



MINIDOKA
MEMORIAL
HOSPITAL

"A Better Life, A Better Way"



Laboratory Services

YOUR HEALTH FAIR

BLOOD CHEMISTRY TEST RESULTS

Revised September 2006

You and your doctor can learn a great deal about your health from a sample of your blood. This sheet gives a brief explanation about the blood tests listed on your report. To the right of each test name, your results along with its unit of measure is printed. Further to the right is a "Reference Range". If your results are indicated by "Hi" or "Lo" to the left of the result, your results are outside of the expected range for healthy individuals. Frequently, diet, medication, exercise or other personal habits explain these mild variations. Each person, however, has his or her own baseline "normal". When the result is within the expected range, it not only helps to rule out disease, but it also establishes a baseline for you. That "personal baseline" is the best one for monitoring any change that takes place in the future.

The following descriptions will help you to better understand your laboratory test results so that you may have a more meaningful discussion with your doctor. Take "YOUR COPY OF THESE RESULTS" to your doctor on the next visit and review your total health picture with them. In this way, it is our hope you will be able to enjoy the benefits of regular screening at local health fairs.

SODIUM, POTASSIUM, CHLORIDE: These are blood 'electrolytes' that are regulated very carefully by the kidneys, and play an important part in the function of nerves and muscles. Sodium and chloride are also regulated by the adrenal glands.

Sodium plays an important role in salt and water balance in your body. A low level can be caused by too much water intake, heart failure, or kidney failure; also, vomiting and diarrhea. Too much intake of salt or not enough intake of water can cause a high level.

Potassium is found primarily inside of cells and its role is to maintain water balance inside the cells and help in the transmission of nerve impulses. Low levels may be found in patients on diuretics (water pills) and those not receiving enough potassium. A low level can cause muscle weakness and heart problems. A high level can be found in kidney disease or in overuse of potassium supplements. Some "salt" substitutes contain potassium instead of sodium; an excessive use of these can cause dangerously high levels of potassium in the blood. Low or high levels in the blood are of critical importance and should be brought to the immediate attention of your physician

GLUCOSE: This is the chief source of energy for all living organisms. It is a measure of your blood sugar (carbohydrate) level. Values above the expected range are common if you have eaten within 4 hours of having your blood drawn. High blood glucose, in someone who has fasted for 12 hours, suggests diabetes. A low glucose level may mean too much insulin in your blood. If your value is high or low, report the value to your physician.

CREATININE: This is a waste product not effected by high protein diet. The blood level depends upon the amount of muscle you have and the ability of your kidneys to excrete the creatinine. High levels usually indicate deterioration in kidney function.

BUN: (Blood Urea Nitrogen) is a waste product derived from protein breakdown in the liver and is excreted by the kidneys. A rise in the level may indicate the kidneys are not working well, dehydration or blood loss. It can also be a result of a high protein diet and/ or strenuous exercise. Liver disease, a low protein diet or too much water intake may cause a low BUN level.

BUN/ CREATININE RATIO: By comparing the BUN level to the creatinine level, the doctor can determine if the high BUN level is caused by a kidney problem or from something like blood loss into the gut.

CALCIUM AND PHOPHORUS: The parathyroid glands and the kidneys regulate these levels in the blood. These minerals are important in bone formation as well as proper function of nerves and muscles. Calcium is also important in blood clotting. Very low levels of phosphorus and calcium can be associated with starvation or malnutrition and can lead to muscle weakness. High levels of phosphorus are usually associated with kidney disease. High levels of calcium can be caused by bone disease, excess intake of antacids and milk (often seen in people with ulcers), excess intake of Vitamin D, and hyperparathyroidism.

Since Phosphorus and Calcium go hand in hand, a low phosphorus level accompanied by a high calcium level (or the reverse- high phosphorus/ low calcium) could be significant.

MAGNESIUM: This element is found primarily inside the cells of the body. A low level may indicate severe malnutrition, severe diarrhea, alcoholism or excessive use of diuretics. A very low level can cause muscle trembling.

TOTAL PROTEIN, ALBUMIN, and GLOBULIN: These are the major protein components in the blood. Abnormal values may result from liver disease, kidney disease, some malignancies or poor nutrition. Slight elevations of any one of these tests without other abnormalities is probably of no significance.

- **Total Protein** alone is not a specific disease indicator and additional tests would be helpful.
- **Albumin** is approximately 2/3 of the Total Protein. Its function is to keep water inside the blood vessels. When albumin is too low, water can leak from vessels into other parts of the body, causing swelling. A low level can be caused by malnutrition, too much water in the body, liver disease, kidney disease, severe injury such as burns or major bone fractures or slow bleeding over a long period of time.
- **Globulin** is the group of proteins that help fight infections. It is actually comprised of about 60 different important proteins. Some are important in blood clotting and unclotting. If your globulin level is abnormal, your doctor may want to measure some of these individual globulin proteins.

A/G RATIO: The 'Albumin/Globulin' Ratio is a simple way to tell if the albumin or globulin levels are abnormal.

BILIRUBIN, TOTAL, CONJUGATED and UNCONJUGATED (Total Bili, Unconj. Bili, Conj Bili): Bilirubin is the normal breakdown product of old red blood cells in the blood and is the pigment that makes the plasma or serum part of your blood yellow. When the bilirubin level in the blood is very high for a period of time, the whites of the eyes and the skin may become yellow, a condition known as jaundice. The 'conjugated and unconjugated' portions make up the total bilirubin. Specific elevations in these areas help your physician pinpoint specific causes for bilirubin elevations. Increased levels may be caused by too many red cells being destroyed, by liver disease or by a blockage of bile ducts. Slightly elevated levels that are not accompanied by increases in 'enzyme' levels are probably not significant. Fasting can also cause a slight increase in the total bilirubin.

ENZYMES: (Alkaline phosphatase, LDH, AST, ALT) An enzyme is found in all tissues and is a catalyst that is needed for a specific chemical reaction to take place in your body. The pattern of abnormality of enzymes depends on the normal enzyme content of the tissue involved and the extent and type of tissue damage.

- **ALKALINE PHOSPHATASE (Alk P):** This is an enzyme found in all body tissue but most commonly in the liver, bone, bile ducts and gut. A high level may indicate disease or damage to those sites. Also pregnancy and certain drugs may cause high levels. Growing children, because of bone growth, normally have a higher level than adults do. The level will also often increase as an individual advances in age.
- **LDH:** Lactate Dehydrogenase is an enzyme found in all tissues. Elevated levels must be evaluated with other blood tests to determine significance. The most common sources of LDH are the heart, liver, muscles and red blood cells.
- **AST:** The Aspartate Transferase enzyme is found mainly in the heart, liver and muscles. Elevated levels suggest disease in those areas.
- **ALT:** The Alanine Transferase enzyme is found mainly in the liver. If it is elevated after a verified repeat, your doctor may want to screen for hepatitis and liver problems.

URIC ACID: Like BUN and Creatinine, this is a waste product excreted by the kidneys. It is the end product of the breakdown of purines in the body. Purines are an important component of proteins found in food such as kidney, liver, pancreas and sweetbreads. A high level may reflect kidney disease and cause gouty arthritis or kidney stones. Alcohol, stress and certain diuretics may raise the level.

THE LIPID PANEL: The three major purposes of lipids are energy storage, cell membrane development, and serving as a component to [hormones](#) and vitamins in the body. Lipid tests are often part of preventative routine care, as they help determine whether there is significant risk for atherosclerosis, a hardening of the arteries that interferes with or interrupts blood flow.

- **TRIGLYCERIDE AND CHOLESTEROL:** These are two essential blood fats, the elevation of which have been shown to be associated with heart disease and clogged blood vessels. Cholesterol is associated with the ingestion of fats. Triglycerides are associated with the ingestion of carbohydrates and are commonly elevated in people who have not fasted 12 hours thus effecting the accuracy of the test.
- **dHDL:** High density lipoprotein is the 'GOOD' cholesterol. One of the important roles of HDL is to carry cholesterol away from your arteries. **THE HIGHER THE HDL CONCENTRATION, THE LOWER THE RISK OF CORONARY ARTERY DISEASE.**
- **LDL/VLDL:** Low density Lipoprotein and Very Low density Lipoprotein are the 'BAD' cholesterols. VLDL converts to LDL, which collects cholesterol and deposits it in your cells (including blood vessels). The higher the LDL and VLDL, the greater the risk of coronary artery disease.
- **CHOLESTEROL/ HDL (CHOL/HDL):** This number is obtained by comparing the total cholesterol level to the HDL cholesterol level. The higher this number, the greater the risk of coronary artery disease. A high HDL level will result in a lower ratio, which means a lower risk. This could be true even if the total cholesterol level may be high! It is this ratio that appears to best measure the lipid associated risk of developing coronary heart disease.

IRON: The body must have iron to make hemoglobin. Hemoglobin is a major component of blood; its main function is the transfer of oxygen to the muscles. If the body is low in iron, all body cells, particularly muscles in adults and brain cells in children, do not function up to their full potential. On the other hand, too much iron in the body can cause injury to the heart, pancreas, joints, testicles, ovaries, etc. Iron excess is found in the hereditary disease called Hemochromatosis. This disease is found in about 3 out of every 1000 people.

IRON BINDING CAPACITY (IBC): The IBC reflects the ability of a protein called 'Transferrin' to transport the iron in your body to and from the iron stores when it is or isn't needed. A low IBC suggests malnutrition or iron excess. A high IBC suggests iron deficiency. *This test will NOT appear on your report, but if your iron is abnormal, an IBC can be performed per your physician's request. The sample will be frozen and preserved for one month.*

TSH: Thyroid Stimulating Hormone is the hormone that tells the thyroid gland to function. If the gland is underactive (hypothyroid), elevated levels of TSH are produced in an attempt to make the gland produce adequate thyroxine which assists the body to utilize foods (metabolism). Hypothyroidism deprives the tissues of that hormone action leading to symptoms including hoarseness, cold sensitivity, dry skin and muscle weakness. If the gland is overactive (hyperthyroidism), TSH production is very low. Hyperthyroidism exposes the tissues to excessive quantities of thyroid hormones leading to symptoms including heat intolerance, tachycardia, weight loss, weakness, emotional lability and tremor. A variety of disease processes involving the thyroid can exist and should be monitored carefully to achieve the best possible health.

**IF YOU HAVE ANY QUESTIONS REGARDING ANY OF THE TESTS LISTED ABOVE,
PLEASE CONTACT YOUR PHYSICIAN**

**THANK YOU FOR PARTICIPATING IN OUR HEALTH FAIR
AND
WE LOOK FORWARD TO FUTURE FAIRS AND HEALTHY FUTURES.**