VENEPUNCTURE

Definition

- The term venepuncture describes the procedure of inserting a needle into a vein, usually for the purpose of withdrawing blood for haematological, biochemical or bacteriological analysis.
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– It is one of the most commonly performed procedures which, carried out skilfully, carefully and accurately, will provide high quality blood samples without causing discomfort to the patient.

– To perfect the technique of venepuncture, you should have a good understanding of the arteries, veins and associated nerves within the arm.
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– The superficial veins of the arm are usually chosen for venepuncture, namely basilic, cephalic and median cubital veins in the antecubital fossa

– These veins are recommended as they are well supported by muscle and connective tissue, visible and easy to palpate
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Basilic vein pierces deep fascia

Median cubital vein (important site for venepuncture)

Cephalic vein (important site for venepuncture)
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- The walls (outer structure) of veins consist of three layers of tissues that are thinner and less elastic than the corresponding layers of arteries.

- Veins include valves that aid the return of blood to the heart by preventing blood from flowing in the reverse direction.
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There are two stages to locating a vein:

1. Visual inspection
2. Palpation
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■ Visual Inspection
  – The scrutiny of the veins in both arms is essential prior to choosing a vein

■ Veins to avoid:
  – Veins close to an infection
  – Veins close to bruising and phlebitis
  – Oedematous limbs as there is danger of stasis of lymph, predisposing to such complications as phlebitis and cellulites
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- Areas of previous venepuncture should be avoided as a build up of scar tissue can cause difficulty in accessing the vein and can result in pain
- Avoid veins that are thrombosed
- Do not use the affected arm in CVA or mastectomy patients
- A vein sited in the region of a drip site should never be used as it may result in the collection of a diluted samples
Palpation is also an important assessment technique as it:

- determines the location and condition of the veins
- distinguishes veins from arteries and tendons
- identifies the presence of valves
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Healthy veins feel soft and bouncy and will refill when depressed

**Palpate to locate vein**

- Tapping with two fingers will sometimes help
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- Improving venous access

  - There are a number of methods to improve venous access, for example:
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1. Application of a Tourniquet - Promotes venous distension
   - The tourniquet should be tight enough to impede venous return but not restrict arterial flow
   - The tourniquet should be placed about 7 – 8 cm above the venepuncture site
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- The tourniquet should not be left on for longer than 1 minute as it may result in haemo-concentration or pooling of the blood, leading to inaccurate blood results.
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2. Opening and closing of the fist

   – The muscles will force blood into the veins and encourages distension. However this action may affect certain blood results, e.g. potassium

3. Light tapping of the vein

   – May be useful but can be painful and may result in the formation of a haematoma in patients with fragile veins
4. The use of heat

- In the form of warm pack to encourage venodilatation and venous filling

5. Lowering the arm below the level of the heart
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- Skin preparation
  - Asepsis is vital when performing venepuncture as the skin is breached and a foreign device is introduced into a sterile circulatory system
  - Skin cleaning is a controversial subject and it is acknowledged that a cursory wipe with an alcohol swab does more harm than good as it disturbs the skin flora
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- However, where time permits and always for blood culture sampling or if the patient is at increased risk of infection the skin should be cleaned with an alcohol swab BUT you must allow at least 2 minutes for the area to dry thoroughly before proceeding with venepuncture.
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Clean the venipuncture site

- Use fresh alcohol wipe
- Start at site and use circular motion
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■ Hand hygiene
  – Is the single most important activity for reducing the spread of disease, yet evidence suggests that many health care professionals do not decontaminate their hands as often as they need to, or use the correct technique which means that areas of the hands can be missed.
EFFECTIVE HANDWASHING TECHNIQUE

Wet hands, apply liquid soap and wash as follows:
(please note, with practice this procedure only takes 10 - 15 seconds)

1. Rub palm to palm
2. Rub backs of both hands
3. Rub palm to palm with fingers interlaced
4. Rub backs of fingers (interlocked)
5. Rub all parts of both hands
6. Rub both palms with finger tips

Rinse hands under running water and dry thoroughly, preferably using paper towels

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- Improper drying can recontaminate hands that have been washed. Wet surfaces transfer organisms more effectively than dry ones and inadequately dried hands are prone to skin damage. Disposable paper hand towels of good quality should be used to ensure hands are dried thoroughly.
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- Safety of the practitioner
  - It is recommended that well-fitting gloves are worn during any procedure that involves handling of blood and body fluids, particularly with venepuncture. This is to prevent contamination of the practitioner from potential blood spills.
Whilst it is recognised that gloves will not prevent a needle stick injury, the wiping effect of the glove on a needle may reduce the volume of blood to which the hand is exposed, thereby reducing the volume inoculated and the risk of infection.
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- Used needles should always be discarded directly into an appropriate sharps container, without being resheathed.

- Specimens from patients with known suspected infections such as hepatitis or HIV should be double bagged in clear polythene bags with a biohazard label attached.
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- The accompanying request forms should be kept separate from the specimen to avoid contamination (two pockets in bag)
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Complications

- Inability to obtain specimen due to:
  - Inappropriate choice of vein
  - Thrombosed vein (due to previous or repeated attempts)
  - Inexperience of operator
  - Patient shocked, cold or dehydrated causing vasoconstriction
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- Formation of haematoma due to:
  - Poor technique
  - Pressure not being applied to puncture site following removal of needle

- Puncture of an artery
  - If an artery is punctured: release the tourniquet, remove the needle and apply firm pressure for a minimum 5 minutes. Cover the site with a dressing once bleeding has stopped. Re-check for signs of bleeding in 20 minutes.
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OSCE Practice
**Approach and Communication**

- Introduce yourself & check patient’s ID
- Explain what you would like to do & why.
- Gain consent for the procedure and check for allergies, shunts, etc.
- Review the treatment plan & individuals past history as necessary
- Talk the patient through it in a considerate and courteous manner
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- **Sterility**
  - Wash hands
  - Clean and prepare procedure tray according to ANTT guidelines
  - Collect equipment into the tray taking care not to contaminate key parts
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- **Equipment**
  - Skin cleansing wipes
  - Tourniquet
  - Gloves
  - Gauze swabs
  - Adhesive dressing
  - Needles
  - Blood collection tube(s)
  - Sharps container
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– Assemble the vacutainer & needle (or other system) as per manufacturer’s instructions

– Prepare gauze swab etc for eas of use during procedure
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- **Preparation:**
  - The patient should sit in a suitable chair or be lying down.
  - Support arm on pillow or in other suitable manner & position the patient’s arm as needed
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- Check for any contra-indications e.g. infection or trauma
- Select suitable vein
- Clean site for 30 seconds (DO NOT TOUCH AGAIN)
- Leave to dry
- Release Tourniquet
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- **Procedure**
  - Put on gloves and reapply tourniquet
  - With your non-dominant hand; grasp the patient’s arm firmly using your thumb to draw the skin taut and anchor the vein beneath proposed puncture site
  - Insert the needle at approx 30 angle with bevel up. Aim to insert the needle swiftly through the skin and into the lumen of the vein, avoiding trauma and excessive probing.
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- Connect each specimen tube in turn, in order of draw, onto the assembly (blood culture, no additive, gel, liquid)
- As each tube is filled, remove it from the vacutainer assembly by gentle rotation and traction, whilst supporting the vacutainer assembly in the vein
- Invert each tube as required
- Continue until all tubes have been used
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- When the final tube is drawn, release the tourniquet, remove the tube from the needle and then remove the needle from the vein using a swift backward motion
- Dispose of any sharps, connector or other assembly promptly into a sharps container
- Apply gauze and ask patient to apply firm pressure for 2 minutes if required
- Apply sterile plaster to puncture site if required
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- **Completion and organisation**
  - Clear up, dispose of rubbish and clean tray
  - Remove gloves and wash hands
  - Label the tubes correctly at the bedside (Tell examiner)
  - Ensures that the samples are sent to the lab
  - Thank the patient and ensure they are well
  - Document in the patients notes
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Any Questions

Lets Practice