

SODIUM: Major electrolyte found in the fluid surrounding body cells and in blood plasma. Controlled by the kidney and adrenal glands, it helps regulate the body's fluid and acid/base balance. Values outside the reference range may be due to dehydration as well as possible kidney or adrenal gland disease.

POTASSIUM: The kidneys control this electrolyte very carefully. It is important for the proper functioning of the nerves and muscles, particularly the heart. Values outside the expected range require medical evaluation. This is especially important if you are taking a "water pill". Diarrhea or severe vomiting can lower the value; kidney damage may cause an increase.

CHLORIDE: Another electrolyte associated with sodium and regulated by the kidney and adrenal glands. It is essential in regulating fluid and acid/base balances.

CARBON DIOXIDE: CO₂ gas is released from the lungs during normal respiration and is involved in the acid-base (ph) balance of your blood system.

ANION GAP: A calculated value expressing the relationship among the electrolytes above. This may be out of the reference range when one or more of your electrolytes are abnormal.

GLUCOSE: A measure of sugar levels in your blood. High fasting glucose levels, hyperglycemia, of greater than 125mg/dl or more on more than one occasion is suggestive of diabetes. Low levels are an indication of hypoglycemia. Both of these conditions require further evaluation.

BUN: Blood Urea Nitrogen is a waste product of protein metabolism and is excreted by the kidneys and is considered a kidney function test. Renal disease, gastrointestinal bleeding, dehydration, strenuous exercise and/or high protein diets may also elevate BUN.

CREATININE: Also a kidney function test, this value will increase in renal disease and kidney filtration problems.

SGOT/AST: Produced by many organs, but mainly used as an indication of liver inflammation; may be elevated in chronic alcohol ingestion, hepatitis and certain muscle diseases.

ALK PHOS: An enzyme found in the kidneys, intestines, liver and bones. Serum Alkaline Phosphatase is higher in children than adults due to rapid bone growth. Since this enzyme is found in various body sites, there are numerous causes for high and low levels.

TOTAL BILIRUBIN: A liver function test, which is elevated in liver diseases such as cirrhosis and hepatitis. Twenty percent of all patients have a value up to 2.0 due to benign conditions.

TOTAL PROTEIN: Some causes for high Total Protein levels are dehydration and some cases of chronic liver disease. Low values may be caused by over hydration, pregnancy, liver or kidney diseases and malnutrition. Lower dietary calorie/protein intake in the elderly will often result in a low total protein.

ALBUMIN: A serum protein making up a portion of the total protein. High and low values result for reasons similar to total protein. Albumin is also used as a nutritional marker.

A/G RATIO: Ratio of the albumin over the globulin values. This may be decreased in liver and kidney diseases, infections, and inflammatory states.

CALCIUM: Calcium comprises 98% of the bone in the human body. It is the most abundant mineral in the body and its functions are for electrolyte balance and is essential to bone and teeth formation. Calcium may be high in certain malignancies.

CHOLESTEROL: High cholesterol is linked to coronary artery disease, stroke, and certain peripheral arterial disease. High cholesterol, particularly LDL and triglyceride, should be discussed with your physician.

TRIGLYCERIDE: Triglyceride is a form of fat made in the body. Elevated triglycerides can be due to overweight / obesity, physical inactivity, cigarette smoking, excess alcohol consumption and a diet very high in carbohydrates (60 percent of total calories or more). Many people with heart disease and/or diabetes also have high triglyceride levels.

HDL: Cholesterol is known as “good” cholesterol, because high levels of HDL seem to protect against heart attack. Low levels of HDL (less than 40 mg/dl) also increase the risk of heart disease. Medical experts think that HDL tends to carry cholesterol away from the arteries and back to the liver, where it’s passed from the body. Some experts believe that HDL removes excess cholesterol from arterial plaque, slowing its buildup.

LDL: Known as “bad” cholesterol. When too much LDL circulates in the blood, it can slowly build up in the inner walls of the arteries that feed the heart and brain. Together with other substances, it can form plaque, a thick, hard deposit that can narrow the arteries and make them less flexible. This condition is known as atherosclerosis. If a clot forms and blocks a narrowed artery, a heart attack or stroke can result.

CHOL/HDL RATIO: Used to determine your cardiac risk factor. A value of 4.0 or less is optimal. There are several major risk factors for heart disease: smoking, obesity, hereditary tendency, advancing age, stress, lack of exercise, as well as elevated cholesterol, Triglycerides, LDLs and lowered HDLs. The more risk factors you have, the more likely you are to suffer a heart attack or stroke.

GFR: Glomerular Filtration Rate (estimated): Describes the flow rate of filtered fluid through the kidneys and is an assessment of the excretory function of the kidneys. This estimate is a calculation based on age, race and serum Creatinine level.

TSH: The Thyroid gland regulates the metabolic activity of the body. The Thyroid Stimulating Hormone (TSH) is the most common screening test for Thyroid gland function. This level is increased in hypothyroidism and decreased in hyperthyroidism. Values out of range should be interpreted by your health care provider along with any symptoms and history. Additional thyroid testing may be necessary to determine any problems.

PSA: Total PSA levels are often used as an aid in monitoring prostate cancer. Since elevated levels of PSA can be seen in other conditions of prostate inflammation, such as benign prostate hypertrophy, the PSA test should not be used as the sole determining factor in the diagnosis of prostate cancer. It is best used in conjunction with a digital rectal exam and always should be interpreted by your physician.

HEMATOLOGY

WBC: The main function of White Blood Cells is to fight infection, defend the body against invasion by foreign organisms, and to produce, transport and distribute antibodies in the immune response. WBC's are divided into 5 normal types: neutrophils, eosinophils, basophils, lymphocytes and monocytes. The total WBC count plus the percentage of each of the above White Blood cell types provides a vital aid in the diagnosis of many pathologic conditions.

RBC: Red Blood Cell count. Produced in the bone marrow and filled with hemoglobin; used to evaluate anemia.

HEMOGLOBIN: The main component of RBC's whose function is to carry oxygen from the lungs to the body's cells and to transfer carbon dioxide from the tissue to the lungs. Decreased Hemoglobin is called anemia. Hemoglobin determination is used to evaluate anemia, blood loss, hydration and response to therapy.

HEMATOCRIT: The Hematocrit is a measured percentage of red blood cells in whole blood. Since the Hematocrit is related to RBC's, its decrease or increase would be for the same reasons as RBC's and Hemoglobin.

MCV, MCH, MCHC: Synonym for these three is Red Blood Cell Indices. The RBS indices are used to determine the size and hemoglobin content of RBC's. These values can assist in differentiating the type of anemia.

- **MCV:** Mean Corpuscular Volume refers to the average size of a red cell.
- **MCH:** Mean Corpuscular Hemoglobin is the average amount of hemoglobin in your RBC's
- **MCHC:** Mean Corpuscular Hemoglobin Concentration is the amount of hemoglobin present in a red cell in relation to its size

RDW: Red Cell Density Width is a measurement of the distribution of the size of the red cells. If there is a large variation in size, the RDW will be higher. If most of the cells are the same size, the number will be smaller.

PLATELETS: Platelets are involved in the clotting of your blood. They come to the site of an injury and act as a first response in the clotting process. Platelet counts are used to evaluate bleeding disorders. A common cause for low platelet counts are difficult blood draws, drug treatment therapies, as well as certain malignancies.

DIFFERENTIAL: Determines the relative percentage of each type of white blood cell (WBC)

- **Neut%** - Neutrophils are the most abundant type of WBC and form an essential part of the immune system. Neutrophils are recruited to the site of injury within minutes following trauma or infection and are the hallmark of acute inflammation.
- **Lymph%** - Lymphocytes are a type of WBC that is of fundamental importance in the immune system because lymphocytes are the cells that determine the specificity of the immune response to infectious microorganisms and other foreign substances. They are found in the circulation and also are concentrated in central lymphoid organs and tissues, such as the spleen, tonsils and lymph nodes, where the initial immune response is likely to occur.
- **Mono%** - Monocytes have two main functions in the immune system: (1) replenish resident macrophages and dendritic cells under normal states, and (2) in response to inflammation signals, monocytes can move quickly (approx. 8-12 hours) to sites of infection in the tissues and divide/differentiate into macrophages and dendritic cells to elicit an immune response. Monocytes are responsible for phagocytosis (ingestion) of foreign substances in the body.
- **Eos%** - Eosinophils protect the body killing bacteria and parasites, but can cause problems when they react incorrectly and cause allergies and other inflammatory reactions in the body, (eg. food allergies, asthma).
- **Baso%** - Basophils appear in many specific kinds of inflammatory reactions, particularly those that cause allergic symptoms. Basophils contain anticoagulant heparin, which prevents blood from clotting too quickly. They also contain the vasodilator histamine, which promotes blood flow to tissues.
- **ANC#** - Absolute Neutrophil Count is a measure of the total number of neutrophils present in the blood. The ANC is calculated from measurements of the total number of white blood cells (WBC) and the percentage of neutrophils (Neut%).

NORMAL RANGE: Characteristic of 95 percent of values from a normal population. The remaining normal results fall outside the normal range, as do any truly abnormal results. The normal range for a particular test result, condition, symptom, or behavior may differ, based on the patient's age, size, sex, ethnicity, or culture