

## CLINICAL APPLICATIONS OF SPECTRACELL'S MICRONUTRIENT TESTS IN AGING PATIENTS

Chronic illness, heavy use of medications and periods of lengthy hospitalization are often underlying causes of nutritional deficiency in the aging and elderly. In addition, lifestyle factors, immobilization, isolation and physiological factors associated with aging compound the risks and affect the ability of the older person to meet nutritional needs to digest, absorb, utilize or excrete nutrients that are ingested. It is widely recognized that physiological changes associated with aging can compromise the nutritional status of the older person and influence nutritional requirements. Without a vehicle to accurately identify these changes, we risk failing to deliver appropriate nutritional recommendations. With the diagnostic information gathered by SpectraCell's MicroNutrient Testing, clinicians can focus on intracellular deficiencies that may have an impact on chronic disease conditions such as Alzheimers, arthritis, cardiovascular disease, cancer and diabetes.

## DRUGS AND THEIR EFFECT ON NUTRITIONAL STATUS

| DRUG TYPE                      | BRAND NAME   | NUTRIENT LOSS   |
|--------------------------------|--|---|
| ANTACIDS                       | Pepcid, Tagemet, Zantac<br>Prevacid, Prilosec  | Vitamin B12, Folic Acid, Vitamin D, Calcium, Iron, Zinc<br>Vitamin B12  |
| ANTIBIOTICS                    | General Aminoglycosides<br>(gentomycin, neomycin, streptomycin),<br>Cephalosporins, Penicillins<br>Tetracyclines   | B vitamins, Vitamin K, friendly beneficial intestinal bacteria<br>Calcium, Zinc, Magnesium, Iron, Vitamin B6                        |
| ANTI-DIABETIC DRUGS            | Dymelor, Micronase, Tolinase<br>Glucophage   | Coenzyme Q10<br>Coenzyme Q10, Vitamin B12, Folic Acid   |
| ANTIDEPRESSANTS                | Adapin, Aventyl, Elavil, Tofranil, Pamelor,<br>Sinequan, Norpramin   | Vitamin B12, Coenzyme Q10   |
| ANTI-INFLAMMATORIES            | Aspirin & Salicylates<br>Advil, Aleve, Anaprox, Dolobid, Feldene,<br>Lodine, Motrin, Naprosyn, Orudis,<br>Relafen<br>Betamethasone, Cortisone,<br>Dexamethasone, Hydrocortisone,<br>Methylprednisolone, Prednisone | Vitamin C, Folic Acid, Iron, Potassium<br>Folic Acid<br>Vitamins C, D, Folic Acid, Calcium, Magnesium,<br>Potassium, Selenium, Zinc |
| CARDIOVASCULAR DRUGS           | Apresoline<br>Catapres, Aldomet<br>Corgard, Inderal, Lopressor, Betapac,<br>Tenormin, Sectral, Blocadren   | Vitamin B6, Coenzyme Q10<br>Coenzyme Q10<br>Coenzyme Q10, Melatonin   |
| DIURETICS                      | Lasix, Bumex, Edecrin<br>Enduron, Diuril, Lozol, Zaroxolyn,<br>Hygroton  | Vitamins B1, B6, C, Magnesium, Calcium<br>Potassium, Zinc, Sodium<br>Magnesium, Potassium, Zinc, Coenzyme Q10, Sodium               |
| CHOLESTEROL<br>LOWERING AGENTS | Lescol, Lipitor, Mevacor, Zocor,<br>Pravacol<br>Colestid, Questran   | Coenzyme Q10<br>Vitamins A, B12, D, E, K, Beta-Carotene, Folic Acid, Iron   |
| HORMONE<br>REPLACEMENT (HRT)   | Evista, Prempro, Premarin, Estratab  | Vitamins B2, B6, B12, C, Folic Acid, Magnesium, Zinc  |
| ULCER MEDICATIONS              | Tagamet, Pepcid, Axid, Zantac<br>Prevacid, Prilosec  | Vitamins B12, D, Folic Acid, Calcium, Iron, Zinc, Protein<br>Vitamin B12, Protein   |

## NUTRIENTS SPECIFICALLY IMPORTANT TO AGING PATIENTS

In addition to common depletions by various drug treatments, these nutrients have extra significance to aging patients:

|             |  |
|-------------|--|
| CoQ10       | Various cardiovascular problems, weak immune system, low energy  |
| Calcium     | Heart & blood pressure irregularities, osteoporosis, tooth decay   |
| Magnesium   | Cardiovascular problems, asthma, osteoporosis, cramps, PMS   |
| Potassium   | Irregular heartbeat, muscle weakness, fatigue, edema   |
| Vitamin B6  | Increased cardiovascular disease risk, depression, sleep disturbance   |
| Vitamin B12 | Increased cardiovascular disease risk, anemia, tiredness, weakness   |
| Folic Acid  | Cardiovascular disease, birth defects, cervical dysplasia, anemia  |
| Vitamin E   | Hearing disease risk, weak immune system, increased free radical damage                                      |
| Carnitine   | Elevated blood lipid levels, abnormal liver function, muscle weakness, less energy, impaired glucose control |

## NUTRIENTS TESTED BY SPECTRACELL'S MICRONUTRIENT AND CARDIOVASCULAR TESTS

|              |                            |                                      |
|--------------|----------------------------|--------------------------------------|
| Vitamin A    | Asparagine                 | Lipoic Acid                          |
| Vitamin B1   | Calcium                    | Magnesium                            |
| Vitamin B2   | Carnitine                  | Oleic Acid                           |
| Vitamin B3   | Choline                    | Selenium                             |
| Vitamin B6   | Chromium                   | Serine                               |
| Vitamin B12  | Coenzyme Q10               | SPECTROX™ Total Antioxidant Function |
| Vitamin C    | Copper                     | Zinc                                 |
| Vitamin D    | Cysteine                   |                                      |
| Vitamin E    | Fructose Sensitivity       |                                      |
| Vitamin K2   | Glucose/Insulin Metabolism |                                      |
| Biotin       | Glutamine                  |                                      |
| Inositol     | Glutathione                |                                      |
| Folate       |                            |                                      |
| Pantothenate |                            |                                      |

## COMMON RELATED DIAGNOSIS CODES

|        |   |        |   |
|--------|---|--------|---|
| 414.00 | Coronary atherosclerosis, of native coronary artery | 269.90 | Nutritional deficiency, unspecified       |
| 780.71 | Chronic fatigue syndrome                            | 769.40 | Other abnormal clinical findings          |
| 401.90 | Essential Hypertension, unspecified                 | 226.20 | Other nutritional deficiency              |
| 401.10 | Essential Hypertension, benign                      | 277.80 | Other unspecified disorders if metabolism |
| 272.40 | Hyperlipidemia, other and unspecified               | 719.48 | Pain in joint, other specified sites      |
| 272.90 | Disorder of metabolism                              | 272.00 | Pure hypercholesterolemia                 |
| 259.90 | Endocrine disorder, unspecified                     | 786.05 | Shortness of breath                       |
| 780.79 | Malaise and fatigue, other general symptoms         | 780.20 | Syncope and collapse                      |
| 269.30 | Mineral Deficiency, unspecified                     | 785.20 | Undiagnosed cardiac murmurs               |
| 729.10 | Myalgia and myositis, unspesied                     | 269.20 | Vitamin deficiency, unspecified           |

| COMPARISON: MICRONUTRIENT TESTING & OTHER NUTRITIONAL ASSAYS          | Micronutrient Testing | Metabolite Excretion | Enzyme Activation Index | Microbial Growth Assays |
|---|-----------------------|----------------------|-------------------------|-------------------------|
| Measure a combination of cellular functions for each micronutrient?   | YES                   | NO                   | NO                      | NO                      |
| Measure ability to support normal metabolic functions?                | YES                   | NO                   | NO                      | NO                      |
| Determines individual functional requirements?                        | YES                   | NO                   | NO                      | NO                      |
| Demonstrate the intracellular function simultaneously?                | YES                   | NO                   | NO                      | NO                      |
| Reflect average of long-term nutritional history (over three months)? | YES                   | NO                   | NO                      | NO                      |
| Use living cells from the patient?                                    | YES                   | NO                   | NO                      | NO                      |
| Identify biochemical individuality?                                   | YES                   | NO                   | NO                      | LIMITED                 |