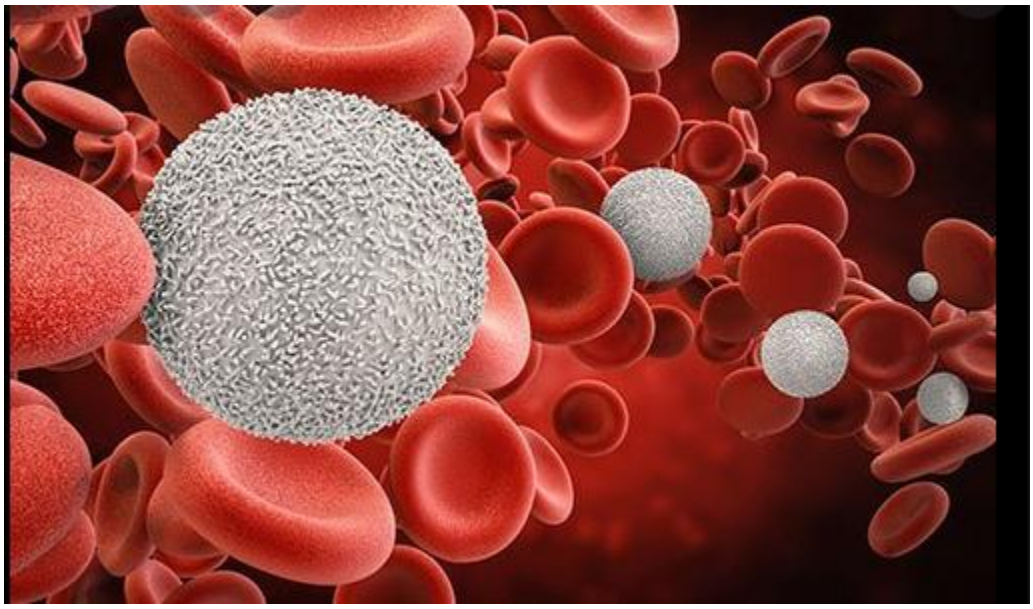
Complete Blood Count

The complete blood count (CBC), also known as a full blood count (FBC), is a set of medical laboratory tests that provide information about the cells in blood. The CBC evaluate the counts of white blood cells (WBCs), red blood cells (RBCs) and platelets (PLTs), the CBC also, reports the concentration of hemoglobin (Hb), and the hematocrit (HCT), the red blood cell indices, and a white blood cell differential.

The CBC can evaluate the overall health and detect a variety of diseases and conditions, such as infections, anemia and leukemia. The results are interpreted by comparing them to reference ranges, which vary with sex and age.

Because of the amount of information it provides, the complete blood count is one of the most commonly performed medical laboratory tests.



Purpose

Blood is composed of a fluid portion, called plasma, and a cellular portion that contains red blood cells, white blood cells and platelets. The complete blood count evaluates the three cellular components of blood.

1. The CBC is often used to screen for diseases as part of a medical assessment, or when suspicion of a disease affects blood cells, such as infection, bleeding, or some cancers.

2. People who have been disorders or receiving treatments that can affect blood cell counts may performed a regular CBC to monitor their health.

3. It is often performed before surgery to detect anemia, sufficient platelet levels, and screen for infection, as well as after surgery, to monitored the blood loss.

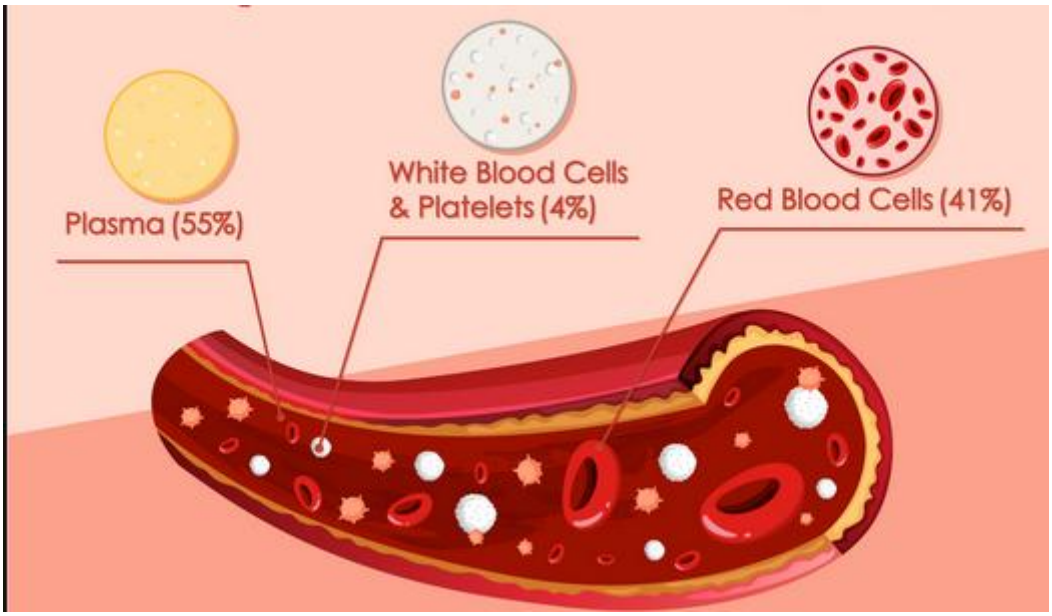
4. In emergency, the CBC is used to investigate numerous symptoms, such as fever, abdominal pain, and breath shortness, and to assess bleeding and trauma.

5. Blood counts are closely monitored in people undergoing chemotherapy or radiation therapy, because these treatments suppress the production of blood cells in the bone marrow.

6. The CBC is a routine part during pregnancy to monitored anemia; and in newborn, it may be needed to investigate jaundice or to count the number of immature cells in the differential white blood cell.

7. The results of the CBC and smear examination reflect the functioning of the organs and tissues involved in the production and development of blood cells, particularly the bone marrow.

8. Examination of the CBC results and blood smear can help to distinguish between causes of anemia, such as nutritional deficiencies, hemolytic anemias and inherited conditions like sickle cell anemia and thalassemia .



Included tests

A standard CBC includes:

Red blood cell (RBC) tests:

 Red blood cell (RBC) count is a count of the actual number of red blood cells in blood sample.

 Hemoglobin (HGB) measures the total amount of the hemoglobin in the blood.

 Hematocrit (HCT) measures the percentage of your total blood volume that consists of red blood cells.

 Red blood cell indices provide information on the physical features of the RBCs:

 Mean corpuscular volume (MCV)

 Mean corpuscular hemoglobin (MCH)

 Mean corpuscular hemoglobin concentration (MCHC)

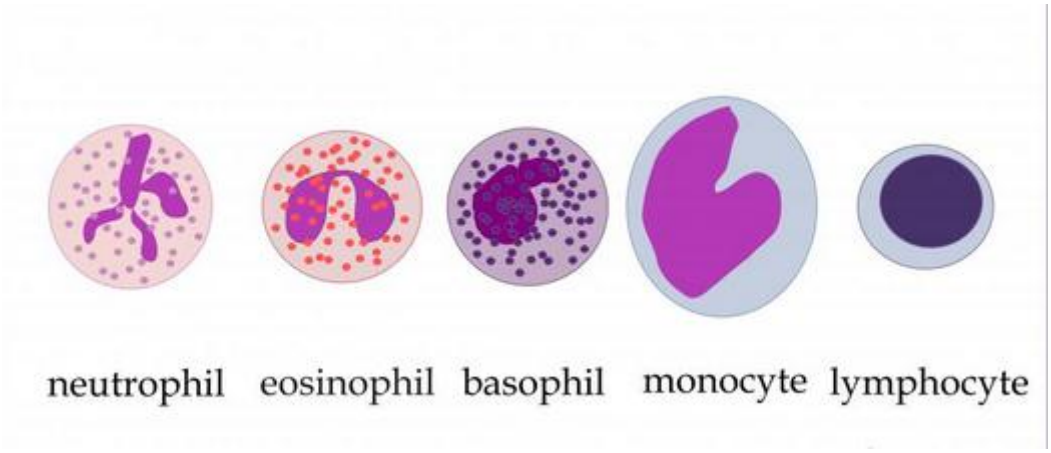
 Red cell distribution width (RDW)

 Reticulocyte count may be included with a CBC, which is a measurement of the newly released young red blood cells in blood sample .

White blood cell (WBC) tests:

 White blood cell (WBC) count is a count of the total number of white blood cells in blood sample.

 Differential white blood cell identifies and counts the number of the five types of white blood cells present (neutrophils, lymphocytes, monocytes, eosinophils, and basophils).

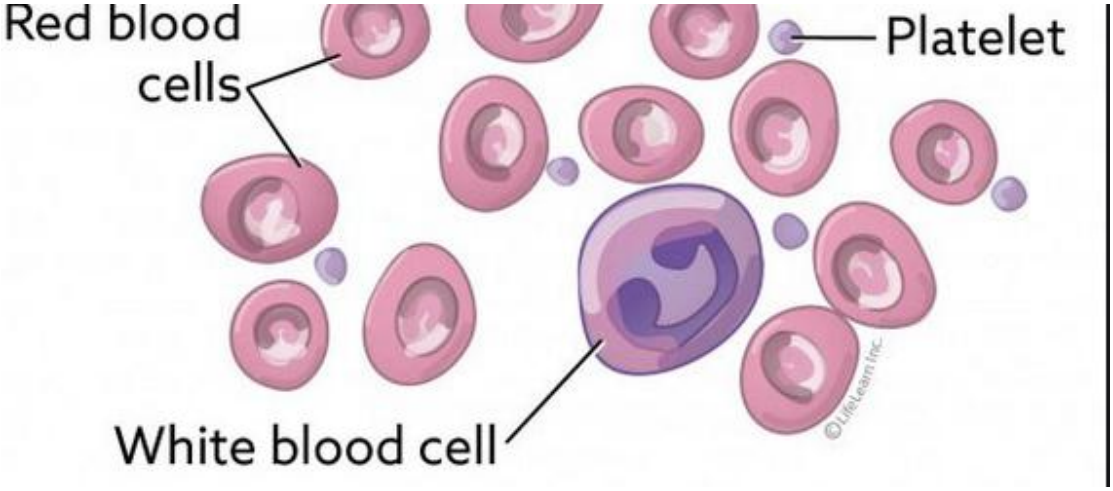


Platelet tests:

- *Platelet count (PLT)* is the number of platelets in blood sample.

- *Mean platelet volume (MPV)* may be reported with a CBC. It is a measurement of the average size of platelets.

- *Platelet distribution width (PDW)* may also be reported with a CBC. It reflects how uniform platelets are in size.



Procedure

The sample is collected by drawing blood into a tube containing an EDTA anticoagulant to stop its natural clotting.

Testing is typically performed on an automated hematology analyzer, but can be performed manually when automated equipment is not available or when the analyzer results needed further investigation.

Manual techniques such as a blood smear examination or manual hematocrit test can be used to investigate abnormal results.