

General Information About Laboratory Tests:

Laboratory testing is useful for a general health assessment. Occasionally an abnormal result will point directly to a specific disorder, which requires treatment or further evaluation. Test results should always be considered along with other information about the individual. Occasionally, test results which fall outside the “reference range” will not be abnormal or diagnostic due to individual circumstance. *Tests do not reveal all possible diseases or abnormalities and should not be considered a substitute for regular medical checkups.*

Comprehensive Metabolic Panel

Glucose: This is the familiar “blood sugar” test. Elevations may be due to diabetes or eating within a few hours of the test. Fasting values over 120 and non-fasting values over 180 should be reviewed with a physician.

Uric acid: Elevated levels may be associated with gout, arthritis, or kidney disease. Values also vary with diet and are often affected by medication.

LD, AST, and ALK PHOS are enzymes generally present in low levels in blood. Injury to a body organ may cause elevated amounts of a specific enzyme. Some enzymes are present in all cells others are more specific:

LD (Lactate Dehydrogenase) is found in liver, red blood cells, skeletal muscle, heart muscle, lung and brain. This test is very sensitive to any disease or injury affecting any of these organs, but is not very specific.

AST (Aspartate Aminotransferase) is found in liver, skeletal muscle, and heart muscle. Again a very sensitive test, but specific only to these organs.

ALT (Alanine Aminotransferase) is found in large amounts in the liver and in much smaller amounts in other organs. This test is the most sensitive indicator of liver disorders.

ALK PHOS (Alkaline Phosphatase) is found in the liver (bile ducts mainly), bone, intestine, and placenta. It may be elevated in liver disease, bone injury or disease including healing fractures, and may be transiently elevated after a big meal. High levels are normal in adolescents and in pregnancy.

T. Bilirubin (Total Bilirubin) is a normal breakdown product from hemoglobin, a component of blood. It is elevated in persons with jaundice due to any of several causes. Slight elevations (Up to 3.0 mg/dl) are occasionally seen in persons who are otherwise well (Gilbert’s Syndrome).

T. Protein (Total Protein) has two components: Albumin and Globulin. Both reflect the individual’s nutritional status.

Albumin is produced in the liver. Decreased values may reflect liver disease or malnutrition. Increased values are not necessarily disease related and are usually related to dehydration.

Globulin is produced in the liver and by white blood cells. Levels in the blood are affected by a variety of disease states including blood disorders, liver disease, inflammation, and other conditions.

Calcium: This test does not indicate the presence or absence of osteoporosis. A physician should evaluate values outside the reference range.

BUN (Blood Urea Nitrogen) is a measure of waste products in the blood stream. High values may reflect kidney disease but are also seen with internal bleeding and high protein diets. Low values are not usually of clinical importance, but occur with low protein diet, malabsorption, and late pregnancy. Normal values rise slightly with advancing age

Creatinine is a normal breakdown product of muscle metabolism and is an accurate assessment of kidney function. It is not affected by diet.

Sodium, Potassium, and Chloride, also called electrolytes, are closely regulated ions, which are vital to cell function. In well persons, deviations from the reference range are seldom seen, except potassium, which is affected by water pills (diuretics) and dehydration.

Complete Blood Count (CBC)

The **CBC** is used as a broad screening test to check for such disorders as anemia, infection, severity of blood loss, leukemia, abnormal bleeding or clotting, response to drugs or radiation treatment, and many other diseases. It is actually a panel of tests that examine different parts of the blood.

White blood Cell (WBC) is a count of the actual number of white blood cells per volume of blood. There are five different types of WBC's, each with its own function in protecting us from infection.

An elevated WBC count can result from conditions, such as bacterial infections, inflammation, leukemia, trauma, or stress. A decreased WBC count can result from conditions, such as chemotherapy, radiation therapy, or diseases of the immune system.

Red Blood Cell (RBC) is a count of actual number of red blood cells per volume of blood. Both increases and decreases can point to abnormal conditions.

A high RBC count may indicate congenital heart disease, dehydration, obstructive lung disease, or bone marrow over-production. A low RBC count may indicate anemia, bleeding, kidney disease, bone marrow failure (for instance, from radiation or cancer), malnutrition, or other causes. A low count may also indicate nutritional deficiencies of iron, folate, vitamin B12, and vitamin B6.

Hemoglobin measures the amount of oxygen-carrying protein in the blood.

Above normal hemoglobin levels may be the result of dehydration, excess production of red blood cells in the bone marrow, severe lung disease, or several other conditions. Below-normal hemoglobin levels may be the result of anemia (caused by iron deficiency), inherited hemoglobin defects, cirrhosis of the liver (during which the liver becomes scarred), excessive bleeding, vitamin and mineral deficiencies, kidney disease, other chronic illnesses, or cancers that affect the bone marrow.

Hematocrit measures the amount of space red blood cells take up in the blood.

Decreased hematocrit indicates anemia, such as that caused by iron deficiency. Other conditions that can result in a low hematocrit include vitamin or mineral deficiencies, recent bleeding, cirrhosis of the liver, and malignancies.

The most common cause of increased hematocrit is dehydration, and with adequate fluid intake, the hematocrit returns back to normal. However, it may reflect a condition called *Polycythemia vera*, or hemochromatosis. Anytime a hematocrit is persistently high, the cause should be determined in consultation with a doctor.

Platelet count is the number of platelets in a given volume of blood and is a component of blood essential in the clotting process. Both increases and decreases can point to abnormal conditions of excess bleeding or abnormalities in clotting.

Low number of platelets occur in some patients with long-term bleeding problems, bone marrow disease, autoimmune disorder or chemotherapy.

Increased platelet counts may be seen in individuals who show no significant medical problems, while others may have a more significant blood disorder problem called myeloproliferative disorder (abnormal growth of blood cell elements).

MCV, MCH, MCHC, and RDW are calculations derived from the RBC counts to help determine size, shape and functionally of red blood cells.