SPECTRACELL LABORATORIES

LABORATORY REPORT

Account Number:

Maurice Darvish, M.D.
11611 San Vincente Blvd.
Los Angeles, CA 90049-
USA

Name:
Gender: Male DOB:

Accession Number:
Requisition Number:

Date of Collection: 08/27/2009
Date Received: 08/28/2009
Date Reported: 09/08/2009

Summary of Deficient Test Results

Micronutrient analysis (WBC) determined the following deficiencies:

Vitamin B2 Vitamin B12 Pantothenate Zinc
Magnesium

9/14/09

John F. Crawford, Ph.D.
Laboratory Director

CLIA# 45D0710715

Magnesium

Status:

The patient's lymphocytes have shown a deficient status for Magnesium.

Function:

Magnesium is predominantly found intracellularly, where it is vital for proper cell functions. Magnesium is the second most prevalent intracellular cation (after potassium). Magnesium functions are numerous and essential, including enzyme activation (over 300 types), neuromuscular activity, membrane transport and interactions, energy metabolism (carbohydrates, fats, proteins), and roles in calcium and phosphorus metabolism.

Deficiency Symptoms:

Deficiency symptoms are both acute (Trouseau and Chvostek signs, muscle spasms, tetany, cardiac arrythmias, ataxia, vertigo, convulsions, organic brain syndrome) and chronic (thrombophlebitis, hemolytic anemia, bone loss, depressed immune function, poor wound healing, hyperirritability, burxism, hyperlipidemia, fatigue, hypertension).

Those at risk for Magnesium deficiency include: malabsorption, malnourished, alcoholics, diabetics, diuretic therapy, children, elderly, pregnant and lactating women, postmenopausal women with osteoporosis, athletes, digitalis therapy, long-term therapy with antibiotics, chemotherapeutic and immunosuppressive medications. In addition, the following diseases are associated with Magnesium deficiency: cardiovascular disease, cirrhosis, renal disease, parathyroid diseases, thyroid conditions.

Repletion Information:

Dietary sources richest in Magnesium (per serving) are:

Nutritional Supplements	Seeds (especially pumpkin)
Nuts	Soybeans
Whole Grains	Potatoes
Legumes	Fresh Vegetables

The 1989 RDA for Magnesium is between 280-400 mg daily for adults. Large oral intakes of Magnesium (400-1000 mg daily), when spread throughout the day, are not considered harmful, except for some persons with impaired renal function. Higher doses have been used as laxatives and antacids. Excessive Magnesium intake may cause diarrhea, nausea, vomiting, hypotension, bradycardia, and CNS depression. Continued excessive intakes of Magnesium may imbalance calcium and phosphorous metabolism.

Zinc

Status:

The patient's lymphocytes have shown a deficient status for Zinc.

Function:

The primary role of zinc is to activate almost 200 enzymes with vital roles in cell regulation, immune function, acid/base balance, DNA, RNA, and protein synthesis, lipid metabolism, eicosanoid production, and digestion. Zinc also is a component of insulin (energy metabolism), thymic hormones (immune function) and gustin (taste acuity).

Deficiency Symptoms:

Symptoms of zinc deficiency include fatigue, dermatitis, acne, loss of taste, poor wound healing, anorexia, decreased immunity, delayed growth, hypogonadism and delayed sexual maturation, diarrhea, skeletal abnormalities, alopecia, behavioral disturbances, white spots on fingernails, infertility and night blindness.

Those at risk for zinc deficiency include alcoholics, malnourished, malabsorption (Crohn's Disease, celiac disease), long-term parenteral nutrition, chronic renal disease, anorexics, dieters, pregnant women, elderly, and sickle-cell disease.

Repletion Information:

Dietary sources rich in Zinc (per serving) are:

Nutritional Supplements	Oysters
Red Meats	Wheat Germ
Seeds	Nuts
Soybean Products	Legumes
Potatoes	Zinc-Fortified Cereal Products

Compounds found in meats enhance absorption of zinc from plant sources.

The 1989 RDA for zinc is 12-15 mg. In general, daily doses up to 50mg of elemental zinc appear safe. Acute toxicity (nausea, vomiting, diarrhea, fever, muscle pain) may occur after intake of 1-2 grams of zinc. Chronic intakes of 150 mg of zinc for several months may impair certain immune responses, decrease high-density lipoprotein levels, or impair copper status (possibly leading to normocytic anemia). Significant differences in tolerability between inorganic zinc salts and organic zinc chelates exist with organic chelates recommended for supplementation.

Pantothenate

Status:

The patient's lymphocytes have shown a deficient status for Pantothenic Acid.

Function:

Pantothenic acid plays vital roles in energy production from foodstuffs. Pantothenate is a component of coenzyme A, which is indispensable for two-carbon unit metabolism (acetyl groups). Acetyl groups are involved in the release of energy from carbohydrates, fats, proteins, and other compounds, as well as synthesis of fats, cholesterol, steroid hormones, porphyrin and phospholipids.

Deficiency Symptoms:

Pantothenate deficiency symptoms are thought to be uncommon because of widespread distribution in all foodstuffs. However, human deficiency symptoms may include fatigue, depression, burning feet, dermatitis, burning or pain of arms and legs, anorexia, nausea, indigestion, irritability, mental depression, fainting, hair loss, increased heart rate, and susceptibility to infection.

Repletion Information:

Dietary sources richest in Pantothenate (per serving) include:

Nutritional Supplements	Nutritional Yeasts
Meats	Legumes
Whole Grain Products	Wheat Germ
Vegetables	Nuts
Seeds	

The estimated safe and adequate daily dietary intake for pantothenate is 4-7 mg for adults. Oral administration of pantothenate has shown no toxicity in doses up to 10 gms daily. Higher doses may cause diarrhea.

Vitamin B12 (Cobalamin)

Status:

The patient's lymphocytes have shown a deficient status for vitamin B12 (Cobalamins).

Function:

Vitamin B12 is required to form blood and immune cells, and support a healthy nervous system. A series of closely-related compounds known collectively as cobalamins or vitamin B12 are converted into active forms methylcobalamin or 5-deoxyadenosylcobalamin. Methylcobalamin interacts with folate metabolism, preventing folate derivatives from being trapped in unusable states. Adenosylcobalamin is involved in the metabolism of odd-chain fatty acids and branched-chain amino acids.

Deficiency Symptoms:

Deficiency symptoms of vitamin B12 are both hematological (pernicious anemia) and neurological. A megaloblastic anemia may occur because the effects of the vitamin B12 deficiency on folate metabolism. Shortness of breath, fatigue, weakness, irritability, sore tongue, decrease in blood cell counts (red, white and platelets) are all clinical signs of a vitamin B12 deficiency. Neurological symptoms are manifested as a progressive neuropathy, with loss of position sense and ataxia. If vitamin B12 repletion is not initiated, permanent neurological damage, including degeneration of nerves and spinal cord can result. Recent evidence suggests that mental symptoms of depression and fatigue are detectable before anemia develops. Vitamin B12 is necessary to prevent accumulation of homocysteine, a toxic metabolic byproduct linked to cardiovascular disease and connective tissue abnormalities. Hypochlorhydria and gastrointestinal disturbances are frequently associated with vitamin B12 deficiency.

Repletion information:

Dietary sources for cobalamins are strictly from animal foodstuffs. Vitamin B12 is not found in plant foodstuffs. Dietary supplements can also contain vitamin B12

The 1989 RDA for vitamin B12 is 2.0 ug for adults. No toxic effects of oral vitamin B12 intake have been demonstrated, even in doses over 1000 ug daily.

Since the absorption and intracellular activation of oral vitamin B12 are frequently difficult, consideration should be given to injectable forms of vitamin B12. Some patients may require more frequent or larger doses than usual before repletion occurs.

Vitamin B2 (Riboflavin)

Status:

The patient's lymphocytes have shown a deficiency status for Vitamin B2 (riboflavin)

Function:

Riboflavin helps to metabolize foodstuffs into energy. Riboflavin is converted into its active forms, flavin adenine dinucleotide (FAD) and flavin mononucleotide (FMN). FAD and FMN are primarily involved as cofactors in oxidation-reduction reactions for flavoproteins, essential for cellular energy production and respiration. Riboflavin has a role in antioxidant status by activating glutathione reductase, which regenerates reduced glutathione.

Deficiency Symptoms:

Clinical signs of riboflavin deficiency are less clear-cut than other B Vitamins, but include depression, dizziness, sore or burning lips, mouth, and tongue, photophobia, burning, itching or teary eyes, and loss of visual acuity in early stages. More severe deficiency symptoms for riboflavin are dermatitis (nasal, scrotal), glossitis, cheilosis, angular stomatitis, and corneal vascularization. Frequently, riboflavin deficiencies overlap with niacin, pyridoxine, or iron deficiencies. There is no specific name for riboflavin deficiency disease.

Repletion Information:

Dietary Sources rich in riboflavin (per serving) include:

Nutritional Supplements	Nutritional Yeasts
Meats and Dairy Products	Green Leafy Vegetables
Grain Products	Enriched Grains

The 1989 RDA for riboflavin is 1.2-1.8 mg for adults. There is no evidence of toxicity from oral administration of riboflavin, except for rare cases of sensitivity.

SPECTRACELL LABORATORIES

SUPPLEMENTAL INFORMATION

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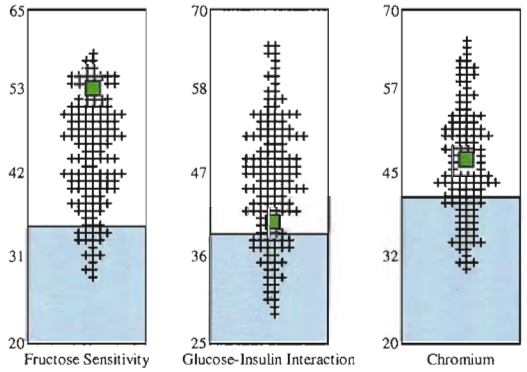
Adequate

Deficient

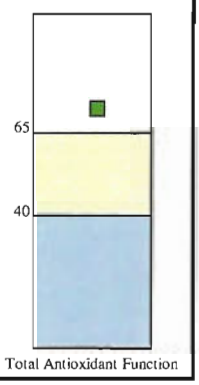
Values in this area represent a deficiency and patient may require nutrient repletion or dietary changes

Accession Number:

Carbohydrate Metabolism



Spectrox

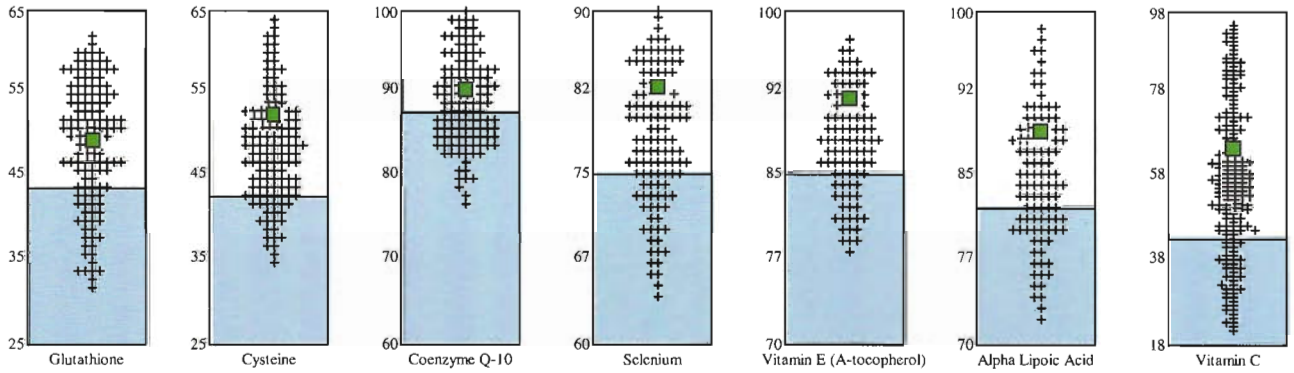


A Spectrox value above 65%
indicates a desirable status for apparently healthy individuals. Since antioxidants are protective nutrients, the most desired status would be the greatest ability to resist oxidative stress.

A Spectrox value between 40% and 65%
indicates an average antioxidant function for apparently healthy individuals. An average status means the ability to resist oxidative stress similar to the majority of persons. However, average status is not ideal, nor is it clearly deficient.

A Spectrox value below 40%
indicates a deficient antioxidant function resulting in a decreased ability to resist oxidative stress or an increased antioxidant load.

Individual Antioxidants



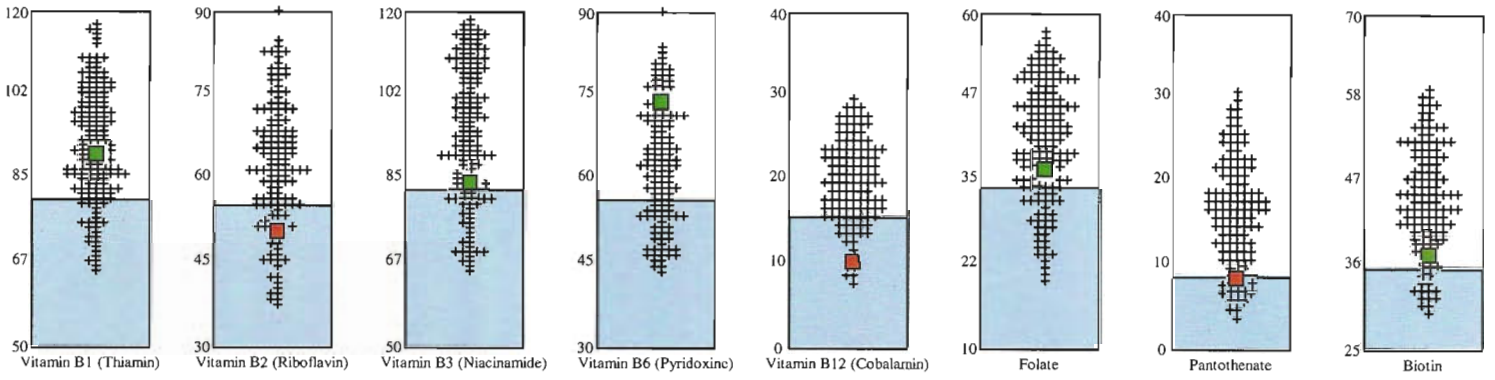
Adequate

Deficient

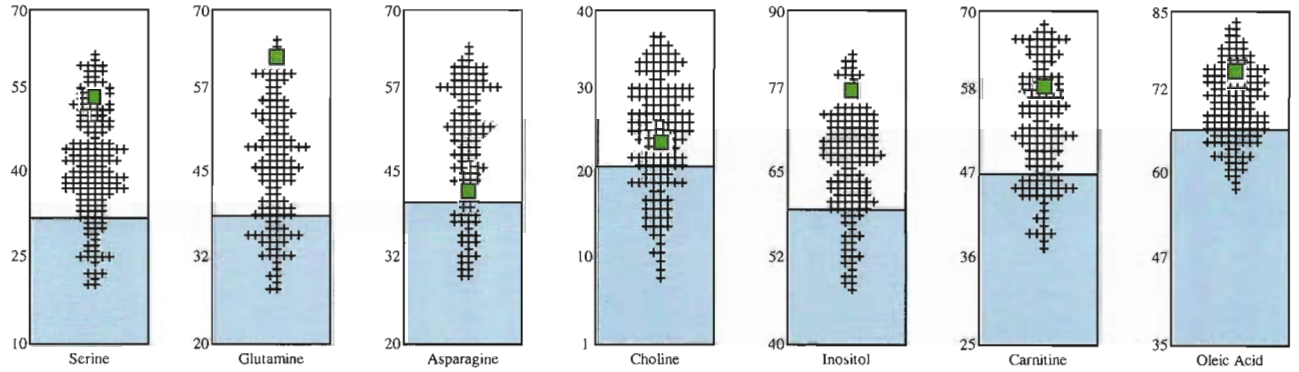
Values in this area represent a deficiency and patient may require nutrient repletion or dietary changes

Accession Number:

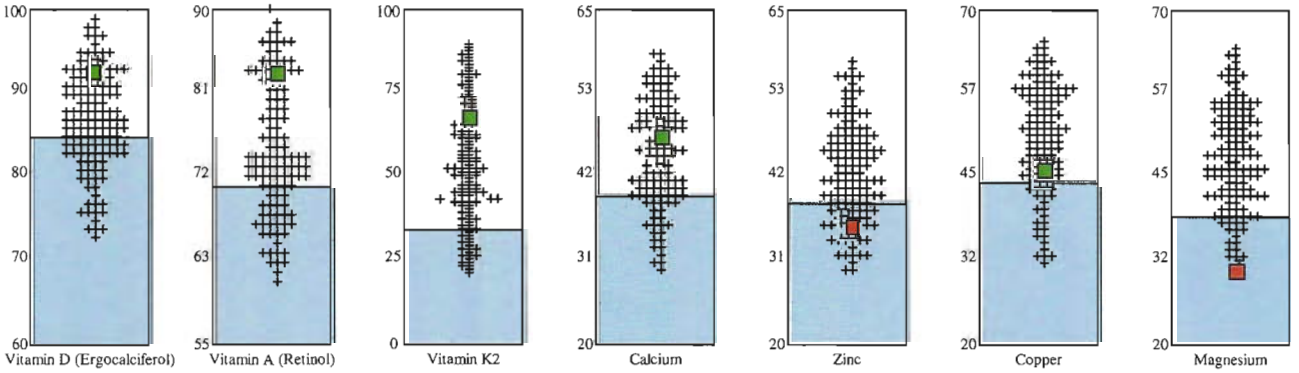
B Complex Vitamins



Amino Acids & Metabolites



Other Vitamins & Minerals



Micronutrients	Patient Results (% Control)	Functional Abnormals	Reference Range (greater than)
B Complex Vitamins			
Vitamin B1 (Thiamin)	88		>78%
Vitamin B2 (Riboflavin)	49	Deficient	>53%
Vitamin B3 (Niacinamide)	82		>80%
Vitamin B6 (Pyridoxine)	72		>54%
Vitamin B12 (Cobalamin)	9	Deficient	>14%
Folate	35		>32%
Pantothenate	7	Deficient	>7%
Biotin	36		>34%
Amino Acids			
Serine	52		>30%
Glutamine	61		>37%
Asparagine	41		>39%
Metabolites			
Choline	23		>20%
Inositol	76		>58%
Carnitine	58		>46%
Fatty Acids			
Oleic Acid	74		>65%
Other Vitamins			
Vitamin D (Ergocalciferol)	91		>83%
Vitamin A (Retinol)	82		>70%
Vitamin K2	64		>30%
Minerals			
Calcium	46		>38%
Zinc	34	Deficient	>37%
Copper	44		>42%
Magnesium	29	Deficient	>37%
Carbohydrate Metabolism			
Glucose-Insulin Interaction	40		>38%
Fructose Sensitivity	53		>34%
Chromium	46		>40%
Antioxidants			
Glutathione	48		>42%
Cysteine	51		>41%
Coenzyme Q-10	89		>86%
Selenium	82		>74%
Vitamin E (A-tocopherol)	91		>84%
Alpha Lipoic Acid	88		>81%
Vitamin C	62		>40%
SPECTROX™			
Total Antioxidant Function	71.0		>65%

The reference ranges listed in the above table are valid for male and female patients 12 years of age or older.

Repletion Suggestions

1. Vitamin B2 (Riboflavin)	20 mg daily of Riboflavin or Riboflavin-5-Phosphate
2. Vitamin B12 (Cobalamin)	1000 mcg daily (consider injectable forms)
3. Pantothenate	500 mg b.i.d. (1000 mg daily)
4. Zinc	25 mg daily
5. Magnesium	200 mg t.i.d. (600 mg daily) as aspartate, citrate, lysinate, glycinate, or malate

Please note: Supplementation is usually required for four to six months to effect the repletion of a functional deficiency in lymphocytes

Suggestions for supplementation with specific micronutrients must be evaluated and approved by the attending physician. This decision should be based upon the clinical condition of the patient and the evaluation of the effects of supplementation on current treatment and medication of the patient.

OVERVIEW OF TEST PROCEDURE

1. A mixture of lymphocytes is isolated from the blood.
2. These cells are grown in a defined culture medium containing optimal levels of all essential. nutrients necessary to sustain their growth in cell culture.
3. The T-lymphocytes are stimulated to grow with a mitogen (phytohemagglutinin) and growth is measured by the incorporation of tritiated (radioactive) thymidine into the DNA of the cells.

The growth response under optimal conditions is defined as 100%, and all other growth rates are compared to this 100% level of growth.

For example – we remove vitamin B6 from the medium and stimulate the cells to grow by mitogen stimulation. Growth is measured by DNA synthesis and the rate of growth is dependent only upon the functional level of vitamin B6 available within the cells to support growth. For Vitamin B6 a growth rate of at least 55% of the growth rate observed in the optimal (100%) media is considered normal. Results less than 55% are considered to indicate a functional deficiency for Vitamin B6. Each nutrient has a different reference range that was established by assaying thousands of apparently healthy individuals.

BREAKING DOWN THE REPORT

1. TEST RESULT (% CONTROL)

This column represents the patient's growth response in the test media measured by DNA synthesis as compared to the optimal growth observed in the 100% media.

2. FUNCTIONAL ABNORMALS

An interpretation is provided for those nutrients found to be deficient.

3. REFERENCE RANGE

This column represents how this patient's result compares to thousands of patients previously tested. A patient's result is considered deficient when it is less than the reference range.

4. GRAPHS

The abnormal range of results is noted in the blue area. Abnormal results are indicated in red. The gray cross hatch area is a representation of the range of test results found in a random selection of subjects.

SPECTROX® – TOTAL ANTIOXIDANT FUNCTION

SPECTROX® is a measurement of overall antioxidant function. The patient's cells are grown in the optimal media, stimulated to grow, and then increasing amounts of a free radical generating system (H2O2) are added. The cell's ability to resist oxidative damage is determined. The increasing levels of peroxide will result in diminished growth rates in those patients with poor antioxidant function capacity.

INDIVIDUAL ANTIOXIDANT LEVELS

In the tests for individual antioxidants, it is determined which specific antioxidants may be deficient and thus affecting the SPECTROX® antioxidant function result. For these tests, the patient's cells are preincubated with one of the nutrient antioxidants, i.e. selenium, and then the Spectrox® test is repeated to determine if the addition of selenium improves the patient's antioxidant function. This process is repeated for each individual antioxidant.

Antioxidants tested with this process:
Glutathione, Cysteine, Coenzyme-Q10, Selenium, Vitamin E, and Alpha Lipoic Acid