PERSONAL BLOOD PROFILE

Understanding Your Blood Chemistry

One of the ways to monitor your health is to evaluate your blood chemistry periodically. One of the more standard and complete tests is a Chemistry Panel, which is like a physical exam of the blood. The panel presented herein is one physicians frequently request as a health checkup for their clients.

An annual analysis of your blood chemistry can be valuable in determining your overall health and wellness. The purpose of this program is to provide you with education, so our focus is on information. Only your physician can diagnose a medical condition.

Some of the blood chemistry analysis has direct relationships to nutritional deficiency, the risk of coronary heart disease, and the effects of either an active or sedentary lifestyle. Certain changes in blood chemistry can come about by following sound nutritional and exercise guidelines. Other changes have to do with bodily malfunctions that can not be modified by lifestyle changes. They can only be treated by your doctor.

Your result is shown for each of the blood chemistries identified on the laboratory report. The report shows the normal range for each component, and whether any of your results are outside of the normal range. The normal range may not always be the same as the ideal range. If you have any questions about any result outside of (above or below) the normal range, contact your doctor.

Some of the biochemical variables reported herein are electrolytes, enzymes, lipids, and lipoproteins. There are many other blood components that are not included in this chemistry panel.

Electrolytes are negatively or positively charged ions that make up essential salt balances in the tissues.

Enzymes are protein substances produced by body organs. Different kinds of cells produce different enzymes. When cells are damaged, certain enzymes are released. A laboratory can measure the kind and amount of enzymes in blood serum to determine where injury has taken place and what kind of injury it is. For example, elevated AP, SGPT, or SGOT values may suggest liver or heart damage. GGTP is elevated in the face of chronic liver damage.

Lipids are fats. A certain amount are necessary for bodily functions. They are not water-soluble.

Lipoproteins: In order that the insoluble lipids may be allowed to circulate freely in the blood, they are combined with certain blood proteins which form water soluble lipid-protein complexes called lipoproteins. The lipoproteins act as the primary transport vehicles for the lipids in biological fluids. Because of the polar nature of the proteins (net positive and negative charges), they may be separated in an electric field. This process is called lipoprotein electrophoresis which enables the analysis herein.

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If any results are outside of the normal range you should contact your physician. Only your physician is qualified to make a diagnosis of any medical condition. If you have any other questions regarding the test process, contact the service provider.

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The following information is provided as a brief explanation of each blood chemistry. (Alternate names for each blood chemistry are shown in parenthesis):

Albumin: Albumin is a measure of protein in the blood. It transports many small molecules and metabolites in the blood such as free fatty acids and uric acid. Albumin tends to go down when there is a debilitating disease or severe malnutrition.

Albumin/Globulin Ratio: The A/G ratio, or ratio between albumin and globulin, is often used by a physician to differentiate certain disease states which result in either decreased albumin or an increase in globulin.

Bilirubin (Total Bilirubin): Bilirubin is the product of normal destruction of red blood cells. It is filtered by the liver and excreted by the kidney. When the liver is not filtering normally, bilirubin builds up in the blood, which in turn results in a condition known as jaundice ("yellow skin"). Bilirubin is an indicator of liver function. Excessive use of alcohol can lead to a damaged liver (cirrhosis) and an abnormally high bilirubin. Total bilirubin is made up of direct and indirect analysis. They may be looked at separately.

Blood Urea Nitrogen (BUN): Urea nitrogen is a protein breakdown product circulating in the blood which is removed by the kidney. The kidney continually filters urea from the blood, excreting it in the urine. Many Americans carry high levels of protein breakdown products in their blood, primarily because of their high protein diet, particularly animal protein. Healthier low-protein nutrition characteristically lowers the urea nitrogen circulating in the blood.

BUN/CREAT Ratio: This ratio is another index of kidney function. If the BUN falls, the ratio of BUN/creatinine will reduce as well. Therefore, a lower BUN/creatinine ratio represents healthier kidney function at a reduced level of toxic protein products in the blood.

Calcium: The blood level of calcium is maintained within a specific range by hormones in the body. Diet, or even the presence of calcium in the diet, has little to do with the blood levels. However, diet has a lot to do with "calcium balance" -- how much calcium you take in and how much calcium is lost from the body. A low-protein diet is important for the maintenance of positive calcium balance, indicating the deposition of calcium, thus strengthening the bones. A high-protein diet tends to cause a negative calcium balance, which in turn is a cause of osteoporosis.

Cholesterol (Total serum cholesterol): Cholesterol is the most infamous of the essential lipid (fat) components. It is one of the most common sterols found in human tissue. It is important for a number of substances such as bile salts, sex hormones, adrenal steroids, and Vitamin D. Cholesterol also serves as an insulator for nerve fibers and is a component of certain cell membranes. Cholesterol is used by the body for cell membrane integrity, hormonal functions and digestive processes.

> The body manufactures all the cholesterol normally needed to maintain these bodily functions. Excess cholesterol levels are generally related to dietary patterns, exercise habits and gender. See Health Profile for additional information.
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> HDL, LDL, and VLDL are the carriers of cholesterol in the blood stream. If you add up HDL, LDL, and VLDL cholesterol, you get the figure for the total cholesterol in your blood.

Cholesterol/HDL Ratio: Total cholesterol divided by HDL cholesterol. The ratio is an indication of how much of the good cholesterol you have compared to the total. The lower the ratio the better. See Health Profile for additional information.

Creatinine (CREAT): Creatinine is also a protein breakdown product, but unlike BUN, it is not significantly altered by high protein intakes. However, high protein intake will accelerate kidney damage, and if the kidney is damaged, the creatinine level will elevate.

Electrolytes: Chloride, Phosphorous, Potassium, and Sodium are tests usually grouped together for the purpose of determining either hydration (presence of water) or dehydration (lack of water).

Enzymes in the blood: SGPT (ALT or Alanine Aminotransferase), SGOT (AST or Aspartic Transaminase), Alkaline Phosphatase, , Gamma Glutamyltransferase (GGT or GGTP), and Lactate Dehydrogenase (LDH), are all enzymes.

These enzymes are produced by all the cells in your body, but the liver and muscle are the largest producers. If there is liver or muscle damage -- such as in hepatitis, gall bladder disease, or heart attack -- levels of these enzymes are elevated. Normally, modest elevations of any of these enzymes are not cause for concern, unless they remain elevated on a repeated test. If you have a question, contact your physician.

> One of the contributing factors to elevated enzymes, particularly GGT, is the excess use of alcohol. When alcohol is consumed to excess, the liver can become clogged with alcohol pollutants. When that happens the liver can become damaged, and liver enzymes elevate.

Globulin: Globulin is another protein intimately associated with the immune system. Certain diseases cause either elevation or decrease in the globulin blood level due to plasma cell dysfunctions.

Glucose (GLU): Glucose is a form of sugar or carbohydrate that is used as an immediate source of energy. A certain level is always maintained in the blood. Diabetics are unable to utilize glucose properly and usually maintain high blood concentrations.

> Exercise may influence the better utilization of glucose by the tissues. This can be an important therapeutic benefit for diabetics because it may under certain conditions decrease their dependence on insulin. Diabetics should work closely with their physician to monitor insulin therapy during any exercise program.

High Density Lipoprotein (HDL Cholesterol): HDL is known as the "good" cholesterol. It is one of the components of total cholesterol. HDL transports cholesterol from the tissues and blood vessel walls to the liver so it can be excreted. See the Health Profile for more information.

Low Density Lipoprotein (LDL Cholesterol): LDL is known as the "bad" cholesterol. It is one of the components of total cholesterol, and a certain amount in the blood stream is vital. The role of LDL is apparently to carry cholesterol to the tissues. High levels of LDL deposit cholesterol on blood vessel walls in a combination of calcium and plaque, and that's bad. See Health Profile for more information.

> LDL itself can not be identified from a blood test. It is arithmetically calculated by subtracting HDL and VLDL from Total Cholesterol. VLDL is normally calculated as 20% of triglycerides. The number shown for LDL is valid only for a fasting test because triglycerides go up immediately after eating and thereby invalidate all these arithmetic calculations.

Since LDL Cholesterol is the result of an arithmetic calculation rather than an actual test, Apolipo B is considered to be a more accurate determination of the "bad" cholesterol in your blood stream.

LDL/HDL Ratio: The LDL cholesterol divided by the HDL cholesterol. The number indicates how much of the good cholesterol you have compared to the bad cholesterol. The lower the ratio the better.

Nicotine: Nicotine is a component of cigarettes and chewing tobacco. It is a stimulant and very addictive. It can be added to chewing gum and other products. It has been found to be damaging to the nervous system. When nicotine is inhaled through cigarette smoke other pollutants such as tars and carbon monoxide are formed which the body in turn has difficulty eliminating. **Cotinine** is a metabolite of nicotine used to identify nicotine in the blood.

Serum Alcohol: Serum alcohol is alcohol found in blood serum. Virtually all serum alcohol enters the blood stream from drinking alcoholic beverages. If alcohol is found in the blood after a period of fasting, there is probably a drinking problem.

Total Protein (Protein): Proteins are one of the essential nutritive components, along with carbohydrates, fats, water, vitamins, and minerals. Serum proteins act as transport agents for many vital substances such as hormones and lipids. Elevated levels may be useful in determining liver insufficiency and chronic inflammation. In addition, total protein levels are often used to evaluate the level of dehydration (high protein concentration) or hemodilution (low protein concentration).

Triglycerides: They are the principal lipids of foodstuffs and mammalian fat storage depots (adipose tissue). Triglycerides are neutral fats, totally insoluble in water (hydrophobic) which makes them ideal as storage fuel. However, significant triglyceride elevations reduce the fluidity and oxygen-carrying capacity of the blood. Triglycerides present in the blood originate from either dietary fat or from de novo synthesis in the liver which in turn comes about due to high sugar consumption. The blood triglyceride level is considered an essential lipid component, along with cholesterol, in the prediction of arterial blockage (fatty deposits collected along the walls). See Health Profile for more information.

Uric Acid (U.A.): Uric acid is a waste product of nucleoprotein metabolism (protein breakdown). It is normally filtered by the liver and excreted by the kidney. In large amounts it collects in the joints causing inflammation and "gouty" arthritis. Elevated uric acid levels may be genetic, but a high-protein diet plays a big role as well.

> Recently, elevated uric acid has been found to be a strong indicator of heart disease. Like the blood cholesterol level, it should be kept at a low level within the normal range.

Very low-density lipoproteins (VLDL Cholesterol): VLDL is one of the lipoproteins that acts as a transport vehicle for lipids. It is carried in the triglyceride fraction of the blood. The cholesterol concentration carried on the VLDL appears to be unimportant relative to the major VLDL function which is to transport triglycerides. It can not be analyzed directly from a blood sample. VLDL is arithmetically calculated as 20% of triglycerides.

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Please remember that the information contained herein is for educational purposes. Only a physician is qualified to make a diagnosis of any medical condition. If any of your blood chemistries are "out-of-range" as identified in the laboratory report, immediately notify your physician of the results.