SOP

Intravenous Cannulation

Department of Medicine

Faculty of Medicine

UWUSL

Standard Operating Procedure (SOP) on Intravenous Cannulation

Title

Intravenous (IV) Cannulation

Issued By

Department of Medicine, Faculty of Medicine, Uva Wellassa University of Sri Lanka

1. Purpose

To ensure safe, aseptic, and accurate insertion of an intravenous (IV) cannula for administration of fluids, medications, and blood products, while minimizing patient discomfort and preventing complications.

2. Scope

This SOP applies to all medical students, nurses, and healthcare staff performing intravenous (IV) cannulation in clinical and teaching settings.

3. Responsibilities

3.1) Medical Officers

1) Supervise the procedure and ensure adherence to the SOP.
2) Manage complications and provide clinical guidance when needed.

3.2) Medical Student

1) Perform IV cannulation under the supervision of a trained professional.
2) Follow aseptic techniques and safety protocols at all times.

3.3) Health Care Staff

1) Perform IV cannulation according to established guidelines.
2) Monitor the IV site and patient for any complications.
3) Maintain proper documentation of the procedure.

3.4) Ward/Clinical Support Staff

1) Assist in preparation of equipment and patient positioning.
2) Ensure proper disposal of sharps and clinical waste.

4. Indications

1) Administration of drugs
2) Administration of intravenous fluids
3) Administration of blood and blood products
4) Administration of intravenous nutritional support

5. Contraindications

1) Injured, infected, swelled or burned extremity
2) Limb with arteriovenous fistula
3) Post-mastectomy arm

6. Procedure

6.1) Assemble Equipment

Before starting the procedure, gather all necessary equipment and place it on a tray or trolley:

Well-fitting, non-sterile gloves

Tourniquet

Alcohol hand rub

70% alcohol swabs
(for skin disinfection)

Local anesthetic solution (Optional)

Cannula dressing

Cannula (size appropriate to the indication for cannulation)

Saline flush

Puncture-resistant sharps container

Cannula Sizes with Indications

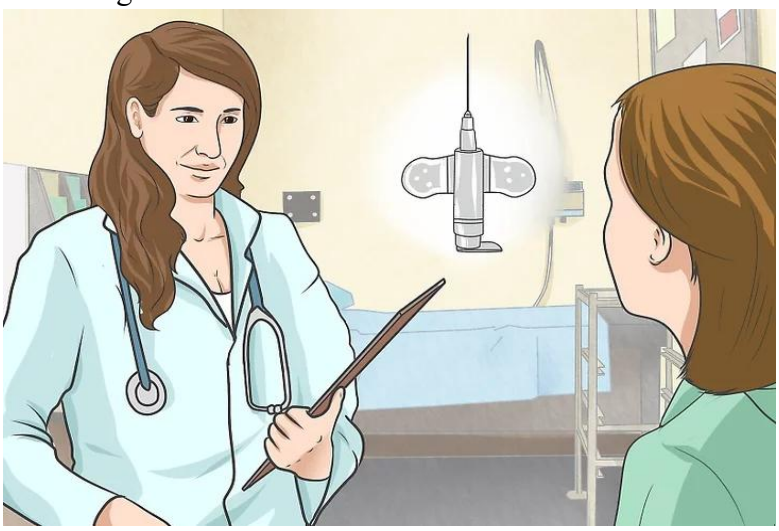
Gauge	Colour Code	Ext.Dia. mm	Length mm	Flow Rate ml/min	Indications
14G	Orange	2.1	45	240	Trauma, surgical procedures
16G	Grey	1.8	45	180	Trauma, surgical procedures
18G	Green	1.3	32/45	90	Trauma, quick blood transfusion
20G	Pink	1.1	32	60	Normal IV or blood transfusion
22G	Blue	0.9	25	36	Children, older adults
24G	Yellow	0.7	19	20	Neonates, children, old elderly
26G	Violet	0.6	19	13	Neonates

6.2) Patient Identification and Request Consent

1. Introduce yourself and confirm the patient's identity using at least two identifiers (e.g., name and date of birth).

2. Explain the IV cannulation procedure clearly, including its purpose and possible discomfort, request consent for the procedure, and check for allergies such as latex or antiseptics.

3. Ensure adequate exposure of the arm while maintaining patient dignity, position the patient comfortably (sitting or supine if prone to fainting), and assess for pain or any risk of vasovagal syncope before proceeding.



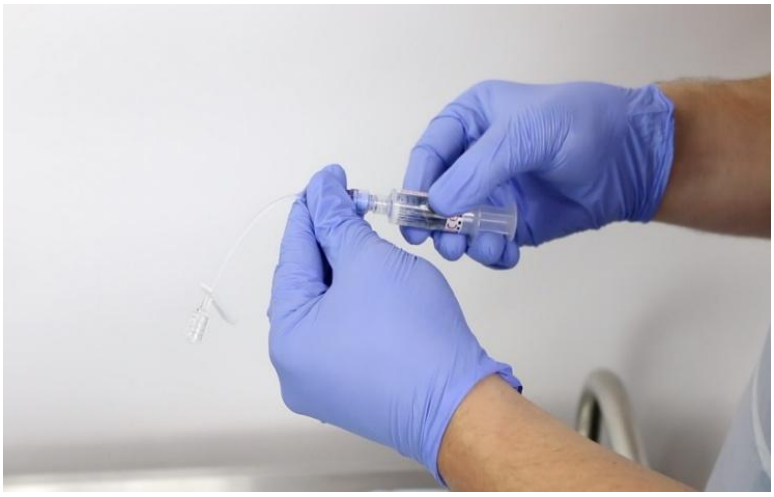
6.3) Patient Preparation

1. Perform hand hygiene using soap and water or an alcohol-based hand rub before the procedure, then wear non-sterile gloves.

2. Open the sterile dressing pack carefully and arrange the cannula, cannula dressing, and all required equipment onto the sterile field in an organized manner to maintain aseptic technique throughout the procedure.

3. Prepare the normal saline flush by drawing sterile saline into a syringe, unless a pre-filled flush is being used.

If an extension set is required, attach it securely to the syringe and prime the line with saline to remove air and ensure patency before use.



4. Selection and Positioning of Cannulation Site

Discuss with the patient and select an appropriate arm, preferably the non-dominant limb, while considering any contraindications such as an arteriovenous fistula, lymphoedema, or other pre-existing conditions.

Support the chosen arm with a pillow to ensure patient comfort and optimal positioning.

Place a protective field or pad beneath the arm to maintain hygiene and prevent blood spillage during the procedure.

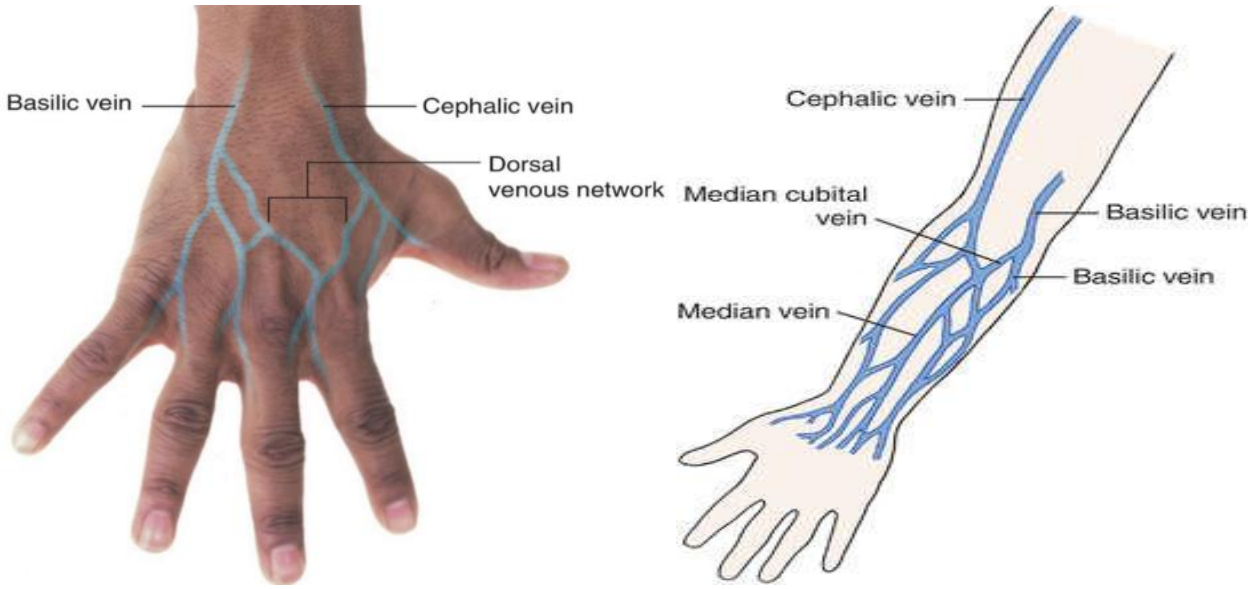
6.4) Site Selection for the insertion of cannula

1. Inspect the patient's arm for an appropriate cannulation site.

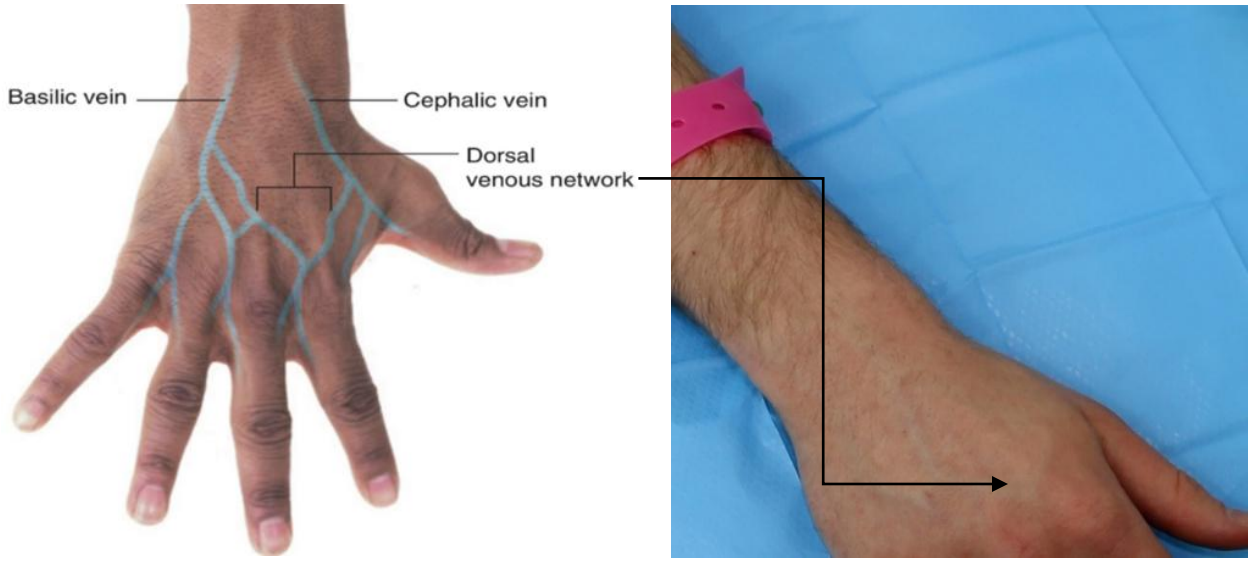
Inspect the patient's arm to identify a suitable cannulation site, preferably a vein on the dorsum of the hand or posterior forearm, as these are less restrictive for movement.

Avoid sites near joints (e.g., wrist and elbow), areas with broken, bruised, or inflamed skin, and regions where veins join, as these may contain valves and increase complication risk.

In emergency situations, any accessible large peripheral vein may be used if an optimal site is not available. Prefer the median cubital vein (easiest and safest).



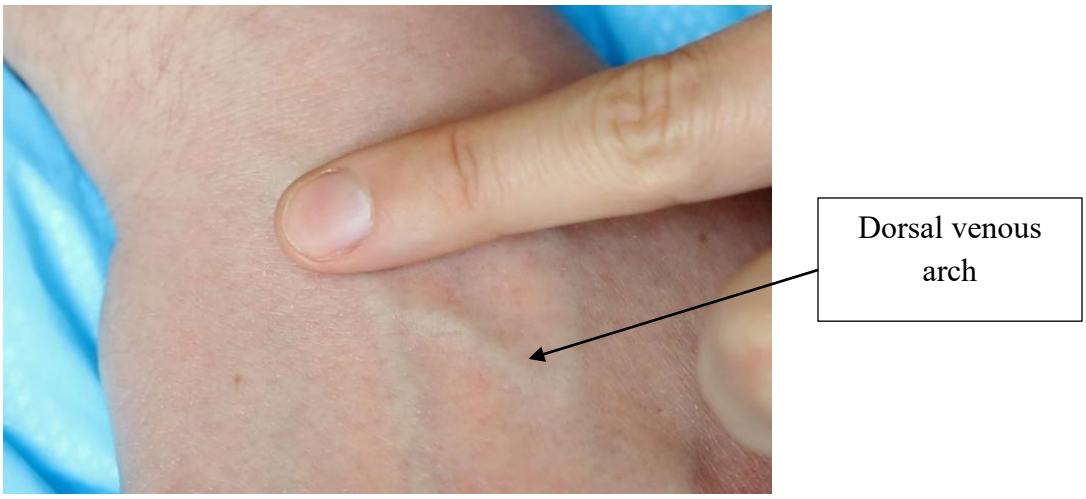
2. Position the patient's arm in a comfortable extended position that provides adequate access to the planned cannulation site and apply the tourniquet approximately 4-5 finger-widths above the planned cannulation site.



3.Palpate the selected vein to determine its suitability for cannulation.

Tapping the area and asking the patient to repeatedly clench and release their fist may help make the vein more visible and easier to feel.

A suitable vein should feel soft and elastic (springy), whereas veins that feel hard, cord-like, or tender may indicate sclerosis, thrombosis, or phlebitis and should be avoided.



4. Once a suitable vein has been identified, the tourniquet should be briefly released if it has been applied for more than 1–2 minutes, as prolonged application can cause venous stasis and affect vein quality.

5. Clean the selected cannulation site using an alcohol swab for at least 30 seconds, starting from the centre and moving outward in a circular motion to cover an area of approximately 5 cm or more.

Allow the area to air dry completely for a further 30 seconds to ensure effective antisepsis.

Do not touch the prepared site after cleaning. If the area is contaminated, the cleaning process must be repeated before proceeding with cannulation.

6.5) Inserting the cannula

1. Perform hand hygiene again and remove any previously worn gloves to maintain asepsis. Put on a new pair of non-sterile gloves before proceeding.

2. Re-apply the tourniquet if it had been removed, ensuring it is tight enough to make the vein visible and palpable but not causing discomfort.

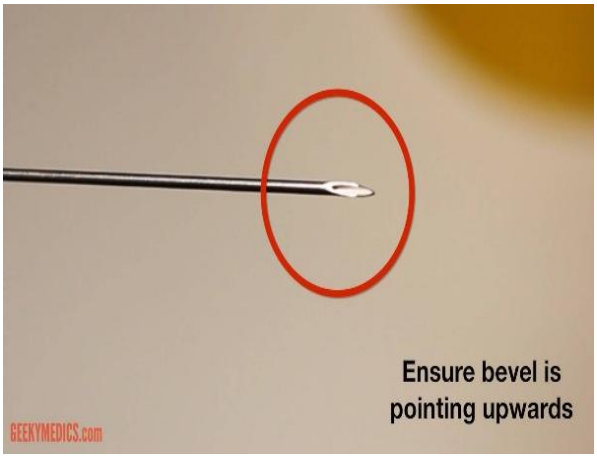
3. Remove the cannula from its sheath while maintaining sterility.

If wings are present, open them to improve handling, and gently adjust the needle by slightly withdrawing and re-advancing it to ensure smooth insertion during cannulation.

If the cannula is ported, unscrew the back cap and place it upright in the tray to keep it clean and ready for use.

4. Stabilize the vein using your non-dominant hand by gently pulling the skin distal to the insertion site to prevent vein movement during cannulation. Inform the patient that they may feel a brief sharp scratch as the needle is inserted to help them stay prepared and reduce anxiety.

5. Insert the cannula over the selected vein at an angle of approximately 10–30°, ensuring the bevel is facing upwards to facilitate smooth entry.



6. Once inserted, observe for a flashback of blood in the cannula chamber, which confirms successful entry into the vein.

7. After observing flashback, lower the cannula angle closer to the skin and advance it approximately 2 mm further to ensure the catheter tip is fully within the vein lumen.

Partially withdraw the introducer needle so that its tip remains within the plastic cannula tubing. During this step, blood should be seen entering the cannula tubing, confirming correct intravascular placement.

8. Carefully advance the plastic cannula into the vein while simultaneously withdrawing the introducer needle, ensuring smooth and controlled movement. Continue until the cannula is fully inserted and only the needle tip remains before complete removal.

9. Release the tourniquet once the cannula is securely in place. Place sterile gauze beneath the cannula hub to absorb any blood leakage. Apply gentle pressure to the proximal vein near the cannula tip to minimise back-bleeding.

10. Gently withdraw the introducer needle while keeping the cannula stable in the vein, continuing until the needle is fully removed and safely disposed of in a sharps container.

Immediately attach a lock cap or a primed extension set to the cannula hub to maintain patency and prevent air entry or bleeding.

11. Dispose of the introducer needle immediately into an approved sharps container to ensure safe handling of clinical waste.

12. Secure the cannula in place using adhesive strips applied to the wings, taking care not to cover the insertion site so it remains visible for ongoing monitoring of complications such as phlebitis.

6.6) Flushing the cannula

1. Inject the prepared normal saline flush into the cannula using gentle pressure. It should be easily administered with minimal resistance, confirming patency. Observe the insertion site for any signs of swelling, leakage, or patient discomfort, and stop immediately if these occur.

2. If the cannula is ported, close the port after flushing, and secure the cannula with an appropriate sterile dressing once patency is confirmed.

6.7) Complete the procedure

1. Inform the patient that the procedure is complete and advise them to seek medical review if the cannulation site becomes painful, red, swollen, or shows signs of inflammation.

2. Thank the patient for their cooperation and dispose of all personal protective equipment (PPE) and clinical waste in the appropriate clinical waste bins. Remove personal protective equipment (PPE) and perform hand hygiene.

3. Document the procedure in the cannulation chart or patient notes, including key details such as the date and time of insertion, site of cannulation, gauge and type of cannula used, number of attempts, complications (if any), and confirmation of patency with saline flush.

7. Complications

1) Haematoma
2) Phlebitis
3) Thrombophlebitis
4) Infections
5) Venous spasms
6) Occlusion
7) Extravasation

8. Reference

1) WHO guideline on hand hygiene in healthcare
2) WHO guideline on drawing blood

Prepared by:

Prof. Nilanka Perera
Department of Medicine
Faculty of Medical Sciences
University of Sri Jayewardenepura

Dr. Sudath Abeywickrama
Head of the Department (Acting)
Department of Medicine
Faculty of Medicine
Uva Wellassa University of Sri Lanka

Snr. Prof. Muditha Vidanapathirana
Dean
Faculty of Medicine
Uva Wellassa University of Sri Lanka

Dr. Hashini Gunawardana
Temporary Demonstrator
Department of Medicine
Faculty of Medicine
Uva Wellassa University of Sri Lanka

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