Collection a blood sample and measuring blood sugar

اعداد

م .د.زينب علي سلمان

Introduction

A blood sample is taken by a physician , in a laboratory or hospital and in many cases the blood sample is sent on to analysis. It takes about 5 min. to take a blood sample. Blood samples are taken in the arm, hand, finger or ear, depending on the analysis to be made.

Blood: is the red fluid in the body that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells, blood is approximately 55% fluid and 45% blood cells.

Blood cells are classified as:

1- White blood cells (leukocytes).

2- Red blood cells (erythrocytes).

3- Platelets (thrombocytes).

Requesting Patient Samples

- Patient identification
- Accurate and legibly written information about the patient is essential, although electronic requesting systems are now widespread in some areas. This information includes the patient's:

_ hospital case number, and/or healthcare number,

_ surname and first name(s), correctly and consistently spelt,

date of birth, rather than age.

These would usually be considered the minimum acceptable dataset for patient identification details. Any of these may be recorded inaccurately on the form and, unless there is complete agreement with previous details, results may be entered into the wrong patient's record either on a computer or in the patient's case notes, causing confusion and possible danger to the patient.

General Specimen Collection

* Some of the common considerations affecting all types of specimens:

- Please examine specimen collection and transportation supplies to be sure they do not include **expired containers**.
- **Label a specimen** correctly and provide all pertinent information required on the test request form.
- Submit a quantity of specimen sufficient to perform the test.
- **Use the container/tube indicated in the test requirements for appropriate specimen preservation**.
- **Follow patient instructions** prior to specimen collection.
- **Carefully** tighten specimen container lids to avoid leakage and/or potential contamination of specimens.
- **Maintain the specimen at the temperature** indicated in the test requirements.

Different Procedures for Whole Blood Collection

Finger Prick

Venous Blood

MATERIALS AND TOOLS

Syringes & needles

Tourniquet

Test-tubes

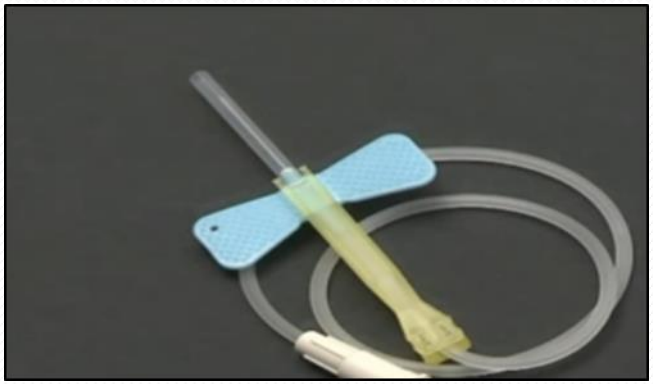
70% isopropanol

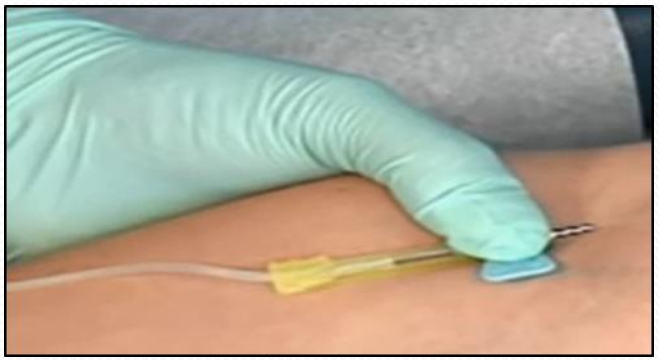
Cotton

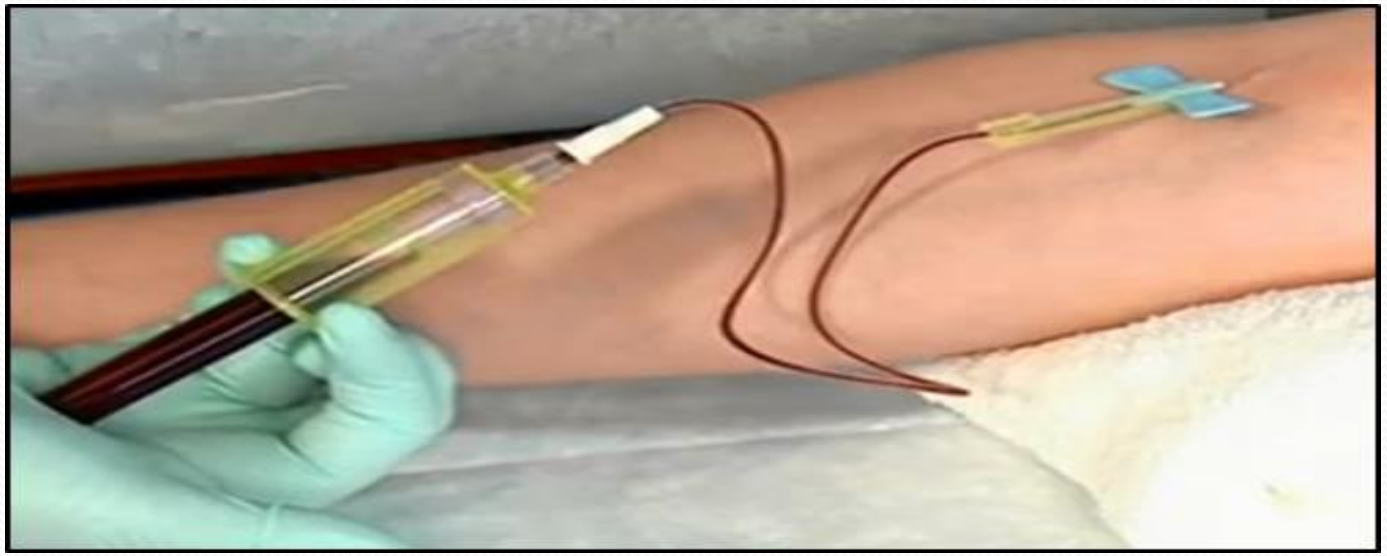
Marker pen

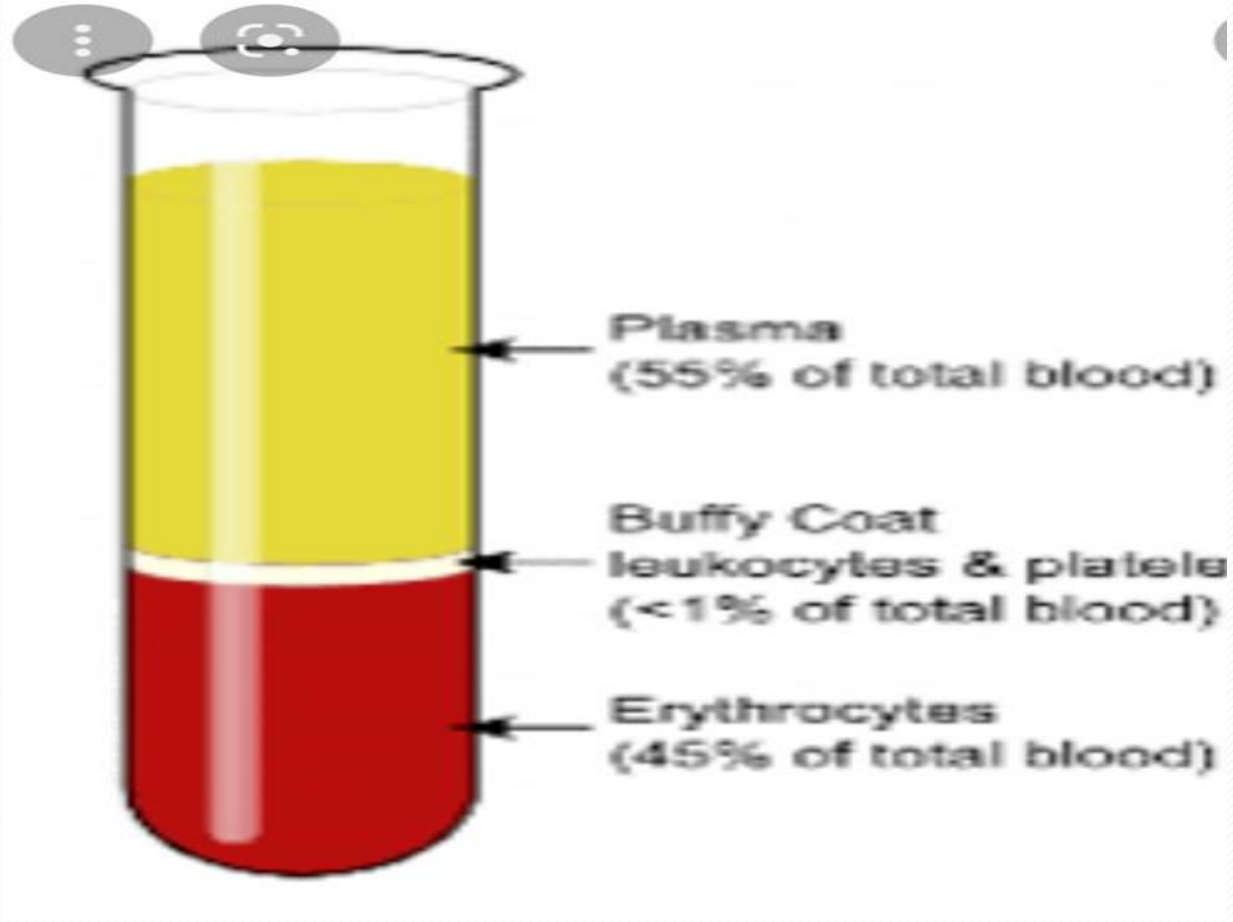
Gloves


PROCEDURE OF
BLOOD COLLECTION








Plasma
(55% of total blood)
Buffy Coat
leukocytes & platele
(<1% of total blood)
Erythrocytes
(45% of total blood)

Types of blood specimens:

1- Whole blood: A venous, arterial or capillary blood sample collected in anticoagulant tube.

2- Serum: blood collected without any anti-coagulant and centrifuged. Clear supernatant fluid devoid of any fibrin products (clotting factor).

3- Plasma: blood collected & mixed with anticoagulant and centrifuged. Clear supernatant fluid with thrombosis inhibited. No changes occur in blood

-Indicate type of anticoagulant (eg, “Ethylene Diamine Tetra acid (EDTA),” “citrate,” Heparin ,Oxalate).

Hemoguard stopper	Tube Content	Determination
	Serum separator tube (SST)	All biochemistry not mentioned elsewhere (1 tube), microbiology (1 tube)
	Heparin	Chromosome studies, lead, amino acids, troponin
	Fluoride/ oxalate	Glucose
	EDTA	Full Blood Count (FBC) and ESR, C3/C4, Hemoglobin A1c, Homocysteine, ACTH
	Plain (No additive)	LDH, Ca, Drugs (Phenytoin, Theophylline, Lithium), Endocrine testing (except Thyroid)
	Sodium citrate	Coagulation testing, PT, INR, APTT, D-Dimer, etc...
	ESR	Westergren Sedimentation Rate; requires full draw

Blood Collection Supplies: Finger Prick

1. Lancet (1),
2. Alcohol swab (1),
3. Gauze square (1),
4. Loop (1) (provided by kit),
5. Gloves (2),
6. Optional: Plaster (1)

Source of glucose in blood derived from:

1-Dietary carbohydrate

2-Glycogenolysis of liver glycogen (breakdown of glycogen to glucose)

3-Gluconeogenesis formation of glucose from non carbohydrate sources, such as amino acids, glycerol, or lactate

Clinical Significance:

Normal level of plasma glucose:

1-Fasting blood glucose (79 - 110 mg/dl).(

For a FBGT, you can't eat or drink anything but water for eight hours before your test)

2-2-hour postprandial blood glucose less than 140 mg/dl.(measures blood glucose exactly 2 hours after eating a meal).


PD-303

► **Hyperglycemia is** elevated blood glucose occurs in the following conditions:

1**. Diabetes mellitus** a metabolic disease (FBS >120 mg/dl) with two major causes:

- (T1DM) Absolute deficiency of insulin
- Resistance to insulin (T2DM) (tissues do not respond to the action of insulin

2.Cushing's syndrome (increased glucocorticoids cause elevated blood sugar levels)

3**.Pheochromocytom**a (tumor of adrenal medulla).

4.Pituitary adenoma (increased secretion or growth hormone causes elevated blood glucose levels)

5.Acromegaly.

Hypoglycemia: Decreased glucose concentrations in the blood:

Decreased blood plasma glucose (hypoglycemia) occurs in the following conditions:

a. Pancreatic islet cell carcinoma (insulinoma)

b. Extrapancreatic stomach tumors (carcinoma)

c. Addison's disease

Glycated hemoglobin test or Glycohemoglobin test (HbA1c)

- HbA1c is a test that used to show the average level of blood sugar (glucose)over the previous 3 months. It shows how controlling your diabetes .This test not special preparation is needed . The food you have recently eaten does not affect the HbA1c test.
- **Normal Results**
- The results when HbA1c is being used to diagnosis diabetes :
- Normal(no diabetes): less than 5.7%
- Prediabetes: 5.7% to 6.4%
- Diabetes: 6.5% or higher
- The higher level HbA1c risk factor lead to many problems such as (eye disease, heart disease, kidney disease, nerve damage and stroke).


thank
you