



Blood Testing Definitions

Lipid Panel & Glucose

(Provided at no out of pocket expense to PEIA members).

\$20.50 plus a \$2.00 charge for waist circumference & blood pressure to others

Blood Fats

- Cholesterol is a fat-like substance in the blood which, if elevated, has been associated with heart disease.
- There are three major kinds of cholesterol, High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL), and Very Low Density Lipoprotein (VLDL).
- LDL Cholesterol is considered "bad cholesterol" because cholesterol deposits form in the arteries when LDL levels are high. You should consult with your doctor regarding which LDL target he or she recommends.
- HDL cholesterol is known as 'good cholesterol' as it protects against heart disease by helping remove excess cholesterol deposited in the arteries. High levels, *even those above the "normal" lab range*, seem to be associated with a lower incidence of coronary heart disease.
- Triglyceride is fat in the blood which, if elevated, has been associated with heart disease, especially if over 500 mg. High triglycerides are also associated with pancreatitis. Elevated levels may be associated with problems other than heart disease.
- VLDL (very low density lipoprotein) is another carrier of fat in the blood. It can be somewhat related to heart disease and can be reduced by exercise.

Glucose: This is a measure of the sugar level in the blood.

- High values are associated with eating before the test and possible diabetes. Lower than expected glucose levels can indicate an under active thyroid gland or pituitary gland, liver disease, malnutrition, or a problem that prevents the intestines from absorbing the nutrients in food.

TSH (only)

\$20.00

This test should only be ordered by those with a history of thyroid disorder.

- Thyroid Stimulating Hormone (TSH): This protein hormone is secreted by the pituitary gland and regulates the thyroid gland. A high level suggests the thyroid is under active and a low level suggests the thyroid is overactive.

Hemoglobin A1C

\$14.00

This test should only be ordered by those with a known history of diabetes.

- This test is primarily for those at high risk for developing diabetes or those who have already been diagnosed with the disease.
- This test will tell you about your average blood glucose level for the past 2-3 months. It can help you and your health care provider judge whether your diabetes care plan is working. If your long-term blood glucose level is high, something in your plan may need to be changed. It shows you how a change in your plan has affected your diabetes.

- The A1C test does not measure your day-to-day control. You cannot adjust your insulin on the basis of your A1C tests. Although the A1C test is an important tool, it can not replace daily self-testing of blood glucose. Your health care provider can advise you as to how often you should have the Hemoglobin A1 test.

Comprehensive Metabolic Panel

\$15.50

This blood test is a broad screening test of the electrolytes and liver function. It should only be ordered by those who are on medications that can affect these levels, have a history of liver disease, or have had a prior history of abnormal laboratory values as listed below.

Glucose: This is a measure of the sugar level in the blood. High values may be a result of eating before the test and possible diabetes. Low glucose levels can indicate an under active thyroid or pituitary gland, liver disease, malnutrition, or a problem that prevents the intestines from absorbing the nutrients in food.

Electrolytes: These include potassium, sodium, chloride, and CO₂ levels.

- Potassium is controlled by the kidneys. It is important for the proper functioning of the nerves and muscles, particularly the heart. If your value is outside the expected range you should contact your doctor especially if you are taking a diuretic (water pill) or heart pill (Digitalis, Lanoxin, etc.).
- Sodium is regulated by the kidneys and adrenal glands. There are numerous causes of high or low sodium levels, but the most common causes are diuretics usage, diabetes drugs or excessive water intake in those with heart or liver disease.
- CO₂ reflects the acid status of the blood. Low levels can be due to either to increased acidity from uncontrolled diabetes, kidney disease, metabolic disorders, or chronic hyperventilation.
- Chloride helps keep the amount of fluid inside and outside of cells in balance. It helps maintain proper blood volume, blood pressure and balance of body fluids. Most of the chloride in the body comes from table salt.

Waste products:

- Blood Urea Nitrogen (BUN) is a waste product produced in the liver and excreted by the kidneys. High values may mean that the kidneys are not working properly.
- Creatinine is a waste product largely from muscle breakdown. High values, especially with high BUN levels, may indicate problems with the kidneys.

Enzymes

- Alkaline phosphatase is an enzyme found primarily in the bones and liver. Values are often higher for those growing individuals like children and pregnant women. Those with gallstones or bone or liver damage may see high results. Low values are not always significant.
- AST/SGOT, ALT/ SGPT are liver and muscle enzymes. They may be elevated from liver problems, hepatitis, excess alcohol ingestion, muscle injury and a recent heart attack.
- Bilirubin is a pigment removed from the blood by the liver. Low values may be of no concern. If slightly elevated above the expected ranges, your doctor may check this again along with your other enzyme results.

Proteins

- Total Protein measures the total amount of protein in blood serum as well as the amounts of albumin and globulin. Total protein is of little value alone and should be looked at along with albumin and globulin levels.
- Albumin is often used to assess nutritional status and is important for tissue growth and healing. It is produced mainly in the liver and keeps blood from leaking from vessels. When levels drop, fluid may collect in ankles, lungs or abdomen.
- Globulin is the "antibody" protein important for fighting disease. Globulins are formed in the liver and by the immune system. Some globulins bind with hemoglobin while others transport metals in the blood and provide a defense against infection.

Minerals

- Calcium is controlled in the blood by the parathyroid glands and kidneys. Calcium is found mostly in bone and is for proper blood clotting, nerve, and cell activity. High levels can be due to medication among other things. Low levels are seen with metabolic disorders like insufficient parathyroid hormone; or drugs like Fosamax.

Complete Blood Count (CBC)

\$10.00

This test should only be ordered by those with a history of anemia, excessive red blood cells, or abnormal white blood cell counts.

- White Blood Count (WBC) is the number of white blood cells. High WBC can be a sign of infection in the body. WBC is also increased in certain types of leukemia. Low white counts can be a sign of bone marrow diseases, an enlarged spleen or immune disorders.
- Red Blood Count (RBC) is the number of red blood cells. A low RBC can be associated with anemia. If the RBC count is low, the body may not be getting the oxygen it needs. If the count is too high there is a risk that the red blood cells can clump together and block tiny blood vessels.
- Hemoglobin(Hgb) and Hematocrit (Hct): The hemoglobin is the amount of oxygen carrying protein contained within the red blood cells. The hematocrit is the percentage of the blood volume occupied by red blood cells. Low Hgb or Hct may suggest anemia. Anemia can be due to nutritional deficiencies, blood loss, destruction of blood cells internally or failure to produce blood in the bone marrow. High Hgb can occur due to lung disease, exercise, living at high altitude or excessive bone marrow production of blood cells.
- Mean Corpuscular Volume(MCV) can help to diagnose a cause of anemia. Certain chronic diseases like diabetes and arthritis may cause low volumes. High values may suggest either deficiencies of B12 or Folate, ineffective production in the bone marrow, smoking, heavy drinking, or recent blood loss with replacement by newer (and larger) cells from the bone marrow. Low volumes can be associated with iron deficiency.
- Mean Corpuscular Hemoglobin (MCH) value is the amount of hemoglobin in an average red blood cell.
- Mean Corpuscular Hemoglobin Concentration (MCHC) measures the concentration of hemoglobin in an average red blood cell. Low volumes can indicate lack of iron.
- Platelet Count(PLT): This is the number of cells that plug up holes in the blood vessels and prevent bleeding. High values can occur with bleeding, cigarette smoking or excess production by the bone marrow. Low values can occur for many reasons and need to be checked by your physician.
- Red Cell Distribution Width (RDW) reports whether all the red cells are about the same width, size, and shape. This helps further classify the types of anemia.
- Monocyte is a white blood cell that can be increased by infections such as with a virus or fungus (like yeast), some types of cancer and leukemia and tuberculosis (TB).
- Basophil is a white blood cell that usually increases in response to parasitic infections and allergic reaction.
- Eosinophil is a white blood cell that can increase in response to parasitic infections and allergic reactions.
- Lymphocyte is a white blood cell that often fights viral and bacterial infections by direct attack or production of antibodies.
- Neutrophil is a white blood cell that sometimes increases in response to bacterial infection and removes and kills bacteria.