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| GUIDELINE FOR CLINICAL STAFF ON INTRAVENOUS CANNULATION | |
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1.0 Definition

A Peripheral Venous cannula is defined as a hollow plastic tube used for accessing the vascular system (Weinstein 2008). Peripheral Intravenous Cannulation (Access) is used to administer fluids, drugs, blood products and nutrition through the venous route.

Over-the-needle type of cannula is the most commonly used device for peripheral venous access, and is available in various gauge sizes, lengths, and composition and design features. The cannula is mounted on the needle and once the device is pushed off the needle into the vein, the needle is removed (Dougherty and Lister 2015).

1.1 Indications for insertion of a Peripheral Intravenous Cannula

- Administration of IV (Intravenous) Fluids
- Total Parenteral Nutrition
- Blood / Blood Products
- Administration of Intravenous Fluid Therapy
- Administration of Intravenous Drug Therapy - Continuous or
 - Intermittent
- Pre-procedure Venous Access
- Selective pre – operative Venous Access
- Blood Sampling


1.2 Who may insert an Intravenous Cannula?

A peripheral intravenous cannula may be inserted by:

1. A medical practitioner
2. A member of the IV team or Phlebotomy team

1.3 Principles of care of a peripheral IV cannula are:

- To monitor and assess the IV cannula site and surrounding area at least hourly or more frequently as required and document same.
- To apply measures to minimise and/or prevent IV-related complications
- To implement aseptic technique prior to manipulation of IV device and IV system to reduce the associated risk of infection to the child.

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1.4 Guidelines for the Insertion of a Peripheral Intravenous Cannula


- Intravenous Cannulation is an invasive and traumatic procedure and is ordered only for the administration of treatment to the patient.
- Intravenous Cannulation procedure should not be ordered for routine phlebotomy.
- Decision to cannulate or re-cannulate is assessed regularly.
- Intravenous Cannulation is carried out as close to the time of use to reduce the risk of accidental dislodgement and IV related complications.
- Where peripheral venous access is poor and cannulation is difficult, alternative methods of IV access are considered and discussed with the appropriate medical team.
- Patients' veins are assessed to provide the most suitable site for IV cannulation with regard to type and duration of treatment.
- Peripheral IV Cannulation is regarded as a minor surgical procedure and is carried out with a high standard of hand-washing, site preparation and maintenance (Weinstein, S. M 2008). Level 3 Aseptic Non-Touch Technique is used.
- If the site chosen for arterial monitoring is at or near an intravenous cannula site, the IV cannula is removed before arterial placement and resited elsewhere if required.
- For monitoring purposes, IV Cannulae should not be sited in close proximity to each other, and should not be secured under the same IV dressing

1.5 Requesting a Peripheral Intravenous Cannula

1. All IV Cannulae are requested by a doctor and must be charted on the appropriate IV request form with:
 - a) Patient's Name, Healthcare record number and Date of Birth (Addressograph label)
 - b) Date
 - c) Request for IV Cannula
 - d) Doctor's Signature

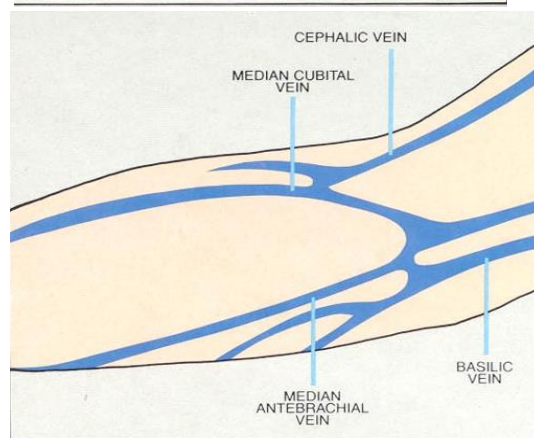
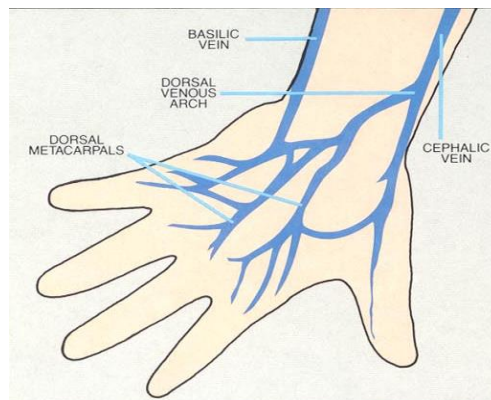
The request for IV Cannula should include reason for cannula, e.g. IV Fluids; IV Antibiotics; Blood Transfusion.


2. If additional cannulae are required, they are requested as 2nd Cannula or 3rd Cannula and a reason given for same e.g. Replacement Fluid, IV Antibiotics, and IV Morphine etc.
3. If IV Fluids have been discontinued for any length of time, and it is found necessary to recommence fluids or commence other treatment via a new cannula, a new request for IV Cannula is required.
4. A Peripheral IV Cannula should not be left in situ following discontinuation of treatment unless specifically indicated in which case it continues to be flushed with saline and monitored for patency.
5. Resiting of Peripheral IV Cannula does not require re-charting when it is a continuation of same treatment.

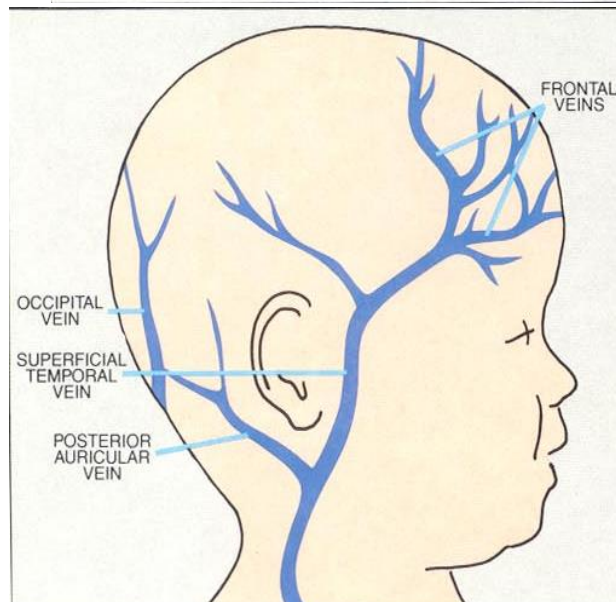
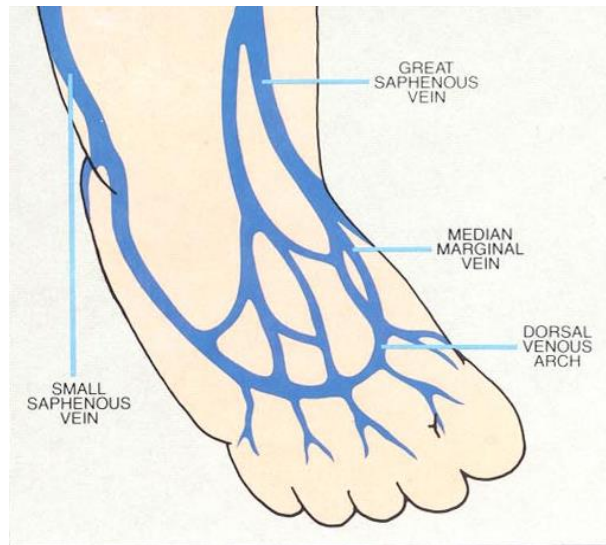
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1.6 Sites for Insertion of Peripheral IV Cannulae

- Metacarpal Veins
- Dorsal Venous Network, including the Cephalic and Basilic Veins.
- (Ante)Cubital Fossa, containing the
 - Median Basilic, Cubital, Cephalic and Antebrachial Veins
- Axillary Basilic Vein
- Dorsal Venous Arch and Venous Plexus of the foot.
 - Long Saphenous Vein
 - Short Saphenous Vein
 - Lateral and Medial Marginal Veins.
- Scalp Veins including:
 - Frontal Veins
 - Superficial Temporal Vein
 - Posterior Auricular Vein
 - Occipital Veins




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2.0 Preparation of the child for insertion of a peripheral IV cannula


- Topical anaesthetic, e.g. Amethocaine 4% W/W (Ametop®), is applied to the proposed cannulation site 45 minutes prior to the procedure to reduce the pain associated with venepuncture. This is applied in accordance with medication guidance.
- The child's peripheries are warm. Avoid attempting cannulation if the peripheries are cold. If so, warm the child prior to the procedure.
- All cannulation procedures are carried out in accordance with the Guidelines for Good Practice (OLCHC 2002).

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2.1 Procedure for Peripheral IV Cannulation-use level 2 ANTT

| EQUIPMENT |
|------------------------------------|
| IV Tray x 2 |
| IV cannula (appropriate size) |
| Skin cleansing swabs |
| 3ml.Syringe |
| Sodium Chloride 0.9% for injection |
| T-connector |
| Needle free system |
| Steristrip 12mm x 2 |
| Elastoplast strapping |
| Tegaderm |
| Clean scissors |
| Non sterile powder free gloves |

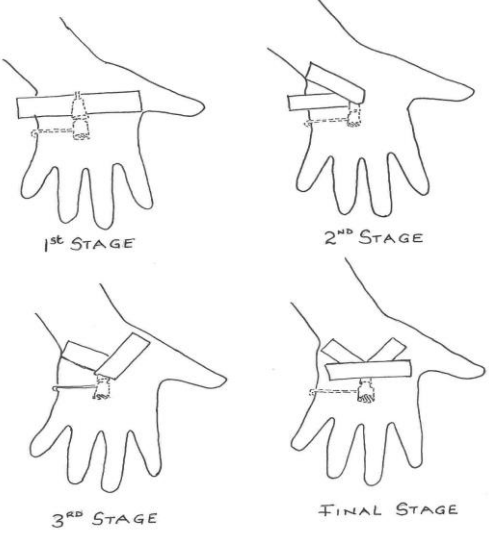
| ACTION | RATIONALE AND REFERENCE |
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| <p>Collect all appropriate equipment Locate patient, check patient identification</p> <p>Explain the procedure to the child and family, relative to the child's age and understanding</p> <p>Correct lighting and ventilation is required for the procedure.</p> <p>Ensure the patient is in a comfortable position and that his/her privacy is maintained.</p> | <p>To allow for full concentration on patient and procedure To minimize the risk of error and to ensure that the procedure is carried out on the correct child (<i>Dougherty and Lister 2015</i>)</p> <p>To obtain patient co-operation and alleviate anxieties. Ensure child/parents understand the procedure (<i>Trigg & Mohammed, 2010</i>)</p> <p>To ensure operator and patient are comfortable and that adequate light is available to illuminate the procedure (<i>Dougherty and Lister 2015</i>).</p> |

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| <p>Establish whether patient has allergy to skin preparation solution and adhesive material.</p> | <p>To prevent skin irritation (<i>Dougherty and Lister 2015</i>)</p> |
| <p>Decontaminate hands.</p> | <p>To prevent cross-infection (<i>OLCHC, 2010a</i>)</p> |
| <p>Select and assemble appropriate equipment prior to procedure</p> | <p>To prevent undue delays during procedure.</p> |
| <p>Attach the Needle free to the T-Connector. Check Sodium Chloride 0.9% for Injection. Prepare a 3ml syringe with saline for priming the Needle free and T-connector.</p> | <p>To check cannula patency Use of a T-connector prevents manipulation of the cannula hub at a future date.</p> |
| <p>Assess venous access and choose appropriate vein</p> | <p>To optimize best site for appropriate treatment. The selection of the vein may be a deciding factor in the success of and preservation of, veins for subsequent treatment. To minimize pain of insertion. (<i>Dougherty and Lister 2015</i>)</p> |
| <p>If excess hair removal is necessary, it is clipped with scissors If the selected extremity is very dirty, it is washed with soap and water before the insertion site is prepared.</p> | <p>Shaving may cause micro- abrasions, which can harbour bacteria (<i>INS 2001</i>)</p> |
| <p>Apply local anaesthetic cream to chosen venepuncture site and leave for allotted time</p> | <p>To prevent infection of the insertion site (<i>INS 2008</i>)</p> |
| <p>Position child in a supine position with the arm at 45⁰, with ability to move arm to a 90⁰ angle</p> | <p>To reduce the pain of the procedure</p> |
| <p>Decontaminate Hands</p> | <p>To aid insertion of introducer and then advancement of catheter. (<i>Dougherty and Lister 2015</i>)</p> |
| <p>Put on sterile gloves Remove cap from the extension set and attach 0.9% sodium chloride, gently flush with 2 ml and leave syringe attached</p> | <p>To minimize risk of infection <i>OLCHC 2010</i></p> |
| <p>Clean the insertion site with:</p> <ul style="list-style-type: none"> • 2% Chlorohexidine & Isopropyl Alcohol 70% if > 2months corrected gestational age. • If < 2months corrected gestational age use 0.05% Chlorohexidine w/v in aqueous solution. | <p>To prevent cross-infection and protect the healthcare worker from blood spillage (<i>INS 2001, OLCHC 2010a</i>)</p> |
| <p>Apply with friction, in a circular motion, from</p> | <p>This rapidly reduces microbial counts on the skin (<i>INS 2008, SARI 2009, OLCHC 2011</i>)</p> |
| | <p>To provide a sterile field. (<i>Dougherty and Lister 2015</i>)</p> |


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| <p>insertion site outwards to a diameter of 5-10 cm.</p> <p>Allow to air dry for 40 seconds.</p> <p>Do not repalpate the site.</p> <p>Reapply tourniquet.</p> <p>Use non-dominant hand to achieve skin traction, above or below the insertion site.</p> <p>Insert cannula through the skin at an angle of 10-30 degrees, with the bevel of the needle in the upward position.</p> <p>As the tip of the cannula enters the vein a flash-back of blood will appear in the chamber of the cannula.</p> <p>Decrease the angle between the cannula and the skin and advance the cannula a further 2mm into the vein.</p> <p>Withdraw the stylet slightly, and advance the cannula gently and fully into the vein.</p> <p>Remove tourniquet.</p> <p>Note: A smooth entry is experienced. Resistance indicates a problem.</p> <p>Apply digital pressure over the cannula tip site and remove stylet.</p> <p>Place alcohol swab under cannula hub</p> <p>Place stylet in second IV Tray/Sharps Box.</p> <p>Do not resheath stylet</p> <p>Attach a needle-free device and flush catheter.</p> | <p>To prevent re-contamination of the site(OLCHC 2010a)</p> <p>To encourage venous distension by obstructing venous return (<i>Dougherty and Lister 2015</i>)</p> <p>To promote stability of vein for ease of cannula insertion (<i>Trigg & Mohammed, 2010</i>)</p> <p>To ensure atraumatic skin entry and reduce pain (<i>Dougherty and Lister 2015</i>)</p> <p>To indicate that the needle has entered the vein (<i>Dougherty and Lister 2015</i>)</p> <p>To prevent puncturing the posterior wall of the vein.</p> <p>To ensure that the cannula tip is located in the lumen of the vein (<i>Dougherty and Lister 2015</i>)</p> <p>To prevent stylet from penetrating wall of the vein.</p> <p>To prevent trauma to venous lining (<i>Dougherty and Lister 2015</i>)</p> <p>To reduce blood flow. To prevent obstruction to arterial flow. (<i>Dougherty and Lister 2015</i>)</p> <p>To prevent back-flow of blood. (<i>Dougherty and Lister 2015</i>)</p> <p>To absorb blood spillage.</p> <p>To minimize damage to the intima of the vein. (<i>Dougherty and Lister 2015</i>)</p> <p>To ensure patency of device.</p> |
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| <p>Secure the catheter with steristrips in the Chevron style</p> <ul style="list-style-type: none"> ➤ Place a full 12mm Steristrip, adhesive side up, under the hub of the cannula. ➤ Fold one end of the strip diagonally over the cannula ➤ Fold the other end of the steri-strip diagonally over the other side of the cannula ➤ Place another strip (not as long as the 1st) across the hub of the cannula. <p><u>Unsterile</u> tape should not be placed over the actual insertion site.</p> <p>Cover with transparent dressing. Apply low-linting gauze under the extension set, then bandage</p> <p>Dispose of equipment appropriately. Wash hands with antiseptic solution.</p> <p>Document procedure in notes.</p> | <p>To anchor the catheter securely to the skin, preventing cannula movement, mechanical irritation or extrinsic contamination of the wound. (Maki 1991, INS 2001, OLCHC 2010a).</p>  <p>To ensure protection of the site. To prevent the tubing pressing into the child's skin. (Dougherty and Lister 2015)</p> <p>To promote safety and prevent cross infection. (OLCHC 2010b , 2010a, SARI 2009,)</p> <p>To allow position of the tip to be assessed. To ensure correct location. (Dougherty and Lister 2015)</p> <p>To prevent cross-infection (OLCHC 2010a)</p> <p>To maintain accurate patient records. (NHO, 2012) To act as referral source for Information. (NMBI, 2016)</p> |
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2.2 Needle Free System

Needle free devices were introduced to reduce the risk of both needle stick injury and transmission of blood borne pathogens to healthcare workers. (Epic 3, 2014). A needle free system is in use in OLCHC. The Needle Free Bung is attached to the hub of the vascular access device, and syringes, giving sets, etc. are connected directly to it. Do not put a cap or obturator on the bung and never use a needle with a Needle Free System. It is possible to withdraw blood through a Needle Free Bung. Needle Free Bungs are changed weekly, or if visibly soiled or damaged. There is evidence to suggest that the use of Needle free bungs may increase the risk of Catheter related infection. It is suggested that manufacturer's instructions for use of the

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needle free system be followed. Excellent hand hygiene technique will reduce the risk of line contamination, **Level 3 Aseptic Non-Touch Technique** should be observed when accessing a Needle free system (See table 1.3).

2.3 Care and Maintenance of a Peripheral intravenous Cannula

Patients receiving continuous Intravenous Therapy i.e. IV Fluids, Drugs, Nutrition, must have their IV site monitored hourly.

- It is recommended that the site be observed within the hour, and during routine patient care.
- The site of the infusion must be observed for inflammation, infiltration, extravasation, infection and leaking or pressure of the cannula on the surrounding tissues. Hourly observation of site is initialed on the IV fluid chart.
- Early detection of complications and intervention will reduce the risk to patient safety.
- IV Therapy should not be disconnected unnecessarily. In the event of disconnection, it important to use level 2 Aseptic Non-Touch Technique when disconnecting the system and reconnecting the system and flush the cannula before recommencing therapy. (See appendix 2)
- Avoid alternating IV sites unless clinically indicated.

IV sites for Intermittent Therapy must be checked:

1. For patency, by flushing with 1ml of Sodium Chloride 0.9%, prior to administration of treatment, between administration of different fluids or medications and post administration of treatment using the 'positive-pressure technique.
2. IV site is examined for signs of inflammation and site is palpated for signs of pressure on surrounding tissue.

Patients with IV cannulae in situ for Access purposes must have their IV sites monitored carefully.


1. To maintain patency, the IV cannula is flushed at least six hourly with 1ml of Sodium Chloride 0.9%.
2. Charting the flush solution in patient's medication sheet serves as a reminder that the cannula is in situ.

Patients with IV cannula in situ for Intermittent Blood Profiles

1. To maintain patency, the IV cannula is flushed with 2.5 mls of 0.9% Sodium Chloride at least 6 hourly if not in use.
2. The IV cannula is flushed after withdrawing blood samples, using the 'positive-pressure method, to keep the cannula patent.

Patient with an IV cannula inserted by Transferring Hospital

1. Assess insertion site for inflammation, infiltration, extravasation, infection and leaking or pressure of the cannula on the surrounding tissues.


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2. Flush the IV cannula on arrival to OLCHC with 1ml of Sodium Chloride 0.9%, if cannula is not patent remove same.
3. Continue care of IV cannula as above

2.4 Guidelines for care of the Peripheral Intravenous site using ANTT level 2

| Equipment |
|--------------------------------|
| IV Tray |
| Tape |
| 2ml syringe |
| 0.9% Sodium Chloride |
| Skin cleansing swabs X 2 |
| Cotton-wool swabs |
| Powder free non-sterile gloves |

| ACTION | RATIONALE AND REFERENCE |
|--|--|
| Decontaminate hands prior to touching IV site and equipment | To prevent cross-infection (<i>OLCHC 2010a, Sari 2009, HSE, 2013</i>) |
| Explain procedure to patient | To gain the patient's co-operation and trust (<i>Trigg and Mohammed, 2010</i>) |
| Apply non-sterile gloves | |
| Palpate IV Site and surrounding tissues. | To check for tenderness and swelling. |
| Use opposite limb as comparison. | To avoid manipulating the cannula hub connection, causing mechanical phlebitis. |
| Disconnect IV tubing from needle free system, clean bung with a cleansing swab and allow to dry for 40 seconds and attach flush syringe. | To determine correct position of the cannula within the lumen of the vein. |
| Flush IV Cannula with 1ml. 0.9% Sodium Chloride. | To monitor the development of phlebitis. |

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| <p>Observe patient's reaction to cannula being flushed.</p> <p>Frequent observations is made of the IV site for erythema, induration, or tenderness or pain Such signs require immediate removal of the cannula.</p> <p>Clean needle free bung with alcohol swab and allow to dry for 40 seconds, then re-connect IV tubing to the needle free system. Re-commence IV Therapy.</p> <p>Document procedure in appropriate patient record.</p> | <p>To detect signs of malfunction of the cannula; infiltration; and phlebitis (<i>Weinstein 2008</i>) Immediate removal prevents further complications to IV site and to the patient</p> <p>To prevent infection (OLCHC 2013)</p> <p>Maintains accountability through accurate recording of nursing intervention (<i>An Bord Altranais 2002, NMBI, 2015</i>)</p> |
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2.5 Removal of a Peripheral Intravenous Cannula

A peripheral intravenous cannula is removed immediately if:


1. Infiltration is evident
2. Signs of phlebitis i.e. erythema, pain, heat are present
3. Contamination is suspected
4. Treatment is discontinued

Antiseptic hand washing technique must be used throughout any procedure involving manipulation of the intravenous system (OLCHC 1998, Maki 1991).

| Equipment |
|--------------------------------|
| Clean IV Tray |
| Powder free non-sterile gloves |
| Adhesive remover spray/swab |
| Cotton wool balls |
| Tape |
| Plaster |

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| <p>Stop IV fluids, if infusing</p> <p>Examine the IV site and surrounding area.</p> <p>Explain procedure to patient</p> <p>Decontaminate hands. Apply non-sterile gloves</p> <p>Remove outer Elastoplast strapping with adhesive remover</p> <p>To prevent accidental damage to the catheter do not use a scissors or other sharp instrument near the catheter</p> <p>Apply cotton-wool ball over IV site</p> <p>Gently remove IV cannula, applying slight pressure as tip is removed.</p> <p>Do not press down on site.</p> <p>Hold cotton-wool ball on IV site for a few minutes.</p> <p>Inspect cannula length and integrity on removal.</p> <p>Inspect IV site for evidence of entry-site for infection/inflammation.</p> <p>Apply plaster to puncture site.</p> <p>Advise patient and/or parents to report any signs of local inflammation to ward staff.</p> <p>Dispose of used equipment appropriately.</p> <p>Remove gloves and wash hands.</p> <p>Document procedure and the condition of the insertion site in the patient's nursing record.</p> | <p>Prevent further complications developing.</p> <p>To assess for evidence of local complication. <i>(Bennett & Brachman 1998)</i></p> <p>To inform patient of impending action and to obtain patient co-operation <i>(Dougherty and Lister 2015)</i></p> <p>To prevent cross-infection <i>(OLCHC 2010a, Sari 2009)</i></p> <p>To protect staff member from blood spillage and bacterial contamination <i>(INS 2008)</i></p> <p>To reduce patient discomfort.</p> <p>Using a sharp implement close to the catheter may result in accidental damage to the catheter or to patient's skin.</p> <p>To prevent haematoma formation</p> <p>To prevent haematoma formation and to stop blood flow.</p> <p>To ensure the device is intact, and to examine device for damage <i>(INS 2008)</i></p> <p>To ascertain current condition of IV site for future reference <i>(Weinstein 2008)</i></p> <p>To reduce risk of infection at the insertion site.</p> <p>To intervene at the earliest onset of inflammation and act promptly to prevent further complications.</p> <p>To prevent cross-infection <i>(OLCHC 2010a, Sari 2009)</i></p> <p>To prevent cross infection <i>(OLCHC 2010a, Sari 2009)</i></p> <p>Maintains accountability through accurate recording of nursing intervention. <i>(An Bord Altranais 2002, NMBI 2016)</i></p> |

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2.6 Guidelines for re-siting of a Peripheral IV cannula

In Children under 1 year, the peripheral cannula is checked on day 3 post insertion for signs of infiltration, phlebitis and other IV related complications. Following the 3 day (72 hour) check the cannula is checked daily until day 7 post insertion for signs of infiltration or phlebitis. The cannula is electively re-sited on day 7 unless there is a clinical indication not to. This is documented in the patient healthcare record.

In children over 1 year, the peripheral IV cannula is left in situ until the course of treatment concludes, unless signs of infiltration, phlebitis or other IV related complications arise.

Elective resiting of a peripheral intravenous cannula is performed in certain cases:

- a) Child who is neutropenic or immune compromised – **every 72 hours**
- b) Child with a cardiac condition and Sub-acute Bacterial Endocarditis – **every 72 hours**
- c) Child receiving Total Parenteral Nutrition – **every 48 hours**

2.7 Points to note when sending a child home with a Peripheral Cannula


From time to time children are sent home with a peripheral cannula in situ. This decision is made by the multidisciplinary team involved in the child's care. It is essential in this situation that parents are competent in the management of the peripheral cannula.

- The consultant responsible for the child's care must agree that sending a child home with a peripheral cannula is reasonable.
- The parent is educated in the care of the cannula at home.
- The cannula is flushed prior to discharge home.
- The cannula is covered with an appropriate cover, Tubiton, Tubinet and a spare dressing cover is given to the parent.
- A sterile dressing is given to the parent/guardian in the event that the cannula dislodges or falls out.

Advise to parents / guardians:

1. Advise the parent to check the cannula regularly to ensure it remains intact.
2. The needle free bung must not be removed for any reason.

Should the cannula dislodge or fall out a dry sterile dressing (Supplied) is applied to the site to ensure blood loss is minimised. Once bleeding has ceased a plaster can then be applied.

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