



Blood Chemistry For Nutrition Management

BY MICHELE FERCHOFF, ND

Early identification of nutrition-related diseases and conditions leads to improved health outcomes resulting in economic benefits and improved quality of life. As early intervention takes on a more predominant role in the management of patients' health care, nutrition screening, assessment, counseling, and referrals will become essential. At the same time, changes in the health care field mean that health care professionals other than registered dietitians may have the initial contact with a patient. In addition to meeting the public's demand for reliable nutrition information, screening, and intervention, health care professionals of the future will have to integrate nutrition services into their practice.

The shift in health care to earlier intervention makes it necessary for health care professionals to be able to identify nutrition risk and provide nutritional recommendations, which requires time. Evaluating blood chemistry is an efficient method to help health care professionals address potential disease and determine nutritional deficiencies.

Blood chemistry has been used historically to diagnose disease. It is a common test ordered by practitioners to look at kidney function, liver function, electrolyte balance, etc. It was not until the work of Weston A. Price, D.D.S. that blood chemistry was seen as a tool to diagnose nutritional deficiencies. Blood chemistry is a snapshot of a patient's overall health. Blood chemistry should be ordered on every patient as a screening tool for disease tendency and nutritional deficiencies. Optimal reference ranges, as listed below, can direct the practitioner toward certain imbalances before they develop into disease.

Albumin/Globulin ratio (Optimal: 2.0) is an index for liver disease and blood viscosity. It may be increased if the patient has low thyroid function or a depressed immune system. It may be elevated in liver dysfunction.

Albumin (Optimal: 4.5-4.8g/100) is a strong predictor of health. Low and high levels may indicate liver, kidney, and thyroid dysfunction.

Total Globulins (Optimal: 2.8-3.0g/dl) are proteins that are important in forming antibodies. It also shows protein status of the patient. Immune dysfunction, maldigestion, and absorption can skew the level.

Total Protein (Optimal: 7.0-8.5g/100ml) is a measurement of the combination of albumin and globulin.

Alkaline Phosphatase (Optimal: 45-70 mg/DL) identifies biliary obstruction, gallbladder disease, mineral and electrolyte dysfunction, and adrenal and pituitary dysfunction.

Total Bilirubin (Optimal: 0.1-1.2) looks at hemoglobin

breakdown and liver function. Increased levels are found in liver dysfunction, hemolytic anemia, and biliary dysfunction.

BUN (Optimal: 12-20 mg/DL) looks at the body's ability to breakdown and utilize protein. Kidney dysfunction, diabetes mellitus, maldigestion can lead to increased or decreased levels of BUN.

Total Serum Calcium (Optimal: 9.5-10.0mg %) does not reflect the body's stores of calcium. It reflects the metabolic and hormonal status of the patient. It reflects the amount of albumin and the pH of the blood, which is indicative of the metabolic state of the patient. A calcium/phosphorus ratio of 2.5 can lead to hormonal imbalances.

Chloride (Optimal: 101-103 mEq/L) indicates the state of acid/base balance along with sodium, potassium, and CO₂. It helps to evaluate a patient's state of hydration and functioning of the adrenal gland and kidney.

Cholesterol (Optimal: 180-200mg/dl) is essential for hormonal balance, digestion of fats, and cellular structure. High cholesterol levels can be caused from thyroid, liver, pancreas, and kidney dysfunction.

CO₂ Bicarbonate (Optimal: 24-28mEq/L) is a compensatory mechanism essential to maintain acid-base balance within the body. Adrenal and kidney dysfunction can cause an increase in CO₂.

Creatinine (Optimal: 0.8-1.1) is a protein formed in muscles from creatine. Liver function facilitates the production of creatine, which forms creatinine. All excretion is through the kidneys. Creatinine levels show liver and kidney function.

GGTP (Optimal: 20-30 U/L) is an indicator of liver damage or biliary obstruction. Thyroid dysfunction, hypothalamic malfunction, and low magnesium levels can contribute to low levels of GGTP. Liver, pancreatic, and biliary dysfunction can contribute to elevated levels of GGTP.

Glucose (Optimal: 85-100mg/DL) levels indicates sugar handling capabilities and hormonal balance. Adrenals, liver, and pancreas are all responsible for managing blood sugar levels. These organ systems must be supported when sugar-handling problems exist.

LDH (Optimal: 90-150 IU/L) looks at energy production at the cellular level. Low levels can stem from thyroid and adrenal dysfunction. High levels are indicative of cellular damage.

Phosphorus (Optimal: 4.0-4.2) is an important constituent in body and nervous tissue, as well as maintaining acid-base balance. High phosphorus can be due to hyper functioning of the thyroid, adrenal, and pituitary. Low levels may be

due to excess insulin production and parathyroid functioning.

Potassium (Optimal: 4.1-4.6mEq/L) is the major electrolyte dealing with cardiac functioning. Increased levels may be due to the dysfunction of the adrenals and kidneys. Decreased levels may be caused by poor dietary intake and magnesium deficiency.

SGOT/AST and SGPT/ALT (Optimal: 20-30U/L) indicate cellular damage of high metabolic cells found mainly in the heart, liver, and skeletal muscle. Elevations are primarily indicative of liver dysfunction.

Sodium (Optimal: 142-145mEq/L) is important in electrolyte balance, acid-base regulation, and adrenal function. Increased and decreased levels can be due to dehydration. Adrenal insufficiency is usually found with decreased levels of sodium.

A common trend in organ system involvement seems to exist with blood chemistry. Liver, pancreas, adrenal, thyroid, kidney, endocrine hormones, and the digestive system are all involved as either the contributor to abnormal lab values or the target system affected by the abnormal lab values.

Nutrition can support these organ systems when the optimal reference range is not met. Consuming a high-protein, low-glycemic carbohydrate diet will provide the proteins necessary for the production of albumin, globulin, and creatinine and support appropriate blood sugar and cholesterol

metabolism. Digestive enzymes are important to avoid malabsorption by ensuring the breakdown and absorption of nutrients. Immune system dysfunction can be supported with a multivitamin containing vitamin C, zinc, and glandulars from the thymus, adrenal, and liver. Calcium intake is important for all patients. To ensure optimal calcium utilization, vitamin F must be taken in conjunction. Foods such as fruits, vegetables, green leafy vegetables, prunes and figs will provide the minerals needed to support the endocrine system, as well as the organ systems.

Eating a variety of foods is an important way to feed the body the nutrients it needs. Unfortunately, not all of the nutritional requirements can be met through diet alone. Nutritional supplements containing whole foods must be incorporated to ensure adequate nutrition.

About The Author

Michele Ferchoff earned her B.S. in biology from the University Wisconsin, La Crosse and then attended the Southwest College of Naturopathic Medicine and Health Sciences, one of four accredited naturopathic medical schools in the country, where she graduated as a N.M.D. in 2002. Michele has several years of practical and clinical experience. She was selected as one of two residents for the National College of Naturopathic Medicine/Standard Process residency program, the first naturopathic residency in Wisconsin's history, beginning in September 2002. Michele is one of only five naturopathic physicians in Wisconsin who have graduated from a four-year accredited naturopathic medical school.

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