Royal Hospital for Women (RHW)
BUSINESS RULE
COVER SHEET

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AUTHOR	KB Lindrea (CNC)
SUMMARY	To guide clinicians in the insertion and management of PICC lines.

Royal Hospital for Women (RHW)
BUSINESS RULE

PERIPHERALLY INSERTED CENTRAL CATHETER (PICC) – INSERTION AND CARE

RHW CLIN056

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1. BACKGROUND

A peripherally inserted central catheter (PICC) line is a long catheter inserted into a large vein with the tip positioned in a central vein. The line is used for long-term intravenous nutrition and medications.

2. RESPONSIBILITIES

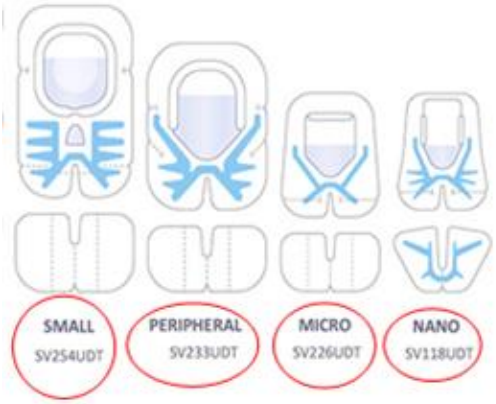
Medical, midwifery and nursing staff

3. PROCEDURE

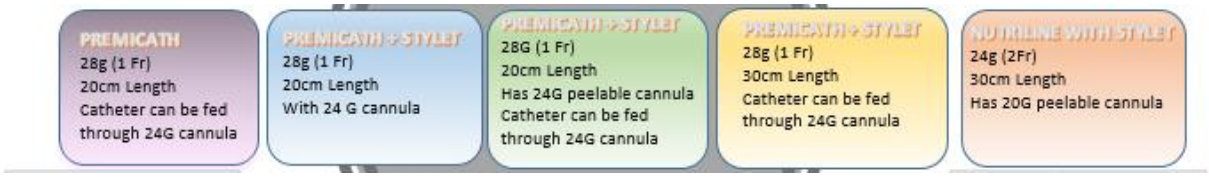
3.1 Equipment

Insertion

- Surgical hat and mask
- Sterile gown, gloves x 2 and eye goggles
- CVC Pack
- Sterile green drape x 1 and plastic drape (large) x 1
- SorbaView dressing (appropriate size for neonate) (Picture 1)
- Duoderm
- 0.9% sodium chloride ampoules (5 or 10 mL) x 3
- 24g cannula x 1
- SmartSite™ Needle-free valve
- 0.5% chlorhexidine swab sticks x 2
- Vygon Premicath 28g or 24g Nutriline with trocar (as appropriate for size of neonate) (Picture 2)
- Blue Inco-pad
- Neutral detergent (follow current NCC cleaning policy)
- Procedure trolley
- For assistant: Surgical hat, mask and sterile gloves



Picture 1



Picture 2

Note:
<1800g – 28G (1Fr); 20cm catheter length
≥1800g – Consider 24G (2Fr); 30cm catheter length

Equipment for PICC infusion line

- TPN bag } remove from fridge prior to procedure
- Lipid bag/syringe } to allow to come to room temperature (approximately 30 minutes prior)
- 2 x Yellow Volumat infusion line
- Trifurcated Needlefree Microbore Extension Set
- 1.2 µm lipid filter (large blue filter)

3.2 Clinical Practice

Procedure

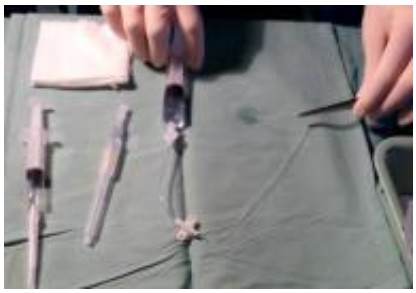
- Perform a "Time-Out" check and record the following in the Mandatory CVAD insertion form in eRIC:
  - Identify a vein to access (see Table 1)
  - Measure the insertion length (see Table 1) and consider the catheter size to use (Picture 2)
  - Discuss/consult the catheter length and site with a senior medical officer
  - Availability of resuscitation equipment and supplemental oxygen for an emergency
  - Ensure the infant is monitored
  - Administer oral sucrose (if required)

Table 1. PICC insertion sites and measurements.

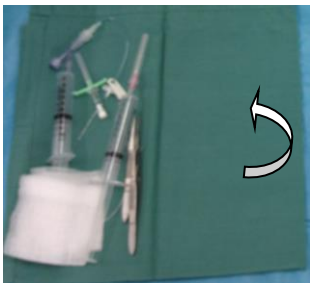
Preferred Veins for PICC Lines	**Measurement of PICC Lines**
Upper limb veins- Basilic; Cephalic	Measure from insertion site to the high mediastinum
Lower limb vein- Long Saphenous	Measure from insertion site to the xiphisternum. Aim is for catheter to be above L4/5 and at least 1cm proximal to the right atrium.
Scalp- Not preferred; use if unable to gain access via other sites	From the insertion site to the clavicular head (on the same side as the entry site) and then to the right second intercostal space.

Note:
Femoral veins are not recommended because of increased risk of sepsis and necrosis of femoral head.

- Prep the infant:
  - Wrap and position the infant in a comfortable posture
  - Insert the infant's limb through a fenestrated hole in the blue inco-pad
- Clean the work surface.
- Collect equipment.
- Request for assistance.
- Proceduralist:
  - Don hat, mask and protective eye wear
  - Open sterile gown pack on a bench near wash basin
  - Add sterile gloves to the sterile field
  - Perform hand hygiene with 2% chlorhexidine skin cleanser (green solution) - scrub hands to elbow for 2 minutes
  - Dry hands to lower elbows with the sterile paper towel in the gown pack
  - Don sterile gown and sterile gloves on (x 2 pairs) using "closed-gloving" technique
- PICC Line Prep:
  - Request assistant to open sterile plastic drape pack
  - Proceduralist to drape work surface with sterile plastic sheet without contaminating the field
  - Request assistant to open packets of equipment – ensure packets of equipment are opened away from the sterile field to avoid contamination
  - Draw up 2 x 10 mL syringes of 0.9% sodium chloride
  - Re-cap drawing-up needle with one syringe
  - Use second 10mL syringe with 0.9% sodium chloride to prime PICC line until fluid is visible at the catheter tip (Picture 3)
  - Leave syringe attached to catheter
  - Place primed catheter and instruments to use for insertion in the green drape – fold drape over contents (Picture 4)



Picture 3



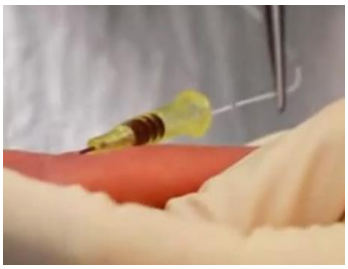
Picture 4

Picture 5

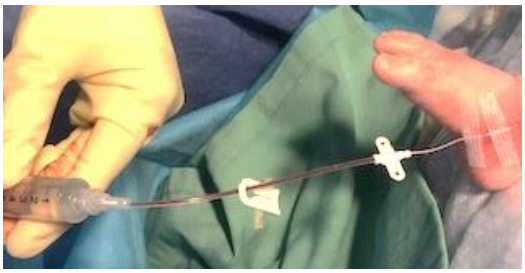
Picture 6

- Prepping Insertion site:
  - Assistant:
    - Scrub and don sterile gloves
    - Hold the infant's limb with non-dominant gloved hand for cleaning (Picture 5)
  - Proceduralist:
    - Scrub the insertion site including the distal part of limb twice and allow air drying time (20 seconds) – repeat
    - Request assistant to hold the distal part of limb using dominant hand with sterile gauze (Picture 6)
    - Repeat cleaning for proximal part of limb and allow air drying time – repeat

- Insert cleaned limb through the fenestrated sterile blue drape (from PICC insertion pack)
- Discard the sterile gauze
- Remove the 1st set of sterile gloves without contaminating the second set of gloves and discard
- Transfer green drape with catheter and instruments onto the sterile blue drape



Picture 7

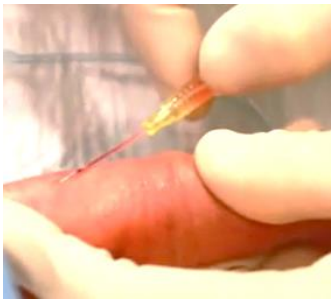


Picture 8

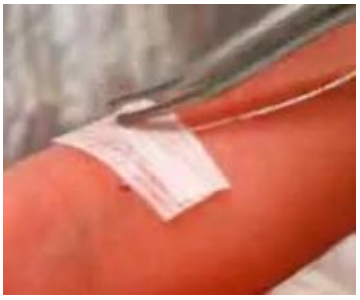
Picture 9

- Inserting PICC line:
  - Apply tourniquet and commence intravenous cannulation with 24G cannula
  - Remove the cannula trocar when blood flashback is visible in the cannula hub
  - Remove tourniquet
  - Using non-toothed forceps, insert and advance the catheter in 0.5-1 cm increments through the cannula to the premeasured insertion length (Picture 7)
  - Flush (pulsatile action) the catheter with 0.9% normal saline via syringe attached to catheter while threading
  - Aspirate PICC line for blood to confirm catheter is in a large vein and can flush easily (Picture 8)
  - Flush blood pooling – use a 10 mL 0.9% normal saline syringe with a blunt needle to flush blood pooling in cannula hub during insertion (Picture 9)

Picture 10

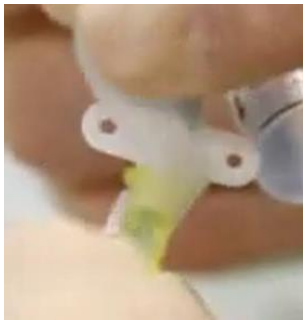


Picture 11

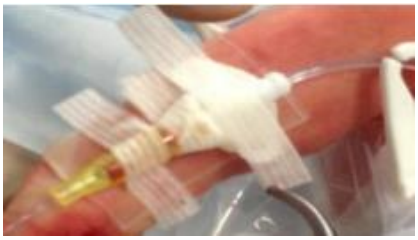


Picture 12

- Removing introducer:
  - Gently ease the introducer out of insertion site and peel or breakaway the introducer (not for cannulas) (Picture 10)
- Removing cannula:
  - Gently ease the cannula out of the insertion site when the determined catheter distance is reached (Picture 11)
  - Apply pressure with a sterile gauze to insertion site to stop bleeding
  - Use a Fibrillar if the infant continues to bleed



Picture 13



Picture 14

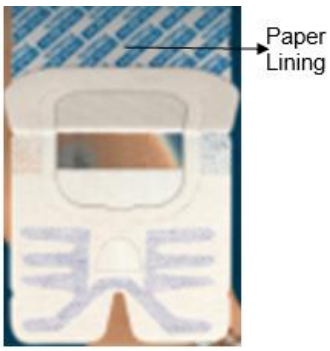
Picture 15

Note:
Use of Fibrillar (Absorbable Haemostat) (kept on shelf in NCC NUM's office)

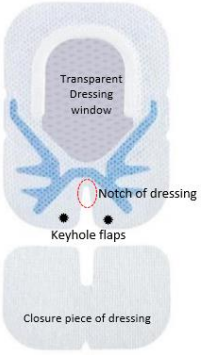
- **May be used if haemostasis cannot be achieved**
- **May leave a small piece of Fibrillar inside SorbaView dressing on insertion site**
- **Daily monitoring for homeostasis**
- **May change dressing after 72 hours if bloodstained**

- Securing and checking PICC line:
  - Clean any blood residual around the insertion site
  - Allow air drying time to ensure dressing adhesion
  - Apply 2 short small steristrips to secure catheter onto skin near the insertion site (Picture 12)
  - Secure cannula to catheter with steristrips (Picture 13)
  - Apply a piece of Comfeel on the infants skin to form a platform (Picture 14)
  - Apply steristrips to secure the cannula and connections onto comfeel platform (Picture 14)
  - Avoid excessive application of steristrips which will obstruct monitoring of insertion site
  - Coil catheter and apply steristrips to secure the catheter (Picture 15)
- Application of SorbaView Dressing:
  - Select the appropriate size dressing to cover the PICC line and connections (Picture 2)
  - Ensure catheter site and surrounding skin is clean and dry
  - Cut the clear long strip into 3 pieces (Picture 16)
  - Remove paper liner of transparent window of SorbaView dressing without touching adhesive section of dressing (Picture 17)
  - Centre transparent window on insertion site (Picture 18 & 19)
  - Smooth down dressing to adhere

Picture 16



Picture 17



Picture 18

PERIPHERALLY INSERTED CENTRAL CATHETER (PICC) – INSERTION AND CARE

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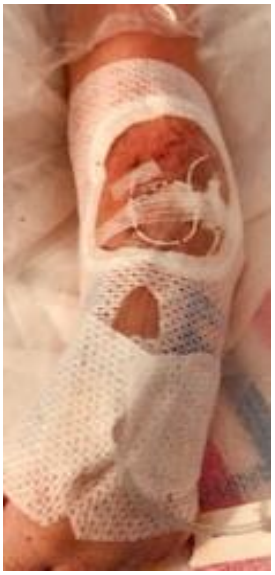
Picture 19

Picture 20



Picture 23

Picture 21

Picture 22

- Guide the plastic tubing of the catheter through the notch of the dressing (Picture 20)
- Ensure the catheter and connections are covered by the dressing (Picture 21)
- Apply the first clear strip of clear tape to plastic tubing of catheter exiting from the dressing (Picture 22)
- Remove the paper liner of closure dressing and apply under tubing and on top of the edges of main dressing (Picture 23)
- Secure plastic tubing of catheter at exit point of dressing with second piece of clear strip (Picture 23)
- Apply third piece of clear strip to secure catheter tube to the limb
- Check that the dressing encloses the catheter and cannula (Picture 23)
- Organise for an x-ray of the catheter
- X-ray result must be reviewed by a fellow or consultant to confirm tip position

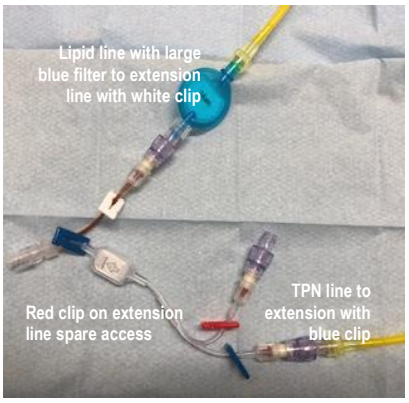
NOTE:
Use of Omnipaque (x-ray contrast)

- **This is sometimes required for x-ray to identify the catheter tip position.**
- **Draw up 1 mL of Omnipaque in a 10 mL syringe**
- **Inject (pulsatile action – push pause action x 6) the contrast into the catheter**
- **Flush (pulsatile action – push pause action x 6) with normal saline in a 10 mL syringe post administration**

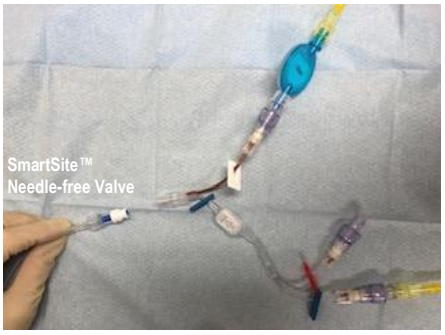
- Setting-up PICC infusion Line:
  - Ensure a primed SmartSite™ Needle-free Valve is attached to the PICC catheter by proceduralist (Picture 24)
  - For TPN and Lipid infusion only:

- Connect the Yellow Volumat infusion lines to TPN and Lipid bag and the Needlefree Microbore extension set (Picture 25)
- Connect the Needlefree Microbore extension to the SmartSite™ Needle-free Valve on the PICC catheter (Picture 26)
- Insert the infusion set into the infusion pump
- Check the infusion rate that is set on the pump with another nurse before starting infusing
- Leave red clip extension line as a spare access

Picture 24



Picture 25



Picture 26

- Post-procedure cleaning and documentation:
  - Remove and dispose all drapes, gloves and gowns after connecting infusion set
  - Dispose all sharps equipment in the yellow BD Sharps Collector
  - Perform hand hygiene
  - Clean the work surface of procedure trolley and return to storage area
  - Complete the Mandatory CVAD Insertion form in eRIC
- Care and management:
  - Monitoring:
    - Hourly observation of insertion site looking for redness, discharge, swelling
    - Hourly observation of catheter-tip site for swelling/redness (end-point of catheter-tip – shoulder area for upper limb insertions or abdominal area for lower limb insertions)
    - Dressing is not restrictive to circulation and/or movement – must not circumvent the limb
    - Observe the catheter through the window of SorbaView dressing:
      - To ensure that catheter is not stretched or pulled taut post-dressing application
      - Catheter is not tightly coiled
    - Limb with PICC line should be visible for observation - must not be swaddled
    - Dressing is clean, dry and intact with no lifting or tunnelling to site
    - PICC line and junction of yellow cannula and catheter connection to tubing is enclosed in dressing
    - Dressing of PICC line in upper limb is protected with a physical barrier to avoid contamination from vomit
  - Daily review of infant's need for a PICC line
  - Dressing Change:
    - Sterile procedure
    - Performed by senior medical staff, nurse practitioners, clinical nurse consultant or nursing staff accredited to do PICC dressing change
    - PICC dressing changes are not routine
    - Consult with a medical officer to review/evaluate the need for dressing change

- Indications for changing dressing:
  - Evidence of large amount of old blood around the insertion site
  - Dressing is restrictive to limb extremities
  - Lifted edges of dressing exposing insertion site
  - Fluid leakage around insertion site (needs medical review and possible removal)
  - High PICC pressures on infusion pump after trouble shooting lines and filters
- Accessing the PICC line:
  - Do not "break" the PICC line to give bolus administration of fluids/medications unless it is discussed with medical team due to difficult access
  - No bolus administration via the PICC line to prevent catheter rupture (must be infused via a syringe driver or pump)
  - Access line with a size 10mL syringe or greater
  - Accessing PICC lines is a sterile procedure

3.3 Educational Notes

- Peripherally Inserted Central Catheters (PICCs) are long thin polyurethane flexible tubes that are inserted into a vein until it reaches a large blood vessel near the heart.
- PICC lines are more durable for long-term use than a PIVC for sick newborns to provide nutrition and medication to avoid multiple peripheral insertions of lines.[1]
- Neonatal PICC lines are not for blood transfusion use. The diameter of the catheter can easily block with blood clot formation.
- Phlebitis, malposition and infection are the most common complications associated with PICC lines.

3.4 Abbreviations

PICC	Peripherally inserted central catheter	TPN	Total Parenteral Nutrition
NCC	Newborn Care Centre	CVAD	Central Venous Access Devices
CVC	Central Venous Catheter	NUM	Nursing Unit Manager

3.5 References

1. Ainsworth S, McGuire W. Percutaneous central venous catheters versus peripheral cannulae for delivery of parenteral nutrition in neonates. Cochrane Database Syst Rev. 2015;10:CD004219.

4. RELATED BUSINESS RULES AND POLICY DOCUMENTS

- RHW NCC Nursing CBR – PICC Line – Insertion of percutaneous intravenous central catheter (video)
- RHW NCC Nursing CBR – PICC Removal
- RHW NCC Nursing CBR – Intravenous Line Management
- RHW NCC Medical CBR – Extravasation and infiltration injuries prevention and management

5. CULTURAL SUPPORT

- When clinical risks are identified for an Aboriginal family, they may require additional supports. This may include Aboriginal health professionals such as Aboriginal liaison officers, health workers or other culturally specific services.

- For a Culturally and Linguistically Diverse CALD family, notify the nominated cross-cultural health worker during Monday to Friday business hours.
- If the family is from a non-English speaking background, call the interpreter service: NSW Ministry of Health Policy Directive PD2017_044-Interpreters Standard Procedures for Working with Health Care Interpreters.

6. IMPLEMENTATION PLAN

This (revised) CBR will be distributed to all medical, nursing and midwifery staff via @health email. The CBR will be discussed at ward meetings, education and patient quality and safety meetings. Education will occur through in-services, open forum and local ward implementation strategies to address changes to practice. The staff are asked to respond to an email or sign an audit sheet in their clinical area to acknowledge they have read and understood the revised CBR. The CBR will be uploaded to the CBR tab on the intranet and staff are informed how to access.

7. RISK RATING

- Low

8. NATIONAL STANDARDS

- Standard 1 Clinical Governance
- Standard 3 Preventing and Controlling Infections
- Standard 4 Medication Safety
- Standard 5 Comprehensive Care
- Standard 6 Communicating for Safety

9. REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
4/11/2005	1	KB Lindrea (CNC)
12/1/2010	2	KB Lindrea (CNC), S Gan (RN); Revised and Approved NCC Policy/Procedure Working Group
24/9/2014	3	J Blaeck (CNS); Revised and Approved NCC Policy/Procedure Working Group
31/7/2018	4	KB Lindrea (CNC); Revised and Approved NCC LOPs Committee
07/07/2023 3.6.24	5	KB Lindrea (CNC); Approved NCC CBR Committee Endorsed BRGC