



كلية المستقبل الجامعة
قسم تقنيات المختبرات الطبية
كيمياء سريرية – المرحلة الرابعة

دليل تجارب مختبر الكيمياء السريرية

اعداد

م.م. حوراء سعد حمود

م.م. سلام محمد ناصر

م.ك. هند عدنان

Clinical Chemistry

Is a quantitative science that is concerned with the measurement of amounts of biologically important substances (called analytes) in body fluids. The methods to measure these substances are carefully designed to provide accurate assessments of their concentration

Specimen Collection and Processing

Proper 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. Many errors can occur during these steps. Minimizing these errors through careful adherence to the concepts discussed here.

Types of Specimens

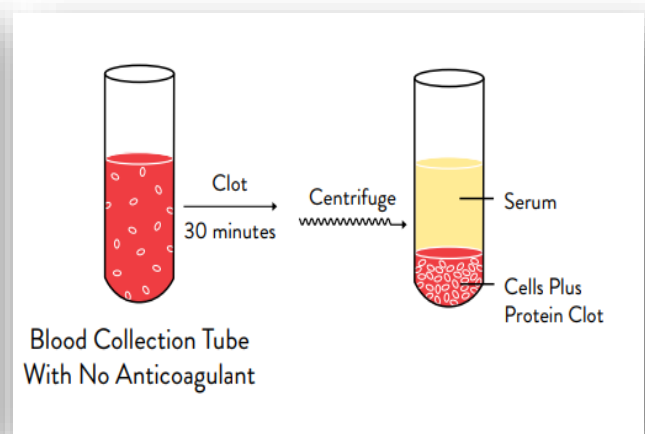
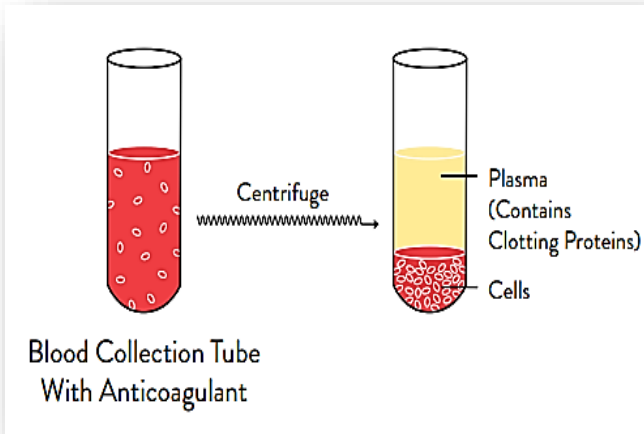
Types of biological specimens that are analyzed in clinical laboratories include

- ❖ Whole Blood
- ❖ Serum
- ❖ Plasma
- ❖ Urine
- ❖ Feces
- ❖ Saliva
- ❖ Spinal, Synovial, amniotic, pleural, pericardial, and ascitic fluids
- ❖ Various types of solid tissue.

The Clinical and Laboratory Standards Institute (CLSI) has published several procedures for collecting many of these specimens under standardized conditions.

Blood

Blood for analysis may be obtained from **veins**, **arteries**, or **capillaries**. Venous blood is usually the specimen of choice, and venipuncture is the method for obtaining this specimen. Arterial puncture is used mainly for blood gas analyses.



Venipuncture

In the clinical laboratory, venipuncture is defined as all of the steps involved in obtaining an appropriate and identified blood specimen from a patient's vein.

Preliminary Steps

Before any specimen is collected, the phlebotomist must confirm the identity of the patient. Two or three items of identification should be used

(e.g., [1] **name**, [2] **medical record number**, [3] **date of birth**, [4] **address if the patient is an outpatient**). Before collection of a specimen, a phlebotomist should dress in personal protective equipment (PPE), such as an impervious gown and gloves applied immediately before approaching the patient,








Preparation of Site

The area around the intended puncture site should be cleaned with whatever cleanser is approved for use by the institution. Three commonly used materials are a prepackaged

- ❖ Alcohol Swab,
- ❖ A Gauze Pad Saturated With 70% Isopropanol
- ❖ A Benzalkonium chloride solution (Zephiran chloride solution, 1: 750).

Cleaning of the Venipuncture

Types of Tubes Used for Collection Blood Samples

Important Notes	Tube Colour	Tube Type	Information
<p>The sample should be inverted about six times to ensure the blood and gel mixes to activate the clotting process.</p> <p>The samples must not be shaken to mix the blood</p>	 Gold	Serum Separating Tube (SST)	This tube type is used for the vast majority of Biochemistry, Immunology and Serology tests. Please check the website if unsure of the correct sample type.
<p>The tubes should be filled up to the line indicated on the tube to ensure the correct ratio of blood to anticoagulant is achieved for analysis. The sample should be inverted about six times to ensure the blood and anticoagulant mixes.</p> <p>The samples must not be shaken to mix the blood</p>	 Green	Lithium Heparin/Plasma Separating Tube	A few of the tests that use this tube type require the plasma to be frozen within half an hour of the sample being take. Please check the test information on the website.
<p>The tubes should be filled up to the line indicated on the tube to ensure the correct ratio of blood to anticoagulant is achieved for analysis. The sample should be inverted about six times to ensure the blood and anticoagulant mixes.</p> <p>The samples must not be shaken to mix the blood</p>	 Royal Blue	Sodium Heparin Tube	These sample are used to check the levels of trace metals, lead and mercury in the blood.
<p>These tubes should not be shaken</p>	 Red	Plain Tube	These tubes are very rarely used and should only be used for a specimen under instruction from the laboratory.
<p>The tubes should be filled up to the line indicated on the tube to ensure the correct ratio of blood to anticoagulant is achieved for analysis. The sample should be inverted about six times to ensure the blood and anticoagulant mixes.</p> <p>The samples must not be shaken to mix the blood</p>	 Grey	Fluoride Oxalate Tube	Anticoagulant and fluoride salt act as a glycolysis inhibitor to stabilise the glucose concentration in the sample. Main tests analysed on the sample: Glucose, Lactate and Alcohol.
<p>The tubes should be filled up to the line indicated on the tube to ensure the correct ratio of blood to anticoagulant is achieved for analysis. The sample should be inverted about six times to ensure the blood and anticoagulant mixes.</p> <p>The samples must not be shaken to mix the blood</p>	 Lavender	Potassium EDTA Tube	Potassium EDTA serves as the anticoagulant for the performance of almost all haematological tests. Larger EDTA bottles are used for transfusion samples only.
<p>The tubes should be filled up to the line indicated on the tube to ensure the correct ratio of blood to anticoagulant is achieved for analysis. The sample should be inverted about six times to ensure the blood and anticoagulant mixes.</p> <p>The samples must not be shaken to mix the blood</p>	 Light Blue	Sodium Citrate Tube	The ratio between anticoagulant and blood for physiological examinations is 1:9