



VENIPUNCTURE

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VENIPUNCTURE



- One of the most common invasive procedures.
- Can be traumatic for the patient and the family.
- It should only be ordered when necessary.
- A clinical assessment should be undertaken prior to the venipuncture procedure.



VENIPUNCTURE



➤ Venipuncture is the procedure of entering a vein with a needle

Undertaken to:

➤ Obtain a blood sample for diagnostic purposes using,

- Haematological,
- biochemical
- bacteriological analysis.

➤ Blood donation purposes.

Ancient Egyptians around 1000 BC



VENIPUNCTURE – Associated issues



➤ Risk of blood borne infections following needle puncture

- Human immunodeficiency virus (HIV),
- Hepatitis B virus (HBV),
- Hepatitis C virus (HCV),
- Viral haemorrhagic fevers (Crimean Congo haemorrhagic fever, Ebola, Lassa)
- Dengue

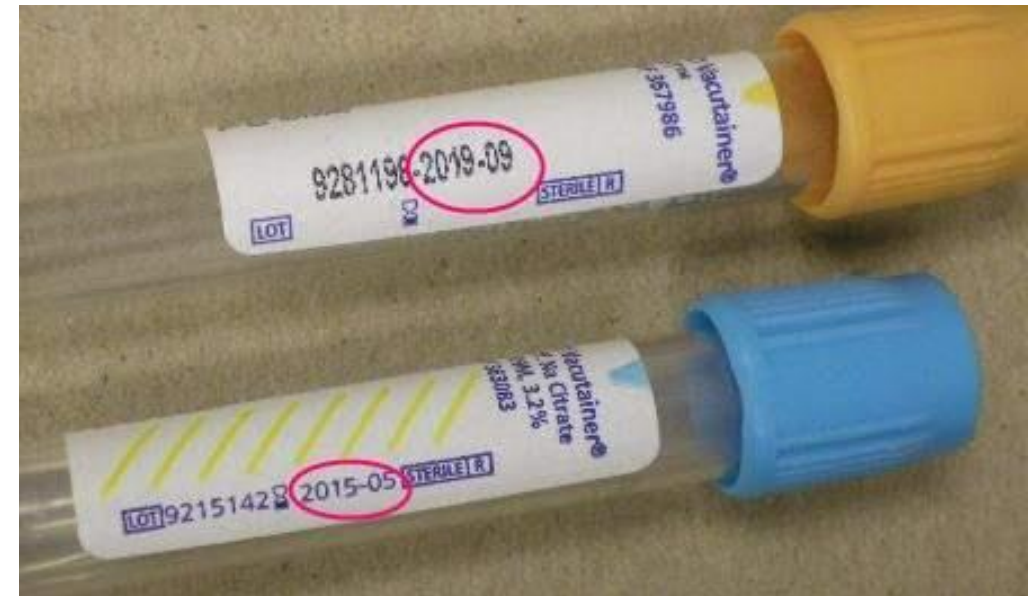


VENIPUNCTURE – Associated issues



- Poor infection control practices
 - Spread of bacterial infection to the patient
 - Contamination of specimens – lead to false results .

- Errors in collection of blood sample
 - Haemolysis
 - Contamination
 - Inaccurate labelling causing misinterpretation of results.

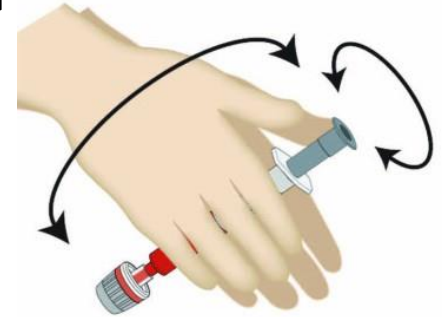


Factors that increase the risk of haemolysis



➤ include:

- Use of a of too small gauge needles (23 G or under)
- Drawing blood specimens from an intravenous receiving vessel or central line;
- Under filling a tube ➡ ratio of anticoagulant to blood is greater than 1:9
- Mixing a tube too vigorously;
- Failing to let alcohol or disinfectant dry before the puncture
- Using too great a vacuum ➡ using too large a syringe (10–20 ml for a paediatric patient).



Infection prevention and control practices



Do

DO carry out hand hygiene (use soap and water or alcohol rub), and wash carefully, including wrists and spaces between the fingers for at least 30 seconds (follow WHO's 'My 5 moments for hand hygiene'^a)

DO use one pair of non-sterile gloves per procedure or patient

DO use a single-use device for blood sampling and drawing

DO disinfect the skin at the venepuncture site

DO discard the used device (a needle and syringe is a single unit) immediately into a robust sharps container

Where recapping of a needle is unavoidable, DO use the one-hand scoop technique (see Annex G)

DO seal the sharps container with a tamper-proof lid

DO place laboratory sample tubes in a sturdy rack before injecting into the rubber stopper

DO immediately report any incident or accident linked to a needle or sharp injury, and seek assistance; start PEP as soon as possible, following protocols

Do not

DO NOT forget to clean your hands

DO NOT use the same pair of gloves for more than one patient

DO NOT wash gloves for reuse

DO NOT use a syringe, needle or lancet for more than one patient

DO NOT touch the puncture site after disinfecting it

DO NOT leave an unprotected needle lying outside the sharps container

DO NOT recap a needle using both hands

DO NOT overfill or decant a sharps container

DO NOT inject into a laboratory tube while holding it with the other hand

DO NOT delay PEP after exposure to potentially contaminated material; beyond 72 hours, PEP is NOT effective

Venepuncture Procedure -List of Equipment



- Collect all the equipments needed for the procedure
- Place it within safe and easy reach on a tray or trolley, ensuring that all the items are clearly visible.
- The equipment required includes,
 - Laboratory sample tubes, which should be stored dry and upright in a rack
 - Blood can be collected in
 - Sterile glass or plastic tubes with rubber caps
 - Vacuum-extraction blood tubes
 - Glass tubes with screw caps
 - Well-fitting sterile or non-sterile gloves;



Venepuncture Procedure -List of Equipment

- A suitable syringe (infant 2 CC, Child 5, adult 10 cc)
- A tourniquet
- Alcohol hand rub
- 3 cleaning swabs –for skin disinfection
 - Two 70% alcohol swabs
 - One Povidone Iodine.
- One gauze or cotton-wool ball to be applied over puncture site
- Laboratory specimen labels
- Writing equipment
- Laboratory request forms
- Leak-proof transportation bags or containers
- A puncture-resistant sharps container.



Identify and prepare the patient



When the patient is adult and conscious, follow the steps outlined below.

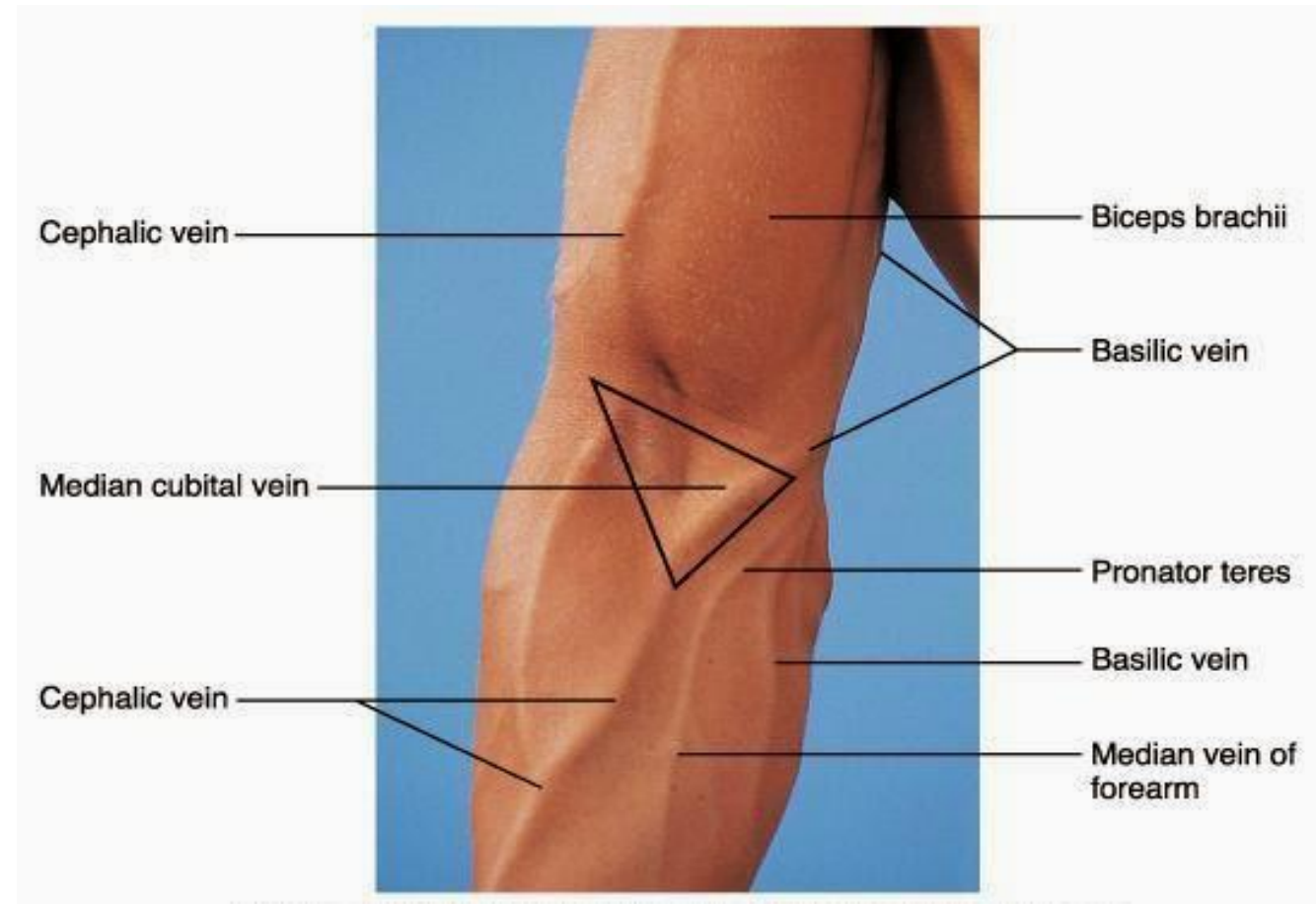
- Introduce yourself to the patient, and ask the patient to state their name.
- Check that the laboratory form that matches the patient's identity
- Ask whether the patient has allergies, phobias or has ever fainted during previous injections or blood draws.
- Make the patient comfortable in a supine position (if possible).
- Place a clean paper or towel under the patient's arm.
- Obtain verbal consent.

(The patient has a right to refuse a test at any time before the blood sampling, so it is important to ensure that the patient has understood the procedure)

Vein Selection in Adults



- Choosing the correct vein is important.
- Best practice to begin in the most distal aspect of the vein.
- This allows for further attempts above the selected vein



Vein Selection



Median Cubital Vein in the Antecubital Fossa

Advantages

- Clearly visible and accessible
- Deep veins with rich blood supply
- Easy to palpate
- Well supported by subcutaneous tissue (prevents vein rolling under the needle)
- Accessible in thin people

Disadvantages

- Brachial artery and radial nerve in close proximity
- Difficult to locate in child with increased subcutaneous fat

Cephalic and Basilic Veins in the Forearm

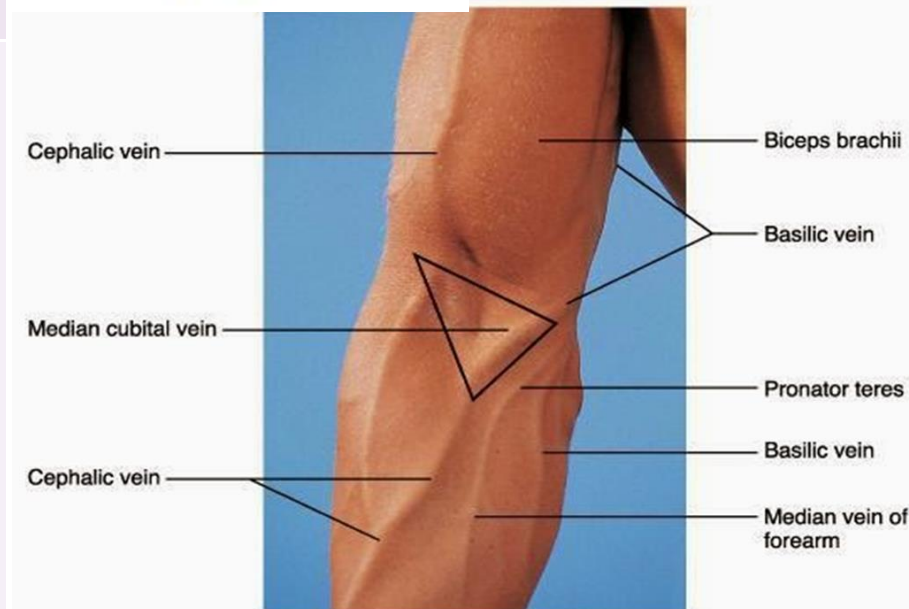
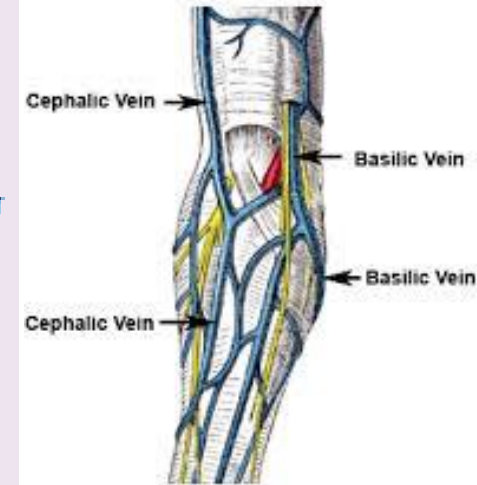
Advantages

- Easy to locate
- Larger veins

Disadvantages

- Cannot be used if site is used for arteriovenous fistula
- Not well supported by subcutaneous tissue (vein can roll from needle)
- Brachial artery close to both veins
- Median nerve close to basilic vein
- Radial nerve close to cephalic vein

Veins of the arm



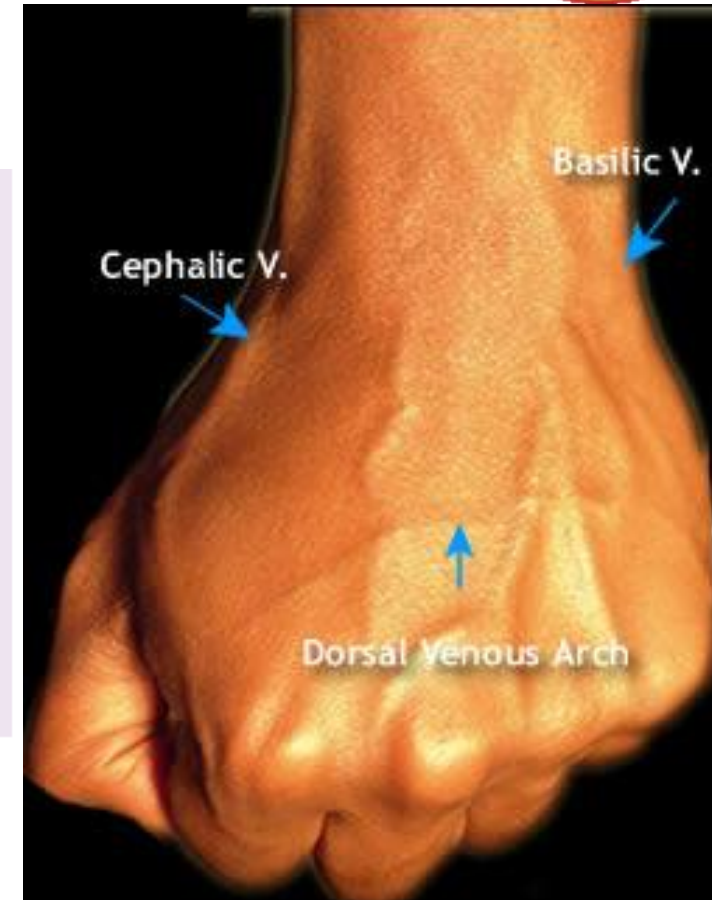
Metacarpal Veins in the Dorsal Venous Network

Advantages

- Easily accessible, easily visualised and palpable
- Prominent in obese patients

Disadvantages

- Difficult to secure
- Skin can be delicate and subcutaneous tissue is diminished (small veins may only offer small volumes of blood)
- Only suitable for small blood collection set (23G Butterfly system)



Clinical Assessment - Four Step Approach



Check

- Check indication for venipuncture. To determine equipment and specific bottles to use
- If the patient has fasted as required for specific tests
- Location and length of the vein
- Condition of the vein (visual and palpation)
- Allergies to topical anesthetic agents or plasters
- For needle phobia
- Previous history of difficult venipuncture procedures
- For history of blood borne viruses, bleeding disorders or if receiving anticoagulation therapy

Clinical Assessment - Four Step Approach



Choose

- Most distal aspect of the vein
- Non dominant hand
- Correct location, avoiding arteries and nerves
- Appropriate equipment to undertake the procedure
- Appropriate topical anesthetic agent

Clinical Assessment - Four Step Approach



Avoid

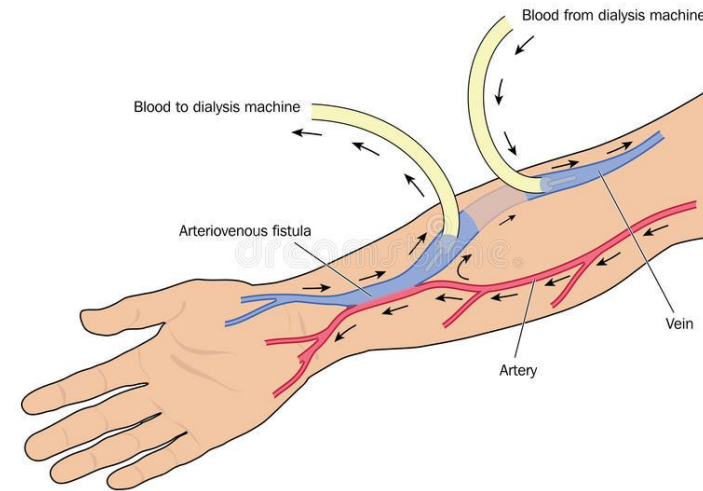
- Hard, sclerosed, fibrosed, knotty, thrombosed veins or previous vinepuncture sites
- Sites with intravenous infusions in situ
- Sites that may require peripheral intravenous central catheter (PICC) insertion
- Valves in the vein (if visible or palpable)
- Veins suitable for peripheral IV cannula and treatment if the patient requires repeated treatments such as chemotherapy.

Clinical Assessment - Four Step Approach



Do Not Use

- Arm with obvious infection or bruising
- Arm with a fracture
- Arm with an arteriovenous (AV) fistula
- Arm affected by a cerebro vascular accident
- Arm affected by lymphoedema or where axillary node clearance has taken place, for example post mastectomy



Procedure –For blood culture



- Wash hands with soap and water : dry with clean towel
- Position the patients forearm for easy access of a vein.
- Selection of the site of puncture with a good vein.
- Apply tourniquet above the level where you hope to puncture the vein and wait till it fill up.
- Clean the puncture site
 - 70 % Alcohol –Wait till evaporate
 - Providone Iodine –Keep for 1 min
 - 70 % Alcohol -wait till it evaporate

Procedure –For blood culture

- Again wash your hands or clean your hands with alcohol hand rubbing solution
- Wear Sterile gloves (or non sterile in other lx)
- Puncture the vein by piercing the skin laterally (30 degree angle or less)
- with bevel side facing up Draw 5 ml of blood (or desired amount in other lx)
- Remove the tourniquet and withdraw the needle applying pressure on puncture site to arrest bleeding.

Procedure –For blood culture



- Remove the covering cap or plaster of the blood culture bottle and clean the area with 70% alcohol (Assistant may do)
- Deliver the blood in to culture bottles and shake it gently to mix blood with broth so as to prevent clot formation.
- (Always make sure that blood culture media is at room temperature before inoculating blood sample in to the bottle.
- Do not recap or remove the needle from syringe.



Procedure –For blood culture



- Dispose the needle with syringe to sharp bin.
- Swabs – to blood and blood products bin
(Yellow bin/Clinical waste bin)
- Place the other equipment at correct place.
- Dispatch the sample and accompanying properly filled request form immediately to the laboratory.
- If there is delay keep at room temperature
- NEVER refrigerate the blood culture specimen.





Recommended order of draw











Table 2.3 Recommended order of draw for plastic vacuum tubes

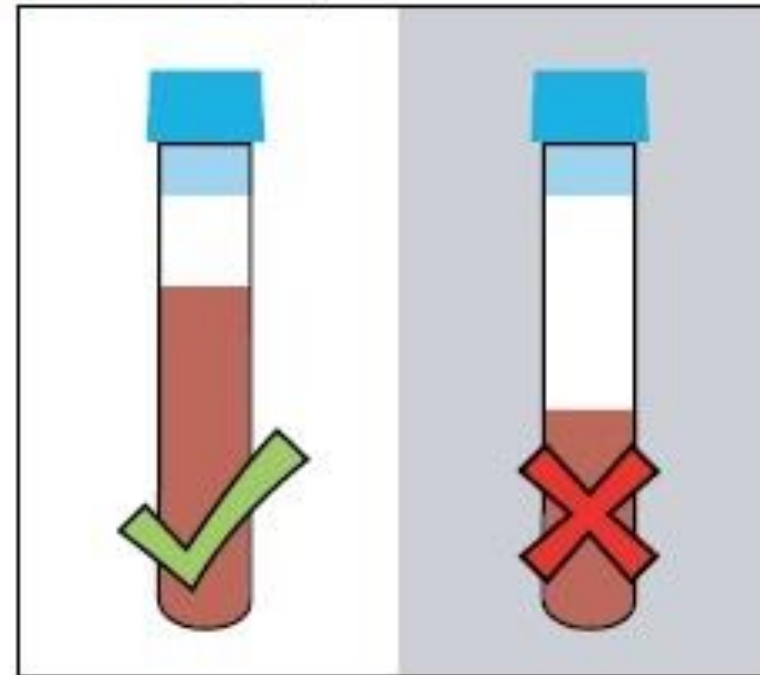
Order of use ^a	Type of tube/usual colour ^b	Additive ^c	Mode of action	Uses
1	Blood culture bottle (yellow-black striped tubes)	Broth mixture	Preserves viability of microorganisms	Microbiology – aerobes, anaerobes, fungi
2	Non-additive tube			
3	Coagulation tube ^d (light blue top)	Sodium citrate	Forms calcium salts to remove calcium	Coagulation tests (protime and prothrombin time), requires full draw
4	Clot activator (red top)	Clot activator	Blood clots, and the serum is separated by centrifugation	Chemistries, immunology and serology, blood bank (cross-match)
5	Serum separator tube (red-grey tiger top or gold)	None	Contains a gel at the bottom to separate blood from serum on centrifugation	Chemistries, immunology and serology

Recommended order of draw & colour coding



Stopper	Additive	Sequence
	YELLOW (CULTURE)	SPS FIRST
	LIGHT BLUE	Citrate
	LIGHT YELLOW	Citrate ACD
	GOLDEN YELLOW	Gel, serum
	RED	No gel, serum
	GREEN	Heparin
	LAVENDER	EDTA
	GRAY	Sodium Fluoride (Glucose)
TUBES WITH OTHER ADDITIVES		LAST

Fill tubes to capacity





Thank you !!!

