



Clinical Practice Guideline

Guideline coverage includes NICU KEMH, NICU PMH and NETS WA

Peripheral Intravenous Cannula (PIVC) Insertion and Management

This document should be read in conjunction with the [Disclaimer](#)

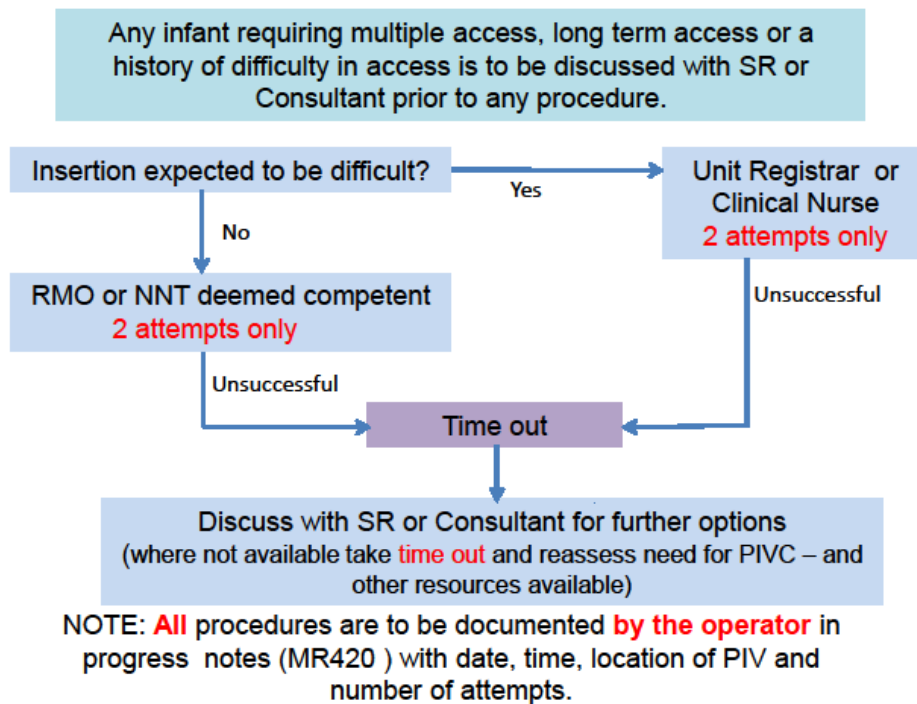
Aim

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

Key Points

- Aseptic technique is to be used in all aspects of PIVC insertion and ongoing management.
- Consideration should be given to the use of a PICC line with sterile insertion after the initial use of umbilical lines. This will be particularly relevant if it is felt the infant will require a PIVC for more than several days.
- Discussion of PIVC length of use is to occur at each medical ward round and nursing handover.
- If PIVC is in situ for greater than 72 hours, a medical review and decision to keep, replace the PIVC or insert a long line **must** be documented.
- Avoid multiple attempts.
- Provide pain relief - sucrose +/- pacifier.
- Secure carefully, ensuring visualisation of cannula at all times.

PIV Insertion Flow Chart



Site Selection

- Take time to choose site carefully.
- 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.
- Veins in the hands and feet are preferable.
- Choose veins that run straight, fill and empty and easy to splint.
- Avoid using veins that may be required for PICC line access.

Equipment

- Sterile dressing pack
- 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
- Needleless system/short extension
- Tegaderm - sterile transparent occlusive dressing (not < 27 weeks)
- Leukostrips
- Arm-board and leukoplast tape (backed with cotton wool)

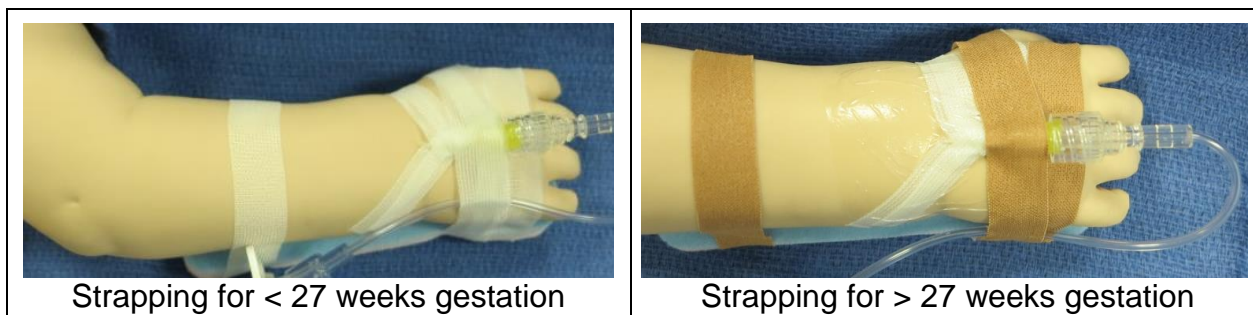
Procedure (Aseptic Technique)

1. Check correct patient for procedure.
2. Give oral sucrose and/or swaddle as clinically appropriate.
3. Perform hand hygiene.
4. 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).
5. Perform hand hygiene and don sterile gloves.
6. Clean selected site with appropriate skin prep for gestation and allow skin prep to dry before proceeding with the procedure:
 - 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.
7. Inspect the cannula to ensure the needle is fully inserted into the plastic cannula and the tip is not damaged.
8. Ensure the bevel of the needle is facing upwards.
9. Insert the needle into the vein at an angle of 10-15°.
10. When blood return/flashback is seen partially withdraw the needle and advance the cannula.
11. Dispose of needle immediately into sharps container.
12. Apply slight occlusive pressure to the vein above the end of the cannula while attaching extension set.
13. Flush to ensure patency with 1 mL syringe and attach primed needless extension system.
14. Secure the hub with sterile leukostrips taking care not to contaminate site.
15. Cover site with sterile Tegaderm, taking care not to contaminate the adhesive surface.
16. Use appropriate size splint to immobilise the limb. Ensure taping does not inhibit visualisation of the site.
17. PIVC is to be labelled with – Date and Time of insertion on the splint by person inserting the cannula.
18. Dispose of equipment safely.
19. Perform hand hygiene.
20. Complete documentation.

Securement and Dressing Management

Taping for infants < 27 weeks	Taping for infants > 27 weeks
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 3 small Leukostrips 6.4mm x 76mm • Appropriately sized splint • Tegaderm • 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.



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 checked by 2 staff members at the commencement of the infusion and if a rate adjustment is required.

Management of Administration Sets

- Administration sets, including all tubing, connections, extension sets and needless valves are to be changed when the PIVC is re-sited.
- Administration sets are to be changed at least every 96 hours.
- Administration sets are to be changed more frequently if contaminated or accidental disconnection occurs.
- 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.
- Label all administration sets attached to PIVC with an intravenous line label.



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

- Inspect the PIVC insertion site and the limb above and below the site:
 - At least hourly when a continuous infusion is in progress.
 - With each intermittent medication.
 - With each flush administration.
- Use the PIVAS tool to perform checks. The score is to be documented with each inspection on the MR489 or 491.
- Document pump pressure and volume infused hourly with PIVAS score.
- 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.

Removal of PIVC

- Perform hand hygiene.
- Remove tapes and dressing with care to prevent dermal stripping.
- Use adhesive remover as required. 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 reason for removal.
- The PIV site is to be monitored for a further 48 hours post removal and to be documented on the PIVC insertion record.

Complications

Complication	Definition	Signs and Symptoms
Phlebitis	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 See Extravasation Injuries	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.

Neonatal Peripheral Intravenous Assessment Score (PIVAS)

Signs and Symptoms	Score	Intervention
Healthy Looking PIV Site	0	Observe
One of the following <ul style="list-style-type: none"> • Slight pain near IV site • Slight redness near IV site • Increase in pump pressure 	1	Possible first signs phlebitis Observe closely
Two of the following <ul style="list-style-type: none"> • Pain on flushing • Redness • Swelling • Increase in pump pressure 	2	<ul style="list-style-type: none"> • Immediate medical review • Remove PIVC • Document action and plan • Continue to observe site for at least 48hours
All of the following <ul style="list-style-type: none"> • Pain on flushing • Redness • Swelling • Increase in pump pressure 	3	<ul style="list-style-type: none"> • Immediate medical review • Remove PIVC • Document action and plan • Complete incident form • Observe site until healed
Extravasation Stop infusion immediately - Do not remove cannula. Notify Medical Staff and Shift Coordinator. See Extravasation Guideline for further management.		

References



1. Clohert J., Eichenwald E, Hansen A, Stark A. Manual of intensive care. Lippincott Williams & Wilkins; 2012.
2. Gomella T. Neonatology: management, procedures, on-call problems, diseases and drugs. McGraw-Hill Education; 2013.
3. Rennie J, Kendall G. A manual of neonatal intensive care. CRC Press; 2013.

Related policies

MP 0038/16 [Insertion and Management of Peripheral Intravenous Cannulae in Western Australian Healthcare Facilities](#)

Related WNHS policies, procedures and guidelines

[Infection Control Manual - Aseptic Technique](#)
[Neonatology Clinical Guidelines - Extravasation Injuries](#)

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