Peripheral Intravenous (PIV) Cannulation and Taping in NICU

Procedure Responsibilities and Authorisation

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Target Audience	NICU staff

Procedure Review History

Version	Updated by	Date Updated	Description of Changes
1	Leanne Baker	Jan 2017	New procedure
2	Leanne Baker	January 2023	General update, new photos.

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Peripheral Intravenous (PIV) Cannulation and Taping in NICU

1 Overview

1.1 Purpose

Peripheral intravenous (PIV) catheters are inserted into peripheral veins to provide access for administration of fluids, medications and blood products.

Blood may also be collected from the newly inserted cannula prior to the commencement of other fluids and sent to the laboratory for diagnostic testing i.e. blood cultures, U & E's and CBC.

1.2 Scope

Te Whatu Ora staff working in Newborn Intensive Care (NICU).

1.3 Patient / client group

Infants admitted to the neonatal Intensive care unit.

1.4 Exceptions / contraindications

Infants with limb or peripheral anomalies or compromised clotting capability must be reviewed by an SMO prior to insertion of PIV access.

1.5 Definitions and acronyms

CBC	Complete Blood Count
CGA	Corrected gestational age
NICU	Newborn Intensive Care Unit
PIV	Peripheral intravenous cannula
RN	Registered Nurse
SMO	Senior Medical Officer
U&E	Urea & Electrolytes

2 Clinical Management

2.1 Roles and Responsibilities

All RN Staff
Safe assessment and management of the insitu PIV – including taping, administration of fluid and medication and removal of IV luers when no longer required.

Clinicians
Safe insertion and securing of the PIV in neonates

2.2 Competency required

Generic Te Whatu Ora Waikato IV medicine management certification and orientation to NICU specific PIV cannulation guideline and practice.

2.3 Equipment

- Sucrose for analgesia as per guideline Sucrose Oral Liquid for Analgesia in Neonates and Infants Ref 2905
- Cleaned trolley with sterile guard
- Sterile gloves
- Sterile gauze pack and Prep-pads (chlorhexidine 2% and alcohol 70%)
- Sterile sodium chloride 0.9% – 10ml ampoule
- 3ml luer lock syringe x1 (extra syringe x1 if cultures/bloods required during insertion)
- 1ml slip lock syringe x1
- Drawing up needle x1 (extra x1 if cultures/bloods required during insertion)
- Blood culture bottle and correct lab tubes as required e.g CBC, blood chemistry etc.
- Short IV extension set
- BD 24g 14mm **or** 19mm Insyte IV cannula x2. (NB: The 14mm "Instaflash" cannula will give a flashback along the cannula and into the hub. The longer 19mm cannula will only flashback into the hub. The 19mm cannula may be better for larger babies with more mature skin)
- Coban tape for tourniquet
- Steristrips and Tegaderm IV Advanced 1680/1682 all-in-one dressing or alternatively Tegaderm/Opsite dressing.
- White Tensoplast tape
- Baby board splint of appropriate size
- Green IV insertion record sticker

3 Procedure

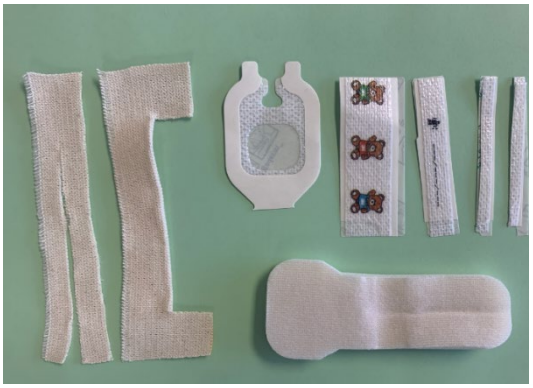
2.4 General considerations

- Identify the ongoing need for IV therapy prior to replacing or inserting cannula
- Use distal peripheral veins first to maximise available proximal vein sites for future use.
- Select a vein that is relatively straight in an area that has not been infiltrated or bruised previously
- Use comfort measures such as swaddling, breastfeeding, non-nutritive sucking, and sucrose for babies for CGA ≥26 weeks

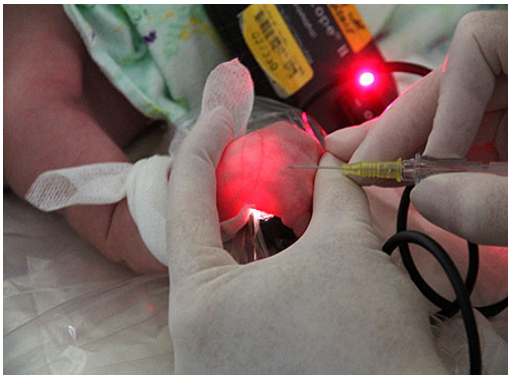
- Protect infant's eyes from procedure lights
- For further information on site selection and PIV use refer to Lippincott paediatric PIV guidelines at http://procedures.lww.com/lnp/view.do?pId=729269

2.5 Insertion of cannula

1. Perform hand hygiene and explain procedure to parents
2. Identify suitable insertion site – avoid scalp and areas that may be used for central access at a later time
3. Open sterile guard onto clean trolley and assemble equipment.



4. Draw up sodium chloride 0.9% into both syringes and prime short extension set
5. Consider giving sucrose for babies for CGA ≥26 weeks swaddle and apply comfort measures
6. Perform hand hygiene and apply sterile gloves
7. Place tourniquet if required, stabilise the vein above and below and pull skin taut – Ensure good light is available – use the mobile procedure light if needed, the Wee-sight transilluminator or the Astodia cold light may be helpful to visualise veins in infants with difficult to locate veins.

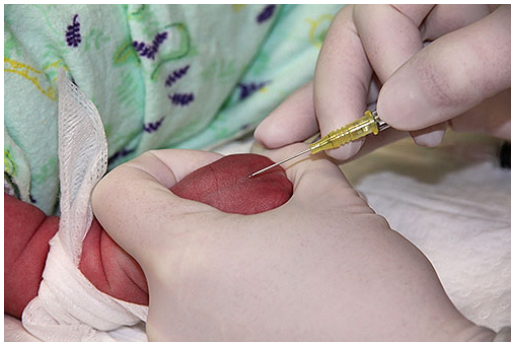


Transillumination of peripheral veins on the hand

8. Clean skin with prep pad – allow to dry

9. Hold cannula at the side with the bevel up and loosen the cannula on the needle prior to insertion

10. Insert the cannula into the vein at a 10° angle and advance until blood flashback appears then advance slightly further. Gently push cannula off stylet and thread into vein up to the hub if possible – assess for blood flashback

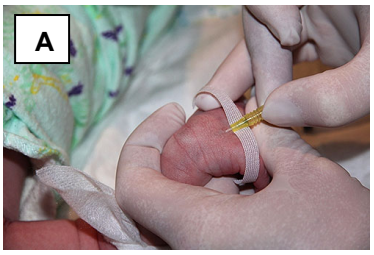


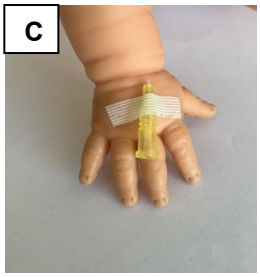
- *In some cases there may be little or no flashback – cautiously advance and flush as the cannula still may be within the vein.*
- *For **all** cannulation attempts - maximum 2 attempts allowed – then you must seek help. (If venous access is known to be difficult consider leaving for registrar/NNP/CNS/SMO)*

11. If blood sample required, use the second sterile 3 ml syringe and needle to aspirate blood from hub at this point. Blood cultures should be collected in the first draw syringe with subsequent samples collected in a second syringe.

12. While holding cannula secure attach 1ml slip lock syringe - flush sodium chloride 0.9% into vein to verify correct placement of the cannula – watch for blanching or swelling of skin adjacent to tip site

13. If using a steristrip to secure the cannula use a small steristrip **across the cannula hub (C)** or a **steristrip chevron (A & B)** prior to attaching IV primed extension and confirming patency with a small flush.





If using steristrip to secure the hub prior to attaching extension set, start with strip from the underside coming up and around the cannula in the chevron technique.

If cannula insertion is not successful a new cannula must be used for each attempt.

2.6 Recommended taping technique for PIV

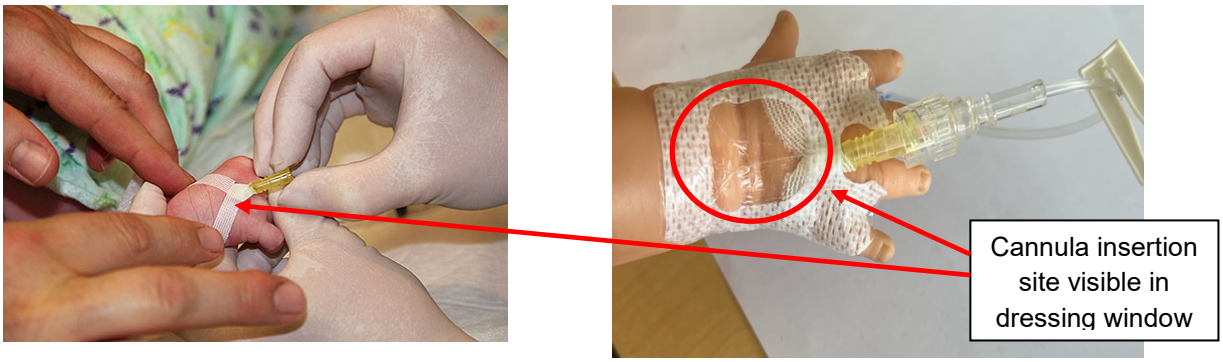
Taping of IV cannula: There may be some clinician variation in the method of taping the IV cannula and splint however practice must adhere to the following principles:

- must be done in a manner which prevents accidental dislodgement,
- minimises damage to skin integrity
- protects from infection
- maintains comfort for the baby
- facilitates easy and safe removal of the cannula.
- Use of steristrips is not recommended practice – use only if increased risk of dislodgement prior to or during taping e.g very active baby

2.6.1 Procedure for taping

1. Cover insertion site and steristrip/s with Tegaderm IV Advanced 1680/1682 **– ensure cannula insertion site is visible in dressing window prior to adhering to skin.**

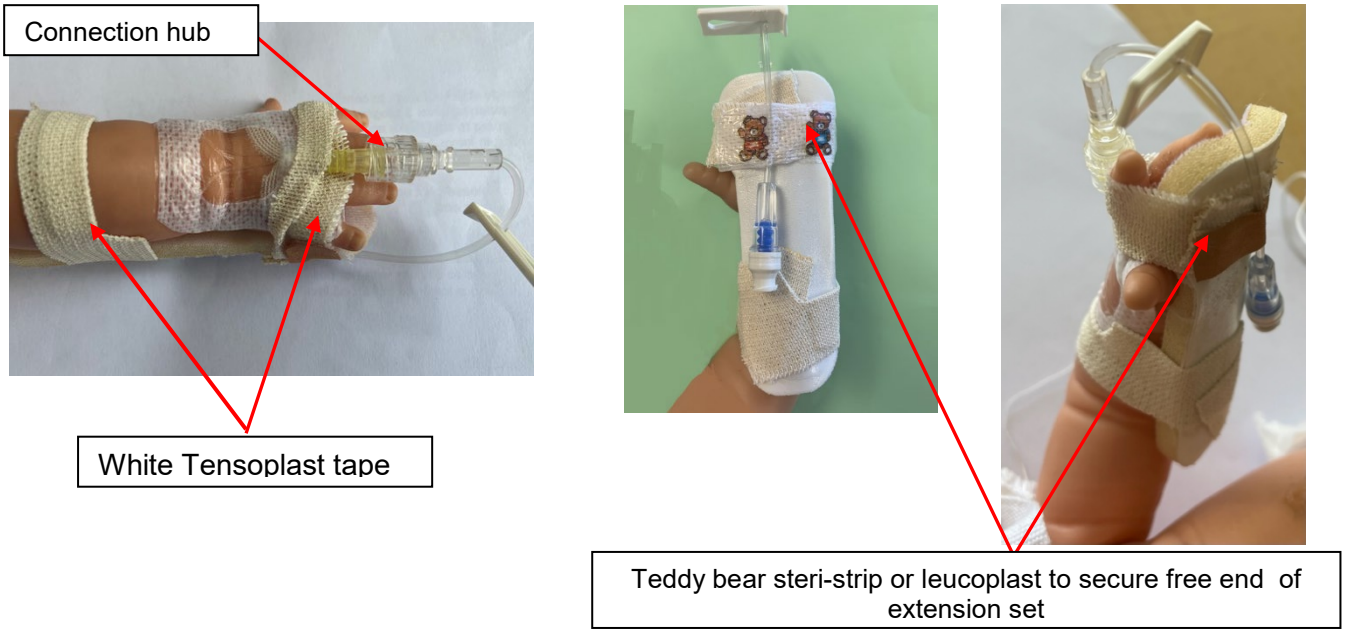
   Use steristrips with caution in the extremely preterm baby – until the skin is keratinised at 3-4 weeks



3. Attach the splint and secure in a developmentally and anatomically appropriate position with white Tensoplast tape – monitor nail beds to ensure adequate peripheral circulation
   ** Blue silicone tape or white non-adhesive Handy gauze may be used to secure the splint in extremely preterm infants (refer Appendix A)*

- Ensure plastic rim of luer lock connection is not causing pressure directly on baby's skin - use sterile gauze or tape under hub to protect skin from pressure if required.
- Ensure thumb is free and fingers and toes are fully visible.
- Use minimal taping to ensure security – i.e. ELBW babies will require an extra small splint (or folded gauze fashioned splint) and minimal adhesive on the skin while a large term baby will require more robust taping.

- Ensure the extension tubing is secured to the underside of the splint so the line does not pull/swing directly on the connection hub – use teddy bear steri-strip in dressing pack or brown leucoplast.



4. Dispose of all sharps and other rubbish in the appropriate receptacles and reposition the baby comfortably.

5. Document insertion site and date on the observation sheet and using the green IV insertion sticker in the clinical notes.

2.7 Removal of IV cannula

When IV therapy is discontinued or the luer is clearly blocked, the luer must be removed at the earliest convenience to minimise potential risks (refer below) If the PIV has signs of extravasation injury please refer to Extravasation Injury in NICU guideline Ref 1559.

2. Clamp fluid infusions

2. Use adhesive remover wipes to loosen tapes if necessary

4. Gently remove the transparent dressing by pulling the dressing edges back toward the insertion site to avoid stripping or tearing the skin –

Do not use scissors to remove tapes.

5) Hold the gauze pad over the puncture site with one hand, and use your other hand to withdraw the catheter slowly and smoothly.

6. Apply pressure to the puncture site until bleeding stops - assess the site junction for signs of infection or phlebitis – document and report if necessary

7. Dispose of rubbish in appropriate containers

8. Leave uncovered and observe for bleeding for 1 hour post removal.

2.8 Potential Complications:

- Phlebitis (Appendix C – Visual Infusion Phlebitis score)
- Infection – local and systemic
- Bleeding if disconnected
- Extravasation – +/- blistering, swelling, tissue necrosis
- Haematoma
- Thrombus
- Air embolus
- Accidental arterial cannulation

3 Evidence Base

3.1 References

- Lippincott – Retrieved March 2023 from: https://procedures.lww.com/lnp/view.do?pId=729269&hits=pediatric,iv,intravenous,pediatrics,intravascular&a=false&ad=false&q=paediatric%20IV
- Safer Care Victoria (Australia) Peripheral intravenous (IV) catheter insertion for neonates https://www.safercare.vic.gov.au/clinical-guidance/neonatal/peripheral-intravenous-iv-catheter-insertion-for-neonates Last updated 02 February 2023
- Newborn Services Clinical Guideline https://starship.org.nz/guidelines/intravenous-cannulation-in-neonates 20 May 2021
- Retrieved from https://www.piernetwork.org/uploads/4/7/8/1/47810883/care_of_a_pvl_guideline_dec_2019_final.pdf. pdf 02/03/2023

Appendix A – Alternative Taping Options for Skin Protection

HandyGauze Cohesive tape

Handygauze Cohesive is a white, non-slip cohesive bandage for securing dressings. It is low-bulk and sticks only to itself, not to skin, hair or clothing. Handygauze Cohesive is air permeable, making it cool and comfortable to wear. It can be cut from the roll to any length, making it highly cost-effective. Available in both a 4m and 20m roll format, Handygauze Cohesive is an extremely versatile dressing option.

3M Kind Removal Silicone Tape

3M Kind Removal Silicone Tape provides reliable securement, kind removal, and gentle wear without compromise. The unique silicone adhesive is repositionable and does not stick to gloves or to itself.

Ideal for patients with at-risk skin or sensitive skin.

Appendix B – Application and Removal of Tegaderm

See attached product information sheet

Nexcare™ PRODUCTS

How To Apply and Remove Nexcare™ Tegaderm™ Waterproof Transparent Dressing

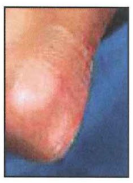
Site Inspection

Check your wound, incision or IV site daily without removing the transparent dressing. Call your health care provider if you notice any of the following signs of infection:

- Fever
- Pain
- Redness
- Swelling
- Itching, burning or rash

What Is A Tegaderm™ Dressing?

A thin, clear dressing that keeps out water, dirt and germs, yet lets the skin breathe. It is designed to be applied directly over clean skin or wounds, and to stay on until new skin covers the wound surface, or up to seven days.



Applying Tegaderm™ Dressings

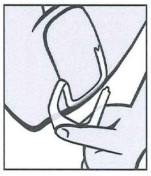
Wash your hands. Clean and dry wound and surrounding skin thoroughly. Make sure the skin is free of soap residue or lotion.

Allow any prep liquids to dry completely before applying your dressing.

Peel away the printed liner from the paper-framed dressing, exposing the adhesive surface.

Apply dressing over your wound. Do not stretch the dressing when applying.

Remove the paper frame from the dressing while smoothing down the edges.



3M

Nexcare™ PRODUCTS

Removing The Tegaderm™ Dressing

Stretch Method

- Grasp one edge or catch a "corner" of the Tegaderm™ Dressing with a piece of tape.
- Gently lift edge.
- With other hand, place fingers on top of dressing to support skin.
- Gently stretch the Tegaderm™ Dressing straight out and parallel to skin. This will release the adhesion of the dressing. As Tegaderm™ Dressing is loosened, you may either (1) alternatively stretch and relax the dressing or (2) "walk" your fingers under the dressing to continue stretching it. With both approaches, one hand continually supports the skin adhered to the dressing. Remember to stretch the dressing straight out, rather than pulling it up from the skin.

Tape Method

- To aid in lifting a dressing edge, secure a piece of tape to one corner and rub firmly. Use the tape as a tab to help slowly peel back the dressing.
- Support and stabilize the skin next to the Tegaderm™ Dressing while removing.
- Slowly peel the dressing back over itself, "low and slow," in direction of hair growth.

As the dressing is removed, continue moving finger as necessary, supporting newly exposed skin.

3M

Appendix C – Visual Infusion Phlebitis Score

3.7 Fig 1: Visual Infusion Phlebitis score (adapted from Jackson, 1998)

V.I.P. SCORE		
I.V. Site appears healthy	**0**	No signs of phlebitis
ONE of the following is evident; Slight pain near IV site or slight redness near IV site.	**1**	Possible first signs of phlebitis … Observe cannula
TWO of the following are evident; Pain near IV site, erythema, Swelling.	**2**	Early signs of phlebitis …Observe cannula
ALL of the following are evident Pain along the path of the cannula, Erythema, Induration.	**3**	Medium stages of phlebitis …Resite cannula
All of the following are evident and extensive. Pain along the path of the cannula, erythema, Induration, Palpable venous cord.	**4**	Advanced stages of phlebitis …Resite cannula, consider treatment
All of the following are evident and extensive; Pain along the path of the cannula, erythema, Induration, Palpable venous cord, Pyrexia.	**5**	Advanced stages of thrombophlebitis …Initiate treaterment …Resite cannula.