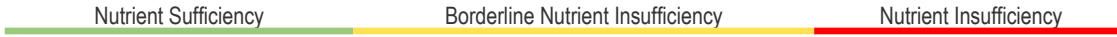


CELLULAR MICRONUTRIENT ASSAY

Lab Director
Dr. Jennifer Spiegel, M.D.

Patient Information		Name: PATIENT II, PRETEND	
Date of Birth: 11/04/1977	Gender: F	Lab ID: 68220	
Date Received: 02/11/2010	Date Collected: 01/01/2010	Date Reported: 09/24/2019	
Physician: Sample Physician		Clinic ID: 10804	



IMPORTANT! Identified adverse food reactions- allergies, sensitivities, and intolerances- should be avoided even if these cellular tests have shown those food sources of micronutrients/botanicals to be "beneficial". The AMA and APA test the responses of B and T lymphocytes, not antibodies (IgE-mediated allergies) or cells of the innate immune system (Alcat Test). Patients and practitioners are encouraged to carefully read all product/supplement labels and avoid all ingredients that are contraindicated for any reason.

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Significant Micronutrients

- **L-Tyrosine** Tyrosine is a non-essential amino acid that is synthesized in the body from an essential amino acid, phenylalanine. **Important for:** • Building block for protein synthesis • Synthesis of the brain chemicals, dopamine, norepinephrine, and epinephrine • Regulation of mood, appetite, pain sensitivity • Thyroid, adrenal, and pituitary function **May be useful for the prevention/treatment of:** depression, ADHD, cognitive performance and memory, narcolepsy, acute stress, alcohol, heroine, and cocaine withdrawal **Good food sources:** poultry, fish, avocados, almonds, cheese, milk, yogurt, bananas, soybean, legumes, nuts, seeds, and some grains
- **Vitamin B6** Pyridoxine helps convert food into fuel and is a cofactor for more than 50 different enzymes. **Important for:** • Metabolism of fats and proteins • Nerve function • Steroid hormone function • Arterial integrity • Immune function • Synthesis of niacin from tryptophan • Breakdown of homocysteine **May be useful for the prevention/treatment of:** atherosclerosis, hair loss, acne, Meniere's disease, taste disorders, vertigo, neurological conditions, gestational diabetes, premenstrual syndrome, anxiety, ADHD cognitive decline, depression, and possibly some protection from certain toxin induced issues **Good food sources:** Poultry, fish, organ meats, potatoes, banana, seeds, soybeans, spinach, whole grains, legumes
- **Biotin** Biotin is an essential B vitamin also known as vitamin B7. **Important for:** • The conversion of carbohydrates, proteins and fats into energy. • Health of skin, nails, eyes, liver, and nervous system. **May be useful for the prevention/treatment of:** diabetes, brittle nails, seborrheic dermatitis of infancy, MS, and uremic neuropathy **Good food sources:** meat, fish, egg yolks, liver, poultry, dairy products, seeds, nuts, sweet potatoes, spinach, and broccoli
- **Vitamin C** Vitamin C (ascorbic acid) is a water soluble vitamin that is essential for human survival. **Important for:** • Antioxidation • Anti-inflammation • Immune function • Blood vessel formation • Muscle formation • Collagen production • Brain Health/neurotransmitter production • Absorption of iron • Blood lipid regulation • Detoxification **May be useful for the prevention/treatment of:** allergic rhinitis, cardiovascular issues, sinusitis, GI issues- constipation, gallstones, gastritis, cold and flu, UTIs, muscle cramps, dysfunctional uterine bleeding, glaucoma, depression, asthma, certain types of cancer, diabetes, obesity, and post exercise muscle soreness **Good food sources:** citrus fruits, raspberries, strawberries pineapple, kiwi, cantaloupe, greens, cruciferous vegetables- Brussels sprouts, broccoli, squash, green beans, carrots, potatoes, tomatoes, peppers
- **Cysteine** L-cysteine is classified as a "semi-essential" amino acid manufactured from methionine. It is made in small amounts by the liver, but the availability of methionine is necessary **Important for:** • Protein synthesis • Support of the synthesis of glutathione, the body's "master antioxidant" • Immune support • Lipid metabolism • Digestive support • Vascular support • Antioxidation • Anti-inflammation • Nerve protection • Detoxification **May be useful for the prevention/treatment of:** Alzheimer's disease, Parkinson's disease, arthritis, poor intestinal health, dementia, multiple sclerosis, male infertility, and osteoporosis **Good food sources:** beef, pork, chicken, sunflower seeds, walnuts, and soy
- **Iron** Iron is a mineral found in trace amounts in every cell in the body. Most of the iron in the body is found in the hemoglobin of red blood cells that carries oxygen from the lungs to the tissues of the body and in myoglobin, a protein providing oxygen to muscles. It also functions in several key enzymes in energy production and metabolism, including DNA synthesis. **Important for:** • Oxygen transport • Growth and development • Immune activity • Energy production and metabolism • Hormone, neurotransmitter, and DNA synthesis **May be useful for the prevention/treatment of:** ADHD, cognitive decline/dementia, fatigue, infertility, and restless leg syndrome. **Good food sources:** Iron exists in foods in two forms, heme iron and nonheme iron. The richest sources of heme iron are oysters, liver, lean red beef, poultry, tuna, and salmon. Non-heme iron is harder for the body to absorb. Sources of non-heme iron are legumes, whole grains, nuts, dried fruit, and greens. Consuming these foods with vitamin C rich foods and/or heme sources of iron, enhances the absorption of nonheme iron.
- **Vitamin B2** Vitamin B2, or riboflavin, is an essential vitamin involved in vital metabolic processes. It is a component of two major coenzymes flavin mononucleotide (FMN-aka riboflavin-5-phosphate) and flavin adenine dinucleotide (FAD). **Important for:** • Normal cell function, growth and development • Metabolism of carbohydrate, protein, and fat for energy production. • Cofactor needed to produce glutathione, a very important antioxidant • Homocysteine metabolism • Promotes iron metabolism • Metabolism of steroids and certain drugs **May be useful for the prevention/treatment of:** migraines, Parkinson's disease, hyperhomocysteinemia, and psoriasis **Good food sources:** turkey, sardines, eggs, legumes, soybeans, broccoli, cauliflower, Brussels sprouts, peppers, root vegetables, and squash
- **Vitamin K1** Vitamin K is a general name of a family of compounds with a common chemical structure-Vitamin K1 (phylloquinone or phytonadione), vitamin K2 (menaquinone), and vitamin K3 (menadione- no longer used in fortified foods/supplements). Vitamin K1 is the primary source of vitamin K that humans obtain through foods. **Important for:** • Regulation of blood clotting • Transport of calcium and bone metabolism • Potential antioxidant protection, and insulin sensitivity support, protection of cells lining blood vessels **May be useful for the prevention/treatment of:** atherosclerosis/ischemic heart disease, nausea hemorrhagic disease of newborns, vomiting of pregnancy, and osteoporosis **Good food sources:** green tea, leafy greens such as kale, turnip greens, and spinach, broccoli, Brussels sprouts, asparagus, cabbage, other vegetables.

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● **High γ - δ Tocopherol**

Vitamin E is a group of eight fat soluble compounds that have varying levels of biological activity. They include four tocopherols (alpha, beta, gamma and delta) and four tocotrienols (alpha, beta, gamma, and delta). Gamma-delta tocopherol comprises about 70% of the vitamin E in a typical American eating pattern. It has very low vitamin E activity but some of its biological effects may be more pronounced than the effects of alpha-tocopherol, the only isomer of vitamin E officially recognized as capable of meeting human requirements. Although gamma tocopherol is not capable of preventing manifestations of vitamin E deficiency, it does appear to have beneficial properties. There is some concern that high doses of vitamin E might have a pro-oxidant rather than an antioxidant effect. High doses of alpha-tocopherol alone might disrupt the normal antioxidant balance and decrease the effect of gamma tocopherol and other vitamin E isomers. No major roles for delta and beta tocopherol have been defined although mixed tocopherols including all tocopherols have been used and have shown benefit. **Important for:** • Antioxidation, prevention of free radical damage • Immune support • Regulation of gene expression • Heart and blood vessel protection, dilation, and inhibits platelet aggregation (gamma and delta tocopherol) • Anti-inflammation **May be useful for the prevention/treatment of:** And more effective than alpha tocopherol in... prostate cancer inhibition, oxidative DNA damage reduction, increase in superoxide dismutase activity, inhibition of platelet aggregation, scavenging of peroxynitrate, a powerful oxidative agent believed to play a role in CVD, cancer, and neurodegenerative diseases, regulation of extracellular fluid volume and blood pressure. **Good food sources:** walnuts, corn oil, soybean oil, flaxseed oil. Some research suggests gamma tocopherol might be transformed to alpha-tocopherol by intestinal microflora

● **Vitamin B9**

Vitamin B9, more commonly known as folate (naturally-occurring form of B9) or folic acid (a synthetic form), is a water-soluble vitamin that is part of the B vitamin family. **Important for:** • Growth and development • Homocysteine and vitamin B12 metabolism • Brain and CNS function • Immune system function • Cardiovascular support • Red blood cell production • Reproductive health **May be useful for the prevention/treatment of:** Alzheimer's disease, cardiovascular disease, homocysteine lowering, anemia, migraines, restless legs, dermatitis, autism, depression, cognitive decline/dementia, age-related macular degeneration, birth defects, diarrhea, hearing loss, osteoporosis, cervical dysplasia, ulcerative colitis, and recurrent miscarriages **Good food sources:** Spinach and other leafy greens, green vegetables, beets, banana, melon, legumes, yeast, mushrooms, oranges and tomato juice.

● **Vitamin D**

Vitamin D, known as the "sunshine" vitamin, is a fat soluble vitamin produced by the body in response to sun exposure; it is naturally present in few foods. It functions as a prohormone. **Important for:** • Calcium absorption in the gut • Bone development, bone mineralization, bone health • Regulation of serum calcium and phosphorous levels • Neuromuscular and immune function and maturation of white blood cells • Cell growth • Enhancement of insulin secretion/action • Reduction of inflammation **May be useful for the prevention/treatment of:** eczema, colds, hepatitis C, osteomalacia/osteoporosis, asthma, burns, cancer, CHF, Crohn's disease, depression, diabetes, fatigue, Parkinson's disease, PCOS, lupus, and more **Good food sources:** oily fish -salmon, sardines, herring, mackerel, and tuna, cod liver oil, fortified milk, eggs, liver

● **Methionine**

Methionine is an essential amino acid that is involved in the synthesis of important protein molecules and other amino acids. **Important for:** • The support of detoxification of toxins and heavy metals • Antioxidant function • Digestive support • The availability of folate • The support of healthy liver function • Reduction of histamine in blood • Exercise recovery, connective tissue production, and cardiovascular health • Hair and nail strength **May be useful for the prevention/treatment of:** pancreatitis, Parkinson's disease, urinary tract infections, and diaper rash **Good food sources:** Brazil nuts, meat, poultry, fish, yogurt, cheese, eggs, legumes, soybeans, sesame seeds, and grains

● **Arginine**

L-arginine is an amino acid, a building block for protein synthesis, and is best known for its effects on the vascular system. **Important for:** • Vasodilation – dilatation and relaxation of blood vessels • Wound healing and enhancement of the immune system • Ammonia detoxification **May be useful for the prevention/treatment of:** anal fissure, congestive heart failure, erectile dysfunction, pre-eclampsia, sickle cell disease, esophageal spasm, infertility, interstitial cystitis, and Raynaud's disease **Good food sources:** meat, poultry, fish, dairy products, peanuts, nuts, seeds, whole grains, legumes, and chocolate.