

## Inserting and Managing Peripheral Vascular devices

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### Key Amendments

Date	Amendment	Approved by
19 <sup>th</sup> Nov 2020	Document extended for 1 year	Dr J West/Paediatric QIM
26 <sup>th</sup> March 2021	Approved with no amendments	Paediatric QIM
9 <sup>th</sup> February 2024	Addition of PVD record	Paediatric Guideline review day
	Second person to assist – Play Specialist – distraction / Nurse / HCA	

## Introduction & Competencies required

### Introduction

To facilitate holistic and timely treatment for patients, nurses increasingly need to develop their competence in inserting peripheral intravenous cannulae. For nurses working with children and young people this is usually regarded as an expanded role (RCN 2005).

It is expected that all staff performing peripheral cannulation should follow this policy when working within the Worcestershire Acute NHS Trust.

In order to do this safely the practitioner must have a basic knowledge of the following:

1. The relevant anatomy and physiology of the suitable sites for peripheral cannulation.
2. The criteria for choosing both the vein/site and device to use.
3. The potential problems which may be encountered, how to prevent them and necessary interventions.
4. The health and safety/risk management of the procedure, as well as the correct disposal of equipment (refer to Needlestick Policy).
5. The practitioner should also demonstrate correct usage of all equipment used for peripheral cannulation.

The circulatory system is a closed sterile system and peripheral cannulation, is a breach of this system providing a method of entry for bacteria. Aseptic principles must therefore be adhered to throughout the procedure.

The practitioner must be aware of the physical and psychological comfort of the child and to appreciate the value of adequate explanation and procedures to reduce anxiety and fear.

### Competencies required

The Royal College of Nursing (2005) advise that there are considerable differences between children of varying ages, and they recommend that practitioners develop competence within specific age bands according to their area of practice. They describe the age band as 0 to 1 years, 1 to 5 years and 5 years and above. Advice should be sought from senior colleagues before performing the skill on pre term infants pre 34 weeks

Non medical practitioners undertaking the skill of peripheral cannulation should complete the following

1. Theory relating to peripheral cannulation via a course recognised by the trust  
And
2. Minimum of 5 supervised successful cannulations  
Or
3. Minimum of 1 supervised successful cannulation per age range if evidence of previous competency can be shown.

NOTE: If the practitioner intends to achieve competency across the three age ranges then they must evidence a minimum of 10 successful cannulations with a minimum of one from each age range

It is expected that medically qualified practitioners will have achieved and developed the requisite knowledge and skill of cannulation of paediatrics patients as part of their core medical training and development.

### **Reducing Anxiety Pain & Discomfort**

Willcock et al (2004) explains that an important role of the children's nurse is to help children cope with procedures and reduce any adverse effects and distressed caused. They explain that these children may need their parents and the health care professionals help to cope by providing distraction and comfort, as well as topical pain relief.

Prior to cannulation the practitioner should:

- Assess the child or young persons perception of pain
- Create a safe, comfortable, calm and child focused environment
- Be empathetic rather than directive
- Consider the use of play and distraction techniques
- Consider using play specialist and psychologist to prepare child for procedure
- Consider the use of local anaesthetic preparations as prescribed e.g. Emla cream, tetracaine (Ametop) gel or ethyl chloride spray

### **Equipment list**

- Plastic tray and sharps bin
- Chlorhexidine 2% in 70% Alcohol (Chloroprep)
- Sodium chloride 0.9% flush and appropriate sized syringe
- Appropriate size cannula
- Gauze swab
- Appropriate IV dressing
- Tourniquet if indicated
- Eye protection if indicated
- Non-sterile surgical gloves (*Gloves **must** be worn when carrying out cannulation procedures*)

### **Site selection & Veins to avoid**

#### **Site selection**

**It is important to make a full assessment of the patient and their veins before the vein and the device are chosen.**

**INSERTION OF AN INTRAVENOUS CANNULA SHOULD ONLY BE CONSIDERED IF THERE IS A CLEAR INDICATION FOR ITS USE**

When selecting a vein for **cannulation** there are a number of factors, which should be taken into consideration

- Insertion site
- Condition of the vein
- Purpose of the infusion (rate and solution to be infused)
- Duration of therapy – over 7 days consider a long line or central access device, if applicable

The sites of choice *See chart below*

SITE	AGE	VEINS USED
Antecubital	All Ages	Cephalic, Basilic, Median
Foot	Infant, Toddler	Saphenous, Median, Marginal, Dorsal Arch
Hand	All Ages	Metacarpal, Dorsal Venous Arch, Tributaries of Cephalic and Basilic
Forearm	All Ages	Cephalic, Basilic, Median, Antebrachial
Scalp	Infant, Toddler	Superficial temporal, Frontal, Occipital, Postauricular, Supraorbital, Posterior Facial

(Modified from Wheeler & Frey 1995)

Preference should be given to a vessel which is unused, easily detected by inspection and or palpation, patent and healthy. These veins feel soft, bouncy and will refill when depressed. They should be straight and free of valves to ensure easy advancement of the cannula into the vein. Valves can be felt as small bumps in the vein or may be visualised at bifurcations (Mallet & Bailey 1999).

The **median cubital vein** of the antecubital fossa is often used, however this should be avoided wherever possible due to it being in an area of flexion and it's close proximity to arteries and nerves. In emergency situations, it is acceptable practice to use these veins.

The Metacarpal veins are accessible, easily visualised and palpated and are well suited to short term or outpatient IV therapy.

### Veins to avoid

Visual inspection will enable the practitioner to avoid areas of phlebitis, infection or oedema, bruised or inflamed veins, or any veins which have undergone multiple punctures. If previous phlebotic or infiltrated areas are used for cannulation, accurate site assessments cannot be performed. Also if damaged veins are used, greater injury to the skin and vein will occur (Perucca 1995) See appendix 1 for Detection and Management Scale for Peripheral Phlebitis.

Using veins which are tender, sclerosed, thrombosed, fibrosed or hard is unacceptable and can result in pain and undue stress (Weinstein 1993)

It is important to note that veins should not be re-cannulated at a point lower than a recently used site in the same vein. Healing will be adversely affected if the vein continues to be used for infusion. Problems relating to phlebitis, thrombophlebitis and infection could be exacerbated for the same reason (Finlay 2004)

### Cannulation procedure

1. Prepare all equipment needed to cannulate the patient.
2. Have someone available to distract and / or hold the CYP such as a play specialist or another nurse / HCA

3. Check patient identification (using identification band) and explain the procedure to the patient and/or legal parent/guardian as indicated and gain verbal consent. Ascertain any previous problems that the patient may have had and any allergies. Allow for time to answer questions and discuss problems which may have previously arisen.
4. Use alcohol gel or Wash and dry hands and put on non-sterile gloves.
5. Depending on the age of the child create adequate venous filling by gently using manual application or by applying a tourniquet 5-10cms above the cannulation site. The manual application or tourniquet should be tight enough to obstruct venous return but not arterial flow (you should still be able to feel a pulse).
  - a) Avoid limbs with compromised circulation
  - b) Avoid veins that have had recent venepunctures
  - c) Avoid joint areas
  - d) Avoid access near long term indwelling devices
6. If necessary, encourage venous filling by tapping the vein lightly, gently opening and closing the fist (if using arm), lowering the extremity below heart level, applying a warm compress or immersing the limb in warm water.
7. Clean the selected skin site with Chlorhexidine 2% in 70% Alcohol (Chloroprep). The prepared skin area should be 4 to 5 cms and the solution applied in a an up and down and side to side motion. The skin should be cleaned for 30 seconds to 1 minute (Weinstein 1993). The area should be allowed to air dry for a minimum of 30 seconds. Fanning, blowing or blotting of the prepared area is contraindicated (Dougherty & Lamb1999). Do not re-palpate the vein or touch the skin.
8. Remove the device from the packaging and inspect for any faults.
9. Anchor the vein by applying manual traction on the skin a few centimetres below the proposed insertion site with your non-dominant hand.
10. Using your dominant hand insert the IV device, bevel side uppermost, into the skin at an angle of 15 to 40° (dependent on the depth of the vein).
11. Entry of the needle tip into the vein is indicated by the presence of blood in the cannula flashback chamber.
12. Level the device by decreasing the angle between the cannula and the skin and advance the cannula a further 2 mm into the vein. This ensures that both the stylet and cannula have entered the vein.
13. Either hold the stylet stationary while advancing the cannula off the stylet OR withdraw the stylet slightly so that the stylet is within the cannula but still accessing the vein, observe for secondary flashback and slowly advance cannula and stylet as one into the vein.
14. Release the tourniquet or manual pressure, apply pressure to the vein above the cannula tip (to avoid blood spillage) and remove stylet completely.
15. Dispose of the stylet immediately into an approved sharps container at point of use.

16. Attach the obturator cap, administration set or an appropriate primed extension set such as a Vygon Octopus with Bionector.
17. Secure the cannula with a sterile, transparent, waterproof dressing such as Smith & Nephew IV 3000/tegaderm dressing as indicated.
18. Flush the cannula with 0.5 to 5 mls of sodium chloride 0.9%, using a push-pause method (see flushing the cannula) to check patency, observing the site for signs of swelling or leakage. Assess the patient for any pain or discomfort.
19. Document on the PVD Record form who inserted the cannula, the type and gauge of the cannula, site used and the reason for the cannulation. Date of removal of the device must also be recorded in the clinical record. Ensure prescription for intravenous normal saline 0.9% is completed.
20. Practitioners should only make two attempts at cannulation. If both attempts fail the procedure should be referred to a more experienced colleague. Cannula are single use only and a new cannula should be used for each attempt.

### Care of cannula

- When a cannula is inserted within the Trust, it is the responsibility of the person inserting the cannula to document its insertion.
- Management and aftercare of a peripheral vascular access device following insertion is the responsibility of all who care for the cannula.
- Site should be inspected for signs of phlebitis, inflammation or infiltration hourly and before and after intermittent injection of drugs. *See appendix 1 for Detection and Management Scale for Peripheral Phlebitis* If the cannula is still required it should be removed and re-sited if the phlebitis score is stage 1 or above. The phlebitis score (see appendix 2) will be documented at least daily.
- Remove and change dressing carefully, if wet or soiled using aseptic technique.
- When handling equipment and associated apparatus always use aseptic technique and wear procedure gloves to avoid contamination.
- Cannula should be removed and resited (if still required) at 72 hours regardless of any sign of phlebitis. In paediatric patients cannula can remain in place for longer than 72 hours but only in exceptional circumstances.
- Administration sets should be changed every 12 hours for colloid and blood products, every 24 hours for IV drug infusions/feeding and every 72 hours for clear fluids. If at any time an administration set is disconnected it must be discarded and a new set attached.
- All connections should be checked for tightness and the port cap should be kept closed at all times. Do not over tighten connections.
- Flush the cannula with 0.5 to 5 mls 0.9% sodium chloride 0.9% 8 hourly if not actively being used and prior to and following intermittent administration of IV therapy.

### Complications and Prevention

#### Haematoma:

- To avoid insertion related haematoma ensure adequate venous filling and plan procedure carefully.

- To prevent withdrawal haematoma apply digital pressure to the puncture site for 3 to 4 minutes after removal of cannula.

#### **Infiltration:**

- Avoid areas of flexion wherever possible.
- Use flexible plastic cannula and ensure good fixation of cannula.

#### **Thromboembolism:**

- Use the smallest cannulae necessary for the task in the most distal vein thought suitable by the practitioner.
- If an infusion stops as a result of clot formation the cannula should be re-sited.
- Flushing the cannula to dislodge a clot should not be attempted

#### **Air Embolism:**

- Ensure all devices attached to cannula are primed and all air removed.
- Ensure infusions are discontinued before bag or bottle completely empty.
- Ensure all luer lock fittings are hand tight

#### **Phlebitis and septicaemia:**

- Use aseptic techniques.
- Choose smallest gauge cannula for prescribed treatment.
- Ensure good secure fixation of all connections.
- Dilute and administer irritant drugs as prescribed.

#### **Extravasation:**

- Check patency prior to administration of vesicant drugs, using 0.9% Normal Saline and ensure frequent monitoring.
- Avoid using cannula that are sited at points of flexion.
- Preference should be given to use of plastic cannula.
- Administer drugs in accordance to drug advice sheet, BNF or Pharmacy.
- Wherever possible use cannula that were inserted successfully at first attempt and give vesicants first check if there is relevant policy for extravasation in children

#### **Removal of Cannula**

- Wash and dry hands apply non sterile procedure gloves
- Remove dressings whilst holding the cannula securely in place (**Do not use scissors**)
- Hold a piece of dry sterile gauze over insertion site but do not apply digital pressure until cannula removed
- Apply pressure for 2 to 3 minutes or until bleeding has stopped. Elevate arm if bleeding persists.
- Apply fresh sterile gauze and secure with tape
- Check cannula to ensure catheter complete and undamaged

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Worcestershire Acute Hospital NHS Trust (2005) *Policy for Consent to Examination or Treatment*

## Appendix 1: Peripheral Vascular Devices Record Sheet

Detection and Management Scale for Peripheral Phlebitis			
Number	Signs	Picture	Action
0	No pain or signs		Continue to observe
1	Pain / redness around insertion site		Remove and replace cannula in a different site. Observe site
2	Pain, redness, swelling Palpable venous cord		Remove and replace cannula in a different site, if still required. Observe Involve medical team to assess for systemic symptoms.
3	Pain, swelling, redness induration, palpable venous cord above 3 cm Presence of pus		Remove cannula, cut tip with sterile scissors and send tip for C+S Take set of blood cultures Involve medical team to assess for systemic symptoms. Therapy to be discussed with microbiology
4	All of the above Presence of tissue damage		As in action 3 plus complete clinical incident form





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<b>3</b>	Date of insertion / / Time of insertion.....	
Insertion Site (please circle all that apply) Left / Right Hand / Wrist / Forearm / Anti Cubital Fossa other (please specify)		
Cannula Size / Gauge (please circle one) 14G 16G 17G 18G 20G 22G 24G 26G Orange Grey White Green Pink Blue Yellow Purple		
Signature of person inserting cannula PLEASE PRINT NAME		
Date/time and person inserting cannula unknown <input type="checkbox"/> (tick box if appropriate)		
Designation (Please circle one option) Doctor /Nurse /Midwife /Paramedic /Theatre /Generic Worker		
<b>+</b>		
DAY	DATE	CANNULA REMOVED YES/NO
1		
2		
3		
Date Cannula removed ...../...../..... REMOVE/REPLACE NO LATER THAN 3 DAYS AFTER INSERTION		
PHLEBITIS SCORE ON REMOVAL OF CANNULA.....		
<b>4</b>	Date of insertion / / Time of insertion.....	
Insertion Site (please circle all that apply) Left / Right Hand / Wrist / Forearm / Anti Cubital Fossa other (please specify)		
Cannula Size / Gauge (please circle one) 14G 16G 17G 18G 20G 22G 24G 26G Orange Grey White Green Pink Blue Yellow Purple		
Signature of person inserting cannula PLEASE PRINT NAME		
Date/time and person inserting cannula unknown <input type="checkbox"/> (tick box if appropriate)		
Designation (Please circle one option) Doctor /Nurse /Midwife /Paramedic /Theatre /Generic Worker		
DAY	DATE	CANNULA REMOVED YES/NO
1		
2		
3		
Date Cannula removed ...../...../..... REMOVE/REPLACE NO LATER THAN 3 DAYS AFTER INSERTION		
PHLEBITIS SCORE ON REMOVAL OF CANNULA.....		
<b>5</b>	Date of insertion / / Time of insertion.....	
Insertion Site (please circle all that apply) Left / Right Hand / Wrist / Forearm / Anti Cubital Fossa other (please specify)		
Cannula Size / Gauge (please circle one) 14G 16G 17G 18G 20G 22G 24G 26G Orange Grey White Green Pink Blue Yellow Purple		
Signature of person inserting cannula PLEASE PRINT NAME		
Date/time and person inserting cannula unknown <input type="checkbox"/> (tick box if appropriate)		
Designation (Please circle one option) Doctor /Nurse /Midwife /Paramedic /Theatre /Generic Worker		
DAY	DATE	CANNULA REMOVED YES/NO
1		
2		
3		