Venipuncture Procedure

IDENTIFY THE PATIENT

- Check the patient's wrist band against the order sheet or lab requisition; make sure the patient's name and hospital number are legible.
- **Check if the patient is on anticoagulants or has a history of bleeding disorders. Special care must be taken to achieve hemostasis.**

OBTAIN AND PREPARE EQUIPMENT

- Gloves
- Labels
- Tourniquet
- 2 × 2 gauze pad
- Alcohol sponge
- Adhesive strip
- Sharps container
- 21- or 22-gauge *safety-engineered* needle, safety needle holder
- Appropriate color evacuated collection tubes. (See Tube Top Colors, pp. 183-184.)

SELECT VENIPUNCTURE METHOD

- **Evacuated tube system:** Evacuated tubes have color-coded tops and fill by vacuum. The tube is used with a collection tube holder and a safety needle to collect blood directly into the tube. The collection tube holder helps in handling the needle and collection tube and allows for changing tubes to obtain multiple samples with one "stick." When the collection tube is disengaged from the needle, a small rubber sleeve covers the needle and prevents loss of blood while the tube is changed.
- **Syringe method:** Uses a 10-mL syringe and a needle to puncture the vein and aspirate blood. The needle is then inserted into the colored tube top for transportation to the lab.
- **Butterfly method**: Uses a small buttlerfly needle and a syringe to obtain the venous sample.

SELECT THE SITE

- Place the patient in a supine or semi-Fowler's position with ventral surfaces of both arms up.
- Examine both arms for suitability. **Never draw blood from the arm if it is on the side of a mastectomy, is edematous, has an IV below the venipuncture site, has a vascular access or fistula, or has a hematoma.**
- Tie a tourniquet approximately 4 inches above the intended venipuncture site. Be sure that it is tight but not uncomfortable.
- Ask the patient to make a fist.
- Assess the antecubital area of the arm. The basilic, cephalic, and median cubital veins are all usually near the skin surface.
- Palpate the vein. It should rebound (bounce).
- If the antecubital veins of both arms are not suitable, assess the forearms first and then the hands and wrist.

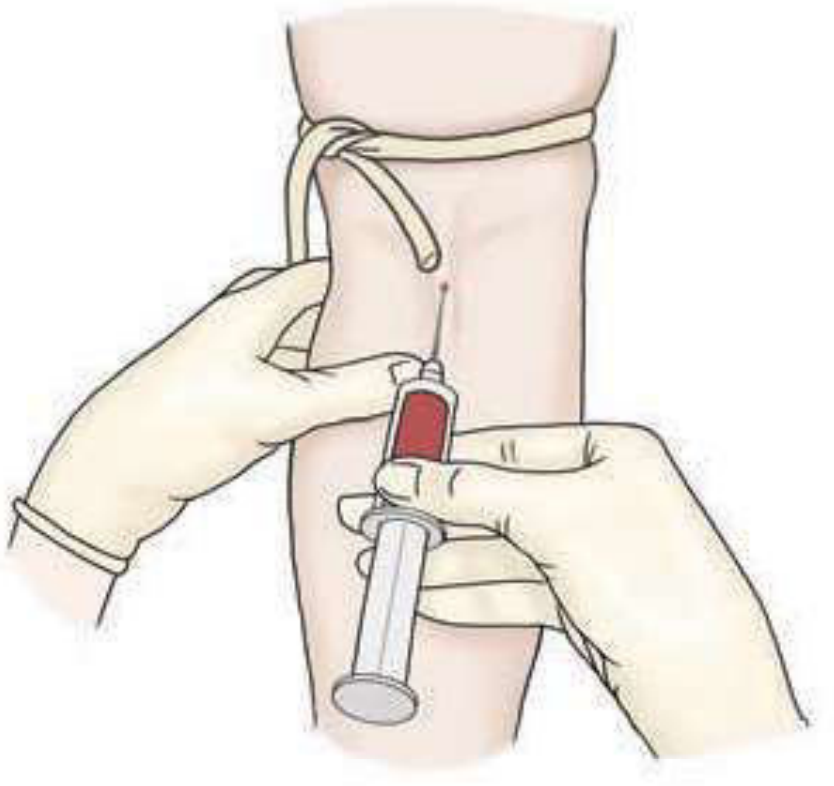
If a suitable vein cannot be found, DO NOT ATTEMPT BLOOD DRAW. Remove the tourniquet and inform the nurse in charge or call the physician.

PREPARE THE SITE

- Observe Standard Precautions.
- Don gloves.
- Open an alcohol pad and rub the site in concentric circles, working outward from the center. To avoid patient discomfort, allow the area to air dry for 30–60 sec (or wipe with a sterile, dry gauze pad).
- Povidone-iodine preps may be used. Check if patient is allergic.

PERFORM THE VENIPUNCTURE

- With your nondominant hand, stabilize the vein by holding the vein between the index finger and thumb.
- With your dominant hand grasp the collection tube holder and turn so that the bevel is UP. Holding the needle at a 15-degree angle, enter the skin directly above the vein and in the same direction as the blood flow. Advance needle into vein. Entry should be smooth and quick.
- See Other Venipuncture Methods on page 181 for procedures for obtaining blood with a syringe using a butterfly or a needle.



Venipuncture technique.The thumb of the left hand stabilizes the vein.

ENGAGE EVACUATED COLLECTION TUBE

- Ease the collection tube further into the safety needle holder.
- Remove the tube when it is filled.
- If the tube contains an additive, gently invert the tube 8–10 times to mix the additive with the blood.
- Engage subsequent collection tubes as needed.
- Obtain specimens in the following order:
  - sterile blood culture tubes
  - nonadditive clotting tubes (red)
  - coagulation tubes and tubes containing citrate (blue)
  - serum-separator tubes (speckled)
  - tubes containing heparin (green)
  - tubes containing EDTA (lavender, royal blue)
  - tubes containing acid citrate dextrose (yellow)
  - tubes containing sodium fluoride and potassium oxalate (gray)

REMOVE NEEDLE

- Release tourniquet as last tube is filling and disengage the collection tube from the safety needle.
- Apply a 2 × 2 gauze pad over the site and withdraw needle.
- Apply direct pressure with 2 × 2 dressing.

CONTROL BLEEDING

- Raise the arm above the heart level for approximately 3–5 min to control bleeding, if necessary. Hold gauze in place until bleeding has completely stopped.
- Fold a single 2 × 2 inch gauze pad into quarters and tape it tightly to the site.

DISCARD USED NEEDLES SAFELY

- DO NOT RECAP, cut, or bend needles. If recapping is done, use approved "One-Handed Method" or recapping block. NEVER RECAP WITH TWO HANDS.
- Do not separate needle from the blood tube holder. Dispose of the entire unit in the proper puncture-resistant SHARPS container.

LABEL SPECIMENS AT THE BEDSIDE

- Send to the lab with a properly filled out requisition.

Other Venipuncture Methods

Venipuncture Using a Syringe

- Use a syringe when the patient's veins are small or fragile because suction from an evacuated tube can cause the vein to collapse. Using a syringe allows control of the amount of suction.
- Steps for entry into the the vein are the same as with the evacuated tube system.
- Once in the vein, pull back on plunger to obtain desired amount of blood. Release tourniquet and withdraw needle while applying a folded gauze 2 × 2 and pressure to venipuncture site.
- Transfer blood to appropriate tubes by first replacing needle with large-bore (18 gauge) needle (prevents hemolysis).
- Insert needle into the stopper and allow tube to fill by vacuum.
- Follow the correct order of tube top color.

Venipuncture Using an IV Infusion Set (Butterfly)

- Used for venipuncture from a very small or fragile vein.
- For small children use a 23-gauge butterfly IV infusion set attached to a 1- or 3-mL syringe (prevents excessive suction).
- Steps for entry into the the vein are the same as with the evacuated tube system.
- Grasp the wings between thumb and index finger, hold skin and vein taut with other hand, and penetrate the skin with the needle.
- As soon blood is visible in the tube, pull back on the plunger or engage the vacuum tube. Release the tourniquet, remove the needle, and complete the procedure.

Skin Puncture

- Blood for laboratory analysis is sometimes obtained by skin puncture rather than venipuncture.
- Sites for skin puncture include the finger, heel (in infants), or ear lobe. To perform skin puncture:
  - Select the site.
  - Apply a warm compress to the site to increase blood flow.
  - Clean the area with 70% alcohol.
  - Thoroughly dry the site with a gauze sponge.

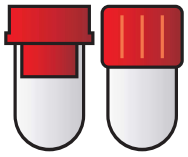
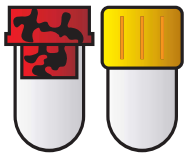
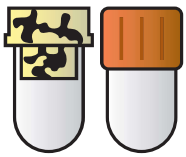
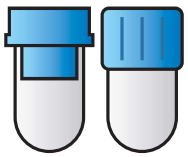
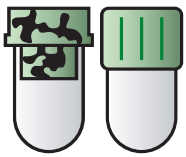
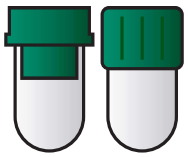
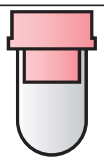
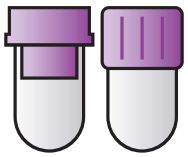
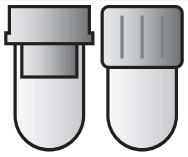
- Firmly prick the site with a lancet.
- To avoid diluting the blood sample with tissue fluid, wipe away this first drop of blood and do not squeeze or milk the surrounding tissue.
- Collect the blood in a capillary tube, on a slide, onto a test strip, or into a small container.
- If using a capillary tube, hold it horizontally and touch the end of the tube to the drop of blood without touching the skin. The tube will fill by capillary action.

Hemolysis

- Hemolysis is the destruction of the encasing membrane of the red blood cell and the subsequent release of hemoglobin into the plasma.
- Hemolyzed blood specimens can give false values and therefore are not acceptable for testing.
- Hemolyzed specimens are often the result of incorrect venipuncture technique or mishandling of the specimen.
- Tips to avoid rejected specimens include:
  - Use a 20- to 22-gauge needle.
  - If air leaks from around the needle or loss of vacuum occurs, replace the tube and collect a new specimen.
  - *Do not remove the needle from the vein with the evacuated tube still engaged in the safety needle.* This will cause air to enter the tube, which can damage red blood cells.
  - When using a syringe to withdraw blood, pull back on the plunger gently and evenly to avoid damaging cells.
  - Allow venipuncture site to dry after cleaning. Alcohol used can contribute to hemolysis.
  - Do not collect a specimen from an area of the arm that has a hematoma.
  - Consider discarding specimens if the blood enters the tube too slowly or if accessing the vein was difficult. Both these scenarios often result in damage to the red blood cells and hemolysis. If good blood flow is established, collect another sample from the same site and discard the first sample. If good blood flow cannot be established, select a new venipuncture site.

Tube Top Colors: Additives and Uses

Common Blood Collection

Color (Additive		Color (Additive	
Red (None)		Yellow (SPS-Sodium Polyanetholesulfonate)	
Red Marble Top or Gold (Clot activator and gel for serum separation)		Yellow Marble Top or Orange Thrombin	
Light Blue (Sodium Citrale		Light Green Lithium heparin and gel for plasma separation	
Green (Sodium Heparin or Lithium Heparin		Pink (EDTA)	
Lavender (EDTA ethylenediamine teraacetic acid)		Tan (Sodium Heparin (glass tubes) EDTA (plastic))	
Gray (Patassium Oxalater sodium Fluoride or sodium Fluoride		Royal Blue (Sodium Heparin EDTA None)	

Tube Top Colors: Uses

Examples of Common Labs

Red:

Blood bank, type and cross, or used as a discard tube

Red Marble-top or Gold:

Chemistry, Ca, BUN, creatinine

Light Blue:

Coagulation studies, PT, PTT, INR, fibrinogen

Lavender:

Hematology, CBC, H&H platelet counts

Gray:

Chemistry, blood glucose

Green:

Chemistry ionized Ca