
Lipid Panel

A total cholesterol test measures the total amount of a fatlike substance in the blood. Lipoprotein analysis (*lipid panel*) measures blood levels of total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides.

The body uses cholesterol to help build cells and produce certain hormones. When there is too much cholesterol in the blood, it and other substances may begin to build up along the inside of the artery walls, forming what is known as plaque. A large deposit of plaque may obstruct the flow of blood through the artery, affecting blood flow to the heart, brain, or other vital organs. If unstable plaque tears open, it may trigger the formation of a blood clot in the artery, which can result in a heart attack or stroke.

There are two main sources of cholesterol, dietary intake and liver production. Dietary cholesterol comes from the foods you eat such as meat, poultry, eggs and dairy products. Your liver will produce up to 80% of what your body needs.

Triglycerides- Triglycerides are a type of fat the body uses to store energy. Triglycerides have been proven useful in diagnosis and treatment of diabetes, kidney, liver obstruction, Lipid metabolism and many endocrine disorders. Levels help to assess risk of coronary heart disease.

Total Cholesterol- Total cholesterol is useful in diagnosis of hyperlipidemias, atherosclerosis, hepatic and thyroid diseases. Total cholesterol, HDL and triglycerides provide information on risk of Coronary Disease.

HDL Cholesterol- High Density Lipoprotein is known as the “GOOD” Cholesterol and the higher the levels the better. HDL cholesterol helps remove LDL cholesterol from the body by binding with it in the bloodstream and carrying it back to the liver for disposal. HDL is a useful indicator of risk of coronary disease as low levels are associated with heart disease, obesity, stress, smoking and diabetes mellitus.

LDL Cholesterol- Low Density Lipoprotein is known as the “BAD” cholesterol. LDL cholesterol collects inside the walls of the arteries and often contributes to the formation of plaque. LDL is a key factor in determining atherosclerosis and coronary artery disease. The higher the level of LDL equals the greater the risk of a heart attack or stroke.

Cholesterol/HDL Ratio- A ratio obtained by dividing the cholesterol total by the HDL. If the cholesterol/HDL ratio is high, there is a greater risk of coronary heart disease; the lower the ratio, the lower the risk for coronary heart disease.

Comprehensive Metabolic Panel

Glucose- Glucose is a type of sugar, found in many foods. Glucose levels are controlled by insulin and glucagon. In the fasting state, glucose levels are low, then glucagon causes glucose levels to rise. After eating, glucose levels are elevated, then insulin is secreted driving the glucose into the cells to be metabolized to glycogen, amino acids, and fatty acids. High glucose elevations may indicate diabetes mellitus. Low glucose elevations may indicate hypoglycemia.

Urea Nitrogen (BUN)- A blood urea nitrogen test measures the amount of nitrogen in your blood that comes from the waste product urea. Urea is formed when protein is broken down in your body. It is produced in the liver and eliminated from your body in urine. A BUN test is done to estimate how well your kidneys are functioning. If your kidneys are not able to remove urea from the blood normally, your BUN level increases. Heart failure, dehydration, or a diet high in protein can also increase your BUN level. Liver disease or damage can decrease your BUN level, because urea is made in the liver. A decreased BUN level can occur normally in the second or third trimester of pregnancy.

Creatinine- Creatinine measures the level of the waste product creatinine in your blood and urine. This test provides information about how well your kidneys are working. Creatine is a substance that forms when food is converted into energy through a process called metabolism. Creatine is broken down into another substance called creatinine, which is filtered out of your blood by the kidneys and then passed out of your body in urine. A high creatinine level may mean your kidneys are not working properly. The amount of creatinine in the blood depends partly on the amount of muscle tissue; therefore, men generally have higher creatinine levels than women.

BUN/Creatinine Ratio- The level of creatinine in your blood also provides information on how well your kidneys are working; a high creatinine level may mean your kidneys are not working properly. The measured blood urea nitrogen (BUN) and creatinine tests can be used to calculate the BUN-to-creatinine ratio. A BUN-to-creatinine ratio can help your health professional predict which conditions, such as dehydration, may be causing abnormal BUN and creatinine levels and decreased kidney function.

Sodium- A sodium test measures the amount of sodium (an electrolyte and a mineral) in the body. Sodium helps regulate the water balance (the amount of fluid inside and surrounding the cells) and electrolyte balance of the body. Sodium also plays an important role in nerve and muscle functions. It carries an electrical charge when it is dissolved in blood. Almost all foods contain sodium as with some medicines, aspirin, mouthwash, and toothpaste. Too much sodium in the diet may raise blood pressure in some people and increase their risk of heart disease, stroke, and kidney damage. High sodium intake can also increase the amount of water retained by the body, leading to swelling of the legs and hands.

Comprehensive Metabolic Panel (cont.)

Potassium- A potassium test measures the amount of potassium (an electrolyte and mineral) in the blood. Potassium is needed for proper nerve and muscle (including heart) function. It helps regulate the water balance (the amount of fluid inside and surrounding the cells) and electrolyte balance of the body. Potassium levels can be affected by kidney function, blood pH, the amount of potassium in the diet, hormone levels in the body, excessive vomiting, and taking certain medications (including potassium supplements). A balanced diet generally contains enough potassium for the body's needs. Potassium is released into the urine by the kidneys, even when the blood potassium level is low and can cause a blood potassium deficiency if the body is unable to control potassium levels. Abnormal potassium levels may cause symptoms such as muscle cramps or weakness, nausea, diarrhea, frequent urination, dehydration, low blood pressure, confusion, irritability, paralysis, and changes in heart rhythm.

Chloride- A chloride test measures the level of chloride in your body. Chloride is one of the most important electrolytes in the blood. Chloride helps keep the amount of fluid inside and outside of your cells in balance. It also helps maintain proper blood volume, blood pressure, and pH of your body fluids. Most of the chloride in your body comes from table salt in the diet. Chloride is absorbed by the intestines during food digestion. Any excess chloride is passed out of your body through the urine. Chloride levels in your blood generally rise and fall along with sodium levels in your blood.

Carbon Dioxide- A carbon dioxide test measures the total amount of the three forms of carbon dioxide (bicarbonate, carbonic acid, and dissolved carbon dioxide) in your blood. This test is also called a total carbon dioxide test. Carbon dioxide is a gaseous waste product made from metabolism. The blood carries carbon dioxide to your lungs, where it is exhaled. More than 90% of carbon dioxide in your blood exists in the form of bicarbonate. The remainder of the carbon dioxide is either dissolved carbon dioxide gas or carbonic acid. Your kidneys and lungs regulate the levels of carbon dioxide, bicarbonate, and carbonic acid in the blood.

Calcium- A test for calcium in the blood measures the calcium level in the body that is not stored in the bones. Calcium is the most plentiful mineral in the body and one of the most important. The body needs it to build and repair bones and teeth, help nerves function, make muscles contract, clot blood, and allow proper function of the heart. Almost all of the calcium in the body is stored in bone. The rest is found in the blood. Under normal conditions, the level of calcium in the blood is carefully controlled. When blood calcium levels fall, calcium is released from bones to restore proper blood levels. When blood calcium levels rise, the excess calcium may be stored in bone or passed out of the body in urine and stool.

Comprehensive Metabolic Panel (cont.)

AST- Aspartate aminotransferase (AST) is an enzyme found in red blood cells, liver and heart cells, and muscle tissue. It also is found in other organs, such as the pancreas and kidneys. AST formerly was called serum glutamic oxaloacetic transaminase (SGOT). When body tissue or an organ such as the heart or liver is diseased or damaged, additional AST is released into the bloodstream. The amount of AST in the blood is directly related to the extent of the tissue damage. After severe damage, AST levels in 6-10 hours and remain high for about 4 days. An AST test is done to help diagnose liver disease, and monitor treatment for liver disease.

ALT- An alanine aminotransferase (ALT) test is a blood test that measures the level of alanine aminotransferase enzyme found mainly in the liver, but also in smaller amounts in the kidneys, heart, muscles, and pancreas. ALT was formerly called serum glutamic pyruvic transaminase (SGPT). ALT is measured to determine whether the liver is damaged or diseased. Low levels of ALT are normally found in the blood. However, when the liver is damaged or diseased, it releases ALT into the bloodstream, causing levels of the enzyme to rise. Although ALT is found in organs other than the liver, most increases in ALT levels are due to liver damage.

GGT- Gamma-glutamyl transferase (GGT) participates in the transfer of amino acids and peptides across the cellular membrane and possibly participates in glutathione metabolism. Highest concentrations of this enzyme are found in the liver. This test is used to detect liver cell dysfunction. Certain drugs and alcohol may cause increased GGT levels.

Complete Blood Count

A complete blood count (CBC) provides important information about the kinds and numbers of cells in the blood, especially red blood cells, white blood cells, and platelets. A CBC helps evaluate symptoms (such as weakness, fatigue, or bruising) and diagnose conditions (such as anemia, infection, and many other disorders).

White Blood Cell Count- White blood cells protect the body against infection. If an infection develops, white blood cells attack and destroy the bacteria, virus, or other organism causing it. White blood cells are bigger than red blood cells and normally fewer in number. When a person has a bacterial infection, the number of white cells can increase dramatically.

Red Blood Cell Count- Red blood cells carry oxygen from the lungs to the rest of the body. They also carry carbon dioxide back to the lungs so it can be exhaled. If the red blood cell count is low (anemia), the body may not be getting the oxygen it needs. If the count is too high (a condition called polycythemia vera), there is a risk that the red blood cells will clump together and block tiny blood vessels.

Hemoglobin- Hemoglobin is the major substance in red blood cells. It carries oxygen and gives the blood cell its red color. The hemoglobin test measures the amount of hemoglobin in the blood and is a good indication of the blood's ability to carry oxygen throughout the body.

Hematocrit- This test measures the amount of space red blood cells occupy in the blood. The value is given as a percentage of red blood cells in a volume of blood. For example, a hematocrit of 38 means that 38% of the blood's volume is composed of red cells.

MCV- Mean corpuscular volume.

MCH- Mean corpuscular hemoglobin.

MCHC- Mean corpuscular hemoglobin concentration.

RDW- Red cell diameter width.

Platelet Count- Platelets are the smallest type of blood cell. They play a major role in blood clotting. When bleeding occurs, the platelets swell, clump together, and form a sticky plug that helps stop the bleeding. If there are too few platelets, uncontrolled bleeding may be a problem. If there are too many platelets, there is a risk of a blood clot forming in a blood vessel. Also, platelets may be involved in hardening of the arteries.

Complete Blood Count (cont.)

Neutrophils- Neutrophils are the most common type of white blood cell and are produced in 7 to 14 days and exist in the circulation for only 6 hours. Their primary function is to kill and digest bacterial microorganisms.

Lymphocytes- Lymphocytes are primarily involved with cellular-type immune reactions and antibody production. They primarily function to fight chronic bacterial infection and acute viral infections.

Monocytes- Monocytes are capable of fighting bacteria in a way very similar to that of neutrophils. However, monocytes can be produced more rapidly and can spend a longer time in the circulation than neutrophils.

Eosinophils and Basophils- Eosinophils as well as basophils are involved in the allergic reaction. Parasitic also are capable of stimulating the production of these cells. Eosinophils and basophils do not respond to bacterial or viral infections.
