

- I Venous
- II Arterial
- III Central Venous
- IV Airway
- V Thoracic
- VI Others
- VII Supplemental Skills

I Venous Section

1. Venous Cannulation

I Venous

II Arterial

III Central Venous

IV Airway

V Thoracic

VI Others

VII Supplemental Skills

If the area where you intend to insert a cannula is hairy, gently shave the skin first with a razor.

- You will see the veins better.
- It will make the cannulation easier.
- The dressing will stick better.
- It will hurt the patient less when the dressing is removed.



Apply a tourniquet and identify a suitable vein.

- A colleague squeezing the arm or a rubber glove will suffice in the absence of a tourniquet.
- Tourniquet pressure should be above venous but below arterial pressure so that the veins fill.
- Try not to snag hairs with the rubber glove, it hurts!
- Reusable tourniquets may be an infection risk.
- Make gravity work for you: dangle the arm down by the side and kneel down beside the patient.
- Tap the vein with the back of your hand, this releases nitric oxide into the vein wall causing vasodilatation.
- Difficult veins need patience; if you know where to find them they may be palpable even when invisible.



Prep the skin before infiltrating the intended puncture site with local anaesthetic.

- Allow the alcohol to evaporate before inserting a needle, otherwise it will sting. This is also necessary for antisepsis.
- Local anaesthetic is required for any cannula larger than 20G (pink). People who claim that local hurts more than the cannula or makes cannulation more difficult are wrong.



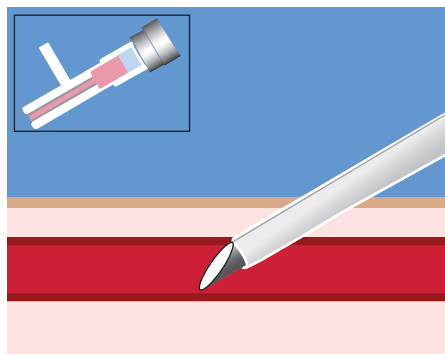
Applying counter traction with your non-dominant hand, puncture the skin and then align the cannula with the vein before advancing along the vessel at least 1-2 mm.

- Aim to pierce the skin with the first movement, and then puncture the vein with a second action. These two elements may occur simultaneously, but they do not have to.
- The veins in elderly patients tend to be very mobile. Once you are through the skin, you need to immobilise the vein using counter-traction. You may require a rapid 'stabbing motion' to puncture the vein, which will otherwise run away from the needle!



Once blood is seen in the chamber, withdraw the needle until you see blood tracking up the cannula, then advance the cannula along the vein. Now, release the tourniquet.

- Remember don't withdraw the needle until the cannula itself is in the vein.
- Avoid touching the cannula itself which is sterile.
- If you meet resistance it may be a venous valve. Gently realign the needle and try to advance it further. Alternatively, attach a syringe of saline to the cannula and advance it whilst flushing with saline.



Remove the needle whilst occluding the vein and immediately cap the cannula.

- Allow blood to fill the cannula before you cap it to avoid air embolism. Whilst this is a good practice in adults, it is also essential in paediatrics.



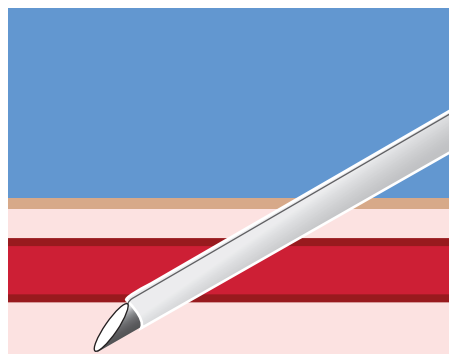
After applying a dressing, flush the cannula with saline solution.

- Carefully examine and/or palpate the site during injection to confirm correct placement. Any resistance, pain or swelling suggests that the cannula is not in the vein.
- Always flush a cannula with saline prior to an injection to confirm that it has not tissue.
- Always suspect and exclude accidental arterial placement of a venous cannula - particularly, if you do not site the cannula yourself - and, especially, if the cannula is sited in the antecubital fossa.



If you get initial flashback of blood as you pass the needle the first time, but then do not get flashback of blood when you withdraw the needle, all is not necessarily lost. The situation may be rescued with care.

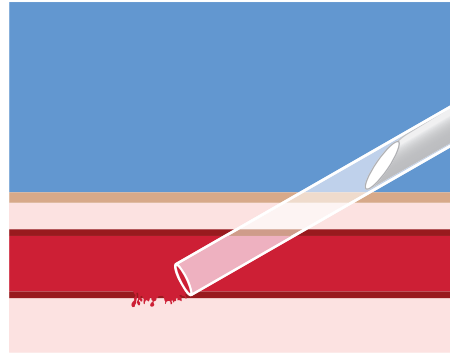
- The most likely cause is that you have punctured the back wall of the vein and have now transixed the vein with your needle.



Keeping the tourniquet applied, withdraw the needle until you can see the lumen of the cannula.

- This enables you to see when blood enters the cannula.

Maintaining counter traction with your non-dominant hand, withdraw the cannula and needle with the other hand as slowly as possible until you see a flashback of blood.



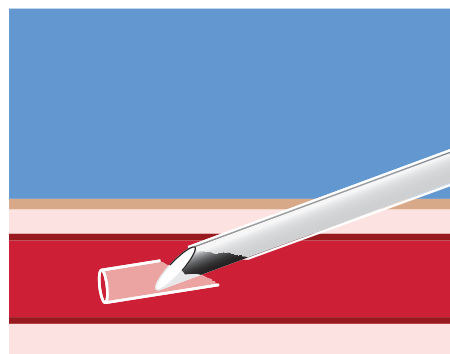
- The flashback occurs as the cannula tip once again re-enters the vein lumen.

Now, all in one motion, advance the cannula and needle together into the vein. Then remove the needle and secure the Luer lock cap

- Flush the cannula with saline to confirm intravenous placement.
- With practice, this technique will succeed more often than not.
- Other possible causes of failure include:
 - Missing the vein altogether, in which case you should start all over again
 - A valve within the vein - this is usually not recoverable unless you can push the needle through the valve to the other side - often the cannula will go through the wall of the vein instead
 - Thrombosis or obliteration of the vein caused by previous cannulation.

Do not re-insert the needle into the cannula during repeated attempts at venous cannulation.

- You can shear the tip off the cannula which could embolise into the patient.



Always dispose of sharps carefully to avoid needlestick:

- Never re-sheath a needle.
- IV cannulae are now available with safety mechanisms to reduce the incidence of needlestick.

