CHEMISTRY

- **A/G Ratio:** A low ratio is found in a variety of disease states related to those of liver or kidney and to infections and inflammations.
- **Albumin:** Albumin is the major protein found in blood. Low levels of Albumin occur in malnutrition, chronic inflammation, and severe acute disease. Dehydration caused by exercise or fluid loss can cause increase serum Albumin levels.
- **Alkaline Phosphatase:** An enzyme originating primarily from the liver and bone. Elevations in the blood are usually indicative of liver or bone disease. Children, because of the activity of bone growth, and pregnant women (third trimester) have significantly higher normal values.
- **Bilirubin:** Bilirubin is a yellow colored substance that is produced in the body from hemoglobin and is released when red blood cells disintegrate due to normal aging or damage. The liver removes the bilirubin from the blood to be excreted in the bile. A small amount of bilirubin is present in the blood of normal individuals. Increases in bilirubin are usually due to liver disease, inflammation (hepatitis), liver failure, obstruction of the bile duct, or excessive destruction of red blood cells.
- **Blood Urea Nitrogen (BUN) :** This waste product from protein metabolism is formed in the liver and excreted by the kidneys. High BUN values could mean that the kidneys are not working as well as they should. Low BUN values are less frequent. They could be due to low protein intake, pregnancy, or severe liver failure.
- **BUN/Creatinine Ratio:** This number is obtained by dividing the BUN result by the creatinine result. It has little significance when the BUN is normal but can help to determine the cause of high BUN levels.
- **Calcium:** Calcium is the most abundant mineral in the body with about 98% found in the skeleton. The calcium level in the blood is normally maintained with a narrow range of about 8.5 to 10.8 mg/dL which is critical for many basic processes such as function of the nervous system and muscle, blood clotting and many others necessary for life. Excessive secretion of parathyriod hormone (PTH) is one cause of high blood calcium levels. Other possible causes for elevated calcium levels are bone disease and excess dietary intake of calcium rich foods (milk) or medicines (antacids). Low blood levels of calcium may lead to tetany (spasms of muscles) and can be due to malfunction of the parathyroid glands, kidney disease, vitamin D deficiency and malabsorption caused by disease of the intestine.
- **Cholesterol:** Cholesterol is a fatty substance necessary for the proper function of every cell in the body. In the blood, cholesterol is carried in tiny packets encased by various proteins of which the major forms are the HDL and the LDL. High levels of total cholesterol are associated with an increased risk of heart disease caused by thickening of the walls of the coronary arteries. High cholesterol levels can be reduced by nutritional supplements, altering the composition of your diet and by certain medications when diet modifications alone are not sufficient.
- **HDL Cholesterol:** This "good" cholesterol is thought to counteract the effects of LDL cholesterol. The higher the HDL cholesterol the better. High levels of HDL cholesterol are associated with lower risk of developing heart disease. Low levels of HDL are associated with higher risk of heart disease. There are measures that can be taken to increase HDL cholesterol, such as regular exercise and losing weight when being overweight. Your doctor will use the total cholesterol, HDL and LDL cholesterol values to determine what, if any, measures need to be taken to minimize your risk of heart disease.
- **Cholesterol/HDL Ratio:** This ratio is obtained by dividing the cholesterol result by the HDL result. The higher this number, the greater the risk of developing coronary heart disease (CDH). Conversely, the lower the ratio the lower the risk of heart disease.
- **LDL Cholesterol:** LDL cholesterol ("bad cholesterol") is the fraction of your cholesterol that is implicated in the deposits that thickens the walls of blood vessels. LDL cholesterol values less than 130 mg/dL are desirable. Values higher than 160 are associated with a higher risk of heart disease.
- **Chloride:** Chloride is one of the electrolytes present in blood. The normal concentration is maintained in a narrow range. Your doctor interprets the significance of low or elevated values, in relation to the other electrolytes.
- **Creatinine:** Creatinine is a waste product of muscle metabolism. The blood is determined by your muscle mass and by the efficiency of the kidneys to excrete creatinine. High values, especially together with a high BUN, usually mean kidney disease.
- **Globulin:** This is the name of a group of proteins, which comprise the remainder of the total protein not present as albumin. It is determined by subtracting albumin from total protein. Low globulin values are found in certain kidney problems. In hematological disorders, diseases of the intestine, and in other special uncommon conditions. High globulin is found in many types of inflammation, certain infections, and in chronic liver disease.
- **Glucose:** In healthy people the blood level of glucose fluctuates in response to food intake and fasting within the fairly narrow range of about 65 to 140mg/dL. It is therefore important to know whether you had eaten before your blood was drawn or whether you were fasting for at least 8-12 hours. The main use of glucose testing are in the diagnosis of diabetes mellitus and in the monitoring of treatment and compliance for this condition. If blood glucose levels fall below the nomal limit, the patient may experience symptoms such as weakness, dizziness, fainting and collapse. This condition is called hypoglycemia. It may occur in diabetic patients whose food intake and insulin dosage are not properly balanced and often in otherwise healthy persons.
- **Iron:** Iron is a critical part of the hemoglobin molecule found in red blood cells. When the body iron is low, the person may eventually suffer from decreased hemoglobin. This is called iron deficiency anemia. Excess iron can be stored in the liver and in other body organs. A rare, but clinically important, disease of excess iron storage is called hemochromatosis. Thus, decrease iron in the blood or increased iron in the blood may be a signal to your doctor for further diagnostic studies.
- **Lactate Dehydrogenase (LDH):** LDH is an enzyme present in almost all tissues of the body. Any damaged tissue may leak LDH into the blood and increases above normal will be observed. These tissues include heart, liver, muscle, kidney, bone marrow, and a variety of tumors. Slight elevations, when other enzymes are normal, are usually of no clinical significance. Strenuous exercise including jogging long distances may result in mild increases in blood LDH.
- **Phosphorus:** Phosphorus, like calcium, is abundant throughout the body with about 85% in the bones. The level in blood varies over a somewhat wide range as food intake can significantly alter blood levels. There are many possible causes for low or high values.
- **Potassium:** The potassium level inside the cells of the body is about 25 times higher than the level in the blood. The maintenance of this balance is important for many life functions. Both low and high values are if clinical significance since potassium is important in the functioning of the neuromuscular system and especially the muscles of the heart.
- **Sodium:** This element, present in body fluids, is the major one of the four electrolytes along with potassium, chloride, and bicarbonate. Sodium plays a key role in salt and water balance. Low sodium can be found in diarrhea, kidney disease, and medications with diuretics. High sodium values can occur in conditions resulting in excess loss of water, e.g. profuse sweating.
- **Total Proteins:** The plasma proteins serve a number of important functions including maintenance of normal blood volume and water content in the tissues, and maintaining normal acid-base balance in the blood.
- **Transaminase SGOT (AST):** This enzyme has its highest concentrations in the heart, liver, and muscles. Increased levels in blood are seen shortly after a heart attack, in liver disease and diseases involving muscle damage.
- **Transaminase SGPT (ALT):** This enzyme is present in higher concentration in the liver than in muscle. Consequently an elevation is more specific for liver disease. Both SGOT and SGPT become elevated whenever liver cells are damaged as, for instance, in viral hepatitis.
- **Triglycerides:** Triglycerides are the major form of fat found in nature and are the storage form of fat in the body. Their primary function is to provide energy. High fasting triglyceride levels are associated with higher risk for coronary heart disease.
- **Uric Acid:** Uric acid is a very important antioxidant. Elevated levels of uric acid are caused by numerous diseases such as gout, kidney failure, diabetes, and the use of diuretics. Low levels may indicate a certain nutritional deficiency that should be corrected.