫ PICC-trained PICU NPs / RNs ▫ NCCC NNPs - call NCCC Fellow phone (984-974-6281)	▫ PICC-trained PICU NPs / MDs / RNs ▫ Interventional cardiology (tunneled femoral line)	▫ PICC-trained PICU NPs / MDs / RNs ▫ PSCT (Peds Specialty Care Team) - EPIC Order "Insert PICC line by Venous Access Team" AND call scheduling team (984-974-6732) or charge (984-974-8080) to coordinate
Limitations / Benefits	▫ Unable to give blood products, draw labs, or perform IV contrast administration ▫ Inappropriate for outpatient therapy ▫ Placed with transilluminator or ultrasound guidance	▫ Require larger vein size for placement ▫ Able to infuse blood products and draw labs (from RED LUMEN only) ▫ Inappropriate for outpatient therapy ▫ Placed with ultrasound guidance	▫ Require larger vein size for placement ▫ Able to infuse blood products and draw labs ▫ Able to administer IV contrast ▫ Placed with ultrasound guidance ▫ Appropriate for outpatient therapy
Maintenance of line	▫ Dressing changes performed ONLY when soiled or non-occlusive ▫ Dressings changed only by PICC-certified PICU or NCCC RNs/NPs ▫ Tegaderm-only dressings (no CHG impregnated patch) ▫ Require continuously infusing heparinized fluids of 0.5 units/mL (minimum rate 0.8 mL/hr) ▫ Accurate placement confirmed by radiograph at minimum q2 weeks ▫ Never use smaller than 5 mL syringe when flushing the line	▫ Dressing changes performed q7 days and when soiled or non-occlusive ▫ Dressings changed by PICU NPs / MDs / RNs ▫ 3 Fr / 4 Fr: Able to be Hep locked per CVAD policy ▫ Require continuously infusing heparinized fluids of 0.5 units/mL (minimum rate 0.8 mL/hr) ▫ Accurate placement confirmed by radiograph at minimum q2 weeks	▫ Dressing changes performed q7 days and when soiled or non-occlusive ▫ Dressings changed by PICU NPs / MDs / RNs ▫ Able to be Hep locked per CVAD policy
Discontinuation	▫ May be discontinued ONLY by PICU NPs, PICC-certified RNs, NCCC NPs/MDs ▫ Document removal with total catheter length removed	▫ May be discontinued by trained RNs, NPs, and MDs ▫ Document removal with total catheter length removed	▫ May be discontinued by trained RNs, NPs, and MDs ▫ Document removal with total catheter length removed

PROCEDURE:

1. Primary team to discuss need for PICC placement with parent / legal guardian and obtain informed consent for procedure

2. Anxiolysis/Sedation Considerations
   - Anxiolytics recommended for PICC Insertion unless contraindicated
     - Anxiolysis includes use of 1 agent (consider Midazolam IV 0.05-0.1 mg/kg)
     - Sedation is >/= 2 agents and requires a qualified practitioner to be present
     - Pediatric Sedation Policy for Non-Anesthesiologists

4. Line Placement
   - Place line utilizing a standardized central line insertion practice and sterile protocol

5. Confirmation by Radiograph
   - Ideal placement for lines placed in the upper extremities is the cavoatrial junction
     - If the PICC is placed in the upper extremity the arm needs to be flexed and adducted to the side to confirm optimal positioning and placement
   - Accurate placement for lines placed in the lower extremities is in the inferior vena cava between the lower right atrium and T11 (T9-11)
     - Consider obtaining lateral radiographs (in addition to anterior) to confirm lower extremity PICC tip placements remain within the IVC
   - If the line needs to be adjusted ≥ 1 cm, then a radiograph should be repeated to confirm accurate placement

6. When position confirmed, CVAD order to be placed by PICU NPs or primary provider indicating line is ready for use ("Central Venous Access Device Status" in EPIC)
   - Indicate if the line can be used for lab draws (Note: 2.6 Fr can be used for lab draws from the RED LUMEN only, put this in the order comments)

7. Order appropriate fluids / Heparin
   - NeoPICCs: Heparinized fluids (0.5 units/mL) as continuous infusion through each lumen (minimum rate of 0.8 mL/hr)
   - 2.6 Fr PICCs: Heparinized fluids (0.5 units/mL) as continuous infusion through each lumen (minimum rate of 0.8 mL/hr)
   - 3 or 4 Fr PICCs: CVAD Heparin flushes (per protocol)

8. Document procedure in a procedure note, including cut length of catheter and add in LDA (use note template .PICUPICCINSERTIONNOTE for standardization)

9. Fill out and place Pediatric PICC Placard (page 5) at the patient's head of bed with appropriate information

DISCONTINUATION:

- Consider when:
  - Deemed no longer needed by primary team
  - If patient develops a complication related to the PICC line (see below)
- Process
  - Determine who is eligible to perform line removal (see “PICC line types - Discontinuation" section below)
  - Check “cut length” prior to removal (documented in insertion procedure note)
    - Note that the “zero” mark on PICCs / NeoPICCs may be a few CM away from the cather’s hub, but the “zero” mark is where the “cut length” is counted from
    - Ensure no portion of the PICC catheter has fractured / is retained following removal
    - If a portion of the catheter is retained, immediately place tourniquet 2-3 inches above insertion site tight enough to reduce venous flow (but not enough to impede arterial flow); notify primary team immediately
  - Document removal, including catheter length removal

TROUBLESHOOTING:

- Who to contact
  - If a PICC complication arises while patient is in PICU – contact PICU NPs or Fellows
  - If a complication arises after patient has transferred to another unit – contact CVAD liaison, NCCC NPs (for NeoPICCs < 2.0 Fr), PSCT (for 3 Fr / 4 Fr), or PICU NPs / Fellows (for 2.6 Fr)
- Consider removal / replacement* for:
  - Confirmed catheter infection
  - Thrombus in / along course of the vein or catheter
  - Evidence of phlebitis at the site
  - Catheter occlusion or malpositioning

*Note: Due to current staffing limitations, PICCs cannot be placed / replaced by PICU personnel on patients located physically outside of the PICU at this time unless specifically approved by hospital leadership (contact NCCC, PSCT, or Peds Surgery if subsequent central access is needed)

Refer to UNC Hospitals PICC Policy and UNC Hospitals CVAD Policy for further details

PEDIATRIC PICC LINE

Catheter Size: _____ Fr

PICC Type:

- ❑ NeoPICC (< 2.0 Fr)
- ❑ PedsPICC (> 2.0 Fr)

Placement date: _____

Tip central: YES / NO

Total catheter length: _____ cm

Length inserted: _____ cm

Length left out: _____ cm

No blood pressures on: _____

Extremity circumference: _____ cm

Blood Draws: YES / NO

*Only the RED lumen of 2.6 Fr may be used for blood draws

Blood Product Administration: YES / NO

IV Contrast Administration: YES / NO

Catheter Maintenance:

- ❑ May hep lock per CVAD policy
- ❑ Infuse heparinized fluids

*Minimum heparin concentration of 0.5 units/mL
*Minimum rate of 0.8 mL/hr per each lumen

Dressing changes:

- ❑ Per CVAD policy
- ❑ *NeoPICC PRN (wet, soiled, non-occlusive)

*NeoPICC dressings by trained personnel only

Revised Feb 2024
Milroy, Kimmel, Nail