

INSERTION OF PERIPHERAL IV LINE

Aims

1. To gain peripheral venous access in order to:
 - administer fluids
 - administer blood products, medications and nutritional components
2. To minimise the risk of complications when initiating IV therapy through:
 - judicious choice of equipment
 - careful choice of IV site
 - good insertion technique
 - aseptic preparation of infusions

Key points

1. Only nurses who have been certified as competent in the insertion of IV cannula will perform this procedure.
2. Where the patient is less than 14 years of age, the IV cannula will be inserted by a medical practitioner. The exception will be in the case of neonates where neonatal trained nurses may insert an IV cannula if directed by a medical officer
3. In the case of two unsuccessful attempts at insertion, the operator will seek the assistance of another experienced nurse for one additional attempt. After a total three unsuccessful attempts the assistance of a medical practitioner will be sought.

Known Complications of IV Therapy¹

Phlebitis

Contributing factors

- Catheter material
- Catheter size
- Site of insertion
- Skill of operator
- Duration of cannula
- Type of infusion
- Rate of infusion
- Dilution of solution
- Frequency of dressing change
- Presence of infection
- Type of skin prep
- Host factors
- Insertion in ED

Infection

Contributing factors

- Contaminated infusions
- Inadequate skin preparation
- Poor technique
- Host factors

Extravasation

Contributing factors

- Age
- Site of cannula
- Type of cannula
- Duration of cannula
- IV drug infusions

Selection of Equipment

Cannula selection

1. Select cannula based on purpose and duration of use, and age of patient.
2. Consider risk of infection and extravasation.
3. Cannulae made from polyurethanes are associated with decreased risk of phlebitis^{2,3}
4. Steel needles have higher risk of extravasation and should be avoided where tissue necrosis is likely if extravasation occurs⁴

Skin prep

Antiseptic solution - 70% isopropyl alcohol, 0.5 - 1% Chlorhexidine⁵

Use an aqueous based alternative if there is a known allergy to alcohol

Other required equipment

Intravenous solution as ordered
Tourniquet
Giving set
IV stand/pole
Infusion pump
Transparent occlusive dressing (e.g. IV 2000[®])⁶
Micropore[®] silk tape or similar to secure cannula
Gloves
Paper bag

Additional equipment which may be required

Syringe (5 mL)
Non bevelled drawing up needle
Needles (21G & 25G)
Sterile sodium chloride 0.9%
Local anaesthetic for use by Medical Officer (e.g. 1% lignocaine)
3-way tap or triflow
Short extension tube

For paediatric patients

Splint and tape (to secure splint)
EMLA[®]*
Burette
Transparent tape for a child less than 12 months of age

Eutetic Mixture of Local Anaesthetic* (EMLA[®])

1. EMLA cream can usually make the insertion of a central or peripheral intravenous cannula or scalp vein needle painless. The use of EMLA however requires planning as the cream must be applied at least one hour and preferably one and a half hours before the proposed procedure⁷. It is therefore suitable for elective procedures but not for emergencies.
2. EMLA will be effective for up to four hours from the time of application, and penetration may continue for 30 minutes after removal.
3. EMLA is not recommended for infants under 3 months of age. Premature infants should be at least 52 weeks post conception before the use of EMLA cream is considered.⁸

Selection of Catheter Site

Choose a suitable vein. In adults, use long straight veins in an upper extremity¹⁰ away from the joints for catheter insertion - in preference to sites on the lower extremities¹¹. If possible avoid veins in the dominant hand and use distal veins first.

Do not insert cannula on the side of mastectomy or AV shunts/Gortex. Transfer catheter inserted in a lower extremity site to an upper extremity site as soon as the latter is available.

In paediatric patients, it is recommended that the cannula be inserted into the scalp, hand, or foot site in preference to a leg, arm, or ante cubital fossa site (Category II)⁹

| PROCEDURE | ADDITIONAL INFORMATION |
|---|--|
| 1. Explain procedure to patient/parent | |
| 2. Wash hands with antiseptic soap. Don gloves | Strict adherence to hand washing and aseptic technique remains the cornerstone of prevention of cannula related infections. ¹² |
| 3. Apply the tourniquet above insertion site | For paediatric patient, an assistant's hand used both as a tourniquet and restraint is often more acceptable to a child than a tourniquet. |

| PROCEDURE | ADDITIONAL INFORMATION |
|---|--|
| 4. Disinfect the selected site with skin prep and allow to dry. | Do not touch the skin with the fingers after preparation solution has been applied. |
| 5. If infiltration of local analgesia is required, inject lignocaine 1% at the proposed site of entry of cannula. | Lignocaine may only be injected by a Medical Officer |
| 6. Inspect the cannula before insertion to ensure that the needle is fully inserted into the plastic cannula and that the cannula tip is not damaged. | Do not touch the shaft or tip of the cannula. |
| 7. Ensure the bevel of the cannula is facing upwards. | Facilitates the piercing of the skin by the bevel. |
| 8. Insert the needle and the cannula into the vein. | Gentle traction on skin may stabilise the vein under the skin |
| 9. Partially withdraw the needle and advance the cannula. | |
| 10. Release the tourniquet | |
| 11. Secure the hub of the cannula with clean adhesive tape. | Do not cover the puncture site. Cut tape immediately prior to use only. |
| 12. Flush the cannula with normal saline | Ensures the line is patent and accessible |
| 13. Cover the intravenous and surrounding area with a sterile transparent dressing. | Ensure that the insertion site and the area proximal to the site are visible for inspection purposes. |
| 14. If infusion ordered, prime the line and connect the intravenous giving set to the cannula | |
| 15. Note the date and time of insertion in the patient's medical record. Record date of line change and secure to IV line | Intravenous lines used for intermittent infusions must be labelled with the patient's name, and the date and time of commencement |
| 14. If the site needs to be immobilised, use a well padded splint and strapping if necessary. | For infants <12 months, a transparent tape must be used. If a bandage is used, apply it at each end of splint so that the central area is lightly covered for easy inspection. Conform bandages to secure the splint are available for paediatric patients if required |
| 15. Dispose of equipment safely | |

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