Specimens

roper collection, identification, processing, storage, and transport of common sample types associated with requests for diagnostic testing are critical to the provision of quality test results.

Preliminary Steps

Before any specimen is collected, the phlebotomist must confirm the identity of the patient through :

1. Name.
2. medical record number .
3. date of birth .
4. address if the patient is an outpatient.

Types of Specimens:

Types of biological specimens that are analyzed in clinical laboratories include

1. whole blood
2. serum
3. plasma
4. urine
5. Stool
6. Saliva
7. spinal, synovial, amniotic, pleural, pericardial, and ascitic fluids .
8. various types of solid tissue.

1- Blood

Blood for analysis may be obtained from veins, arteries, or capillaries. A blood sample can be obtained from three locations :

A - Venipuncture

Venous blood is usually the specimen of choice, and venipuncture is the method for obtaining this specimen.

➢ Location

The median cubital vein in the antecubital fossa, or crook of the elbow, is the preferred site for collecting venous blood in adults because the vein is large and is close to the surface of the skin. Veins on the back of the hand or at the ankle may be used, although these are less desirable and should be avoided in people with diabetes and other individuals with poor circulation.

➢ Preparation of Site

The area around the intended puncture site should be cleaned with whatever cleanser is approved for use by the institution.

➢ Venipuncture in Children

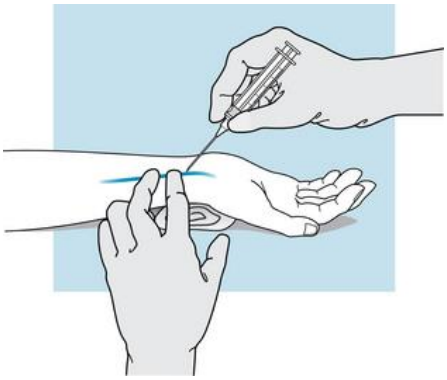
The techniques for venipuncture in children and adults are similar. However, children are likely to make unexpected movements, and assistance in holding them still is often desirable.

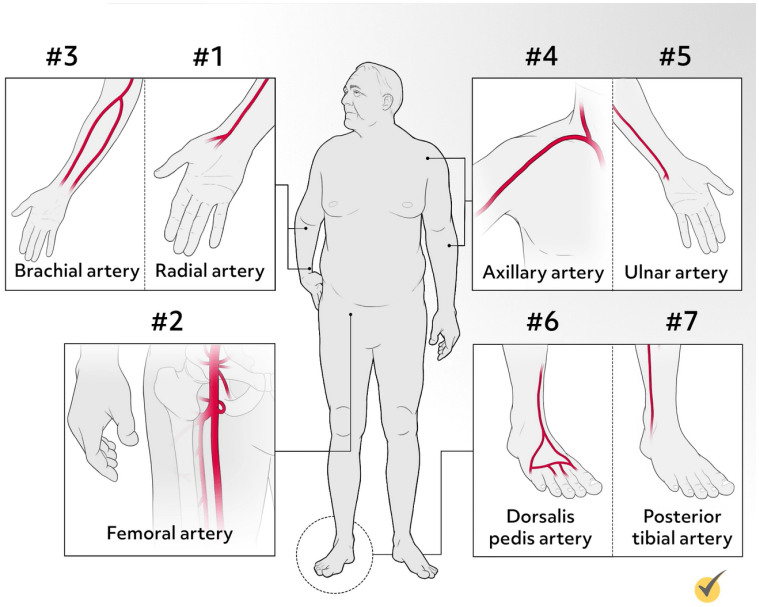
B - Arterial Puncture

Arterial puncture is used mainly for blood gas analyses. Arterial puncture requires considerable skill and is usually performed only by physicians or specially trained technicians or nurses. Preferred sites of arterial puncture are, in order, the :

- **radial artery at the wrist**
- **brachial artery in the elbow, and**

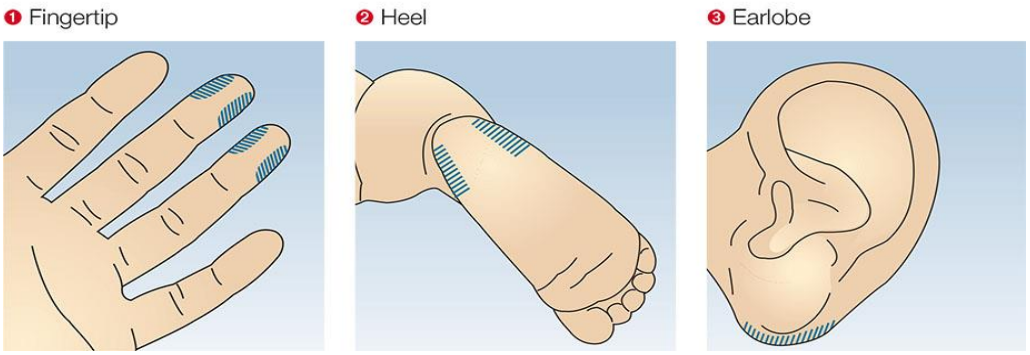
- **femoral artery in the groin.**





C - Skin Puncture

Skin puncture is an open collection technique in which the skin is punctured by a lancet and a small volume of blood is collected into a microdevice .In young children and for many point-of-care tests, skin puncture is frequently used to obtain what is mostly capillary blood. It is most often performed on (1) the tip of a finger, (2) an earlobe, and (3) the heel or big toe of infants.



Types of blood tubes in laboratories for collecting blood samples :

Cap Color	Additive	Tube Material	Tube Size(mm)	Draw Volume(ml)	Clinical Use
 Red	No Additive	PET, Glass	2,3,4,5,6,7,8,9(PET) 2,3,4,5,6,7,8,9,10(Glass)	13 x 75 13 x 100 16 x 100	Biochemistry, Immunology
	Clot Activator	PET, Glass	2,3,4,5,6,7,8,9(PET) 2,3,4,5,6,7,8,9,10(Glass)	13 x 75 13 x 100 16 x 100	Biochemistry, Immunology
 Yellow	Gel & Clot Activator	PET, Glass	2,3,3.5,4,5,6,7,8,8.5	13 x 75 13 x 100 16 x 100	Biochemistry, Immunology
 Grey	EDTA / Sodium Fluoride	PET, Glass	2,3,4,5,6,7,8,9(PET) 2,3,4,5,6,7,8,9,10(Glass)	13 x 75 13 x 100 16 x 100	Blood Sugar, Tolerance
 Lavender	K2EDTA, K3EDTA	PET, Glass	2,3,4,5,6,7,8,9(PET) 2,3,4,5,6,7,8,9,10(Glass)	13 x 75 13 x 100 16 x 100	Clinical Hematology
 Green	Lithium Heparin, Sodium Heparin	PET, Glass	2,3,4,5,6,7,8,9(PET) 2,3,4,5,6,7,8,9,10(Glass)	13 x 75 13 x 100 16 x 100	Plasma Biochemistry Test, Rheology Measurement
 Blue	3.2% Sodium Citrate	PET, Glass	3.6,4.5,5.4,6.3,7.2,8.1,9(PET) 1.8,2.7,3.6,4.5(Glass)	13 x 75 13 x 100 16 x 100	Coagulation Test
 Black	3.8% Sodium Citrate	PP + PET Glass	1.28,1.6,2.4,3.2,4(Glass) 1.6,2.4(PP+PET)	13 x 75 13 x 100 8 x 120	Blood Sedimentation Rate Testing

2 - Stool

How To Collect The Specimen(s)

1. Avoiding contact with urine, pass stool directly into the stool cup OR pass stool into a large clean container (such as a cut out milk jug) OR onto a newspaper placed under the seat of the toilet. Transfer entire specimen into the stool cup using the tongue depressor provided or other handy implement (such as a plastic spoon). If your stools are loose, pass directly into a container, not onto newspaper.
2. Label the stool cup with your full name, date and time of collection.
3. Submit the specimen to the lab within two hours of collection.

3 - Urine

(See specific Microbiology Specimens sections for other instructions.)

Note: Please examine specimen collection and transportation supplies to be sure they do not include expired containers.

Urine Specimen Collection Products

Urinalysis and Culture and Susceptibility

Submit a urinalysis preservative tube and culture and susceptibility preservative tube. Label both filled tubes with the patient's first and last name and second identifier. Include the date and time of specimen collection on each specimen container.

Urinalysis Only

Submit a urinalysis preservative tube. Label filled tube with the patient's first and last name and second identifier. Include the date and time of specimen collection on each specimen container.

Biochemical tests

blood glucose :

The blood glucose level is the amount of glucose present in the blood. Glucose is the primary source of energy for the body's cells.

The blood glucose Types :

1 - A1C Test

The A1C test measures your average blood sugar level over the past 2 or 3 months. An A1C below 5.7% is normal, between 5.7 and 6.4% indicates you have prediabetes, and 6.5% or higher indicates you have diabetes.

2 - Fasting Blood Sugar Test (FBS) :

This measures your blood sugar after an overnight fast (not eating). A fasting blood sugar level of 99 mg/dL or lower is normal, 100 to 125 mg/dL indicates you have prediabetes, and 126 mg/dL or higher indicates you have diabetes.

3 - Glucose Tolerance Test (GTT) :

This measures your blood sugar before and after you drink a liquid that contains glucose.

4 - Random Blood Sugar Test (RBS)

This measures your blood sugar at the time you're tested. You can take this test at any time and don't need to fast (not eat) first. A blood sugar level of 200 mg/dL or higher indicates you have diabetes.

5 - Tests for Gestational Diabetes

Gestational diabetes is diagnosed using blood tests. You'll probably be tested between 24 and 28 weeks of pregnancy.

Result*	A1C Test	Fasting Blood Sugar Test	Glucose Tolerance Test	Random Blood Sugar Test
Diabetes	6.5% or above	126 mg/dL or above	200 mg/dL or above	200 mg/dL or above
Prediabetes	5.7 – 6.4%	100 – 125 mg/dL	140 – 199 mg/dL	N/A
Normal	Below 5.7%	99 mg/dL or below	140 mg/dL or below	N/A

Symptoms of high blood glucose levels include:

- Increased thirst and urination (peeing)
- Blurred vision
- Fatigue
- Sores that don't heal
- Weight loss when you're not trying to lose weight
- Numbness or tingling in your feet or hands

Symptoms of low blood glucose levels include:

- Feeling shaky or jittery
- Hunger
- Fatigue
- Feeling dizzy, confused, or irritable
- Headache
- A fast heartbeat or arrhythmia (a problem with the rate or rhythm of your heartbeat)
- Having trouble seeing or speaking clearly
- Fainting or seizures

You're more likely to develop diabetes if you:

- Are overweight or have obesity
- Are age 45 or older
- Have a family history of diabetes
- Have high blood pressure
- Don't exercise enough
- Have a history of heart disease or stroke

- Have had gestational diabetes (diabetes that happens only during pregnancy)

If your results show higher than normal glucose levels, it may mean you have or are at risk for getting diabetes. High glucose levels may also be a sign of:

- Hyperthyroidism
- Pancreas disorders
- Stress from surgery, very serious illness, or trauma

If you have diabetes, lower than normal glucose levels may be caused by:

- Side effects from certain diabetes medicines
- Not eating enough, especially after taking diabetes medicine
- Being more physically active than usual

If you don't have diabetes, low blood glucose levels may be a sign of:

- Liver disease
- Kidney disease
- Underactive adrenal, pituitary, or thyroid gland (hypothyroidism)
- Alcohol use disorder (AUD)