Prime **H**ealthcare **P**roviders PLLC

Dr. Phillip Weinstein – *General Practice*
Dr. Adam Weinstein *–* ***Internal Medicine***

902 Frostwood, Suite 262 ~ Houston, Texas 77024
Tel: (713) 932-0118 Fax: (713) 932-8303

UNDERSTANDING YOUR TEST RESULTS

BLOOD GLUCOSE:
Glucose is the chief source of energy for all living organisms. A high blood glucose (hyperglycemia) in someone who has fasted for 12 hours suggests diabetes. A low glucose (hypoglycemia) level may indicate too much insulin in your blood as with pancreatic tumors. A low blood sugar can also result from liver disease or poor nutrition.

KIDNEY FUNCTION TESTS:
Blood Urea Nitrogen (BUN) is a waste product derived from protein breakdown in the liver and is excreted by the kidneys. A high BUN level can be caused by such things as kidney failure, blood loss and dehydration. A low BUN level may be caused by liver disease, a low protein diet, or too much water intake.

Creatinine is a waste product found in muscle and blood. The creatinine blood level depends upon two things; (1). the amount of muscle you have and (2). the ability of your kidneys to excrete the creatinine. High levels of creatinine usually indicate a deterioration of kidney function.

URIC ACID:
Uric acid is the end product of the breakdown of purines (an important component of proteins) in your body. A high level of uric acid in your body may cause gouty arthritis or kidney stones. The level of uric acid in the blood is affected by such things as a purine rich diet (foods such as kidney, liver, pancreas, and sweetbreads), alcohol, stress and certain diuretics.

ELECTROLYTES:
Sodium (Na) is an element that plays an important role in salt and water balance in your body. A low level can be caused by such things as too much water intake, heart failure, kidney failure, the loss of sodium in body fluids such as sweat, diarrhea or vomitus. A high level can be caused by the intake of too much salt, not ingesting enough water or water loss in excess of sodium.

Potassium (K) is an element found primarily inside of cells and its role is to maintain cellular water balance and help in the transmission of nerve impulses. Low levels may be found in patients on diuretics or not receiving enough potassium, aldosteronism, cushing's syndrome or the loss of body fluids. A low level can cause muscle weakness and heart problems. A high level can be found in kidney failure, diabetic ketoacidosis, myocardial infarction or in the overuse of potassium supplements. Some "salt" substitutes contain potassium instead of sodium and an excessive use of them can cause dangerously high levels of potassium in the blood.

Chloride (Cl) helps maintain fluid and acid-base balance. It is probably the least important element that is measured in the blood. It is almost never the only element that is high or low. It is usually associated with a high or low level of sodium or potassium. Borderline low or high levels of chloride are of little significance. It is high in kidney disease and excess adrenal hormone. It is low in severe diabetes, intestinal obstruction, kidney failure or inadequate adrenal hormone.

Carbon Dioxide (CO2) is a by product of food breakdown. It is high in emphysema, pneumonia or some endocrine disorders. It is low in diabetic acidosis or kidney failure, severe diarrhea, or hyperventilation.

LIVER FUNCTION TESTS:
Bilirubin is a by-product from the breakdown of old red blood cells. *Total Bilirubin* is the pigment in the blood 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 your eyes and your skin become yellow (jaundice). A high bilirubin level in the blood can be caused by too many red cells being destroyed (hemolysis), by liver disease, or by a blockage of the bile ducts. Fasting and some minor liver problems (Gilbert's Disease) can also cause a slight increase in total bilirubin. The later are not significant.

Alkaline Phosphatase is an enzyme that is found in all body tissues. The most important sites are bone, liver, bile ducts and gut. A high level in your blood may be caused by certain drugs and diseases of the bone, liver or bile ducts. Due to their bone growth children normally have higher levels than do adults.

Gamma-Glutamyltransferase (GGT) is an enzyme that is primarily found in the liver. High levels of GGT in the blood can be caused by certain drugs, liver and bile duct disease and by drinking too much alcohol.

Transaminase (AST / SGOT) is an enzyme that is found mainly in the heart, liver and muscles. High levels of AST in the blood suggest a problem with either the heart, liver or muscles.

Transaminase (ALT / SGPT) is an enzyme that is found mainly in the liver. A high level of ALT may suggest hepatitis.

Lactic Dehydrogenase (LDH) is an enzyme found in all tissues in the body so that a high level in the blood can result from a number of different diseases (hepatitis, anemia, myocardial infarction or cancer). The most common sources of LDH are in the heart, liver, muscle and red blood cells. Slightly elevated levels in the blood are common and usually do not indicate disease.

BLOOD MINERAL CONCENTRATIONS:

Calcium is one of the most important elements in the body. Ninety nine percent of the calcium in the body is in the bones. The one percent that is outside of the bones is very important for the proper function of nerves, enzymes, muscles, and blood clotting. Low levels of calcium in the blood are associated with malnutrition. High levels 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. The parathyroid gland is the main regulator of calcium in the body.

Phosphate is closely associated with calcium in bone development. Therefore, most of the phosphate in the body is found in the bones. The phosphate level in the blood is very important for muscle and nerve function. Very low levels of phosphate in the blood can be associated with starvation or malnutrition and this can lead to muscle weakness. High levels in the blood are usually associated with kidney disease.

Magnesium is an element that is found primarily inside the cells of the body. A low magnesium level in the blood may indicate severe malnutrition, severe diarrhea, alcoholism, or excessive use of diuretics. A very low level of magnesium in the blood can cause your muscles to tremble.

BLOOD LIPIDS:

Total Cholesterol is an essential blood fat. Too high a level of this blood fat has been shown to be associated with a higher risk of heart disease and clogged blood vessels. Regular exercise and eating foods lower in saturated fat have shown to lower cholesterol levels. Desirable cholesterol is less than 200 mg/dl for a younger population.

HDL Cholesterol (high density lipoprotein cholesterol) is the "good" cholesterol. One of the important roles of HDL in your body is to carry cholesterol away from your arteries to your liver. The more HDL you have, the more cholesterol can be carried away and less to clog your arteries, Regular exercise and a lower fat diet have shown to raise levels of HDL. A desirable HDL is above 35 mg/dl.

LDL Cholesterol (low density lipoprotein cholesterol) is the "bad" cholesterol. Higher levels are thought to contribute to clogged arteries. Regular exercise and eating foods lower in saturated fat have shown to lower the LDL levels. A desirable LDL is below 130 mg/dl.

Triglyceride is a blood fat that may be related to a higher risk of heart disease. Typically, the higher the number the higher the risk. Eating less fats and consuming less alcohol and sweets has demonstrated a lowering affect on triglycerides.

Total Cholesterol/HDL Ratio 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 cholesterol level will result in a lower ratio (lower risk). This could be true even if the total cholesterol level may be high. It is this ratio that appears to be the best measure of the lipid associated risk of developing coronary heart disease.

THYROID:

TSH (thyroid stimulating hormone) is produced in the pituitary. It's function is to stimulates the thyroid gland to produce thyroid circulating hormones such as T4. High levels of TSH in the blood can be found when the pituitary gland is either producing too much TSH independently, such as in primary hyperthyroidism or when the thyroid gland is under active and the pituitary responds by producing more TSH to stimulate the thyroid gland to then produce more T4 (feed back mechanism).

***T4 (thyroxine*)** is a thyroid hormone that controls your rate of metabolism. A low level of thyroxine in the blood suggests "hypo"thyroidism or myxedema. A high level of thyroxine suggests "hyper"thyroidism or thyrotoxicosis.

PROTEINS:

Total protein is a measure of the total amount of protein in your blood. A low or high total protein does not indicate a specific disease but it does indicate that some additional test may be required to determine if there is a problem.

Albumin comprises of approximately two thirds of the total protein circulating in your blood. This important protein keeps water inside your blood vessels. When your albumin level is too low, water can leak out of your blood vessels and into your tissues and thus

cause swelling. A low level of albumin in the blood can be caused by malnutrition, too much water in the body, liver disease, kidney disease, severe injury such as burns or major bone fractures and slow bleeding over a long period of time.

Globulin is the group of proteins in your blood that helps to fight infection. It is actually comprised of about 60 different important proteins. Some of the proteins in this group play an important role in blood clotting and unclotting. If your globulin level is abnormal we may want to measure some of the individual proteins that make up this group.

ALB/GLOB ratio is a simple way to tell if the albumin or globulin levels in the blood are abnormal.

IRON:
The body must have iron to make hemoglobin which transfers oxygen to the muscles. If the body is <u>low</u> in iron, all body cells, particularly muscles in adults and brain cells in children, do not function well. If there is <u>too much</u> iron in the body it can cause injury to the heart, liver, pancreas, joints, testicles, ovaries, etc. Iron excess is found in the hereditary disease called "hemochromatosis" which can be found in about 3 out of every 1,000 people.

HEMATOLOGY:
WBC (White Blood Count), RBC (Red Blood Count), HGB (Hemoglobin), HCT (Hematoctrit), MCV, MCH (Red Blood Cell Indices), Platelets, Blood Smear Differential (number of different types of white blood cells), Blood Smear Morphology (shape of red cells). These tests were done to determine whether the red blood cells and oxygen carrying capacity of the blood were normal, and to detect the response to infection, abnormality or lymphoid tissues, or abnormality of the bone marrow.

PSA:
Prostatic Specific Antigen was done to detect cancer of the prostate.

MAMMOGRAM:
Mammogram of the breasts was done to detect breast cancer.

PAP SMEAR:
The ***pap smear*** was done in women to detect abnormal cells of the vagina and/or cervix.

WHAT YOUR BLOOD REPORT TELLS YOU ABOUT YOUR ORGAN SYSTEMS

	Renal Function	Parathyroid / Bone Function	Atherosclerotic Screen	Liver Function Screen	Hematological Screen
TEST	Glucose Sodium Potassium Chloride BUN Creatinine BUN/Creatinine Ratio Uric acid	Phosphate Calcium Magnesium	Cholesterol Triglycerides HDL LDL Cholesterol/HDL ratio	Total protein Albumin Globulin ALB/GLOB ratio Total Bilirubin Alk Phosphatase GGT SGOT SGPT	LDH Iron CBC
ASSOCIATED DISEASES	Renal diseases - acute Renal diseases - chronic dehydration excessive diuresis gout increased protein intake	Hyperparathyroidism Hypoparathyroidism Cancer metastatic to bone Vitamin D intoxication Vitamin D deficiency Sarcoidosis Thryotoxicosis Milk-alkali syndrome Immobilization Malabsorption Renal disease	Atherosclerosis Diabetes mellitus Hypothyroidism Nephrotic syndrome Pancreatitis Alcoholism	Acute viral hepatitis Alcoholic liver disease Cholestatic liver disease Sarcoid granulomas Metastatic liver disease Various drugs	Pernicious Anemia Lmphoma Hemolytic Anemia