

## COLLECTION OF BLOOD

Three methods of blood collection are

1. [Arterial Sampling](#)
2. [Venipuncture Sampling](#)
3. [Finger stick Sampling](#)

The specimen of choice for laboratory analysis is generally a venous specimen. For blood gas analysis, the specimen of choice originates from an arterial draw. When selecting an alternate site for blood collection, one should consider the age and size of the patient. One should also consider which method used.

### Arterial Sampling



This form of blood collection most commonly takes place within a hospital environment. It is used to identify metabolic, respiratory, and mixed acid-base disorders where CO<sub>2</sub> levels require understanding or monitoring.

While generally safe, the procedure can be upsetting and painful for the patient. In addition, several potential contraindications can affect the collection site, such as local infection. There is also an increased risk of bleeding complications in patients with coagulopathy. The blood is drawn from radial or femoral artery.

## Venipuncture Sampling

Venipuncture is the most common way to collect blood from adult patients. Collection takes place from a superficial vein in the upper limb, generally the median cubital vein; this vein is close to the skin and does not have many large nerves positioned nearby, which reduces pain and discomfort for the patient.



- 1-a blood sample will take from a vein in your arm using a needle
  - 2- You will have an elastic band tied around your upper arm to make the veins in your arm stand out.
  - 3-The inside of your arm will be cleaned with an antiseptic pad and allowed to dry.
  - 4- A needle will be inserted into the vein, a vial of blood will be drawn, and then the needle will be removed
- . \* The entire process usually lasts less than a few minutes during which there may be some temporary pain as the needle is inserted and withdrawn

## Finger stick Sampling



Finger stick or finger prick sampling involves taking a minimal amount of blood from the patient, usually from the end of a finger. It is over quickly and requires very little in the way of preparation, therefore, reducing anxiety in patients, particularly in children and nervous adults.

this method should be considered the best way to collect a blood sample. The long-term benefits to the patient include the loss of less blood and the ability to carry out testing at home.

Types of patients \*

- \*. Newborn infant to age 3 months (depending on the size of the foot) - The heel or toe is generally used because these sites are more accessible than the finger

- \*. Young Children - The third or fourth finger is usually punctured, although any finger is acceptable

- \*. Adults - The third or fourth finger is generally used to obtain the specimen, although any finger is acceptable

**Procedure:** . 1. Select the appropriate finger, toe or heel. Cleanse with an alcohol pad and allow the site to dry.

2. With a sterile lancet device, make deep puncture on the side of the fingertip, heel, or toe. (A deep puncture is not more painful than a superficial one and will produce a better flow of blood)
3. Use dry gauze to wipe away the first drop of blood
- . 4. Apply moderate pressure about 1 cm. below the puncture to obtain a drop of blood. 5. Release the pressure for a second or two to allow the blood to recirculate. Repeat the pressure until the desired amount of blood is obtained.
6. Apply a bandage to the wound

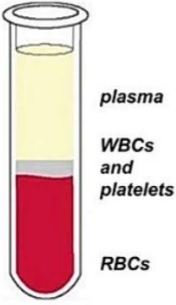
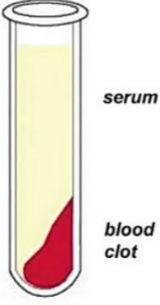
## **Separation of blood**

### **What is Plasma?**

Plasma makes up about 55% of the overall blood volume. It is the liquid portion of blood and is 90% water. Other than water, plasma also contains fibrinogen (which contributes to the normal clotting of blood) and albumin (which acts to keep fluid in your bloodstream and prevent leaking into other tissues). The purpose of plasma in the blood is to transport all the proteins, nutrients, antibodies, hormones etc. all over the body. As the plasma races around the body, cells will deposit their waste into the plasma, which contributes to another job of the plasma: waste removal.

### **What is Serum?**

Put simply, serum is plasma minus the clotting factors and blood cells. During the process of removing the clotting factors (achieved by centrifugation), the protein fibrinogen as described above is converted to fibrin. Fibrin is an insoluble protein that is used to assist in the repair of tissue damage by forming a clot over the wound which acts to hinder the flow of blood.

PLASMA		SERUM	
 <p><i>plasma</i></p> <p><i>WBCs and platelets</i></p> <p><i>RBCs</i></p>	<ul style="list-style-type: none"> <li>• anti-coagulants are needed for purification</li> </ul>	 <p><i>serum</i></p> <p><i>blood clot</i></p>	<ul style="list-style-type: none"> <li>• anti-coagulants are not needed</li> </ul>
	<ul style="list-style-type: none"> <li>• it can be prepared as soon as it has been mixed thoroughly</li> </ul>		<ul style="list-style-type: none"> <li>• 30 minutes delay for a clot formation</li> </ul>
	<ul style="list-style-type: none"> <li>• fibrinogen is present</li> </ul>		<ul style="list-style-type: none"> <li>• fibrinogen is absent</li> </ul>
	<ul style="list-style-type: none"> <li>• platelets and cells (WBCs) can contaminate the liquid fraction</li> </ul>		<ul style="list-style-type: none"> <li>• cleaner sample, depleted of cells and cell remnants, but latent clotting can lead to fibrin formation</li> </ul>
	<ul style="list-style-type: none"> <li>• composition of ions is representative of the circulating blood</li> </ul>		<ul style="list-style-type: none"> <li>• clot retraction elevates potassium level relative to its plasma value</li> </ul>
	<ul style="list-style-type: none"> <li>• considered less stable (especially during longer storage)</li> </ul>		<ul style="list-style-type: none"> <li>• considered more stable – the gold standard for biobanking</li> </ul>

#### Separation of plasma

- 1) Blood will be collected into EDTA tubes and centrifuged (2000 rpm) centrifuge for 20 minutes
- 2) After centrifugation using clean pipette technique place 1.0ml of plasma into 1.5ml tube labeled with tracking number and "plasma"
- 3) Freeze immediately at –80 degree freezer

#### Separation of Serum

1. A 10 ml tube of whole blood will be collected following standard procedures using a serum separator tube from each patient.
2. Allow samples to clot for one hour at room temperature
3. Centrifuge for 10 minutes at approximately 1000g
4. Using clean pipette technique Aliquot 210ul of serum into labeled vials.
5. Immediately freeze vials of serum at –80-degree freezer.