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Learning outcomes

That the clinician can:

- Consider legal and professional implications relating to cannulation & venepuncture
- Revise anatomy in order to complete the skills
- Understand and follow infection control procedures
- Be able to perform cannulation and venepuncture

Legal/professional issues

Before cannulation and/or venepuncture is performed, the clinician should consider the following:

- Development of competence in the skills..... how many supervised practices are required before the skills can be performed autonomously? Check the local Trust policy!
 - Are there any exclusions to performing the skills on specific patient groups? Check the local Trust policy!
 - When attempting cannulation and/or venepuncture, has the patient given informed consent for the procedure?
 - Where and how should these procedures be documented? Check the local Trust policy.
- Remember to sign and date your entry and print your name legibly.

Anatomy/Physiology



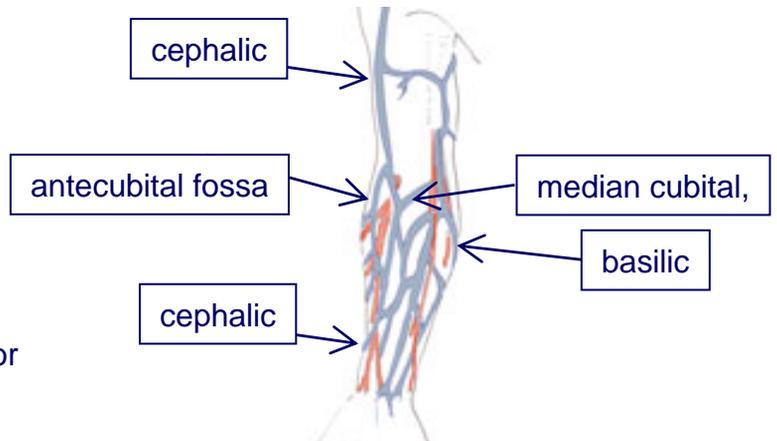
Choosing a vein: position

Metacarpal (used for cannulation)

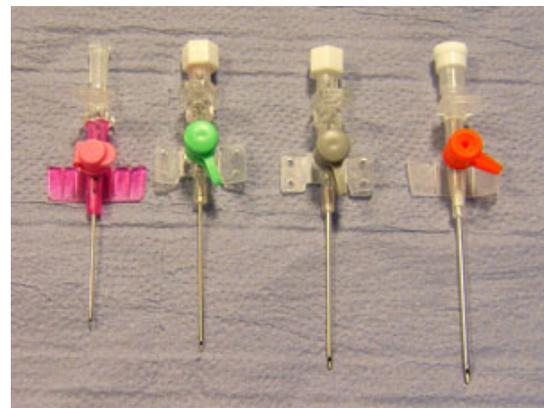
Cephalic (used for cannulation)

Basilic (used for cannulation)

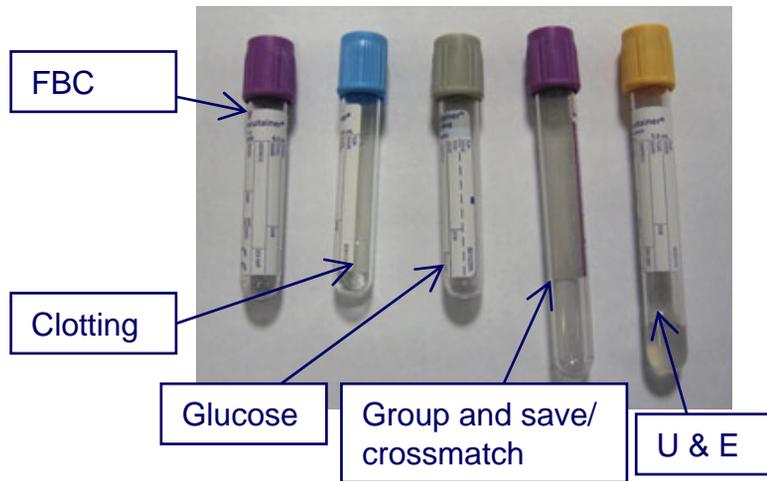
Median cubital, cephalic and basilic (veins in the antecubital fossa are used for venepuncture)



Types of cannula



Types of blood bottles



Choosing a correct cannula size

Cannula colours and sizes. Note that the smaller the number the larger the cannula size		Approximate flow rate l/hr			
Colour	Common Applications	Size Gauge	Crystall oid	Plasma	Blood
Orange	Used in theatres or emergency for rapid transfusion of blood or intravenous fluids	14G	16.2	13.5	10.3
Grey	Used in theatres or emergency for rapid transfusion of blood or intravenous fluids	16G	10.8	9.4	7.1
Green	Blood transfusions, parenteral nutrition, stem cell harvesting and cell separation, large volumes of fluids	18G	4.8	4.1	2.7
Pink	Blood transfusions, intravenous infusions	20G	3.2	2.9	1.9
Blue	For small veins or used in children for most medications and fluids	22G	1.9	1.7	1.1

Infection control

Both procedures cause a breach of the skin – 3 areas of possible contamination to consider:

- Protection from skin flora of the practitioner (wash hands and wear gloves)
- Protection from patients own bacteria (cleans the skin properly)
- Inoculation/exposure prone procedure (avoidance of needle stick injuries and blood spillages)

Hand washing – before and after palpation

Wearing gloves

Clean the skin with a chlorhexidine and alcohol based solution for 30 seconds

Leave the skin to dry thoroughly

Do not re-palpate after cleansing!



Local anaesthesia



Topical anaesthetic can be used to minimise pain for children and needle phobic patients

Ametop – can be used for venepuncture after 30 minutes, cannulation after 45 minutes

Emla – can be used for cannulation and venepuncture after 1 hour

Possible complications of the procedures



Haematoma

Fear/phobia/pain may cause the patient to move

Haematoma formation – ensure that pressure is applied for 2-3 minutes after withdrawing the needle

Puncturing an artery rather than a vein – withdraw the needle and press firmly for 5 minutes

Thrombophlebitis/infection – ensure that infection control procedures are followed rigorously

Extravasation – the cannula enters the tissue rather than the vein – flushing will be difficult and swelling/pain may be noted. Remove the cannula immediately

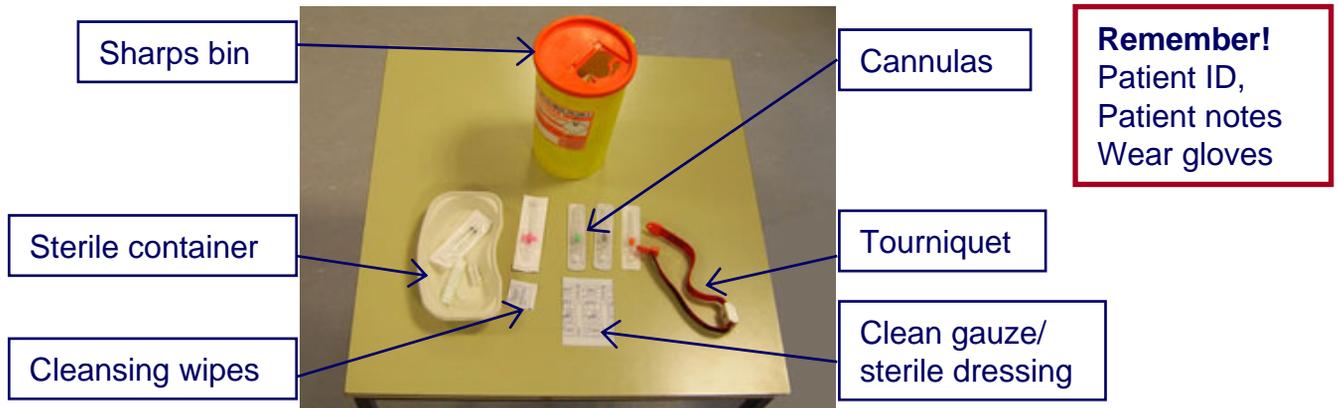
Prior to cannulation consider the following:

Informed consent from the patient

Ensure patient comfort

Collect and prepare the equipment – which size cannula should be inserted? See page 2

Equipment



Procedure



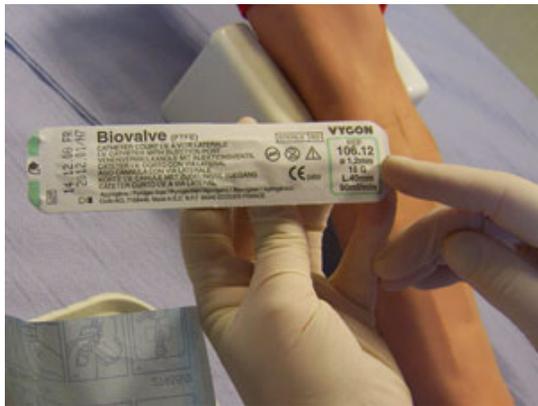
Apply the tourniquet 5-10cm above the cannulation site



For cannulation skin must be cleaned with a 2% chlorhexadine and 70% alcohol solution (such as Chloraprep). Following cleaning the skin must be left to dry thoroughly



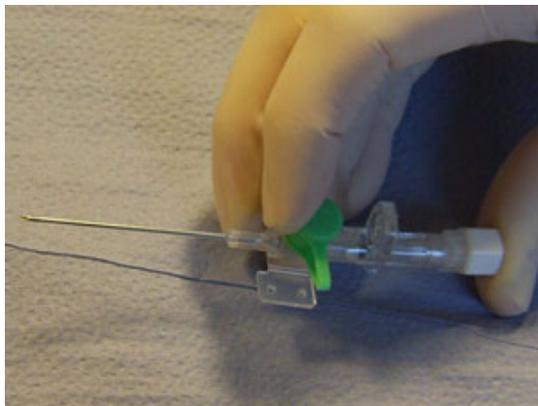
Whilst skin is drying prepare the equipment



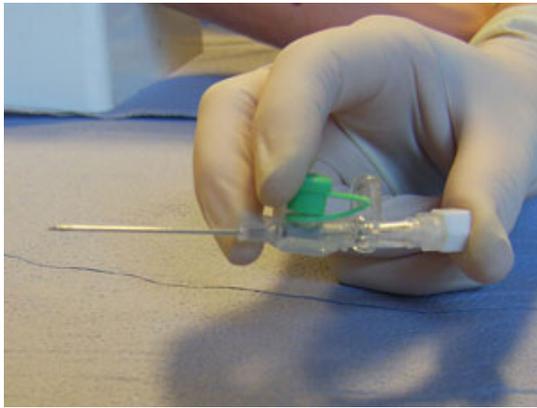
Check cannula size and date of expiry



Open the “wings” of the cannula



Ensure that the bevel (the eye) of the needle is pointing upwards



Hand position: middle finger on the right wing, index finger on the injection port, thumb at the end of the cannula



Alternative hand position: middle and index fingers over both wings, thumb at the end of the cannula



Insert cannula directly into the vein at approximately 30 - 40 degrees

Advance the cannula slowly until.....



A flashback is seen at the base of the cannula



Holding the needle still, gently advance the plastic cannula into the vein



Slowly advance the cannula, NOT the needle. If resistance is felt, stop and withdraw the needle and cannula.



Advance the cannula until the 'hub' meets the skin.



Gauze may help to absorb any leakage during removal of the needle



Remove the tourniquet prior to removing the needle



Press over the end of the cannula (within the vein) to minimise blood loss, whilst removing the needle



Dispose of the needle into a sharps bin (whilst continuing to press over the vein with the other hand)



Remember to keep the bung!



Insert the bung into the end of the cannula



Apply the dressing



Firmly secure the dressing



Current evidence suggests that cannula insertion sites should preferably be covered with a sterile, transparent semi-permeable polyurethane dressing (2)



The cannula should be flushed to ensure correct position within the vein. Check the expiry date of the flush solution (normal saline usually)



Infuse 5 mls of flush solution, noting any resistance, swelling or reports of pain from the patient which may indicate extravasation

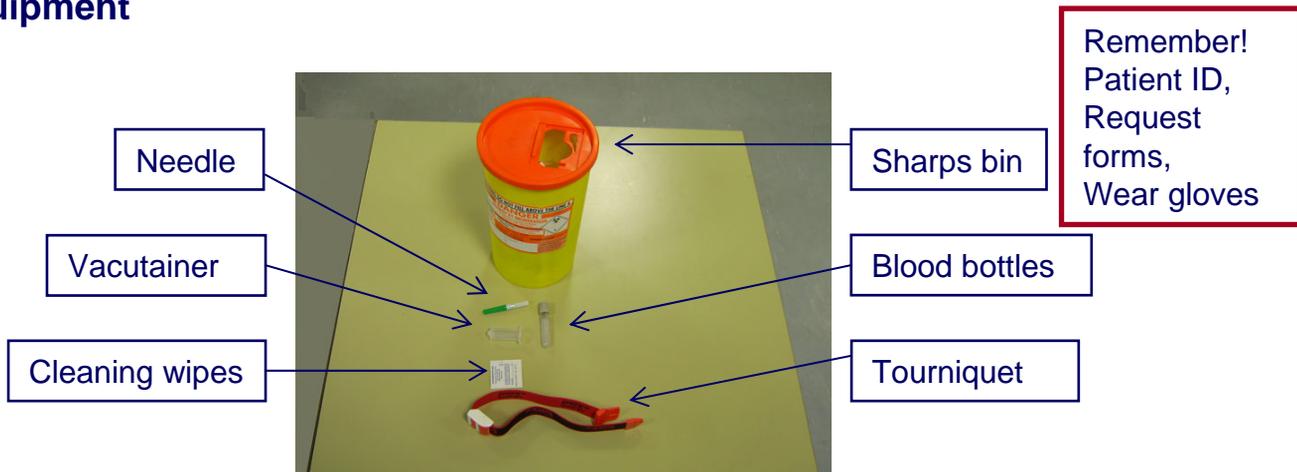


Document the procedure in the patients notes

Prior to venepuncture consider the following:

- Informed consent from the patient
- Ensure patient comfort
- Collect and prepare the equipment – which blood bottles are needed? Check the request forms.

Equipment



Procedure

Apply the tourniquet 5-10cm above the cannulation site. Clean the skin with chlorhexidine and alcohol, starting in the centre, working outwards in concentric circles (see images on page 4)



Carefully twist the vacutainer needle seal open



Remove the white plastic cover. Be very careful! There is a sharp needle beneath the grey plastic end that is now exposed



Carefully insert the grey end into the vacutainer device



Twist tightly to ensure that the connection is secure



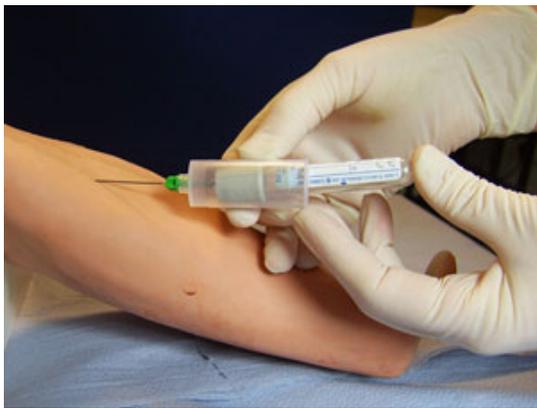
Remove the green plastic cover, this will expose the needle



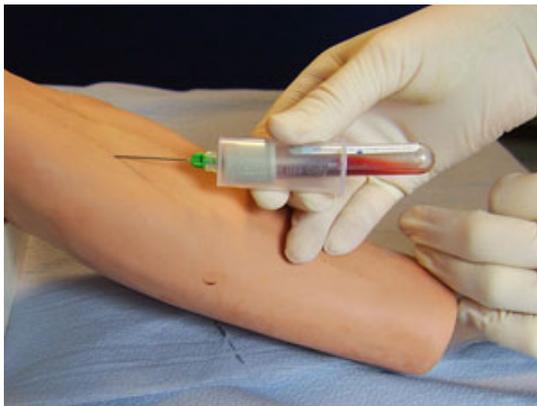
With the bevel of the needle pointing upwards, insert the needle into the vein at approximately 40 degrees



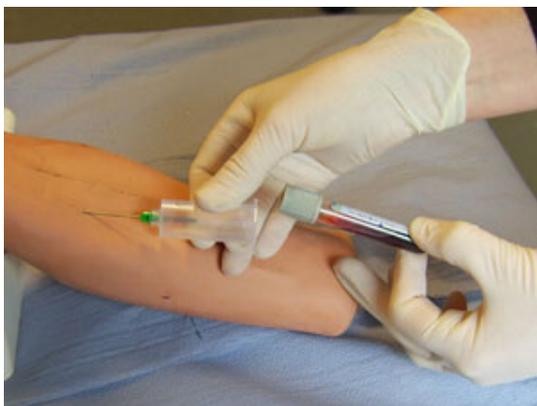
Hold the vacutainer device and needle very still (steady your hand against the patients arm)



Push the blood bottle into the vacutainer device, until the grey spike pierces the rubber stopper at the top of the bottle



The vacuum within the bottle should cause blood to immediately flow into the bottle. If blood does not flow then the needle is not correctly inserted into the vein and should be removed



The blood flow will stop when the correct amount has entered the bottle. Remember to keep the hand holding the vacutainer and needle very still whilst removing the bottle from the device. The procedure shown in the three previous slides can be repeated if further blood bottles are needed



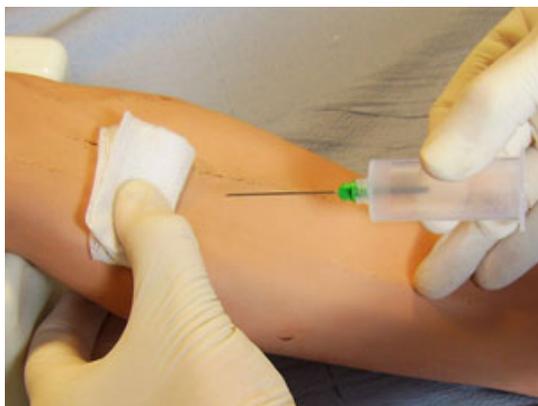
Put the filled blood bottles into a secure container



Prior to removing the needle, remove the tourniquet



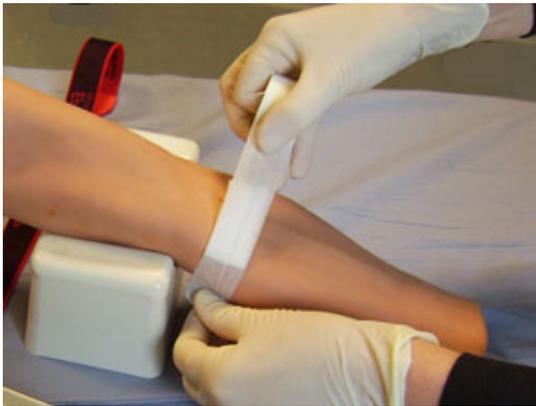
Using a piece of gauze, gently press over the venepuncture site whilst removing the needle



Press firmly to avoid blood loss and haematoma formation



Dispose of sharps carefully



Apply a dressing or plaster over the venepuncture site



Gently rotate the bottle to mix the blood and possible additives



Label the bottle with the patients details, checking the form carefully. Send to the laboratory as per Trust policy

References

1. Collins, M. Phillips, S. Dougherty, L. (2006) **A structured learning programme for venepuncture and cannulation.** *Nursing Standard.* 20 (26). 34-40.
2. Pratt RJ, Pellowe CM, Wilson JA et al (2007) **epic2: National Evidence Based Guidelines for preventing healthcare associated infections in NHS hospitals in England.** *Journal of Hospital Infection.* 65, supplement. Elsevier, Oxford
3. Roberge RJ. (2004) **Venodilatation techniques to enhance venepuncture and intravenous cannulation.** *Journal of Emergency Medicine.* 27(1) 69-73

Produced by Natasa Perovic CETL Learning technologist