

Complete Blood Count (CBC) Test

The CBC is one of the most commonly ordered blood screening tests and is used to present a general picture of a person's overall health. It can help the physician diagnose illness/disease for people with signs and symptoms and monitor treatment of many disease states. In the CBC test, the different types of cells in the blood are counted and examined. The components of a CBC are outlined below.

White Blood Cell count (WBC) White blood cells are cells of the immune system involved in defending the body against both infectious disease and foreign bodies. An increase or decrease in the WBC count may be due to some medications or certain diseases.

Red Blood Cell count (RBC) Red blood cells are the most common type of cells in the blood. Red blood cells are produced continuously in the bone marrow of healthy adults. These cells contain hemoglobin, which carries oxygen throughout the body. The red blood cell count will let your physician know if the number of red blood cells in your body is low (anemia), normal or high (polycythemia).

Hemoglobin (HGB) Hemoglobin is found within the red blood cell. Measuring hemoglobin gives the physician an exact picture of the ability of the blood to carry oxygen. In general, females have lower hemoglobin values than men.

Hematocrit (HCT) Hematocrit measures how much of your blood is made of red blood cells. Females generally have lower hematocrit values than males.

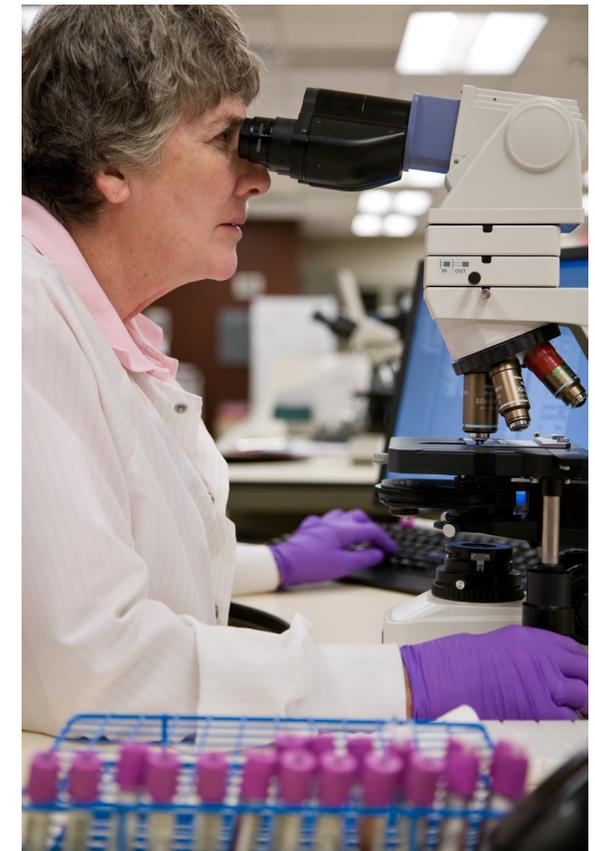
Indicies (MCV, MCH, MCHC, and RDW) Indicies are used to define the size and hemoglobin concentration of the red blood cell. These are mathematical calculations of RBC size and hemoglobin content. They are generally used to categorize anemias.

Platelets Platelets are the smallest type of cell found in the blood. Platelets are essential in blood clotting. High values or low values may be associated with clotting disorders or a wide range of other illnesses or conditions.



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MPV (Mean Platelet Volume) MPV is the average size of the platelets. This value can be useful to diagnose platelet disorders.

Differential There are five different types of white cells that make up the differential. The differential gives a percent of the major types of WBCs listed below.

1. *Neutrophils* are the most numerous of the white blood cells. They are designed to fight off infections and diseases that may enter the body.
2. *Lymphocytes* are the second most numerous of the circulating white blood cells. They too are designed to fight infection, in particular chronic bacterial infections and viral infections.
3. *Monocytes* are very large white blood cells, but generally are not as numerous in the blood as neutrophils or lymphocytes. These cells are very important in fighting bacterial infections.
4. *Eosinophils* are important in fighting allergies and parasitic infections.
5. *Basophils* are the least numerous of the white blood cells and play a role in allergic reactions and parasitic infections.

Health Panel Tests

Diabetes and Glucose Intolerance Glucose, or blood sugar, is measured. High glucose levels may indicate diabetes. Low levels may indicate hypoglycemia or excess insulin.

Kidney Function

1. *BUN (Blood urea nitrogen)* is used as a measure of the kidney's ability to remove waste products. High levels are seen in kidney disease, but can also be increased by dehydration, high-protein diets and strenuous exercise. Low levels may be seen in pregnancy, low-protein diets, over hydration or liver disease.
2. *Creatinine* is also a measure of the kidney's ability to remove waste products. High levels are seen in kidney disease. Dehydration may also elevate creatinine.
3. *Bun/creatinine ratio* is the ratio of the two kidney measurements. It will be increased by dehydration, decreased blood flow to the kidney, congestive heart failure, increased dietary

protein, or gastrointestinal bleeding. Decreased ratios can be present with liver disease and malnutrition.

Electrolytes Electrolytes, including sodium, potassium, chloride and CO₂ are used to assess acid-base imbalances.

1. *Sodium* Low levels are seen with excessive urine loss, over hydration, diarrhea, vomiting, and heart failure. High levels are seen with excessive intake of salt or insufficient water intake.
2. *Potassium* Low levels are seen in those taking diuretics or not taking enough potassium in the diet. High levels are associated with kidney disease or overuse of a supplement.
3. *Chloride* Associated with a high or low potassium or sodium level.
4. *CO₂* Screens for acid-base or electrolyte imbalance.
5. *Anion Gap* measures the difference between measured and unmeasured ions in the blood. It is used to differentiate acid-base imbalances.

Bone Health

1. *Calcium* is important to bone health. Abnormal levels can be associated with an abnormal parathyroid gland, bone disease, and decreased vitamin D.
2. Phosphorus is also indicated in bone health. Phosphorus is affected by the parathyroid gland and vitamin D, and can be abnormal with kidney disease.

Gout Uric Acid at high levels may cause gout, arthritis, or kidney stones.

Liver Function

1. *Protein, total.* Most proteins are made in the liver, so it is an indicator of liver function. High protein levels can be influenced by some types of inflammation and infections, as well some immune system problems. Low levels can be seen in some kidney problems, and with malnutrition.
2. *Albumin* is the major form of protein in the blood. Abnormal albumin levels are associated with protein issues.
3. *Alb/Glob Ratio* is the ratio of albumin to the globulins, the other major blood proteins. It can be used to assess liver disease and some immune system disorders
4. Total Bilirubin can be elevated with some

types of liver disease or with an abnormal breakdown of red blood cells.

Liver and Kidney Function

1. *AST and ALT* are enzymes that may be elevated liver disease.
2. *Alkaline Phosphatase* is another enzyme which may be elevated in liver disease. It will also be elevated in bone growth in adolescents, bone growth following inflammation or damage and in pregnancy.
3. *GGT* is another enzyme elevated in liver disease. It can be elevated by certain medications, alcohol, stress and physical exertion.
4. *LD/LDH* is an enzyme present in many tissues, and is increased when there is damage to their cells.

Lipid Panel The lipid panel contains the major lipid components in the blood.

1. *Cholesterol* at high levels can be associated with heart disease and stroke.
2. *HDL Cholesterol* (high density) is known as the good cholesterol. High levels are associated with a decreased risk of heart disease. Smoking and alcohol use can decrease HDL levels.
3. *Chol/HDL ratio* is a ratio of total cholesterol to the HDL cholesterol. The lower the ratio, the lower the risk of developing heart disease.
4. *LDL Cholesterol* (low density) at high levels is associated with arterial and heart disease.
5. *Triglycerides* at high levels, along with low levels of HDL, can be associated with heart disease. Triglyceride levels are affected by diet, and should be measured after fasting.
6. *VLDL Cholesterol* (very low density) is associated with arteriosclerosis at high levels. It may increase with diets high in animal fats and snack foods.

Thyroid Function TSH (Thyroid Stimulating Hormone) is a pituitary hormone that controls thyroid gland function. TSH is used to detect overactive or underactive thyroid function. (Hyperthyroidism or hypothyroidism)

Iron Iron is decreased in iron deficiency anemia and in some chronic inflammatory diseases. High levels may be the result of diet or supplements, but may also be increased with liver and kidney disease. Hemochromatosis is a disorder where too much iron is absorbed.