GUIDELINE

Peripheral Intravenous Cannula Insertion and Management

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this disclaimer

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Aim

To gain peripheral venous access to administer fluids, blood products, medication and/or parenteral nutrition and minimise the risk of complications of PIVC and intravenous therapy.

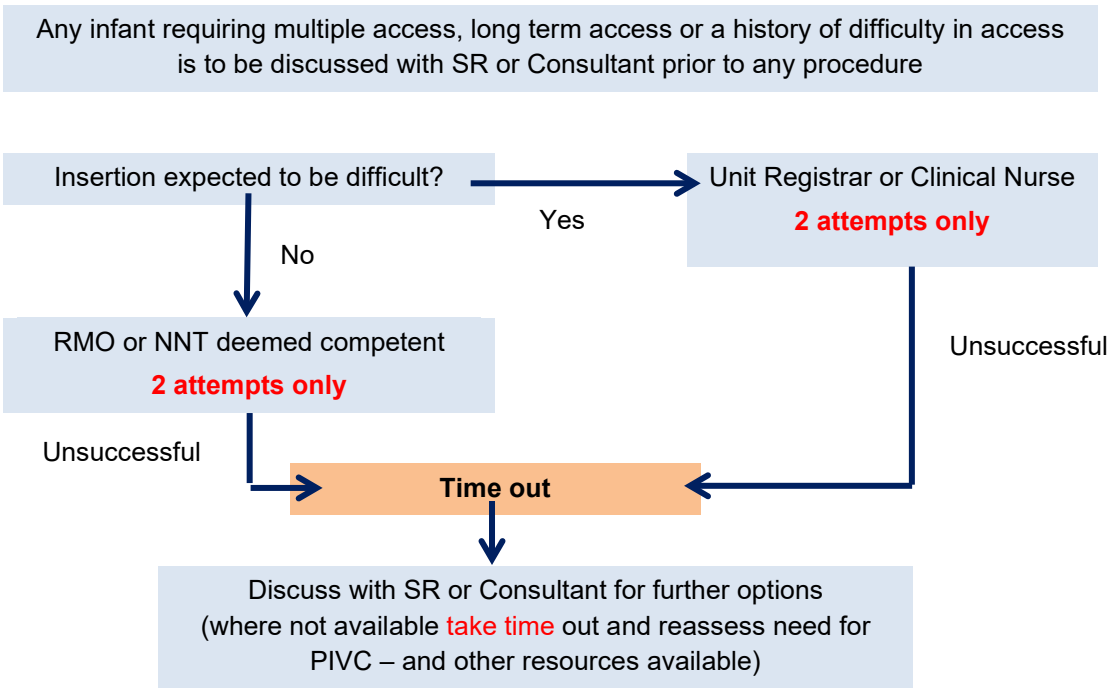
Risk

Increase risk of infection and injury to the skin integrity.

Key Points

- Aseptic technique is to be used in all aspects of PIVC insertion and ongoing management. Staff inserting IV cannulas must be competent and compliant with CAHS mandatory AT modules (Theory and Practical).
- Review indication for IV cannula before inserting. If the infant is on more than 100mLs/kg/day they may not need an IV if feeds are able to graded up as planned or faster.
- Consideration should be given to the use of a PICC line with sterile insertion after the initial use of umbilical lines. This is relevant if the infant will require a PIVC for more than several days. Discuss at the daily ward round and document the plan for a long-term management of PN requirement for greater than 5-7 days.
- Avoid multiple attempts. Provide pain relief - sucrose +/- pacifier.

PIVC Insertion Flow Chart



Note: **All** procedures are documented on MR421 Peripheral Intravenous Cannula Insertion and Management form

- Secure carefully, always ensure visualisation of cannula insertion site.
- If a PIVC has been in situ for greater than 72 hours, a medical review and decision to keep, or replace the PIVC, or insert a long line **must** be discussed at the medical ward round and nursing handover and documented **DAILY** in the patient's progress notes.

Site Selection

- Take time to choose site carefully.
- Veins in the hands and feet are preferable.
- Avoid sites near previous access, areas of bruising, erythema, or loss of skin integrity.
- Avoid areas with flexion where possible as difficult to splint and increases the risk of extravasation.
- Avoid veins that may be used for percutaneous central venous catheters (PICC).
- Choose veins that run straight, fill and empty and are easy to splint.
- Adjuncts that may be considered to aid in line placement include transillumination devices and/or point-of-care ultrasound.

Equipment

- Sterile dressing pack and sterile gloves
- Skin preparation: Chlorhexidine 1% Alcohol / 70% Swab > 27 weeks gestation or Povidone-iodine 10% Swab < 27 weeks gestation.
- 1 mL and 2 mL syringes and blunt drawing up needles
- Normal saline or prefilled normal saline syringe
- 24G cannula (26G cannula can be considered in extremely preterm infants with very thin veins)
- Short extension
- Sterile transparent occlusive dressing (not < 27 weeks)
- Leukostrips
- Arm-board and leukoplast tape (backed with cotton wool)

Procedure (Aseptic Technique)

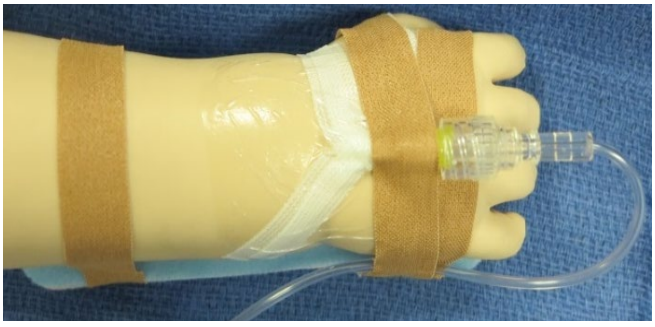
Steps
1. Check correct patient for procedure. Explain procedure to parents' if/when present. Give oral sucrose and/or swaddle as clinically appropriate.
2. Perform hand hygiene. Prepare equipment. *Note: 0.9% Sodium Chloride is to be drawn up direct from ampule (not to be squirted into tray and drawn up from tray)*
3. Perform hand hygiene and don sterile gloves.
4. Clean selected site with appropriate skin prep for gestation and allow skin prep to dry before proceeding with the procedure.

Steps
• Chlorhexidine 1% Alcohol 70% Swab (> 27 weeks gestation) - wait at least 30 seconds. • Povidone-iodine 10% Swab (< 27 weeks gestation) - wait at least 60 seconds, wipe Povidone-iodine off with sterile saline or sterile water prior to cannulation.
5. Inspect the cannula to ensure the needle is fully inserted into the plastic cannula and the tip is not damaged.
6. Ensure the bevel of the needle is facing upwards.
7. Gentle proximal pressure helps to make vein prominent. **Do not apply excessive and prolonged pressure as that can cause bruising and compromise distal circulation.**
8. Insert the needle into the vein at an angle of 10-15°.
9. When blood return/flashback is seen partially withdraw the needle and advance the cannula. Dispose of needle immediately into sharps container.
10. Apply slight occlusive pressure to the vein above the end of the cannula while attaching extension set.
11. Flush to ensure patency with 1 mL syringe and attach primed needleless extension system.
12. Secure the hub with sterile leukostrips taking care not to contaminate site.
13. Cover site with sterile transparent occlusive dressing, taking care not to contaminate the adhesive surface.
14. Use appropriate size splint to immobilise the limb. Ensure taping does not inhibit visualisation of the insertion site.
15. PIVC is to be labelled with – Date and Time of insertion on the splint by person inserting the cannula.
16. Dispose of equipment safely. Perform hand hygiene.
17. Complete documentation.

Securement and Dressing Management

Taping for infants < 27 weeks	Taping for infants > 27 weeks
• 3 small Leukostrips 6.4mm x 76mm • Appropriately sized splint • 3 large Leukostrips 13mm x 102mm to secure splint - do not back with cotton wool	• 3 small Leukostrips 6.4mm x 76mm • Appropriately sized splint • Sterile transparent occlusive dressing • Leukoplast tape - backed with cotton wool if in direct contact with skin. Review need for cotton wool for Term or older infants.
Do Not Use Tegaderm	**Use < 27 guide if poor skin integrity**

- Secure the leukostrips and dressing, taking care not to contaminate the adhesive surfaces and the insertion site.
- When securing the splint, ensure it is positioned and strapped with the limb and digits in a neutral position and the taping is not occluding or restricting circulation.
- Ensure the site is visible when placing the tapes.
- The dressing is to be replaced if it becomes wet, soiled or loose using an aseptic technique.
- If the PIVC becomes accidentally or inadvertently partially withdrawn or dislodged, the PIVC is to be removed and a new PIVC inserted.
- Inspect the splint each shift and replace if soiled or wet.

Strapping for < 27 weeks gestation	 Strapping for > 27 weeks gestation

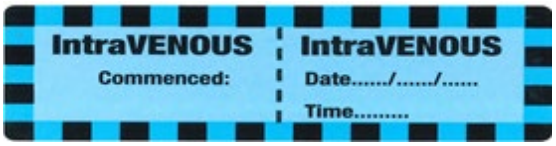
Commencement of Infusions

- Connect all infusion lines using aseptic technique.
- All infusions are to be infused via a pressure sensitive pump.
- Pressure limits are to be set at 50-100mmHg on commencement of all infusions.
- Pressure limits are to be checked at the commencement of each shift.
- Pump pressures are to be documented hourly on the MR489 or 491.
- Infusion rate is to be check by 2 staff members at the commencement of the infusion and when a rate adjustment is required.

Management and Labelling of Administration Sets

- Administration sets, including all tubing, connections, extension sets and needleless valves are to be changed when the PIVC is re-sited.
- Administration sets are to be changed at least every 96 hours.
- Administration sets and fluids are to be changed more frequently if contaminated or with **any** accidental disconnection.
- Administration sets are to be changed utilising an aseptic technique.

- All administration set changes are to be documented on the MR489 or 491 with date and time change.
- All administration sets are to be labelled with an intravenous line label, with date and time administration set commenced. Refer to CAHS Labelling of Injectable Medications and Fluids



Flushing

- Use aseptic technique for all care and maintenance of PIVC.
- PIVC are to be flushed with a minimum of 0.5mL of sterile 0.9% sodium chloride for injection using a 2 mL Leur-lock syringe or pre-filled 3 mL syringe.
- Flush the PIVC using a pulsatile motion (push-pause):
  - After the PIVC is inserted and prior to use to confirm placement.
  - Before each medication or infusion is given to ensure PIVC is still patent.
  - After each medication or infusion.
  - Between multiple infusions or medications to prevent interactions and incompatibilities.
- PIVC without a continuous infusion is to be flushed 4 hourly using an aseptic technique.
- Disconnecting the flush syringe can allow reflux of blood into the hub of the cannula and into the extension set. To prevent this source of occlusion, clamp the extension set prior to removing the syringe.

Assessment

Use the Peripheral Intravenous Assessment Score (PIVAS) to assess the condition of the PIVC site (see the MR421.00).

- Inspect and document site score hourly on the Observation Charts MR489/491, the condition of the PIVC insertion site, and the area above and below the site. Look for signs of pain, swelling and redness at the insertion site
  - Document pump pressure and volume infused.
  - With each intermittent medication.
  - With each flushing episode.
- Document PIVAS and Dressing score 8hrly on the MR421.00.
- Any adverse findings and action plan are to be documented in the patient's medical record.
- PIVC's are not routinely replaced in neonates, however, should be removed at the earliest indication of phlebitis or infiltration.
- Extravasation should have immediate medical review as treatment via the IVC may be required.

Peripheral Intravenous Assessment Score (PIVAS)

PERIPHERAL INTRAVENOUS ASSESSMENT SCORE (PIVAS)		
Score	**Clinical Signs and Symptoms**	**Intervention**
0	Healthy Looking PIV Site	• No action required. Observe hourly
1	**One** of the following • Exhibits slight pain near IV site • Slight redness near IV site • Increase in pump pressure	• Possible first signs of phlebitis • Observe closely and document concern
2	**Two** of the following • Exhibits pain on flushing • Redness • Swelling • Increase in pump pressure	• Immediate medical review • Stop infusion. Do not remove cannula • Document action taken and planned care • Start MR492.00, if applicable • Complete incident form, if applicable
3	**All** of the following • Exhibits pain on flushing • Redness • Swelling • Increase in pump pressure	• Immediate medical review and stop infusion. • Do not remove cannula • Document action and planned care • Start MR492.00, if applicable • Complete incident form

Removal of PIVC

PIVC site is to be monitored for a further 48 hours post removal and to be documented on the MR421 PIVC form

- Perform hand hygiene.
- Remove tapes and dressing with care to prevent dermal stripping.
  - Scissors are **not** to be used to cut or remove tapes.
- Use adhesive remover to remove tapes.
  - Clean skin of adhesive remover with sterile water post procedure.
- Use sterile cotton ball or sterile gauze over the site and slowly withdraw the cannula.
- Maintain slight pressure over the insertion site until blood flow or ooze has ceased.
- Avoid covering the site with adhesives in the preterm infant as there is a risk of dermal stripping upon removal.
- Document removal and reason for removal on the MR820 Peripheral Intravenous Cannula insertion record.

Complications

Complication	Definition	Signs and Symptoms
Phlebitis and/or signs of localised or systemic infection	Local inflammation of the vein at or near the cannula site. **Mechanical** - irritation to the vein at or near the cannula site. **Chemical** - irritation from drug infusion. **Bacterial** - inflammation from microorganism.	Erythema/redness around site or long the vein. Tenderness on palpation. May feel warm to touch. Palpable venous cord - usually present at an advanced stage.
Infiltration (Tissued)	Non-vesicant fluid infused into the tissues surrounding the site.	Leakage around site. Swelling/tightness of skin. Cool to touch. Blanching. Discomfort.
Extravasation	Infiltration of vesicant fluids or chemotherapeutic drugs into the surrounding tissues.	Leakage around site. Painful on palpation. Erythema/redness. Swelling/tightness of skin. Blanching. Blistering.
Blocked cannula	Clot formation in cannula. Kink in cannula. Restrictive taping.	Leakage around site. Can be red or painful if thrombus formation Increase in pump pressures. Unable to flush PIV bung.

References and related external legislation, policies, and guidelines

MP 0038/16 Insertion and Management of Peripheral Intravenous Cannulae in Western Australian Healthcare Facilities *(includes: Reporting of healthcare associated Staphylococcus aureus bloodstream infections as a SAC1.*

Management of Peripheral Intravenous Catheters Clinical Care Standard

National Standard for User-applied Labelling of Injectable Medicines Fluids and Lines

1. Eichenwald E, Hansen A, Martin C, Stark A 2017. *Cloherty and Stark's Manual of Neonatal Care,* 8th edition, Lippincott Williams & Wilkins, Philadelphia.
2. Gomella T, Eyal F, Bany-Mohammed F 2020. *Gomella's Neonatology: Management, Procedures, On-Call Problems, Diseases, and Drugs;* 8th edition, McGraw-Hill Education, Ohio.
3. Pettit J. Assessment of the infant with a peripheral intravenous device. Adv Neonatal Care. 2003 Oct;3(5):230-40. PMID: 14648520.
4. Rennie J, Kendall G 2013. *A manual of neonatal intensive care,* 5th edition, CRC Press, London.

Related CAHS internal policies, procedures and guidelines

- Aseptic Technique in the Neonatal Unit (Neonatology)
- Extravasation Injuries (Neonatology)
- Infection Prevention and Control Policies (CAHS)
- Aseptic Technique (CAHS)
- Labelling of Injectable Medications and Fluids (CAHS)

This document can be made available in alternative formats on request.

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Healthy kids, healthy communities

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