

Vascular Access Devices (VAD)

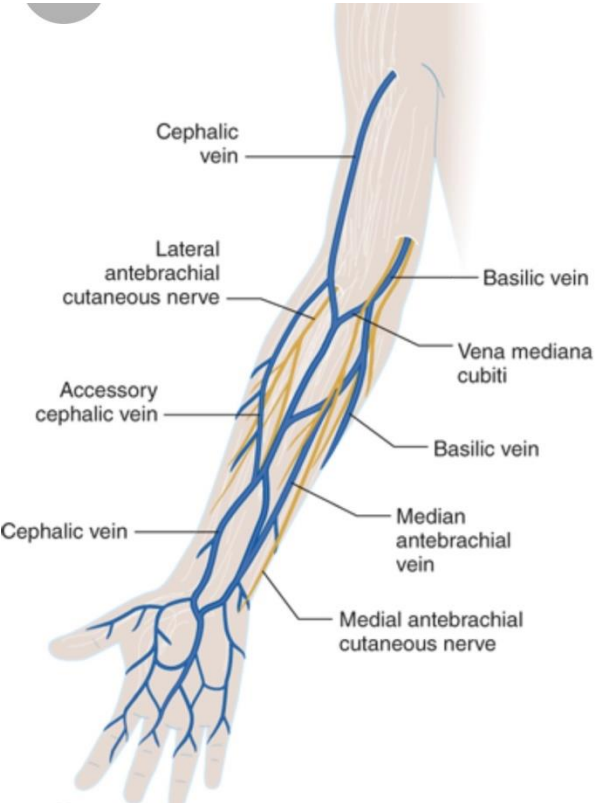
By Dr. Azad J Ali

Senior Anaesthesiologist

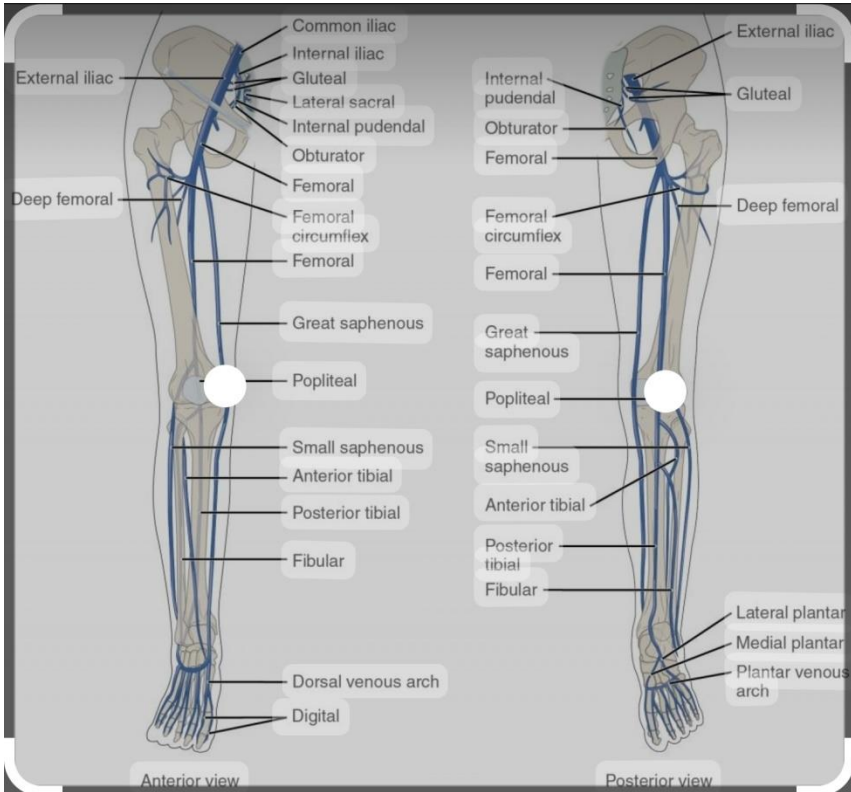
September 14th 2022

Peripheral veins

Upper limb veins



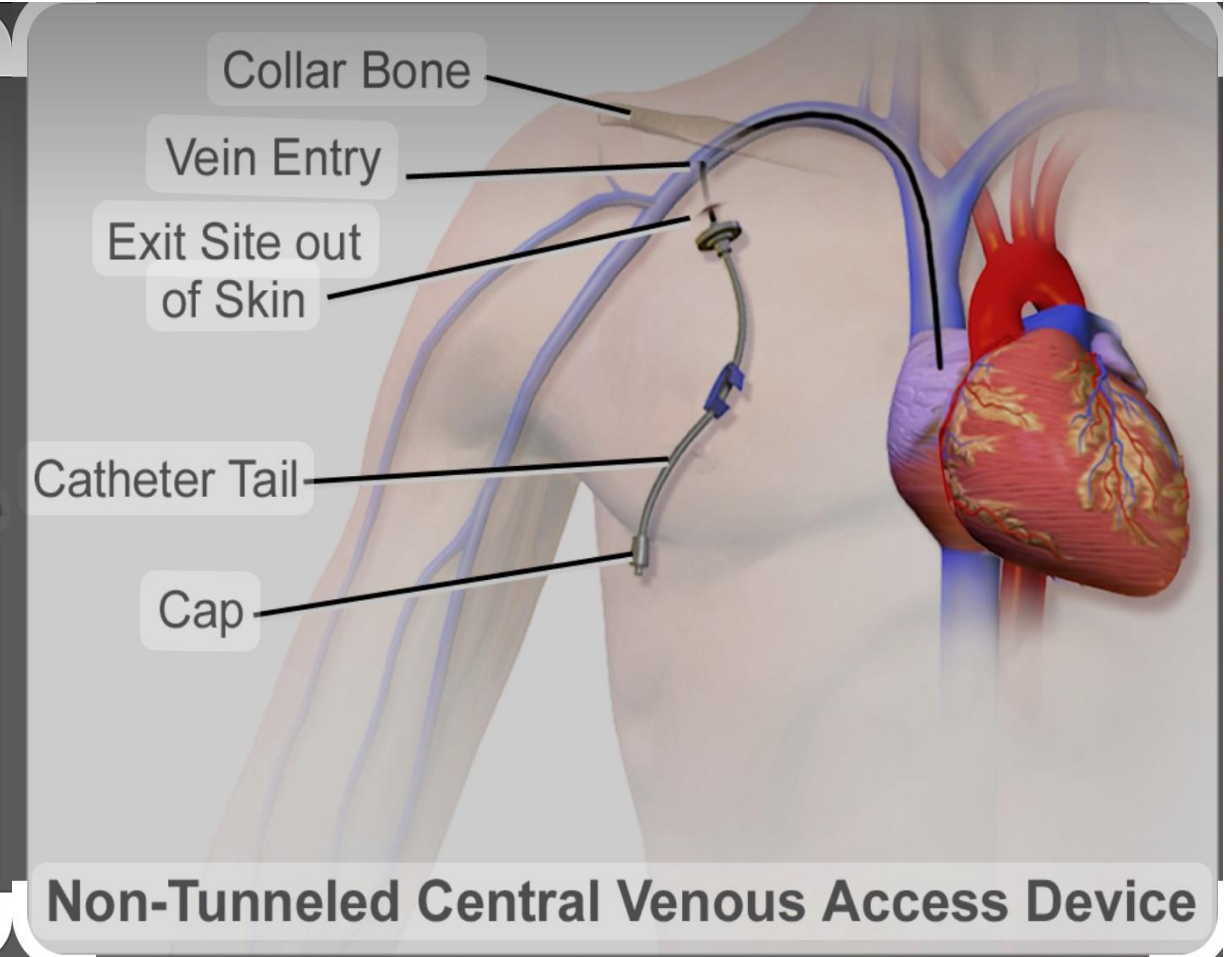
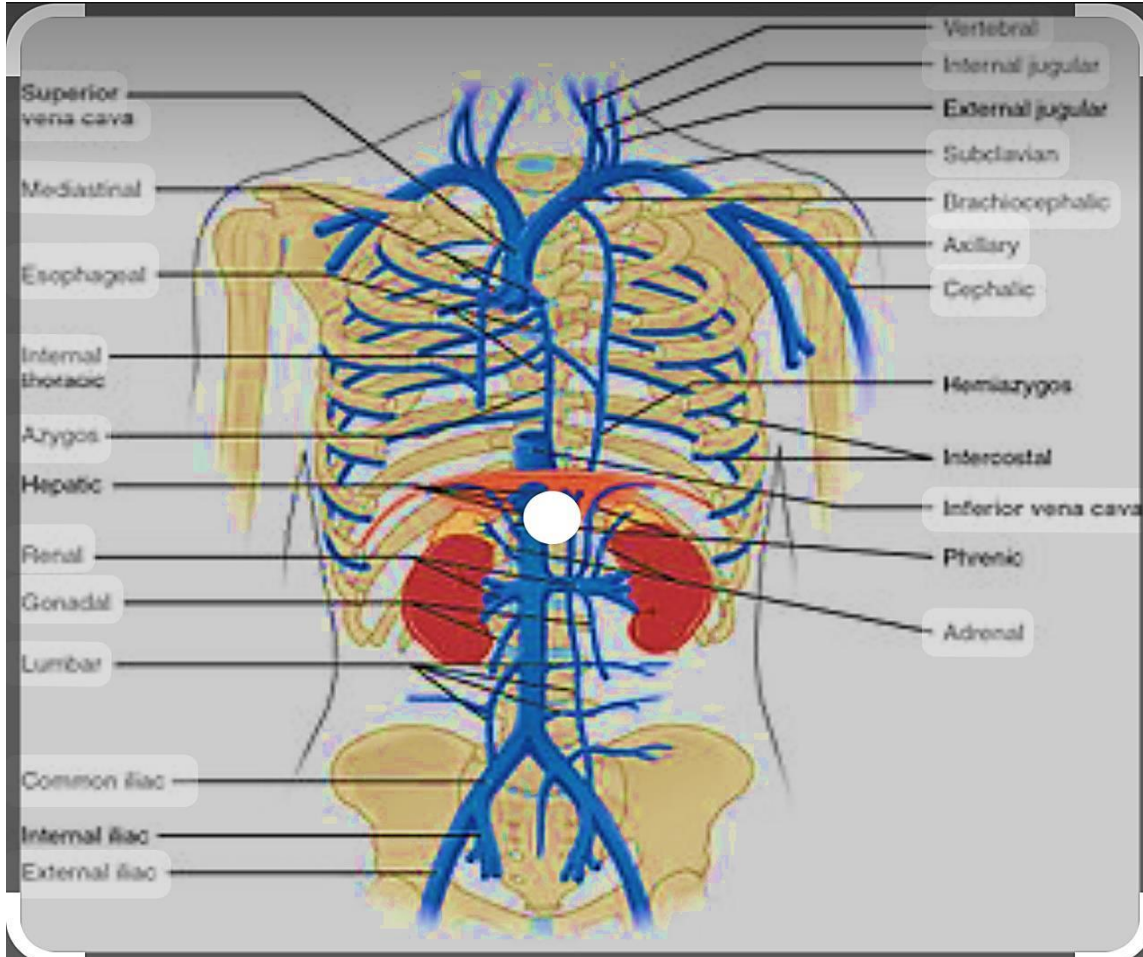
Lower limb veins

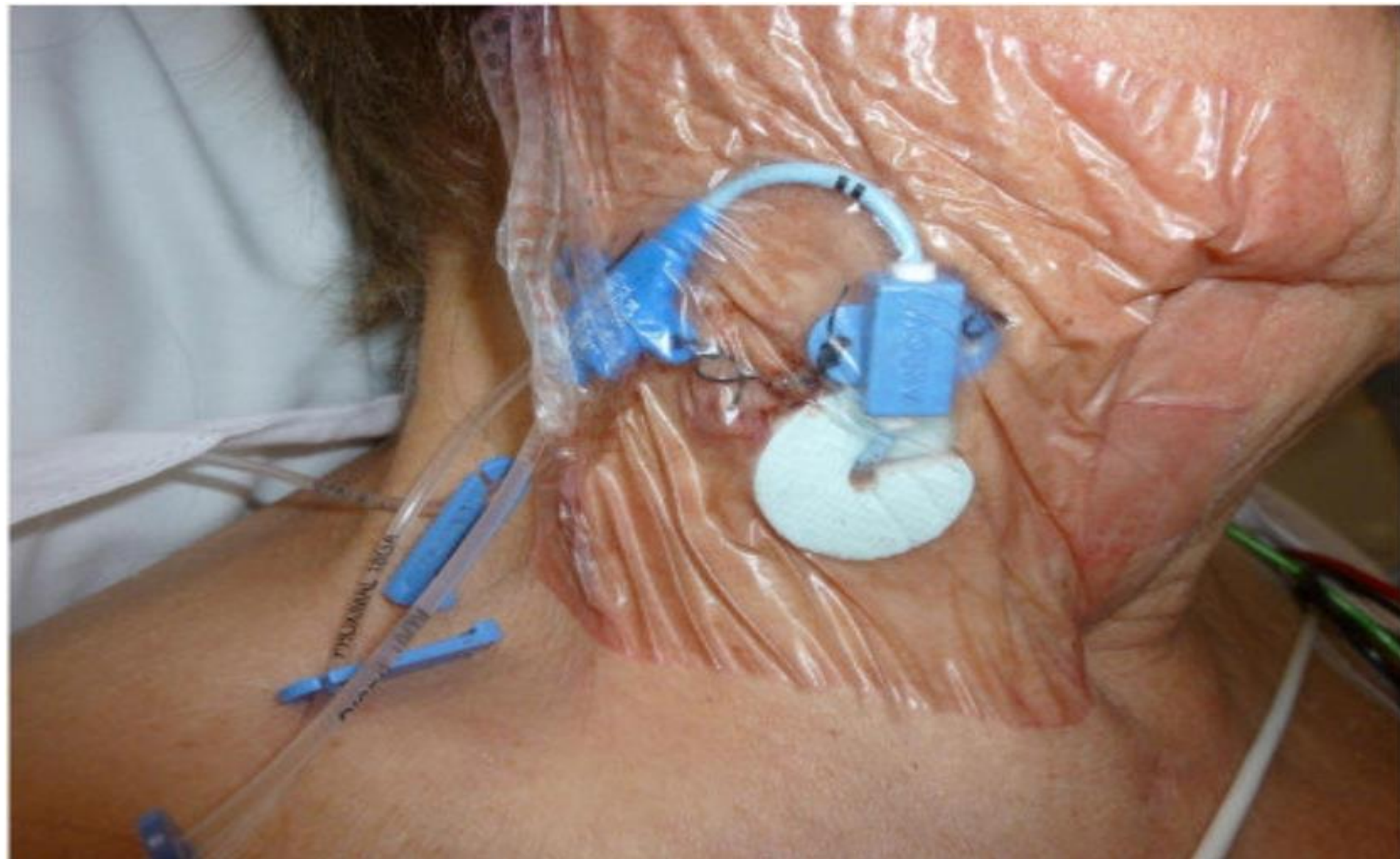


Scalp veins



Central veins





Definition:

Cannulas and catheters are devices used as a route for vascular access regardless to the location.



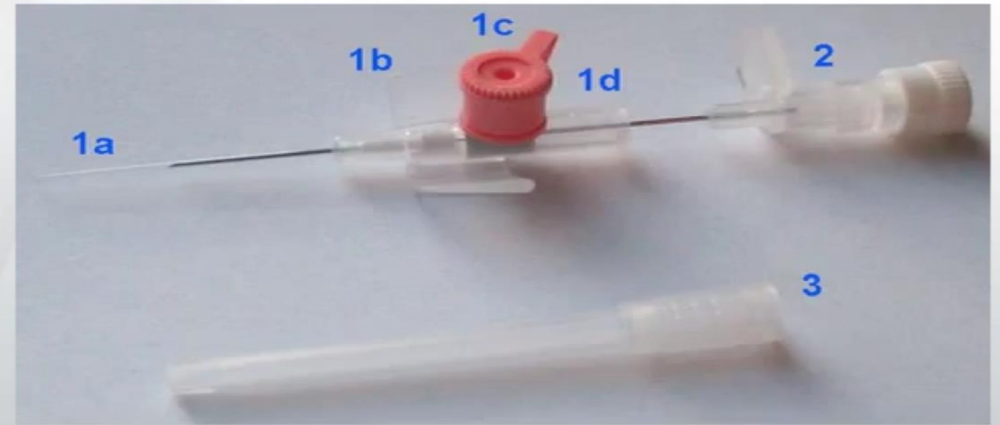
Characteristics of iv cannulas

- ***They are made high quality steel with high chrome-nickel needle and a sheath of plastic.***
- ***Different manufacturers make different characteristics.***
- ***With or without ports.***
- ***Closed (protect against bacterial contamination or exposing the clinician to blood) or open ports.***
- ***Winged or non-winged.***
- ***Peripheral and central intravenous catheter.***

Characteristics of iv cannulas:



Peripheral venous catheter



- *Using distilled water at a temperature of 22°C & under pressure of 10 Kpa , tubing system of 110 cm length & 4 mm internal diameter , the infusion rate is as follows:*

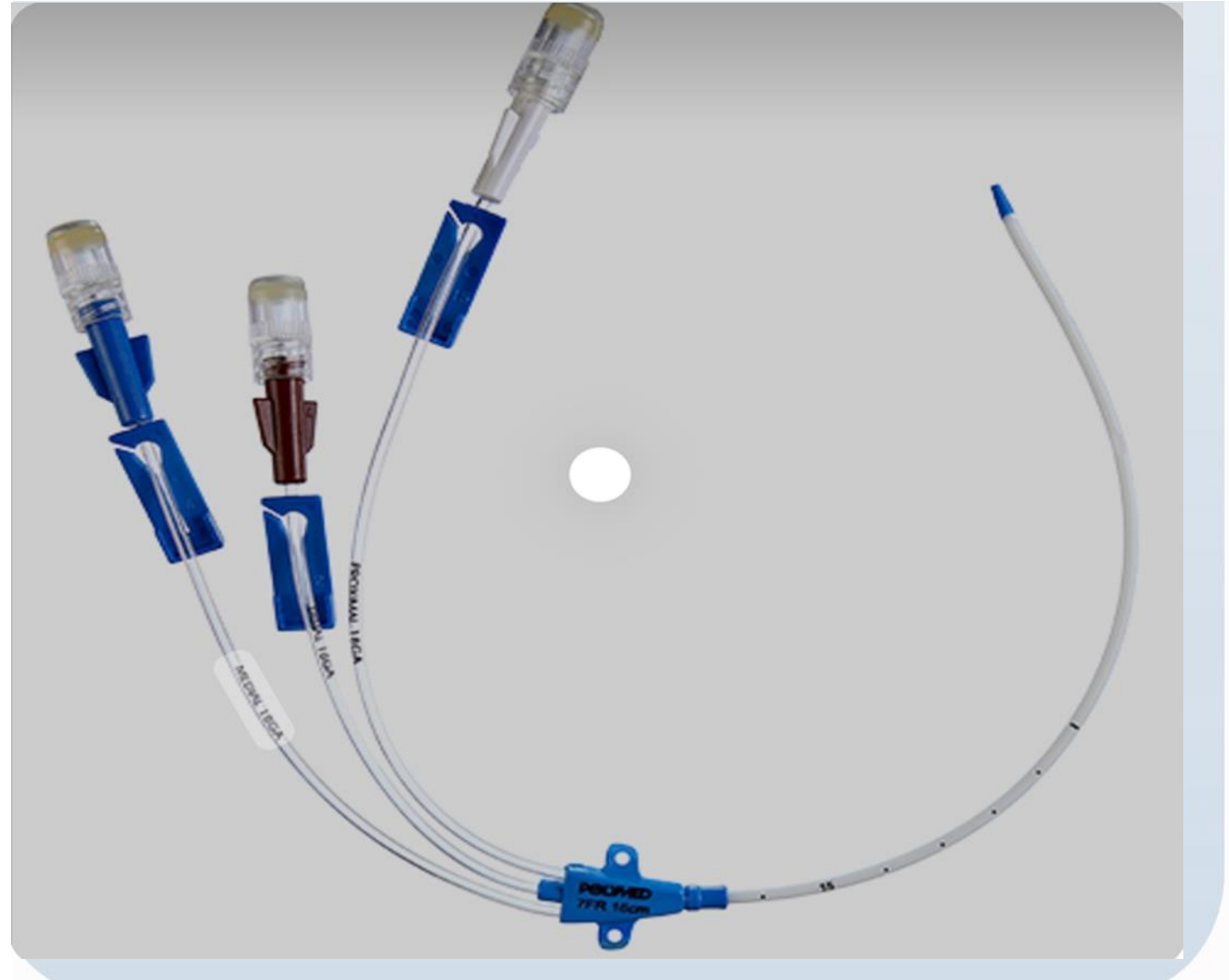
- *20G: 40-80 ml/min*
- *18G: 75-100 ml/min*
- *16G: 130-220 ml/min*
- *14G: 250-360 ml/min*

Flow rate (infusion rate)



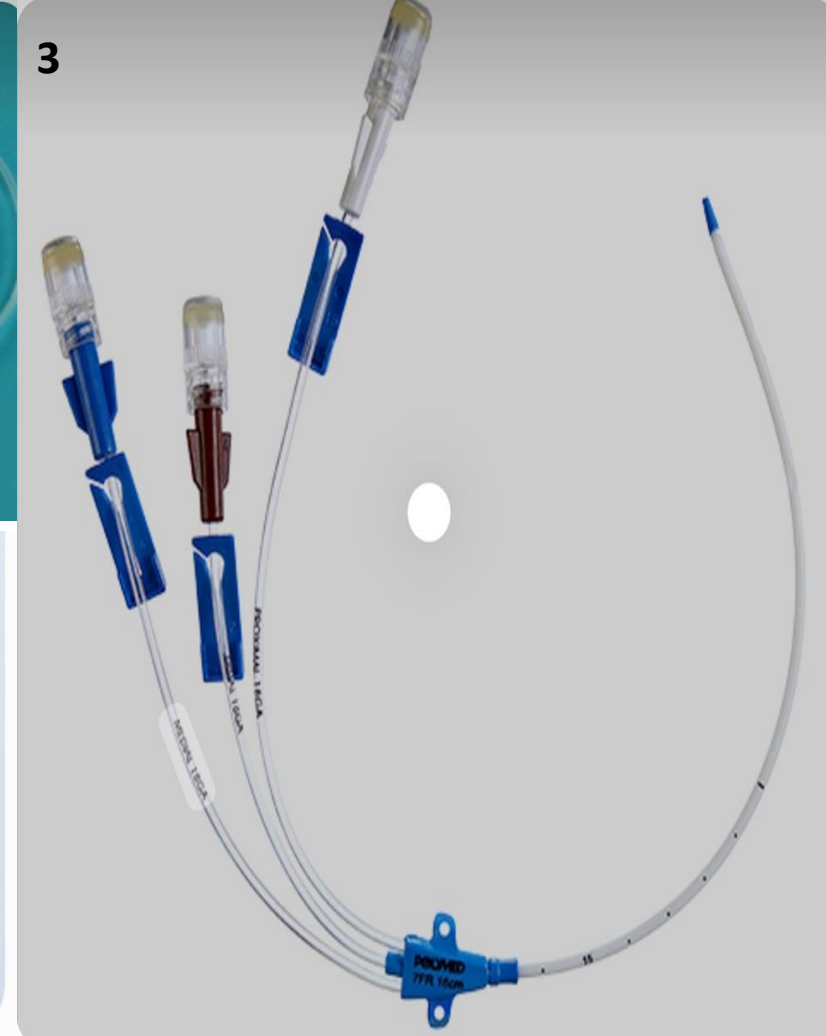
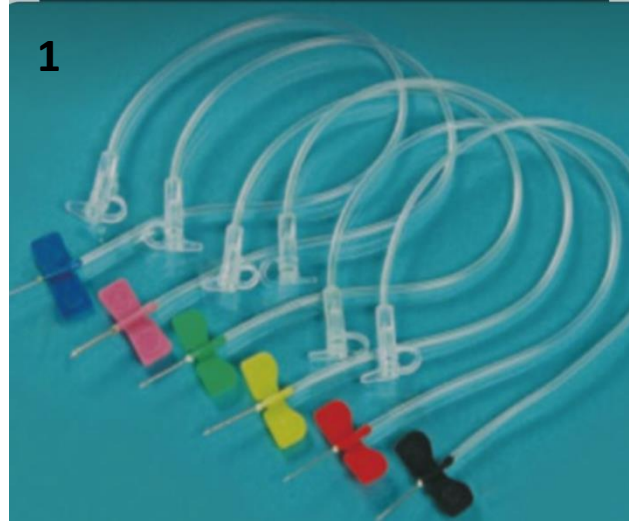
Types of VAD

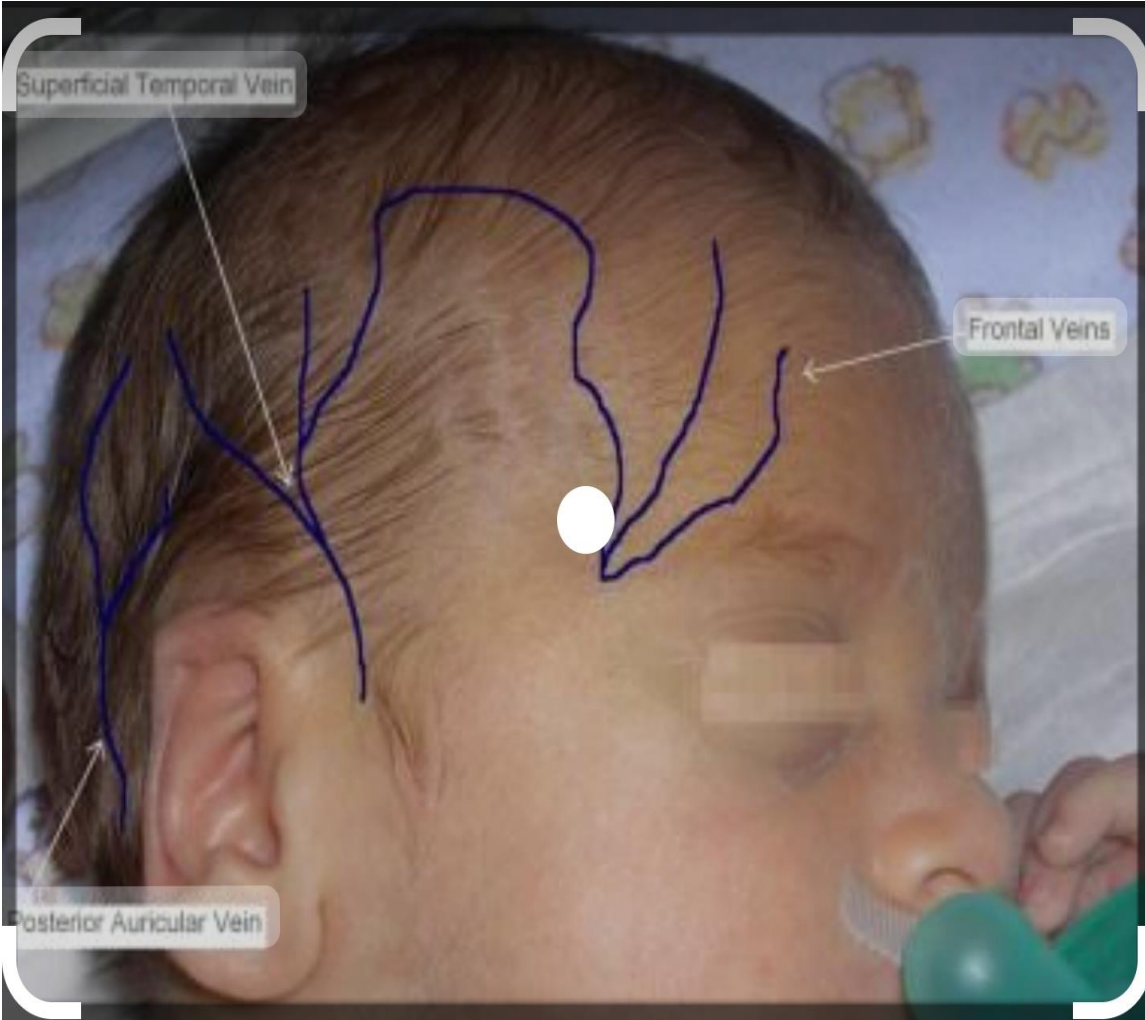
- 1. Peripheral intravenous cannula & scalp vein cannula).***
- 2. Peripheral intravenous catheters.***
- 3. Central venous catheters (central venous access or central lines).***

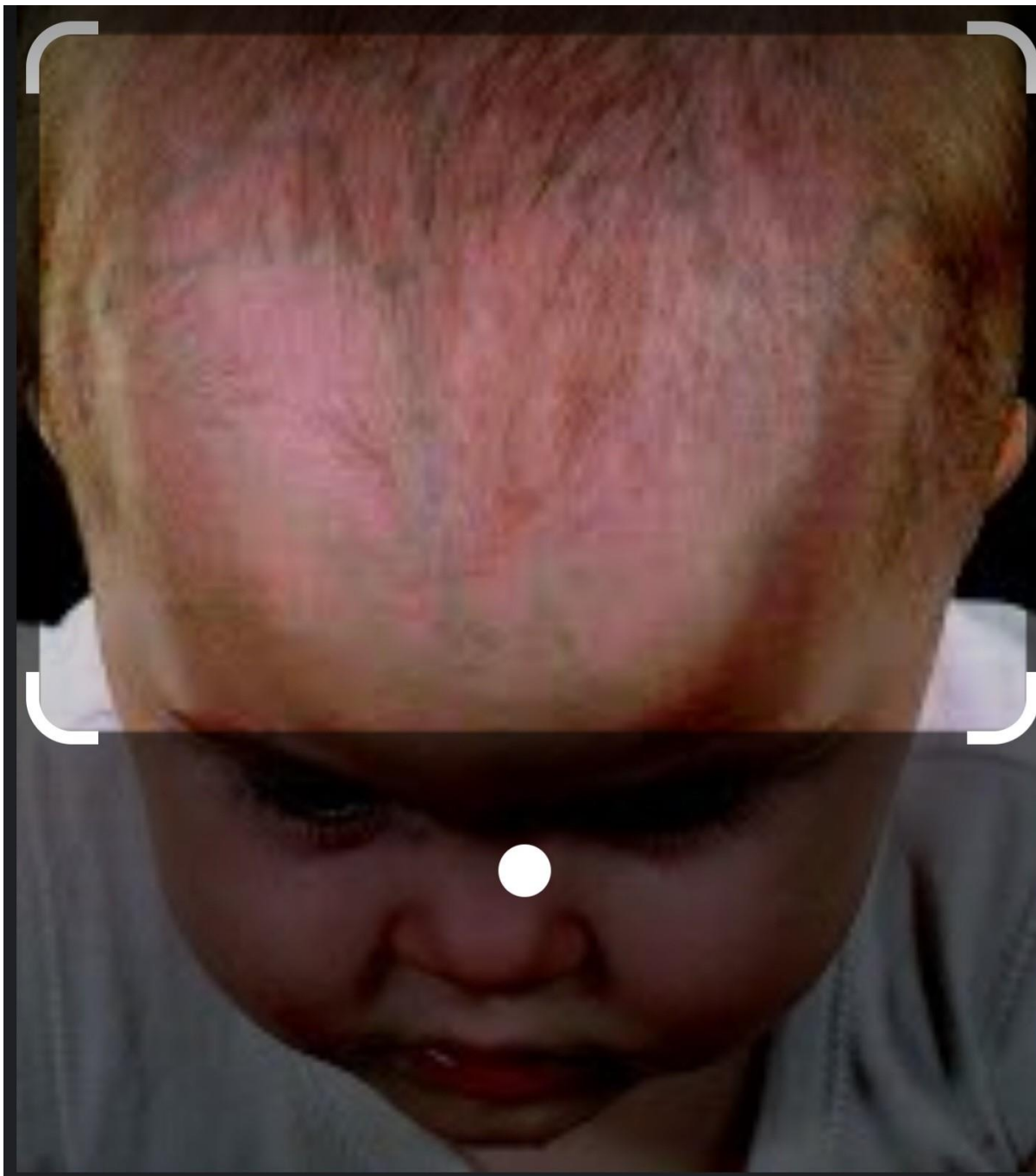


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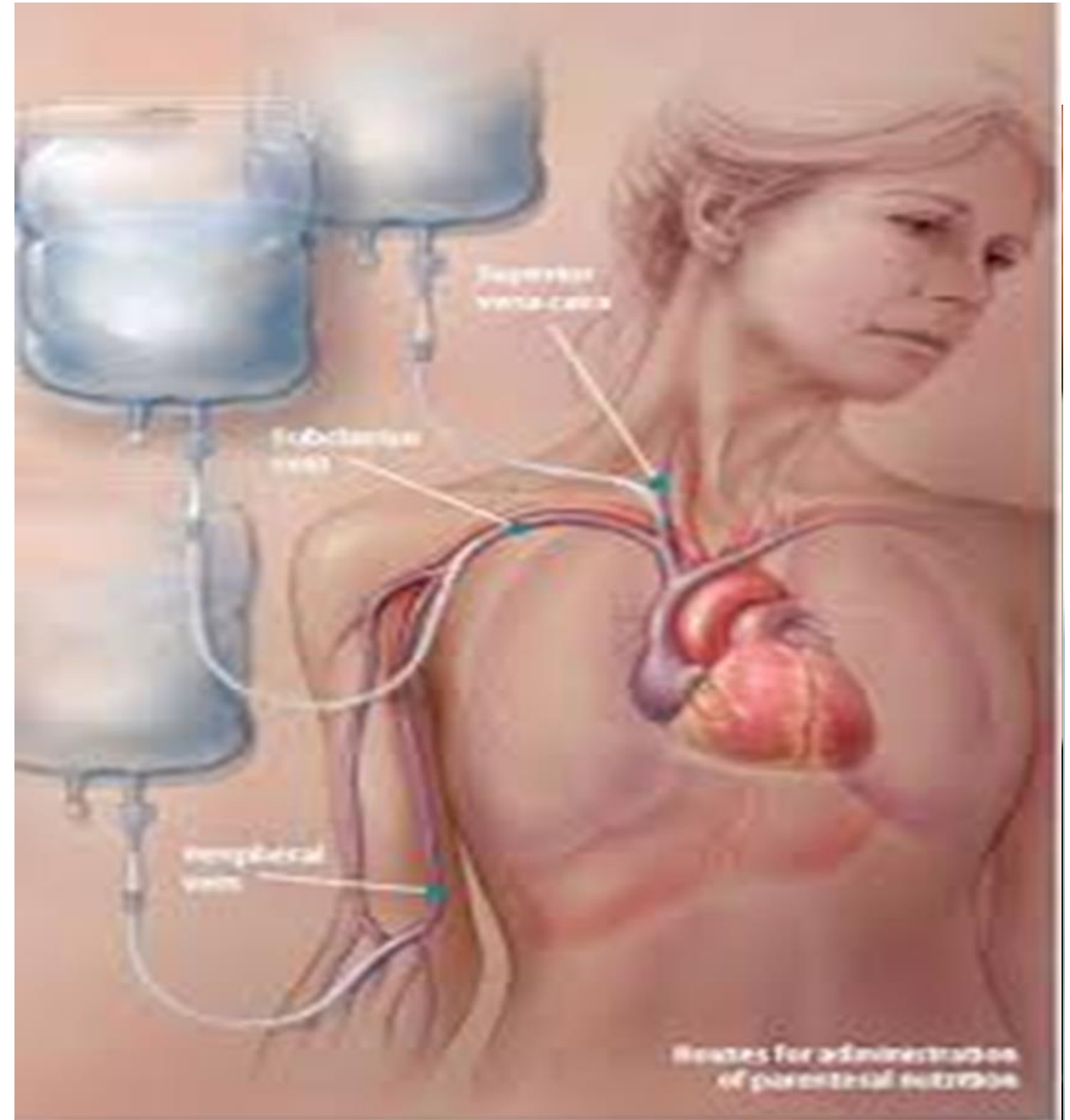






Indications:

- 1. Administration of intravenous fluid, medicines***
- 2. Transfusion of blood and blood products .***
- 3. Blood sampling.***
- 4. Intravascular pressure measurement or monitoring, in major operations and ICU patients.***
- 5. Parenteral nutrition in critically ill patients.***



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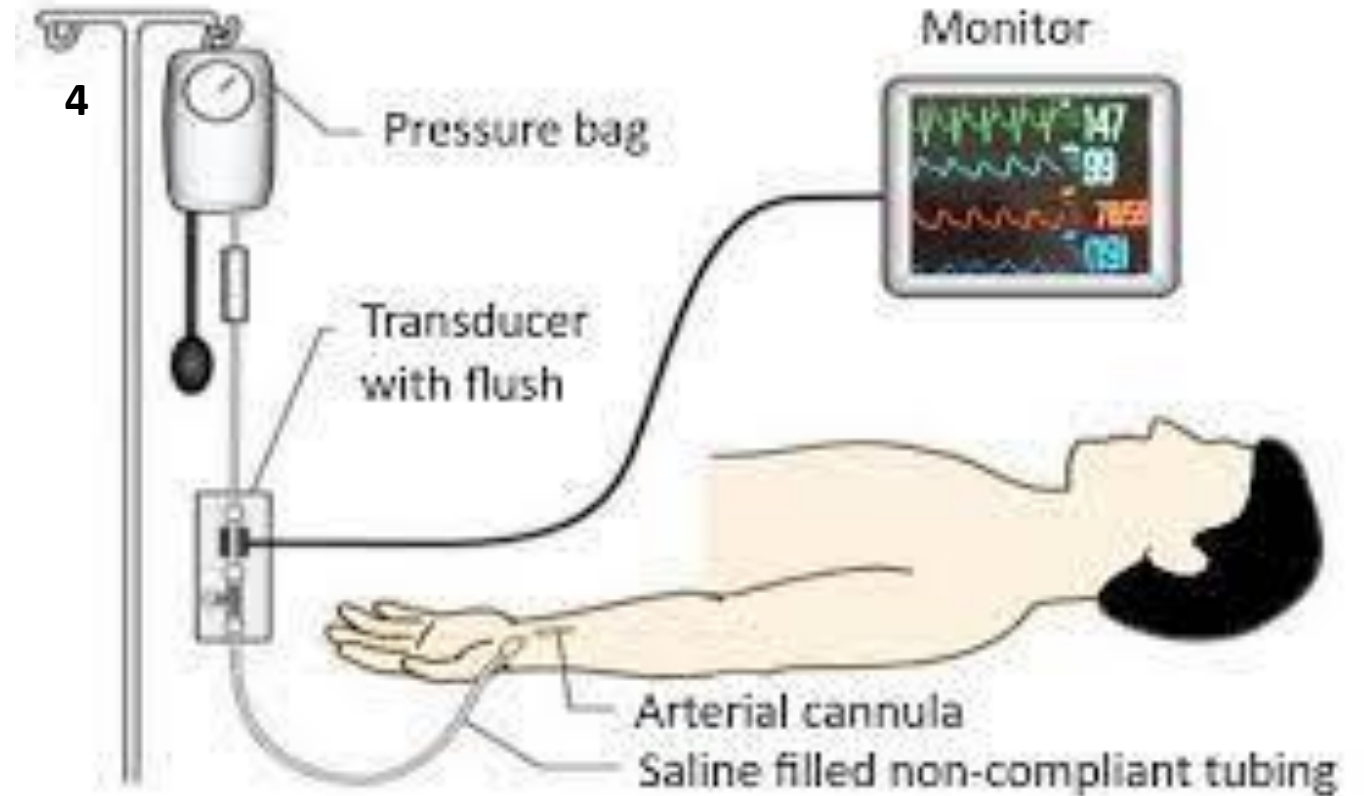
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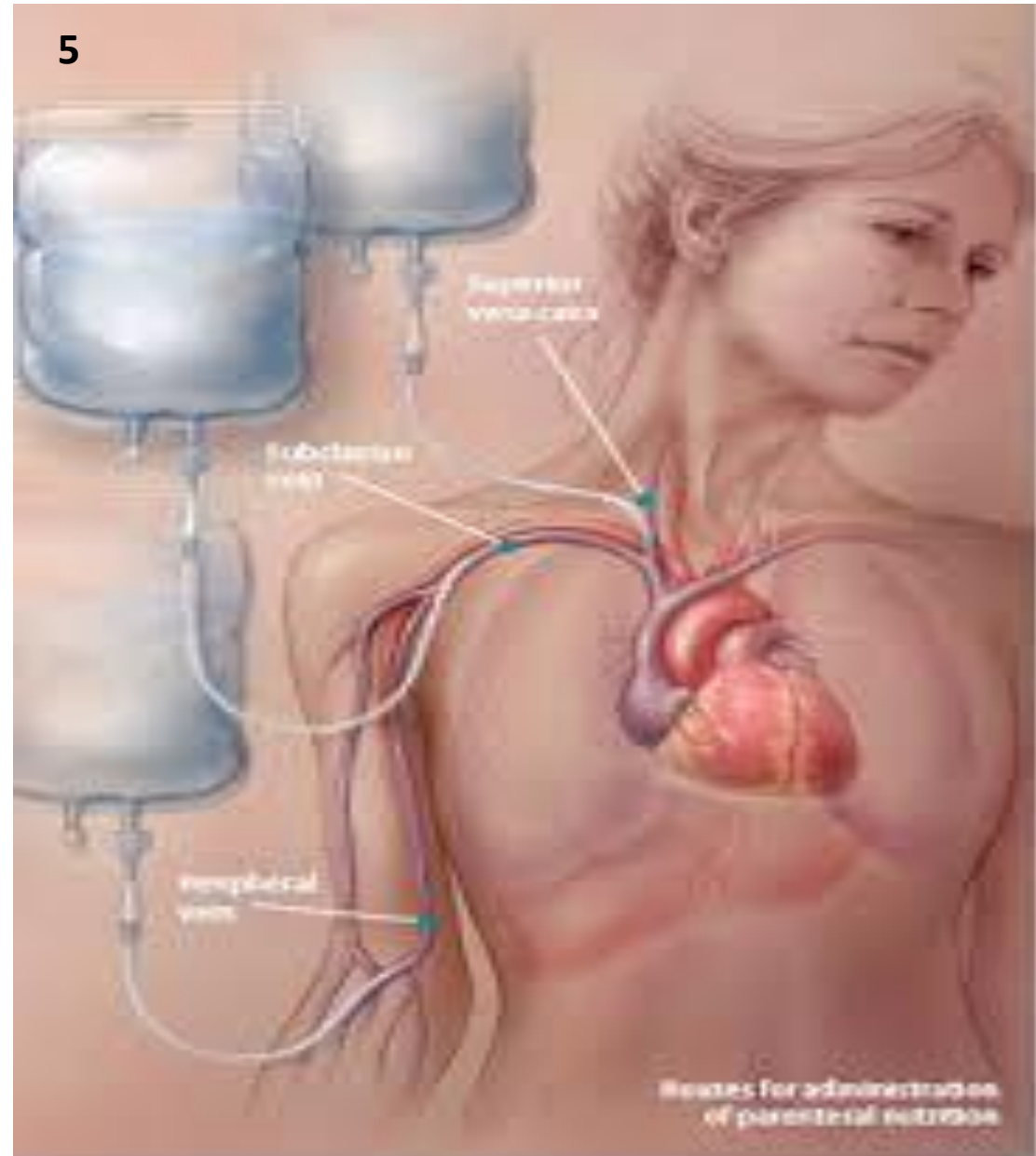
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Equipment needed for iv cannulation:

- 1. EMLA cream 5% (Eutectic Mixture of Local Anaesthetic) to anaesthetize the puncture site in paediatric patients.***
- 2. Suitable gauge cannula.***
- 3. Tourniquet .***
- 4. A pair of non-sterile gloves***
- 5. Alcohol pad for skin sterilization.***
- 6. Saline filled syringe for testing***
- 7. Adhesive tape or transparent plaster for fixation.***
- 8. Vein detector device.***

Equipment needed for iv cannulation:

EMLA cream



Tourniquet



Equipment needed for iv cannulation:

Non-sterile gloves



Alcohol pad



Equipment needed for iv cannulation:

Saline filled syringe



Transparent plaster for cannula



Vein detector machine



General principles for peripheral intravenous cannulations:

- 1. Avoid joints, choose least mobile sites.***
- 2. Avoid tortuous veins.***
- 3. Avoid cubital fossa.***
- 4. Avoid nearby arteries or nerves and tendons.***
- 5. Choose prominent or convex sites.***
- 6. Save large veins for future or possible emergency situations.***

Complications:

- 1. Local or even systemic infection.***
- 2. Phlebitis and Thrombophlebitis.***
- 3. Thromboembolism or even gangrene***
- 4. Pain.***
- 5. Haemorrhage.***
- 6. Haematoma.***
- 7. Extravasation.***
- 8. Inadvertent Intra-arterial cannulation.***
- 9. Needle stick injuries.***

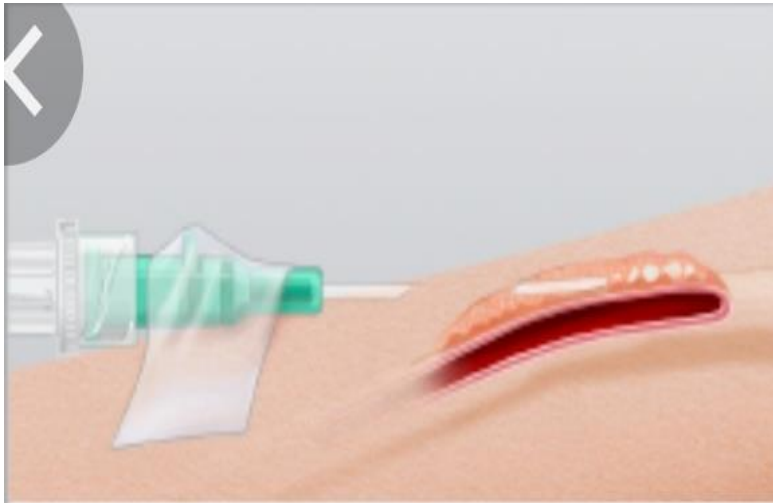
Complications:

thrombosis



Infection

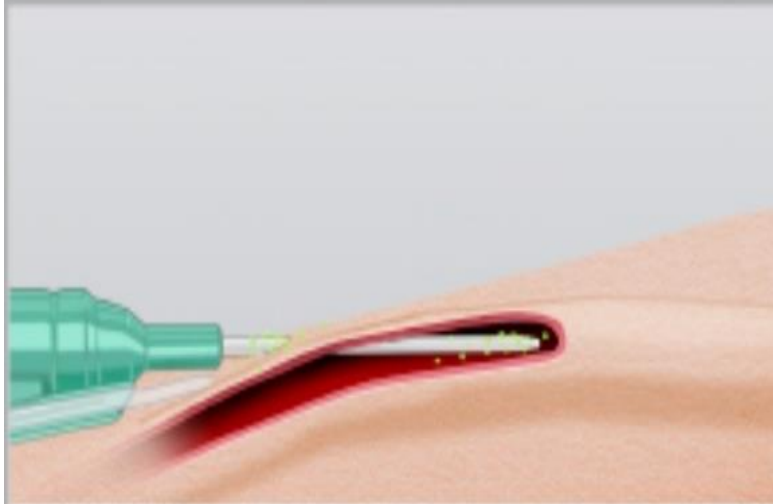




Infiltration & Extravasation⁶



Dislodgement



Site Infection & Sepsis⁶



Occlusion & Mechanical Failure⁶

Procedure of intravenous cannula insertion

Summary

- 1. Confirm patient identity**
- 2. Explanation**
- 3. Assemble and prepare equipment using ANTT**
- 4. Identify vein**
- 5. Insert needle at 30°**
- 6. Prior to removing needle:**
 - a. Gauze**
 - b. Tourniquet**
 - c. Pressure**
- 7. Safe disposal**
- 8. Flush and secure cannula**
- 9. Aftercare advice**
- 10. Documentation**